North Carolina Department of Health and Human Services
Division of Public Health, On-Site Water Protection Branch
Draft 15A NCAC 18E Rules-Review

09.01.2017
Sheet 1

Proposed 18E Rules

Comment/Question/Clarification

Pertinent sections-
.0800 Tank Capacity Requirements
.0805 Tank Structural Integrity and Leak Testing Requirements
.0806 Tank Installation Requirements
.1400 Approval of Tanks and Appurtenances
.1402 Tank Design and Construction
.1403 Tank Material Requirements
.1404 Plans for Risers, Effluent Filters, and Pipe Penetrations
.1405 Risers, Effluent Filters, and Pipe Penetration Approval Renewal

.0800 Tank Capacity

(a) (1) Min cap any tank 1000 Gal
(2) 4 bdrms or less 1000 w/o Garbage Disposal, 1250 w GD
5 bdrms 1250 " 1500 w GD
(3) >5 bdrms min size is 1500

(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. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second compartment of the septic tank. 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:

Comment/Question/Clarification

(1) approved effluent filter shall be in the compartment immediately prior to discharge; and
(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

15A NCAC 18E .0802 PUMP TANK CAPACITY REQUIREMENTS

(a) The minimum pump tank liquid capacity shall be based on one of the following, but shall never be less than 1,000 gallons:

(1) equal to the required septic tank capacity in Group IV soils;
(2) equal to two-thirds of the required septic tank capacity in Group I, II, or III soils; or
(3) based on the following:
(A) pump submergence or as recommended by the pump manufacturer;
(B) required dose volume in accordance with Rule .1101(d) of this Subchapter;
(C) flow equalization storage, if applicable; and
(D) 24-hour emergency storage above the high-water alarm activation level.

Question: Does this apply to conventional systems only? Would the same apply to advanced treatment applications? It would that the final treatment technology used would influence this more than soil class or group.

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

(1) pump submergence or as recommended by the pump manufacturer;
(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;
(3) flow equalization storage, if applicable; and
(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this rule

(c) The emergency storage capacity may be calculated as the sum of freeboard space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

(d) The emergency storage capacity requirement shall be determined based on the following and in accordance with Table XV:

(1) type of facility served;
(2) classification of surface waters which would be impacted by a pump tank failure; and
(3) availability of standby power devices and emergency maintenance personnel.
(Table XV ommitted from analysis)

15A NCAC 18E .0803 GREASE TANK CAPACITY REQUIREMENTS

(a) Grease tanks or grease tanks in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. 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 liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(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 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 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(e) The grease tank liquid capacity shall be calculated by one of the following:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF 16

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

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 and recreational areas;

0.8 if along other roads)

(f) An approved grease rated effluent filter shall be in the second compartment of the grease tank. When two or more grease tanks are used in series in accordance with Paragraph (d) of this Rule, the following conditions shall be met:

Comment/Question/Clarification

Question/Clarification:
Are the "grease tanks" referred herein synonomous with a large volume grease interceptor i.e. per IAPMO Z1001? We struggle with the terms "grease trap", usually a small volume separation device under the sink in a commercial kitchen vs "grease interceptors" usually a larger volume UST in the drain line between the kitchen drains and either an OWTS or a municipal sewere collection system. The terms get used interchangebly. The UPC distinguishes the two as follows:
Grease Trap- <50gpm say (1) for 1-3 drains/sources
Grease Interceptor >50gpm-Multiple drains/sources/traps.
We suggest that the term "Grease Interceptor" be adopted for this and other sections where it is referred to.
Question: Is 2:1 L/W ratio a minimum? If so, it should be stated as such.

Question: When multiple tanks are used to meet GI capacity greater than 1500G, can each the tanks have a 2:1 L/W ratio?

Comment/Question/Clarification

(1) approved grease rated effluent filter shall be in the compartment immediately prior to discharge;
(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank.

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

Clarification: Ref Page 3: Tank vs Interceptor vs Trap

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

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.

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

Question: Will IAPMO Z1000 or CSA B66 listing/continuous compliance program satisfy this requirement?

(3) A concrete tank manufacturer enrolled in a third-party quality assurance and quality control program as described in Subparagraph (a)(2) of this Rule is not subject to 10 percent testing of all tanks installed.

(b) Tanks installed under the following conditions shall be leak tested at the site using leak testing methods described in this Rule:

(1) soil wetness condition is present within five feet of the elevation of the top of a mid-seam pump tank;
(2) advanced pretreatment; or
(3) PE design.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested.

(E) Tank shall be approved if there is no visible flowing leakage and the water level in the tank has not fallen after sitting for one hour.

(2) Vacuum test procedure

(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 2.5 inches of mercury.

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) 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)(17) and (e)(8) of this Subchapter marked over.

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

Comment/Question/Clarification

Comment: Subject to manufacturer's instructions for insitu vacuum testing.

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.
(c) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703 of this Subchapter to prevent differential settling of the pipe and shall be level for two feet after exiting the tank.
(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.
(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.
(f) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approval material, and installed in accordance with the tank manufacturer's instructions and industry standards. When rock or other protruding obstacles are encountered, the bottom of the tank excavation shall be backfilled with sand, gravel, stone, or other approved equivalent material to three inches above rock or obstacle.
(g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section.
SECTION .1400 – APPROVAL OF TANKS AND APPURTENANCES
15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS Pg 120
(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be cor
and shall comply with all rules of this Section.
(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.
(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and a temporary identification number issued, the tank manufacturer shall conduct the structural loading requirements of Paragraph (f) of this Rule. Once third-party documentation in accordance with Paragraph (f) of this Rule has been submitted to the State, a tank approval letter will be issued to the tank manufacturer with a permanent identification number. Tanks may not be sold without a permanent identification number. The temporary identification number is for tracking purposes only.
(d) Plans and specifications for tanks with a total liquid capacity of 3,500 gallons or less shall show the design in

Comment/Question/Clarification

Question: Is the intent that this outlet pipe is provided by the tank mfgr with the prefabricated tank or provided by the installer for assy at the installation site? What is the significance of two feet of length? If the pipe extends from the tank outlet tee to the distrbution box/pump tank/ next segment of the treatment train without a mechanical joint, is that considerd compliant? Is the intent of this that the outlet pipe should be a minimum of 2 ft in length?

detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) wall and slab thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall 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) liquid depth and operating capacity in gallons;

(4) pipe penetration locations and State approved pipe penetration boot;

(5) methods and material for sealing sections and forming water tight joints in tanks with multiple sections;

(6) detailed drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank; and

(7) tank manufacturer and PE requirements for installation, including bedding and recommend methods for additional sealing, as applicable.

(e) Plans and specifications for tanks with a total liquid capacity greater than 3,500 gallons and all tanks designed for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

(2) after completion of the vacuum test requirement in Subparagraph (f)(1) of this Rule, the tank shall be subject to a water test. The water test shall be conducted in accordance with Rule .0805(c)(1); and

(3) written documentation of the testing shall be provided to the State. The written documentation shall

Comment/Question/Clarification

Question: What constitutes a third party?:
PE licensed in the State of NC?
PE licensed in any of the 50 States?
Non-accredided testing agency?
Accredited testing agency?

include:

(A) drawing of the tank model tested, showing dimensions and type of reinforcement used;
(B) results of the vacuum and water tests, including if there was any vacuum or water drop, surface cracking, deformation, or cracking of the tank during the test; and
(C) third-party person(s) present who witnessed the testing and their written statement of agreement with the results submitted to the State.

Comment/Question/Clarification

(g) Plans for prefabricated tanks other than those pre-approved under this Section shall be considered for tank approval on an individual basis based on the information provided by the tank manufacturer or designer to the State. The information shall indicate the tank shall perform in the same manner and to the same standard as those designed in accordance with the rules of this Section.
(h) The State 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.

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION Pg 122

(a) Tanks shall be watertight and not subject to excessive corrosion or decay.
(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.
(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate 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 visibly marked at finished grade.
(d) Septic tanks shall meet the following minimum design standards:

(1) minimum liquid depth of 36 inches;
(2) 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) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;
(4) length of the tank shall be twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;
(5) three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

(6) inlet and outlet openings shall have cast or manufactured penetration points;
(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644;
(8) 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;
(9) no pipe penetration points or openings shall be permitted below the septic tank operating liquid level;
(10) the outlet shall be through an approved effluent filter 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;
(11) invert of the outlet shall be two inches lower in elevation than the invert of the inlet;
(12) other methods of supporting the effluent filter case and for making pipe penetrations shall meet all the requirements of this Rule and shall be reviewed on a case by case basis by the State;
(13) 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 to remain in position when subjected to a liquid capacity in one compartment;
(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 leave a water passage slot four inches high for the full interior width of the tank;
(E) two four-inch openings, or one four-inch opening per 30 linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;
(F) the entire liquid passage shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level;
(G) there shall be no other openings in the partition wall below the water passage slot or

Comment/Question/Clarification

Evaluation of pipe penetration seal design indicates that most if not all ASTM C1644 compliant products are "cast in" sleeves for precast concrete structures. As a thermoplastic tank mfgr., we do not have a means of integrating a "cast in" type seal/sleeve to our product design. Roth supplies ASTM C923 (4" SDR 35) and ASTM C564 (4" Sch 40) rubber septic grommets that ship with all of our tank products. Will these or other products be allowed if no ASTM C1644 listed products are compatible with thermoplastic tank products?

Comment: We have not encountered a tank design standard or regulation that allowed a tank outletflow area less than the inlet.

Clarification: Measured from the tank bottom up or the liquid surface down?

Clarification: 30 linear inches of baffle wall- horizontal or vertical plane?

Comment/Question/Clarification

openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal 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;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds; and

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks.

(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 six inches above finished grade;

(2) the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening;

(3) larger or multiple access risers shall be provided when two or more pumps are required;

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain two four-inch diameter circular openings, or equivalent, 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 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 more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be approved septic tanks with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, 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;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less;

(4) 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. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when a sanitary tee is used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tee(s) shall be provided for servicing and routine maintenance.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and

(4) tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS Pg 125

(a) Tanks designed to hold sewage shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls. Tanks and tank lids shall be able to withstand a uniform live loading of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

Comment/Question/Clarification

"Grease Interceptors"

Meausured from tank bottom or liquid surface?

Ditto

Ditto

It might be worthwhile to include a requirement that Grease Interceptors installed in parking areas proximate to food service establishments or areas with vehicle access, must be traffic rated or installed using methods PE approved to provide traffic rated load bearing capacity.

(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 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;

(A) the reinforcing wire shall be lapped six inches;

(B) concrete cover shall be required for all reinforcement; and

(C) reinforcement shall be placed to maximize the structural integrity of the tank;

(3) 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;

(4) 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 State for review and tank approval;

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Testing shall be performed using a properly calibrated Schmidt Rebound Hammer or approved equal;

(6) 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 State approved equivalent that is waterproof, corrosion-resistant, and approved for use with concrete tanks; and

(7) tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

(c) Unless otherwise required, thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified.

(d) Glass-fiber-reinforced tanks shall meet the following material and construction requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 0.2 inches. The baffle wall shall be 3/16-inch thick; and

(2) material and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks.

(e) Cast in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

Comment/Question/Clarification

Ref: .0805 (a)(1) 3rd party QA/QC program

15A NCAC 18E .1404 PLANS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS Pg 126

Comment/Question/Clarification

(a) Risers and riser lids shall be able to withstand a uniform live loading of 300 pounds per square foot 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.

(b) Riser plans and specifications submitted for review and riser approval shall show the design of the riser in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

(2) physical dimensions of the riser and riser cover, such as wall thickness, internal diameter, proposed casting or installation details and methods, pipe penetrations, and all other dimensions as appropriate;

(3) material type and strength including reinforcement material and location as required;

(4) documentation by a third-party of structural testing to four inches of mercury for five minutes without deformation or failure. Testing shall be done on each diameter of riser and shall be done on the greatest height of a single section that the owner is seeking approval for;

(5) for septic tank risers, a secondary lid, concrete plug, or other State approved safety device to be provided inside the riser for additional security and to prevent accidental entry;

(6) for pump tank risers, State approved primary and secondary safety mechanism shall be provided; and

Clarification:
Can primary and secondary be interpreted as locking outer lid/cover with secondary lid/net to protect from unauthorized/accidental entry?

(7) installation instructions, for both new and retrofit applications, for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and effluent filter approval shall show the design of the effluent filter in detail, including:

(1) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(2) sizing as to capacity and wastewater strength for all models of proposed filters to be approved; and

(3) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and pipe penetration approval shall show the design of the pipe penetration in detail, including:

(1) manufacturer's name, address, phone and fax numbers;

(2) design specifications and materials used in the manufacture of pipe penetration components;

(3) applicable testing results from third-party verification showing pull and flexibility testing;
(4) testing for watertight seal around piping including any component or device included to assure the seal, such as non-corrodible adjustable bands;
(5) documentation that the pipe penetration meets the requirements of ASTM C1644; and
(6) specifications for application, installation, operation, and maintenance.

(e) Plans for risers, effluent filters, and pipe penetrations shall be reviewed and approved by the State and assigned an Identification Number when the design is found to comply with this Section.
(f) Plans for prefabricated risers, effluent filters, and pipe penetrations other than those pre-approved under this Rule shall be considered for approval on an individual basis based on the information provided by the manufacturer or designer to the State. The information shall indicate the riser, effluent filter, or pipe penetration shall perform to the same standard as those designed in accordance with the provisions of this Section.

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL Pg 127

(a) All riser, effluent filter, and pipe penetration approvals will expire five years after the date the approval is signed. Approvals shall be re-issued when the provisions of this Rule have been met.
(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued compliance with the criteria listed in Rule .1404 of this Section.
(c) The State may re-issue a riser, effluent filter, or pipe penetration approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product compliance.

Comment/Question/Clarification

Ref: Comment/Question .1402(d)(7)&(8)

Comments on Proposed 15A NCAC 18E

Page 7 Line 3 **15A NCAC 18E .0105 DEFINITIONS (11)**

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

Should this definition also include "Sewer Laterals" that run from a structure to the structure's wastewater disposal system (on-site wastewater treatment system) or collection system (sewer outfall).

Page 54 Line 5 **TABLE IX. Minimum setbacks from all wastewater systems to site features**

TABLE IX. Minimum setbacks from all wastewater systems to site features

Site Features	Setback (feet)
Any public or private water supply source, including a private drinking water well or spring*	100
Surface waters classified Water Supply Class I (WS-I), from mean high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal pool elevation	100
Lake, pond, or stormwater detention pond, from flood pool elevation	50
Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
Any water line, including fire protection and irrigation water lines	10
Geothermal wells – open or closed loop vertical bore	50
Geothermal wells – horizontal closed loop system	10
Building foundation with artificial drainage	15
Building or other foundation without artificial drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	15
Above ground swimming pool	5
Top of slope of embankment or cuts of two feet or more vertical height	15
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25

Surface water diversion, as measured on the ground surface from the edge of the diversion	15
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15
Permanent stormwater retention basin or sediment detention basin	50
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
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	15
Utility transformer, ground-surface mounted	10

Delete "open or" from "Geothermal wells – open or closed loop vertical bore". Open loop wells used in conjunction with a heating and cooling system must comply with construction standards at least as stringent as a water supply well. This would require a separation distance of 100 feet. An open loop heating and cooling system that discharges to the surface would require more water than one that returns the water to a subsurface aquifer.

Change "Geothermal wells – open or closed loop vertical bore" to "Geothermal aqueous closed loop wells". Separation distance of 50 feet complies 15A NCAC 02C .0222 (e) (5) (B).

Add to Site Features "Geothermal Direct Expansion Closed Loop wells". As these boreholes are often drilled diagonally outward from a central location at the surface, separation distance should be established as "50 feet from entire length of the borehole" to comply with 15A NCAC 02C .0223 (e) (6) (B).

Change "Geothermal wells – horizontal closed loop system" to "Horizontal Closed-Loop Geothermal System" as it is not included in definition of "well". Change separation distance to 15 feet as these systems are installed in trenches six to seven feet deep. This is a vertical cut of more than two feet.

There are many types of "injection wells", including "Geothermal wells". Delete "injection well" unless it is specifically defined.

What is the separation distance from "Abandoned Wells"?

Page 55 Line 2 **15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS (b)**

(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:

(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or

(2) the private water supply is a well for which a variance for a reduced separation has been issued.

15A NCAC 18E .0601 (b) (1) would require a separation distance of 100' from a well even when the design flow of the septic system is 100 gpd, much less than the 50' required separation for a 600 gpd single family dwelling. Current separation distance is 50' for a private water supply. The proposed change would make the sewage rules concur with DWR rules. However, the higher the water usage the greater the separation should be. The 50' separation distance should be allowed for daily flows of 480 gpd or less, regardless of usage (single family dwelling or private usage).
In 15A NCAC 18E .0601 (b) (2) who is to issue the variance and what is the reason for the variance?

Page 56 Line 11 **TABLE XI. Minimum setbacks from collection sewers to site features**

(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.

TABLE XI. Minimum setbacks from collection sewers to site features

Site Features	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft.*
Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft.*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main

	standards, in which case the minimum setback may be reduced to 10 ft.*
Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10
Permanent stormwater retention basin or sediment detention basin	10
Bio-retention area, injection well, or infiltration gallery	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
Utility transmission and distribution line poles and towers, including guy wires	5
Utility transformer, ground-surface mounted	5

A sewer lateral from a building to a sewer main outfall or a septic tank would meet the definition of a "collection sewer". On May 12, 2017 the NC Division of Water Resources issued a state-wide variance allowing construction of a well for a residence or non-public water system to be constructed with a minimum separation distance of 25 feet from a sewer lateral. This variance would not apply to any other types of "collection sewers".

Delete "open or" from "Geothermal wells – open or closed loop vertical bore". Open loop wells used in conjunction with a heating and cooling system must comply with construction standards at least as stringent as a water supply well. This would require a separation distance of at least 50 feet. An open loop heating and cooling system that discharges to the surface would require more water than one that returns the water to a subsurface aquifer.

Change "Geothermal wells – open or closed loop vertical bore" to "Geothermal aqueous closed loop wells". Separation distance of 25 feet complies 15A NCAC 02C .0222 (e) (5) (D).

Add to Site Features "Geothermal Direct Expansion closed loop wells". As these boreholes are often drilled diagonally outward from a central location at the surface, separation distance should be established as "25 feet from entire length of the borehole" to comply with 15A NCAC 02C .0223 (e) (6) (D).

Change "Geothermal wells – horizontal closed loop system" to "Horizontal Closed-Loop Geothermal System" as it is not included in definition of "well". Separation distance of 5 feet complies with separation distance to any other dispersal field except designated dispersal field repair area for project site.

There are many types of "injection wells", including "Geothermal wells". Delete "injection well" unless it is specifically defined.

What is the separation distance from "Abandoned Wells"?

Page 60 Line 3 **15A NCAC 18E .0701 COLLECTION SEWERS**

15A NCAC 18E .0701 COLLECTION SEWERS

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.

At what point will DHHS have authority over collection sewers? At what point does the NC Department of Insurance Plumbing Inspector relinquish authority?

0302

SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

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

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 not discharge effluent to the land surface, surface waters, or directly to groundwater.

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

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

15A NCAC 18E .0102 APPLICABILITY

(a) The provisions of this Subchapter shall not apply to functioning wastewater systems in use prior to July 1, 1977, unless the wastewater strength changes or design daily flow increases.

(b) If the existing facility's design daily flow increases or wastewater strength changes, the owner shall submit an application in accordance with Rule .0202 of this Subchapter. The owner shall submit this application to the LHD prior to any change of flow or wastewater strength.

(c) All wastewater systems shall comply with Section .1300 of this Subchapter, except for the wastewater systems that meet the requirements of Paragraph (a) of this Rule.

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, and contact information for where a copy of the documents may be obtained from.

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

United States Department of Agriculture – Natural Resources Conservation Service (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	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	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	
C890	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
C990	Forty dollars ($40.00) each plus six dollars and ten cents ($6.10) shipping and handling

C1644	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D448	Thirty nine dollars ($39.00) each plus six dollars and ten cents ($6.10) shipping and handling
D1784	Thirty nine ($39.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D1785	Fifty dollars ($50.00) plus six dollars and ten cents ($6.10) shipping and handling
D2241	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2466	Forty four ($44.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D2564	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2729	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2774	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D3034	Fifty dollars ($50.00) each plus six dollars and ten cents ($6.10) shipping and handling
D6913	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
D7928	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
F667	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O	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 02C	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	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	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 02U	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 13B	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
NSF International PO Box 130140, Ann Arbor, MI 48105 http://www.nsf.org/	
Standard 40	One hundred five dollars ($105.00) each plus shipping and handling
International Association of Plumbing and Mechanical Officials (IAPMO) 4755 E Philadelphia St, Ontario, CA 91761 http://www.iapmo.org/Pages/IAPMOgroup.aspx	
IAPMO/ANSI Z1000	One hundred dollars ($100.00) each
Canadian Standards Association 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
North Carolina Plumbing Code	
	Available at no charge at:

	http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/2012_NCBuildingCode_amendments/PlumbingCode-2012NCAmendments100517.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
American Association of State and Highway Transportation Officials (AASHTO) 444 North Capital Street, NW, Suite 249, Washington, DC 20001 https://www.transportation.org/	
Standard Specifications for Highway Bridges (AASHTO H5 and H10)	Three hundred eighty dollars ($380.00) each plus shipping and handling

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

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

15A NCAC 18E .0104 ABBREVIATIONS

As used in this Subchapter, the following abbreviations mean:

(1) ABS: Acrylonitrile-Butadiene-Styrene;

(2) ACEC: Apparent Cation Exchange Capacity;

(3) ANSI: American National Standards Institute;

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

(5) ATO: Authorization to Operate;

ATO for EOP

(6) BOD: Biochemical Oxygen Demand;

(7) CA: Construction Authorization;

(8) CBOD: Carbonaceous Biochemical Oxygen Demand;

(9) CFR: Code of Federal Regulations;

(10) CSA: Canadian Standards Association;

(11) DDF: Design Daily Flow;

(12) DEQ: Department of Environmental Quality;

(13) DIP: Ductile Iron Pipe;

(14) DOT: Department of Transportation;

(15) DSE: Domestic Strength Effluent;

(16) EOP: Engineer Option Permit;

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

(18) gpd: Gallons per Day;

(19) IP: Improvement Permit;

(20) IPWW: Industrial Process Wastewater;

(21) LC: Limiting Condition;

(22) LDP: Large Diameter Pipe;

(23) LG: Licensed Geologist;

(24) LHD: Local Health Department;

(25) LPP: Low Pressure Pipe;

(26) LSS: Licensed Soil Scientist;

(27) LTAR: Long Term Acceptance Rate;

(28) mg/L: Milligrams/Liter;

(29) NEMA: National Electrical Manufacturers Association;

(30) NH_3: Total Ammonia Nitrogen;

(31) NOI: Notice of Intent to Construct;

(32) NOV: Notice of Violation;

(33) NSF: NSF International;

(34) OP: Operation Permit;

(35) PE: Professional Engineer;

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

(37) PPBPS: Prefabricated Permeable Block Panel System;

(38) psi: Pounds per square inch;

(39) PVC: Poly Vinyl Chloride;

(40) RV: Recreational Vehicle;

(41) RWTS: Residential Wastewater Treatment Systems;

(42) SDR: Standard Dimension Ratio;

(43) SWC: Soil Wetness Condition;

(44) TKN: Total Kjeldahl Nitrogen;

(45) TL: Trench Length;

(46) TN: Total Nitrogen;

(47) TSS: Total Suspended Solids;

(48) TW: Trench Width;

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

(50) VIP: Visual Inspection Protocol; and

(51) 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

The following definitions shall apply throughout this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material (crushed rock or gravel) screened to size for various uses.

(2) "Apparent Cation Exchange Capacity" (ACEC) means the sum of exchangeable bases plus total soil acidity at a pH of 7.0. ACEC is expressed in milliequivalents per 100 grams of soil (meq/100g of soil) or centimoles per kilogram of soil (cmols/kg of soil). The apparent soil ACEC is calculated by determining the ACEC using the neutral normal ammonium acetate method, pH of 7.0 neutral normal, and then dividing by the percent clay as determined by particle size distribution (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.

(3) "Approved" means that which the State 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 soil wetness condition or intercept lateral flowing ground or surface water. Artificial drainage systems include the following: groundwater lowering system, interceptor drain, foundation drain, and surface water diversion.

(5) "Authorized agent of the LHD" referred to as authorized agent, means a person who has been authorized by the State 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) "Bed" means an excavation with a width greater than three feet containing dispersal media and one or more laterals.

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

(9) "Berm" means a raised drainage feature used to divert stormwater runoff.

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

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

As defined in the Statutes ?

this is defined as per current rules, but defined as collection system by others i.e. CIDWT , perhaps creates conflicts on setbacks from forcemain/supply line, PM etc...

(12) "Complete data set" means analytical results for all required influent and effluent constituents (as specified in the effluent quality 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.

(13) "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.

(14) "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 dosing activation elevation settings.

(15) "Design daily flow" means the 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.

(16) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater design daily flows are based. Multiple design units can comprise a facility.

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

(18) "Dispersal media" means the media used to provide void space through which effluent flows and is stored prior to infiltration (e.g., washed gravel or crushed stone, polystyrene aggregate, chambers, pipe, drip tubing with emitters, etc.).

(19) "Dose volume" means an amount of effluent delivered during a dosing event as determined by the activation levels in a demand dosing system or by a timer in a time dosing system.

(20) "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.

(21) "Effluent" means the liquid discharge from a pretreatment component.

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

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

(24) "Flood pool elevation" means the maximum water surface elevation of a reservoir, equal to the elevation of the spillway.

(25) "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.

(26) "Full kitchen" means all the appliances in a warming kitchen plus a warewashing machine or equipment.

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

(28) "Gravity distribution" means gravity delivery of effluent to and within each lateral.

Include definition Certified Installer, Certified Contractor

(29) "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 distance beneath a dispersal field.

(30) "Horizon" means a layer of soil, approximately 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.

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

(32) "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.

(33) "Interceptor drain" means subsurface 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. Interceptor drains are a type of artificial drainage.

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

(35) "Jurisdictional wetland" means land established as a wetland by DEQ or the US Army Corp of Engineers under Section 404 of the Federal Clean Water Act.

(36) "Ksat" or saturated hydraulic conductivity, means the value of water flow (flux) 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.

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

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

(39) "Limiting condition" means soil conditions (morphology, wetness, depth, restrictive horizon, or organic matter content) or site features (topography, slope, landscape position, or available space) that restrict design options or prohibit permitting a wastewater system.

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

(41) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil or saprolite in a wastewater system after long-term use. The LTAR, in units of gallons per day per square foot (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.

Public Management Entity with Certified Operator?

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

(43) "Management Entity" means the person, entity, company, or firm designated by the owner of the 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 can 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.

LLC incorporation ?

(44) "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.

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

(46) "Mean high-water mark" or normal 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 most stringent high-water mark shall be applied.

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

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

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

(50) "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.

(51) "NSF-40 systems" means individual residential wastewater treatment systems (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.

(52) "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.

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

including a single lot which is continuous but joined by a narrow portion land separating wastewater system and the facility it serves.

the disintegrated rock material usually unconsolidated and unchanged or only slightly changed that underlies and generally gives rise to the true soil by the natural process of soil development — called also source material >>> this definition from Webster...clearer ?

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

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

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

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

(58) "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 formed artificially.

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

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

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

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

(63) "Public management entity" means a city (G.S. 160A, Article 16), county (G.S. 153A, Article 15), interlocal contract (G.S. 153A, Article 16), joint management agency (G.S. 160A, Articles 461 and 462), county service district (G.S. 153A, Article 16), county water and sewer district (G.S. 162A, Article 6), sanitary district (G.S. 130A, Article 2), water and sewer authority (G.S. 162A, Article 1), metropolitan water district (G.S. 162A, Article 4), metropolitan sewerage district (G.S. 162A, Article 5), public utility [G.S. 62-3(23)], county or district health department (G.S. 130A, Article 2), or other public entity legally authorized to operate and maintain wastewater systems.

(64) "Redoximorphic features" means a color pattern of a horizon due to a loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation and reduction of iron (Fe) coupled with its removal, translocation, or accrual, or a soil matrix color controlled by the presence of Fe^{+2}.

(65) "Repair area" means an area that has been classified suitable consistent with the rules in this Subchapter. The repair area 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.

The upper boundary of rock is saprolite, soil, or the land surface/in some cases water?.

(66) "Residential Wastewater Treatment Systems," referred to as RWTS, means approved individual advanced pretreatment systems which are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable rules in this Subchapter.

(67) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent. Restrictive horizons may occur as:

(a) physical root restrictions due to high bulk density;

(b) strong pedogenic cementation or induration, physically root restrictive;

(c) plinthite; or

(d) fragipan characteristics.

The horizon suffixes d, m, and x from the USDA-NRCS Field Book for Describing and Sampling Soils can be used to describe restrictive horizons. Restrictive horizons are recognized by their resistance in excavation or in using a soil auger.

(68) "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.

(69) "Saprolite" means the body of porous material formed in place by weathering of rock that has a massive, rock-controlled structure and retains the fabric (arrangement of minerals) of its parent rock in 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.

(70) "Septic tank" means a water-tight, covered receptacle designed for primary treatment of wastewater and 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.

(71) "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 relief line or device to the succeeding trench at a lower elevation. All trenches are fed through the proximal end.

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

(73) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level and passes through a relief line or device to the succeeding trench, in a single uninterrupted flow path.

(74) "Soil" means the naturally occurring body of porous 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

The upper limit of "a given" soil formation is generally land surface sometimes water or organic deposits , and its lower limit is either saprolite, or rock, or foreign parent material than that of current soil itself. Organic soil is defined separately.

volume as rock, saprolite, or coarse-earth fraction (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.

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

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

(77) "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 aggregates.

(78) "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 (2.0 - 0.05 mm in size), silt (less than 0.05 mm or greater than 0.002 mm in size), and clay (less than 0.002 mm in size) particles.

(79) "State" means the Department of Health and Human Services, Division of Public Health, Environmental Health Section, On-Site Water Protection Branch. The mailing address for the State is as follows: 1642 Mail Service Center, Raleigh, NC 27699-1642.

(80) "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.

(81) "Suitable" means classification of a specific site evaluation parameter or the site. A site is classified suitable for a wastewater system when all site evaluation parameters are suitable.

(82) "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, interceptor drains, foundation drains, swales, and ditches. Surface water diversions are a type of artificial drainage.

(83) "Swales" mean natural or constructed elongated, sloped depressional drainage features used to collect runoff and direct the flow to an effective outlet to prevent surface water convergence downslope. Swales can be used in conjunction with a berm.

(84) "TS-I systems" means advanced pretreatment systems which are approved in accordance with TS-I effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(85) "TS-II systems" means advanced pretreatment systems which are approved in accordance with TS-II effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(86) "Third-party" means a person or body 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 body has knowledge of the subject area based upon relevant training and experience.

(87) "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.

(88) "Treatment media" means the non- or slowly-degradable media used for physical, chemical, and biological treatment in a wastewater treatment component.

(89) "Trench" means an excavation with a width of three feet or less containing dipsersal media and one or more laterals.

(90) "Unstable slopes" means areas showing indications of mass downslope movement.

(91) "Unsuitable" means classification of a specific site evaluation parameter or the site. A site is classified unsuitable for a wastewater system when any one site evaluation parameter is unsuitable.

(92) "Vertical separation distance" means the vertical measurement from the infiltrative surface to a limiting condition.

Break Room Kitchen?

(93) "Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

all or any of

domestic level only dishwasher (no commercial dishwasher) or one sink, one stove /200 people is the way to define this ????

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

SECTION .0200 – PERMITS

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

15A NCAC 18E .0201 GENERAL

Wastewater system permits issued in accordance with the rules of this Subchapter shall be a three-tier process. Upon receipt from the owner of an application which includes a site plan or plat, the LHD shall perform a soil and site evaluation to determine if the site is suitable or unsuitable in accordance with Section .0500 of this Subchapter. If the site is classified suitable, the LHD shall issue an IP which states that a specific trench type can be installed in a specific location on the site, based on the proposed facility type listed in the application. The LHD shall issue a CA with the design details for the wastewater system. After the wastewater system has been installed, the LHD shall inspect the wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP. A PE, LSS, or LG may be needed to perform the soil and site evaluation, geologic or hydrogeologic evaluation, or wastewater system design if required in G.S. 89C, 89E, or 89F.

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

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

15A NCAC 18E .0202 APPLICATION

(a) Any person owning or controlling a facility containing water-using fixtures connected to a water supply source shall discharge all wastewater directly to an approved wastewater system permitted for that specific use.

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

(c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

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

(e) 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 design daily flow; 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) site for the 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) all existing and proposed artificial drainage;

(4) designation of the permit requested: five-year expiration (with site plan) or non-expiring (with plat);

(5) location, Parcel Identification Number or other property identification, 911 address (if known), acreage, and general directions to the property;

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

(7) information needed to determine design daily flow and effluent strength of the facility(s) served including number and function of individual design units, number of bedrooms, or number of occupants;

(8) notification if the property contains any of the following, when applicable:

(A) previously identified jurisdictional wetlands;

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

(C) site is subject to approval by other public agencies, such as the Coastal Area Management Act, U.S. Army Corp of Engineers, etc.; and

(9) signature of owner.

(f) The application for a CA shall contain:

(1) the information required in Paragraph (e) of this Rule;

(2) identification of the proposed use of a garbage disposal, grinder pump, ~~or~~ sewage pump; and

WC supports

perhaps difficult to figure out

solids handling ?

(3) the proposed wastewater system type in accordance with Table XXXI of Rule .1301 of this Subchapter specified by the owner.

(g) 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, 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 design daily flow of the facility served including number and function of individual design units, number of bedrooms, or number of occupants; and

(5) signature of owner.

(h) The application shall state that submittal of a signed application constitutes right of entry to the property.

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, a 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 that includes the items contained in G.S. 130A-336(a)(1) through (6) and the following information:

(1) a site plan or plat as defined in G.S. 130A-334 showing the location of the initial wastewater system and repair area including dimensions from two fixed reference points;

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

(3) location(s) of existing and proposed public or private water supplies, including private drinking water wells and springs and associated water lines;

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

(5) design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(6) the proposed initial wastewater system and repair system types in accordance with Table XXXI of Rule .1301 of this Subchapter, including LTARs for each system;

(7) required effluent quality standard - DSE, NSF-40, TS-I, or TS-II in accordance with Table III of Rule .0402 and Table XXIV of Rule .1201 of this Subchapter;

(8) easements, rights-of-way, encroachments agreements, as applicable; and

(9) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

Consider a form that has all these information?

(c) When the site is classified unsuitable, the IP application shall be denied and 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, this information shall be included in the report.

(d) An IP for which a plat is provided shall be valid without expiration. An IP for which a site plan is provided shall be valid for five years from the date of issue.

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

(f) An IP shall be revoked or suspended if:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(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; or

(4) a new application for an IP is filed 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.

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) The CA shall contain 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 widths, lengths, and depth on the downslope side of the trench;

(3) if a Management Entity is 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.

(d) 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 until CAs for all wastewater system components serving the facility have been issued.

(e) 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 the LHD for approval. 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.

(f) 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 system.

(g) The CA shall be valid for a period equal to the period of validity of the IP.

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

(i) A CA shall be revoked or suspended if:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(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; or

(4) a new application for an CA is filed for the same design unit on the same property.

(j) Upon written request of the owner, revised CAs shall be issued for sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance.

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 and the authorized agent has inspected the system prior to the system being covered and determined that the system has been installed in accordance with this Subchapter and any conditions of the IP, CA.

(b) If the wastewater system has been permitted in accordance with G.S. 130A-336.1 and Rule .0207 of the Section, an ATO shall be issued by the authorized agent

suggest to move to last or reword ??

(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXI of Rule .1301 of this Subchapter and the system code assigned under Rule .1713(9) of this Subchapter;

(2) facility description including design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength;

(3) a site plan or plat showing the location of the proposed or existing facility, the entire wastewater system as installed from two fixed reference points, including the location and dimensions of the repair area;

(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; and

(8) approved engineered plans and specifications if required in Rule .0303(b) 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 designed by an authorized designer or PE, the information in Rule .0303(e) of this Subchapter shall be provided to the authorized agent prior to issuance of the OP.

(f) When an authorized agent determines that the system installation does 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. 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 Revoke the IP and CA. A copy of the report shall be provided to the owner and the installer.

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

(1) wastewater strength and design daily flow remain unchanged;

(2) the system is operated and maintained in accordance the G.S. 130A, Article 11, and 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) OP has not expired or been revoked.

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

(i) At the compliance inspection frequency specified in Table XXXI of Rule .1301 of this Subchapter, an authorized agent shall determine whether a system complies with the conditions of the OP, this Subchapter, and G.S. 130A, Article 11.

(j) An authorized agent may 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 as specified in G.S. 130A, Article 11, this Subchapter, and all conditions imposed by the OP.

(k) When an OP expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, OP, or existing system authorization.

(l) All documentation related to a wastewater system shall be maintained in the county where the permit is issued.

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

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;

(2) reuse of an existing system; or

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

(b) Approvals for reconnecting a facility to or resuming use of an existing system which has a valid OP or to which Rule .0102 of this Subchapter applies, shall be issued upon determination of the following:

(1) the site complies with its OP or Rule .0102 of this Subchapter;

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

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

(4) the facility meets required setbacks; 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 which do not increase design flow or change wastewater strength and require the issuance of a building permit, an authorization shall be issued upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.

(d) For authorizations issued in accordance with this Rule the authorized agent shall provide written documentation to the owner that describes the site modification, system use and design flow, number of bedrooms, number of occupants and includes 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 ENGINEER OPTION PERMIT

(a) An owner choosing to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 shall employ the services of a PE to prepare signed and sealed drawings, specifications, plans, and reports for the design, construction, operation, and maintenance of the wastewater system.

(b) Prior to the submittal of an NOI for an EOP system as required by G.S. 130A-336.1(b), an LSS shall conduct soil and site evaluations and, as applicable, an LG shall evaluate geologic and hydrogeologic conditions. These evaluations shall be in accordance with the rules of this Subchapter.

(c) The NOI for an EOP System shall be submitted by the owner or a PE to the LHD in the county where the facility is located. The NOI shall be submitted on the common form provided by the State. The common form is available by accessing the State's website at http://ehs.ncpublichealth.com/rules.htm#oswprules. It shall include all the information specified in G.S. 130A-336.1(b) and the following:

(see appendix: EOP common form)

(1) the LSS's, LG's, and installer's name, license number, address, e-mail address, and telephone number;

(2) information required in Rule .0201 of this Subchapter 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 shall reference any existing permit issued for a private drinking water supply, public water supply, 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, LG, and installer, as applicable.

(d) The PE design shall incorporate findings 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(k)(1). 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 manufacturers endorsement of the proposed use.

(e) 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, or the LHD fails to act within 15 business days.

(f) If the owner chooses to increase the design daily flow or change the wastewater strength discharging to the wastewater system prior to construction, a new NOI shall be submitted to the LHD. The owner shall request in writing that the PE invalidate the prior NOI with a signed and sealed letter sent to the owner and LHD.

(g) 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. The owner shall be responsible for preventing modifications or alterations of the site for the wastewater system or the system repair area due to any construction activities for the facility before or after construction of the wastewater system, unless approved by the PE, LSS, or LG, ~~as applicable.~~ or combination

(h) Prior to providing written confirmation for the ATO, the PE shall submit the following to the LHD:

(1) documentation that all reporting requirements identified in G.S. 130A-336.1(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; and

(5) record drawings. reflecting all changes made in the specifications and working drawings including location of all elements, setbacks etc.. per NCBELS guidelines (or define record drawing?)

The LHD shall use the common form for written confirmation.

(i) The owner of the wastewater system approved in accordance with the EOP 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) and Section .1300 of this Subchapter.

(j) For repair of a malfunctioning EOP system, this Rule shall be followed in conjunction with Rule .1306 of this Subchapter. The Management Entity shall notify the LHD within 48 hours of the system malfunction.

(k) The owner of an EOP system who wishes to change the use of the facility shall contact the PE, LSS, LG, and installer, as applicable, to determine whether the current system would continue to meet the requirements of the rules of this Section for the proposed change of use. The PE, LSS, LG, or installer shall determine what, if any, modifications shall be necessary for the wastewater system to continue to meet the requirements of the rules of this Section following the proposed change of use. A NOI reflecting the change of use and any required modifications to the system shall be submitted to the LHD and follow the EOP permitting process.

(l) The LHD is responsible for the following activities related to the EOP system:

(1) file all EOP documentation consistent with current permit filing procedures at the LHD;

(2) submit a copy to the State of the NOI common form and written confirmation of ATO;

(3) review the performance and operation reports submitted in accordance with Rule .1305(c) and Table XXXI of Rule .1301 of this Subchapter;

(4) perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(d) and Table XXXI of Rule .1301 of this Subchapter;

(5) investigate complaints regarding EOP systems;

using defined term as bold/italics etc... helpful

the Certified Installer / Certified Contractor

(6) 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 a NOI for repairs; and

(7) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

common form

(m) The Owner may contract with another licensed professional to complete an EOP project. A revised NOI shall be submitted to the LHD.

(n) 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 as provided for in accordance with G.S. 130A-336.1 and the applicable statues for their respective professions.

History Note: *Authority G.S. 130A-335; 130A-336.1;*

SECTION .0300 – RESPONSIBILITIES

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

15A NCAC 18E .0301 OWNERS

defined word .. capitalized? Artificial Drainage, Installer, Certified Contractors etc... ??

(a) The owner shall:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State in accordance with Rule .0501 of this Subchapter;

(7) provide for system operation, maintenance, monitoring, and reporting, including access for system maintenance;

as required

(8) maintain artificial drainage systems;

(9) prevent encroachment on the initial wastewater system and repair area by utilities, structures, vehicular traffic areas, etc.;

(10) provide necessary records of title to the LHD when seeking an exemption for a lot or tract of land from the minimum setback requirements in Rule .0601(a) of this Subchapter; and

(11) 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 person owning or controlling the system. An easement or encroachment agreement shall be required for the permitting of the following wastewater system installations:

(1) common area with other wastewater systems;

(2) area with multiple or third-party ownership or control;

(3) proposed off-site area; or

(4) system and the facility are located on different lots or tracts of land and cross a property line or right-of-way.

(c) Necessary easements, rights-of-way, or encroachment agreements, as applicable, shall be obtained prior to the issuance of an IP. Terms of the easement, right-of-way, or encroachment agreement shall provide that the easement, right-of-way, or encroachment agreement meets the following criteria:

(1) appurtenant to described property, runs with the land, and is not affected by change of ownership or control;

(2) valid for as long as the wastewater system is required for the facility that it is designed to serve;

(3) describes and specifies the uses being granted and shall include ingress, egress, and regress, system installation, operation, maintenance, monitoring, 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;

(4) specified in a deed by metes and bounds description and attached survey map, the area or site required for the wastewater system and repair area, including collection sewers, tankage or raw sewage lift stations, distribution devices, and dispersal fields; and

(5) shall be recorded with the register of deeds in the county (or counties) 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 STATE

(a) The permitting of a wastewater system shall be the responsibility of agents authorized by the State in accordance with G.S. 130A, Article 4 and 15A NCAC O10 .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.

(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.

for compliance and approval

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

Facility

(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(b)(13) of this Section;

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

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

(d) State review is not required when the design daily flow for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and all the following are met:

(1) individual ground absorption system(s) serving individual design units with a design daily flow less than or equal to 1,500 gpd;

(2) initial and repair dispersal fields for each individual ground absorption system(s) are 20 feet from any other individual wastewater system;

(3) total design daily flow for all ground absorption system(s) on a lot or tract of land is less than 1,500 gpd per acre.

(similar but 1250 gpd/40,000 sft.. is more restrictive)

(e) State review is not required when a PE calculates the proposed design daily flow 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. In accordance with S.L. 2013-413 and S.L. 2014-120, neither the State nor any LHD shall be liable for a system approved or permitted in accordance with this Paragraph.

(f) For systems that require State 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 State. 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 State.

(g) The State will provide technical assistance to the LHD as may be 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) Prior to the issuance of an IP or CA, plans and specifications shall be required by the authorized agent where there is a limiting condition and a groundwater lowering system is required. These plans and specifications shall be prepared by a person or persons who are licensed or registered to consult, investigate, evaluate, plan, or design wastewater

systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, 89E or 89F.

(b) Any wastewater system which meets one or more of the following conditions shall be designed by a PE if required in G.S. 89C and plans and specifications shall comply with Rule .0304 of this Section:

(1) the system has a design daily flow 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;

perhaps simplify?

(2) the system requires advanced pretreatment or drip dispersal other than a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) the system requires pumping more than 1,000 feet horizontally;

(4) elevation head is greater than 100 feet;

(5) 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;

one or more

(6) the pump system has one intermediate high point greater than five feet relative elevation;

(7) the system includes a pressure sewer receiving effluent from two or more pump tanks;

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

solids handling

(9) the system requires use of sewage pumps prior to the septic tank or other treatment system, except for systems subject to 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;

except when pumps media dosing and recir pumping

(10) an individual system uses more than one pump or siphon in a single pump tank;

(11) the system includes a collection sewer prior to the septic tank or other treatment system serving two or more buildings, except for systems subject to the North Carolina Plumbing Code;

(12) the system includes structures which have not been pre-engineered;

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

(A) the State has determined that the wastewater generated by the proposed facility has a pollutant strength which is lower than or equal to domestic wastewater and does not require specialized treatment or management; or

(B) the State has pre-approved a predesigned treatment system or process and management method proposed by the facility owner which shall enable the IPWW to have a pollutant strength which is lower than or equal to domestic wastewater;

(14) 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;

should NCBELS policy apply then?

(15) 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; and

(16) any other system so specified by the LHD.

(c) 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 appropriate Level according to the system design specifications as required by G.S. 90A-72;

(2) notification to the LHD upon completion of the system installation or 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 when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter; and

(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(d) 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.

(e) 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 is based on periodic observations of construction and a final inspection for design compliance.

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

(a) Plans and specifications required to be prepared by a LSS, PE, or other North Carolina licensed professional shall contain the information necessary for construction of the wastewater system in accordance with G.S. 130A, Article 11, and this Subchapter, and shall include the information in Paragraphs (b) through (d) of this Rule, and any other information, determined to be applicable by the LHD or the State.

(b) Applicant information and design daily flow determination:

Make a form for submittal and completion >>> one form

(1) 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;

(2) name, address, and phone number for owner and all consultants; and

(3) design daily flow and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed design daily flow and wastewater strength.

(c) Special Site Evaluation including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:

(1) 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:

(A) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;

(B) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;

(C) soil and site based criteria for dispersal field design and site modifications;

(D) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(e) of this Subchapter; and

(E) recommended effluent quality standard for proposed initial and repair dispersal field areas with justification; and

(2) hydraulic assessment reports on site-specific field information which shall include, as applicable:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation and at every distinct horizon within and beneath the treatment zone;

(B) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;

(C) groundwater mounding analysis (level sites) or lateral flow analysis (sloping sites) in accordance with Rule .0510(d) of this Subchapter; and

(D) contaminant transport assessment showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property; and

see guidance document : appendix ##

(3) site evaluation plan showing:

(A) site topography;

(B) proposed site modifications;

(C) location of existing and proposed site features listed in Rule .0601 of this Subchapter;

(D) proposed facility location;

(E) location and proposed initial and repair dispersal field area and type; and

(F) location of LSS soil pits, hand auger borings, deep borings, and in-situ Ksat tests as

appropriate; and

(4) site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the information listed in Subparagraph (3) of this Rule and the following:

(A) 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;

(B) existing and proposed private wells or water supply sources within 200 feet of existing or proposed system component locations;

(C) 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;

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

(E) 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;

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

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

collection system and collection sewers diff..

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

(1) collection ~~systems and~~ sewers:

collection sewers ?

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

need clarifications .. profile dia., length, supply lines etc....

FORM!

(B) proximity to utilities and pertinent features;

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

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

(2) tank information:

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

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

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

(D) identification number for State approved tanks;

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

(F) anti-buoyancy calculations and provisions; and

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

define

(A) information required in Subparagraph (d)(2) of this Rule;

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

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

(D) control panel, float switches and settings, and high-water alarm components, location, and operational description under normal and high-water conditions;

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

ventilation ?

(F) lighting, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (d)(2) and (3) of this Rule;

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

Supply Lines?

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

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

(A) 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);

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

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

(D) flow distribution device design;

(E) artificial drainage system locations, elevations, discharge points and design details;

(F) site preparation procedures;

(G) construction and system testing phasing; and

(H) final landscaping and compliance with erosion control requirements; and

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

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

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

Wastewater systems with a design daily flow less than or equal to 3,000 gpd that are required to be prepared by a LSS, PE, or other North Carolina licensed professional shall include the following information in the plans and specifications:

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

(2) Rules .0304(c)(1) through (c)(3) of this Section for Special Site Evaluations and submittals prepared under Rule .0510 of this Subchapter; and

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

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

SECTION .0400 DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

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

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum design daily flow for dwelling units shall be based on:

(1) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit;

(2) 60 gpd per person when occupancy exceeds two persons per bedroom; or

(3) greater of Subparagraphs (1) or (2) of this Paragraph.

(b) The minimum design daily flow for dwelling units with one bedroom, no more than two occupants, and 400 square feet of living space or less is 175 gpd.

(c) Table II shall be used to determine design daily flows for facilities other than dwelling units.

(d) The minimum design daily flow from any facility other than a dwelling unit shall be 100 gpd. For facilities with multiple design units, the minimum design daily flow shall be 100 gpd per design unit. The design daily flow of the facility is the sum of all design unit flows.

(e) Design of wastewater systems for 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 one.

(f) Unless otherwise noted in Table II, the design daily flow for laundry facilities is not included. Where laundry is not specified for a facility in Table II, but is proposed to be provided, the design daily flow shall be adjusted to account

for the proposed usage and machine water capacity. Applicant shall provide cut-sheets for laundry machines proposed for use in facilities.

(g) HVAC unit or ice machine condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system. 130A-345 == conflict?

(h) Unless otherwise noted in Table II, the design daily flow per unit includes employees.

(i) Food service facilities and other facilities that are projected to generate wastewater with constituent levels greater than domestic strength, as defined in Rule .0402 of this Section, are identified in Table II. Any facility which has a food service component that contributes 50 percent of the design daily flow shall be considered to generate high strength wastewater. Determination of wastewater strength is based on projected or measured levels of one or more of the following: BOD, TSS, FOG, or TN. Table III identifies the constituent limits for DSE. Excess concentrations of other constituents may result in a high strength wastewater classification on a site-specific basis.

TABLE II. Design daily flow for Facilities

Facility type	**Design daily flow**
Commercial	
Airport, 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, booth, or bowl
Bed and breakfast homes and inns	Dwelling unit design daily flow 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*	2 gal/person with toilets and hand sinks; 3 gal/person with addition of a warming kitchen; 5 gal/person with full kitchen
Markets open less than four days/week	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 (slips on dock) 5 gal/boat slip, dry storage (warehouse)
Motels/hotels	120 gal/room includes the following: No cooking facilities in individual rooms 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/ hour 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 (not retails 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, food preparation not included
Camps/Campgrounds	
Summer camps (overnight stay)**	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 multi use service; or 3 gal/meal served with single-service articles
Temporary Labor Camp or Migrant Housing Camp (overnight stay)**	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/RV in an RV park**	120 gal/space
Recreational Park Trailer (Park Model) in an RV park**	175 gal/space
Bathhouse for campsites and RV park sites with no water and sewer hook ups (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 for the following: Open 6 hrs/day or less Add 2.5 gpd/seat for every additional hour open

Food Establishments with single service articles**	20 gal/seat or 20 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less Add 2.0 gpd/seat for every additional hour open
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/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 WC supports
Day care facilities	15 gal/person/≤ 12 hr shift with the following: No food preparation Warming kitchen only Single service articles No laundry Add 1 gal/person/hr for more than 12 hr shift two = 8 hours shifts multiply by two
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 hours/day Food preparation not included Retail space not included
	325 gal/toilet or urinal meeting the following: Open 16 to 24 hours/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 larger
Country club/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, stadiums*, and other similar facilities	250 gal/toilet or urinal; or 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 as 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	2 gal/seat with no kitchen, school, day care, or camp 3 gal/seat with warming kitchen; no school, day care, or camp 5 gal/seat with full kitchen
Public or private assembly halls used for worship, recreation, regularly scheduled meetings, events, or amusement – building occupancy* (for churches, flow should be in addition to sanctuary 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

*Designer may alternately use the maximum building occupancy assigned by the local fire marshal in determining design daily flow.

**Facility has potential to generate high strength wastewater

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

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

15A NCAC 18E .0402 EFFLUENT CHARACTERISTICS

(a) Effluent quality standards are listed in Table III.

"Effluent" means the liquid discharge from a pretreatment component.

Table III. Effluent quality standards for domestic strength effluent (DSE)

Constituent	**DSE (maximum) mg/L**
BOD	≤ 350
TSS	≤ 200
TN*	≤ 100
FOG	≤ 30

Use BOD5 250
TSS 125
TN 60
FOG 30
ST-out or ST-in .. what is thought here

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

In the event of flow a reduction

(b) Wastewater systems with an adjusted design daily flow in accordance with Rule .0403 of this Section or a design daily flow greater than or equal to 1,500 gpd, and with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Section or otherwise determined by the State, authorized agent, or licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, shall utilize advanced pretreatment to produce DSE prior to dispersal. Alternately, a licensed consultant may justify not using advanced pretreatment by providing the following:

(1) mass loading calculations based on site-specific projected or measured effluent characteristics and water use data. Calculations shall demonstrate that the soil loading rate does not exceed the mass loading rate identified in Table XVI or Table XVII of Rule .0901 or Table XX or Table XXI of Rule .0907 of this Subchapter; and

(2) site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

exceed every parameter ? or any.. FOG is met by GT and BMP. up to 40% TSS and BOD is reduced by using additional ST and effluent filter . simple recirculation reducing N 40%. remove 1,500 gpd. What triggers needing DSE data other than ADF ?

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

Define Adjusted Design Daily Flow

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

for initial flows <= 3k

submitted by others or own design?

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

(a) The authorized agent and the State may approve a proposed adjusted design daily flow relative to the values in Table II. The water use information provided to support the proposed adjusted design daily flow shall meet the requirements of Paragraphs (b) or (c) of this Rule.

(b) Documented data from the facility or a comparable facility justifying an adjusted design daily flow and meeting the following criteria:

ADF for existing systems.. capacity expansion : fully developed ?

(1) the submitted data shall consist 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;

(2) a hydraulic peaking factor shall be derived by dividing the highest monthly flow from the 12 monthly readings by the sum of 30 consecutive daily water consumption readings;

not less than 1.0

(3) the adjusted design daily flow shall be determined by taking the numerical average of the greatest 10 percent of the daily readings and multiplying that average by the hydraulic peaking factor; and

(4) an alternative method of determining the adjusted design daily flow is to multiply the highest monthly flow from the 12 monthly readings by 1.5 and then divide by the number of days in the month.

(c) Proposed use of extreme water-conserving fixtures shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from the proposed facility. Cut sheets of the proposed fixtures shall be provided.

This should be above and beyond required fixtures per current Plumbing Code

(d) The proposed adjusted design daily flow calculations in accordance with Paragraphs (b) or (c) of this Rule shall account for projected increased constituent concentrations in accordance with Rule .0402(b) of this Section.

(e) In accordance with S.L. 2013-413 and S.L. 2014-120, a PE can propose an adjusted design daily flow in accordance with the following:

(1) design daily flows less than those listed in Rule .0401 of this Section that are achieved through engineering design which 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 projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;

(4) proposed adjusted design daily flows for wastewater systems determined to be less than 3,000 gpd shall not require State review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and

(5) neither the State nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE can propose and the State approve an adjusted design daily flow for a facility made up of individual dwelling units when the following criteria are met:

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

(2) adjusted design daily 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 design daily flows based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The design daily flow from Table II shall be used to determine minimum pretreatment component capacities.

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

SECTION .0500 – SOIL AND SITE EVALUATION

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

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site to determine if a wastewater system can be installed. 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) horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) soil wetness;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability and LTAR for each profile description; and

(7) available space.

define?

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation.

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

(1) 48 inches from the ground surface; or

make provisions to

(2) to an unsuitable soil condition determined in accordance with this Section.

(d) Owners may be required to dig pits when necessary for evaluation of the site as determined by the authorized agent.

(e) Soil profiles shall be excavated and described to reflect variations in soil and site characteristics across both initial and repair areas.

(f) Site evaluations shall be completed in accordance with this Section. Based on the evaluation of the soil and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable (S) or unsuitable (U).

(g) A limiting condition initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(c), (d), or (e) of this Section are met.

(h) The authorized agent shall specify the overall site classification and suitability in accordance with Rule .0509 of this Section.

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

up to 30% is considered suitable and may be conisdered suitable up to 65% in case by case basis.

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 considered suitable with respect to topography.~~

(b) Unstable slopes shall be considered unsuitable with respect to topography.

(c) Slopes greater than 65 percent shall be considered unsuitable with respect to topography.

~~(d) Areas subject to surface water convergence shall be considered unsuitable with respect to topography,~~ unless the surface water can be diverted from the site.

(e) Slope patterns (topography) that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system shall be considered unsuitable with respect to topography.

(f) Depressions shall be considered unsuitable with respect to landscape position except when, with site modifications, the site complies with the requirements of this Section and is approved by an authorized agent.

(g) A jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ shall be considered unsuitable with respect to landscape position, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ.

(h) For all sites, except where a drip dispersal system is proposed, additional required soil depth (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 (inches)

MSD = minimum soil depth (inches)

TW = actual trench width (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 by an authorized agent in accordance with the following:

(1) Texture – The texture of each soil horizon in a profile shall be classified into four general groups and 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 are 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

In place of field testing, the LHD or the State may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified granular, blocky, platy, prismatic, and absence of structure and suitability determined based on 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	Size (diameter)	Classification
Granular	N/A	suitable
Blocky	≤ 1 inches (2.5 cm)	suitable
	> 1 inches (2.5 cm)	unsuitable
Platy	N/A	unsuitable
Prismatic	≤ 2 inches (5 cm)	suitable
	> 2 inches (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 suitability shall be determined based on Table VI.

Table VI. Clay mineralogy (consistence) field method results, associated mineralogy, and suitability classification

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 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 must be greater than 35 percent and the organic matter component must be less than 0.5 percent.

Table VII. Clay mineralogy laboratory method results, mineralogy, and associated suitability classification

ACEC (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 48 hours before samples are to be taken by the licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F. The authorized agent and the consultant 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 consultant 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 CONDITIONS

(a) Soil wetness conditions 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 evaluation for soil wetness indicators and field observations, and may be further characterized by well monitoring, computer modeling, or a combination of monitoring and modeling as required by this Rule. All sites shall be evaluated by an authorized agent using Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule.

(b) Basic Field Evaluation Procedures:

(1) A soil wetness condition shall be determined by the indication of colors of chroma 2 or less (Munsell Color System) at greater than or equal to two percent of soil volume in mottles or matrix of a horizon. Colors of chroma 2 or less that are lithochromic shall not be considered indicative of a soil wetness condition; or

(2) A soil wetness condition shall be determined by the periodic observation or indication of saturated soils or 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

of chroma 2 or less. A soil wetness condition resulting from saturated soils or a perched water table shall be confirmed to persist for three consecutive days.

(3) The shallowest depth to soil wetness condition determined by Subparagraph (b)(1) or (b)(2) of this Rule shall take precedence.

(c) Site Suitability as to Soil Wetness: Initial suitability of the site as to soil wetness shall be determined based upon the findings of the Basic Field Evaluation Procedures made in accordance with Paragraph (b) of this Rule. Sites where the soil wetness condition is less than 12 inches below the naturally occurring soil surface shall be considered unsuitable with respect to soil wetness.

(d) Alternative Procedures for Soil Wetness Determination: The owner shall have the opportunity to submit documentation that the soil wetness condition and resultant site classification be alternately determined and reclassified by monitoring, computer modeling, or a combination of monitoring and modeling, in accordance with Direct Monitoring Procedure, Monitoring and Modeling Procedure, or Modeling Procedure made in accordance with Paragraphs (e), (f), or (g) of this Rule. This determination shall take precedence over the determination made in accordance with the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule, when the conditions of Paragraphs (e), (f), or (g) of this Rule are met. Determination by one of these Monitoring or Modeling procedures shall also be required when:

(1) the Owner proposes to use a wastewater system requiring a deeper depth to a soil wetness condition than the depth determined by the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule; or

(2) the Owner proposes to use sites with Group III or IV soil within 36 inches of the naturally occurring soil surface and where artificial drainage systems are existing or are proposed or on such sites when fill is proposed to be used in conjunction with artificial drainage systems. Final determination of soil wetness condition for these sites shall be made in accordance with the Modeling Procedure in Paragraph (g) of this Rule.

(e) Direct Monitoring Procedure: Soil wetness conditions may be determined by observation of the water surface in wells during periods of high-water elevations utilizing the following monitoring procedures and interpretation method.

(1) The owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal that includes a site plan, well and soil profile at each monitoring location, and a monitoring plan no later than 30 days prior to the start of the monitoring period. Soil wetness and rainfall monitoring shall be conducted by a third-party consultant or by the owner. A third-party consultant is qualified when licensed or registered in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, if required. The Owner shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the LHD.

(2) The owner shall submit a site plan showing proposed sites for wastewater systems, shall provide the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the soil wetness conditions, and specify any proposed fill and drainage modifications.

(3) The owner shall submit a monitoring plan indicating the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well, and proposed method of analysis. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a design daily flow greater than 600 gpd shall have one additional well per 600 gpd increment.

(4) The authorized agent shall be given the opportunity to conduct a site visit and verify the appropriateness of the proposed plan. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil/site conditions. Prior to installation of the wells the authorized agent shall approve the plan. If the plan is disapproved, the authorized agent shall include specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend five feet below the naturally occurring soil surface, or existing soil surface for fill installed prior to July 1, 1977 meeting the requirements for consideration of a site with existing fill in accordance with G.S. 130A-341 and the rules of this Subchapter. However, a well or wells which extend(s) down only 40 inches may be used if they provide a continuous record of the water table for half of the monitoring period, and one or more shallower wells may be required on sites where shallow lateral water movement or perched soil wetness conditions are anticipated.

(6) 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). A rain (precipitation) gauge is required within one-half mile of the site. Daily rainfall shall be recorded beginning no later than December 1 through April 30 (the end of the well monitoring period).

(7) Interpretation Method for Direct Monitoring Procedure: The following method of determining depth to soil wetness condition from water surface observations in wells shall be used when the 60-day weighted rainfall index for the January through April monitoring period equals or exceeds the site's long-term (historic) 60-day weighted rainfall index for January to April rainfall with a 30 percent recurrence frequency (wetter than the 9th driest year of 30, on average). The 60-day weighted rainfall index for the monitoring period and historic rainfall record shall be computed as:

$$WRI_{60} = 0.5P_D + P_J + P_F + P_M + 0.5P_A$$

Where WRI_{60} = 60-day weighted rainfall index for January to April

P_D = Total December rainfall (inches)

P_J = Total January rainfall (inches)

P_F = Total February rainfall (inches)

P_M = Total March rainfall (inches)

P_A = Total April rainfall (inches)

The State shall prepare contour maps for each county where this interpretation procedure is proposed. Contours shall be prepared following standard interpolation procedures using normalized

data collected from all National Weather Service Stations, or equivalent, from which appropriate data are available, prior to February 1 of the monitoring season. Data from each station shall be normalized by fitting a 2-parameter gamma distribution to the 60-day weighted rainfall index computed for the most recent three decades of historic data, in accordance with procedures outlined in Chapter 18 of the National Engineering Handbook, USDA-NRCS. From this fitted distribution, the 60-day weighted rainfall index for January through April rainfall with a 30 percent, 50 percent, 70 percent and 80 percent recurrence frequency shall be computed for each Station, to provide the raw data points from which the contour maps shall be prepared. From these maps, the site's 60-day weighted rainfall index for the January through April monitoring period shall be compared to the long-term (historic) January to April 60-day weighted rainfall index at different expected recurrence frequencies. The soil wetness condition shall be determined as the highest level that is continuously saturated for the number of consecutive days during the January through April monitoring period shown in Table VIII.

TABLE VIII. Weighted rainfall index related to number of consecutive days of continuous saturation

Recurrence Frequency Range January to April 60-Day Weighted Rainfall Index	**Number of Consecutive Days of Continuous Saturation for Soil Wetness Condition**
30% to 49.9%	3 days or 72 hours
50% to 69.9%	6 days or 144 hours
70% to 79.9%	9 days or 216 hours
80% to 100%	14 days or 336 hours

(8) If monitoring well data is collected during monitoring periods that span multiple years, the year which yields the highest (shallowest) soil wetness condition shall be applicable.

(f) Monitoring and Modeling Procedure: A combination of monitoring and modeling may be used to determine a soil wetness condition utilizing the following monitoring procedures and interpretation method.

(1) The procedures described for the Direct Monitoring Procedure in Subparagraphs (e)(1) through (e)(6) of this Rule shall be used to monitor water surface elevation and precipitation for determining soil wetness conditions by a combination of direct observation and modeling, except that the rainfall gauge and each monitoring well shall use a recording device and a data file (DRAINMOD compatible) shall be submitted with the report to the LHD (devices shall record rainfall hourly and well water level daily).

(2) The groundwater simulation model DRAINMOD shall be used to predict daily water levels over a 30-year historic time period after the model is calibrated using the water surface and rainfall observations made on-site during the monitoring period. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(A) Weather input files, required to run the DRAINMOD, shall be developed from hourly rainfall gauge data taken within a half-mile of the site and from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants. Daily maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for 30 days prior to this 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 Users Guide, and guidance is also available in Reports 333 and 342 of the University of North Carolina Water Resources Research Institute. DRAINMOD soil data files on file with the State shall be made available upon request to the owner or owner's consultants.

(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 least squares analysis of the daily observations over the whole monitoring period (mean absolute deviation between measured and predicted values no greater than eight inches), and to achieve the best possible match between the highest water table depth during the monitoring period (measured vs predicted) that is saturated for 14 consecutive days.

(D) For sites intended to receive over 1,500 gpd, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(E) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD or Owner may request a technical review by the State prior to approval of the soil wetness condition determination.

(g) Modeling Procedure: A soil wetness condition may be determined by application of DRAINMOD to predict daily water levels over a 30-year historic time period after all site-specific input parameters have been obtained, as outlined in the DRAINMOD Users Guide. This modeling procedure shall be used when a groundwater lowering system is proposed for a site with Group III or IV soils within 36 inches of the naturally occurring soil surface. This procedure shall also be used to evaluate sites with Group III or IV soils within 36 inches of the naturally occurring soil surface,

where the soil wetness condition was initially determined using a procedure described in Paragraphs (e) or (f) of this Rule and where artificial drainage systems are proposed or when fill is proposed to be used in conjunction with artificial drainage systems. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(1) Weather input files, required to run DRAINMOD, shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants.

(2) 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 proposed drainage features and surface storage and drainage parameters, shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide. DRAINMOD soils data files on file with the State shall be made available upon request to the owner or owner's consultants. Inputs shall include:

(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, or other accepted values consistent with the simulation model; and

(F) A sensitivity analysis shall be conducted for the following model parameters: soil input files for 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 soil wetness condition. 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 soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(4) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD shall submit the groundwater simulation analysis to the State for technical review prior to approval of the soil wetness condition determination.

(h) A report of the investigations made for the Direct Monitoring Procedure, Monitoring and Modeling Procedure or Modeling Procedure in accordance with Paragraphs (e), (f), or (g) of this Rule shall be prepared prior to approval of the soil wetness condition determination. Reports prepared by a licensed professional shall bear the professional seal of the person(s) whom conducted the investigation. A request for technical review of the report by the State shall include digital copies of monitoring data and digital copies of 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 TO ROCK, SAPROLITE, OR PARENT MATERIAL

(a) Soil depths to saprolite, rock, or parent material 18 inches or greater shall be considered suitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(b) Soil depths to saprolite, rock, or parent material less than 18 inches shall be considered unsuitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(c) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

saprolite, parent material, or rock

Denial of lots where APT can make it suitable allows owner to get permit for surface discharge? >> comment - no position !

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 as to depth to saprolite may be reclassified suitable in accordance with this Rule.

(b) A 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable soil condition. If any of the vertical separation is suitable soil, then one-inch of suitable soil equals two inches of saprolite.

(c) An investigation of the site using pits, at locations approved by the authorized agent, shall be conducted. The following physical properties and characteristics shall be present in the 24 inches (or less if combined with soil) of saprolite below the proposed infiltrative surface:

(1) 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;

(2) clay mineralogy shall be suitable in accordance with Rule .0503(3) of this Section;

(3) greater than 2/3 of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

(4) the saprolite wet consistence shall be nonsticky or slightly sticky and nonplastic or slightly plastic;

(5) the saprolite shall be in an undisturbed, naturally occurring state;

(6) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock; and

(7) lab determinations may be used to supplement field determinations. Split samples shall be made available to the LHD when requested.

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

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 located at depths less than 18 inches below the naturally occurring soil surface shall be considered unsuitable as to depth to restrictive horizons.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 18 inches below the naturally occurring soil surface shall be considered suitable as to depth to restrictive horizons.

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 sufficient 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 shell meet all required setbacks in Section .0600 of the Subchapter and provide access for operation and maintenance activities.

Repair Area

(b) The ~~dispersal field~~ repair area shall not be altered so that the specified system cannot be installed or function as permitted.

(c) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to determine that initial and repair dispersal field 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 distance to a limiting condition along the entire trench length in accordance with Rule .0901(d)(3) of this Subchapter.

(d) 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) design daily flow is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(4) designed for DSE.

(e) Repair area shall be required for any proposed additional flow from an existing facility meeting the requirements of Paragraph (d) of this Rule.

(f) Repair area shall be required when any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Paragraph (d) of this Rule was previously utilized.

(g) Although a lot or tract of land is exempted under Paragraph (d) of this Rule from the repair area requirement of Paragraph (a) of this Rule, the maximum feasible area, as determined by the authorized agent, shall be allocated for a repair area and documented on the IP, CA, and OP.

Repair Area still seem to address only dispersal area ..

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

Plans (CA) for repair system not required but suitability of Repair Area required at the time

15A NCAC 18E .0509 is proposed for adoption as follows:

sometimes larger tanks to account for repair dosing needs is installed up front ?

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most limiting condition determined in Rules .0502 through .0508 of this Section shall be used to determine the overall site classification as suitable or unsuitable. The overall site shall be classified suitable if there is sufficient soil and area for a wastewater system that complies with the minimum vertical separation distance to a limiting condition consistent with this Subchapter.

suitable soil depth or vertical separation w/o APT?

(b) The minimum ~~vertical separation distance to any~~ limiting conditions shall be 18 inches.

(c) Sites classified unsuitable due to soil wetness conditions may be reclassified suitable when modifications are made to meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation distance to the water table.

(d) Sites classified unsuitable due to soil wetness conditions because of the presence of lateral water movement may be reclassified suitable as to soil wetness conditions when such water is intercepted and diverted to prevent saturation of the wastewater system.

(e) A site classified unsuitable may be approved for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. A Special Site Evaluation in accordance with Rule .0510 of this Section shall be provided to the authorized agent that demonstrates that the proposed system can be expected to overcome the unsuitable soil or site

conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by individuals qualified by training and experience and licensure in North Carolina in accordance with G.S. 89C, G.S. 89E, and G.S. 89F, to consult, investigate and evaluate soil and rock characteristics, groundwater hydrology, design artificial drainage systems, or design wastewater systems. The proposed wastewater system or artificial drainage system shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review the substantiating data if requested by the LHD.

(f) An IP shall not be issued for a site which is classified unsuitable.

simplification possible?

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 adversely impact ground and surface water quality. Any site for a wastewater system that is proposed with one or more of the following shall require a Special Site Evaluation by a person or persons who are licensed or registered to consult, investigate, or evaluate soil characteristics and hydrologic and hydraulic testing and analysis in accordance with G.S. 89F or G.S. 89E:

(1) proposal submitted in accordance with Rule .0504(h) of this Section;

(2) proposal submitted in accordance with Rule .0509(e) of this Section;

(3) advanced pretreatment is required for any of the following:

(A) vertical separation distance to a limiting condition is proposed to be reduced. The vertical separation distance to rock or tidal water shall not be reduced to less than 12 inches;

(B) less than 18 inches of naturally occurring soil to an unsuitable soil condition, excluding soil wetness;

(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 which requires artificial drainage of Group II or III soils;

(E) proposed use of a groundwater lowering system to meet vertical separation distance requirements to a soil wetness condition;

(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent;

(G) bed systems with a design daily flow greater than 1,500 gpd; or

(H) increased LTAR is proposed on a site with a design daily flow greater than 1,500 gpd;

(4) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the design daily flow is greater than 600 gpd; or when the texture of the receiving permeable horizon is silt loam;

(5) DSE drip dispersal systems meeting the following soil and site conditions:

(A) depth from the naturally occurring soil surface to any unsuitable soil condition 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 soil wetness condition 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 depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches;

(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and driplines are installed in new fill material;

(F) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition;

(G) proposed LTAR exceeds that assigned by the LHD;

(H) design daily flow exceeds 1,500 gpd; or

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(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 limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper; or

(9) site-specific nitrogen migration analysis is required to verify that the nitrate concentration at the property line will not exceed groundwater standards;

(10) LHD or State determines that the combination of soil conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances will potentially result in hydraulic overload; or

(11) design daily flow greater than 3,000 gpd, unless the requirements of Rule .0302(d) of this Subchapter are met.

(b) If the adjusted design daily flow is less than or equal to 3,000 gpd, a Special Site Evaluation is not required.

(c) The Special Site Evaluation shall include hydrologic and hydraulic testing and analysis, in accordance with Rule .0304(c)(2) of this Subchapter.

(d) For sites serving systems with a design daily flow 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 (level sites) and the rate of lateral and vertical flow away from the trenches (sloping sites). The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, and in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the State. The site shall be considered unsuitable if the data indicate any of the following:

(1) the groundwater mound which 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 assessment indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

History Note: *Authority G.S. 89E; 89F; 130A-335(a1), (e) and (f);*

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

15A NCAC 18E .0601 is proposed for adoption as follows:

15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

WW systems definition from General Statutes ?

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA approval.

wastewater systems = all components
or tankage and fields? supply lines, PM manifolds etc??

TABLE IX. Minimum setbacks from all wastewater systems to site features

	Site Features	Setback (feet)
1	Any public or private water supply source, including a private drinking water well or spring*	100
2	Surface waters classified Water Supply Class I (WS-I), from mean high-water mark	100
3	Waters classified SA, from mean high-water mark	100
4	Any Class I or Class II reservoir, from normal pool elevation	100
	Lake, pond, or ~~stormwater detention pond,~~ from flood pool elevation	50
	Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
	Any water line, including fire protection and irrigation water lines	10
	Geothermal wells – open or closed loop vertical bore	50
	Geothermal wells – horizontal closed loop system	10
	Building foundation ~~with artificial~~ drainage	15
	Building or other foundation without ~~artificial~~ drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
	Any basement, cellar, or in-ground swimming pool	15
	Buried storage tank or basin, except stormwater	15
	Above ground swimming pool	5
	~~Top of slope of embankment or cuts of two feet or more vertical height~~	15
	Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25
	Surface water diversion, as measured on the ground surface from the edge of the diversion	15
	Any stormwater conveyance (pipe or open channel) or ephemeral stream	15

stormwater retention pond

top slope/down slope?
confusing with artificial drainage def....

Top of vertical cuts or Embankment of 2 ft. or more

other than building drains

(Define)retention basin has permanent pool .. drains from top
detention basin has temp. pool .. drains from bottom

25 feet

~~Permanent~~ stormwater ~~retention basin or sediment detention basin~~ detention basin	~~50~~
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
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	15
Utility transformer, ground-surface mounted	10

WC supports 25 feet

Driveway = 3 feet from all direction,

(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:

(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or

(2) the private water supply is a well for which a variance for a reduced separation has been issued.

(c) The wastewater system sited in accordance with Paragraph (b) of this Rule shall be located the maximum feasible distance and never less than 50 from the private water supply.

(d) Wastewater systems shall not be located closer than 100 feet to springs and uncased wells located downslope from the dispersal field ~~and used as a source of drinking water.~~

or from tankage

(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source.

(f) 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.

(g) If effluent is conveyed under areas subject to vehicular traffic or areas subject to soil disturbance or compaction, one of the following shall be used:

(1) DIP;

(2) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DIP;

(3) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DOT traffic rated culvert pipe;

(4) Schedule 40 pipe (PVC, Polyethylene, or ABS) with 30 inches of compacted cover 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.

or stronger

perhaps a generic def. SCH 40 also implies any stronger pipe of same material

(h) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed design daily flow 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 X.

TABLE X. Minimum setbacks from wastewater systems greater than 3,000 gpd to site features*

Feature	Setback (feet)
Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer	500
Any other public water supply source, unless a confined aquifer	200
Any private water supply source, unless a confined aquifer	100
Surface water classified WS- I, from mean high-water mark	200
Surface waters classified WS-II, WS-III, B, or SB, from mean high-water mark	100
Waters classified SA, from mean high-water mark	200
Any property line	25

*Increased setbacks for separate dispersal fields that are part of wastewater systems with a design daily flow greater than 3,000 gpd shall not apply to one or more field(s) that are designed for less than 1,500 gpd when a Special Site Evaluation in accordance with Rule .0510 of this Subchapter demonstrates that the wastewater system will comply with the performance requirements in Rule .0510(d) of this Subchapter.

revise definition

(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.

by def. includes forcemain, supply lines, any other component --- conflict

TABLE XI. Minimum setbacks from collection sewers to site features

Feature	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft*
Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 ft*

appears a combined chart/Table for IX, X, XI
Illustrative diagrams for tankage would be helpful

Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5 keep 10 feet
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10 5 feet horizontal ?
Permanent stormwater retention basin or sediment detention basin	10
Bio-retention area, injection well, or infiltration gallery	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
Utility transmission and distribution line poles and towers, including guy wires	5
Utility transformer, ground-surface mounted	5

*Pipe materials other than DIP 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.

horizontal

(j) The minimum setback from water lines to collection sewers shall be 10 feet. ~~If a 10-foot setback is not maintained, the following criteria shall be met:~~

~~(1) 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) 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~~

Alternatively, vertical separation of 18" with water line on top is provided in a benched trenches or in separate trenches

~~18 inches above the top of the collection sewer. The collection sewer shall be located the maximum setback from the water line.~~

(k) Crossings of ~~collection sewers~~ and a water line may occur with the following:

(1) 18 inches clear vertical separation distance is maintained, with the sewer line passing under the water line; or

(2) the water line crosses under the sewer line ~~or~~ ~~18~~ inches clear vertical separation distance is not maintained and the following criteria are met:

(A) collection sewer shall be constructed of DIP with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

(B) water line shall be constructed of ferrous materials and with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(l) Collection sewers may cross a storm drain if:

(1) 12 inches clear vertical separation distance is maintained; or

(2) collection sewer is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) collection sewer is encased in concrete or DIP for five feet on either side of the crossing.

(m) Collection sewers may cross a ~~stream~~ if:

(1) 36 inches of stable cover is maintained; or

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) sewer line is encased in concrete or DIP for 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.

(n) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints. Pipe shall be anchored for 10 feet on either side of the crossing.

(o) Septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems shall not be located in areas subject to frequent flooding (areas inundated at a 10-year or less frequency), unless designed and installed to be watertight and to remain operable during a 10-year storm. Mechanical or electrical components of treatment systems shall be above the 100-year flood level or otherwise protected against a 100-year flood.

History Note: Authority G.S. 130A-334; 130A-335(e) and (f);

15A NCAC 18E .0602 is proposed for adoption as follows:

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS

conflict with gravity sewer / supply line / force main >>>> collection system is defined as collection sewer

PWS Rules 15A NCAC 18C Water Supplies

storm sewers (same installation requirement like WL in same trench ?)

or

under

or

1 only or 1, and 2 or 3

make joints watertight whenever Storm and SL cross

min. 6" cover

not clear!

and

water main std.

provide detail

PWS Rule

(c) Crossing a Water Main Under a Sewer. Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

(a) The minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, or 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 design daily flow 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, or other instrument conveying fee title or that is described in a recorded plat;

(2) insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basement, property lines, or 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 as determined by an authorized agent shall be required. The minimum setbacks in Table XII shall be required in all cases.

TABLE XII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	**Minimum setback (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 those lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, and the wastewater system will be installed in Group I soils, the wastewater system shall be located as far as possible, but not less than 10 feet from any other wastewater system.

(d) For those lots or tract of land which, on July 1, 1982, are specifically described in a deed or recorded plat and the minimum horizontal setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems cannot be met, the maximum feasible horizontal distance as determined by the authorized agent shall be required. The minimum setback shall not be less than 10 feet

(e) Any rules and regulations of the Commission for Public Health or any local board of health in effect on June 30, 1977, which establish greater minimum distance 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);

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, AND PIPE MATERIALS

define RSLS

15A NCAC 18E .0701 is proposed for adoption as follows:

15A NCAC 18E .0701 COLLECTION SEWERS

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 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 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.

provide testing outline

(5) Three-foot minimum cover shall be provided for all collection sewers, except as provided for in Rule .0601(g) of this Subchapter.

or .1700 as in off-site system

(6) Ferrous material pipe or other pipe designed and bedded for traffic-bearing loads shall be provided where collection sewers are subject to traffic-bearing loads.

(7) Manholes shall be used for collection sewers at any bends, junctions, and every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation difference exceeds 2.5 feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water supply source, or within 50 feet of any private water supply 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 buildings, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required 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.

Design Unit?

(9) Collection sewers may require additional ventilation provisions. Air relief valves shall be provided as needed for force mains.

or as determined by EHS when it can be easily cleaned/snaked thru the bends.

History Note: *Authority G.S. 130A-335(e), (f), (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 Rule .0601(a) of this Subchapter. If the raw sewage lift station is a sealed, watertight chamber the setbacks requirements for collection sewers in Rule .0601(i) of this Subchapter shall apply.

(b) Raw sewage lift stations shall meet the following design and construction standards:

(1) sealed, watertight chamber shall be a prefabricated unit with a sealed top cover, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent;

(2) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;

(3) pumps shall be listed by Underwriter's Laboratories or an equivalent third-party electrical testing and listing agency;

(4) pumps shall be grinder pumps or solids-handling pumps capable of handling 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;

(5) minimum pump operating flow rate shall be 2.5 times the average design daily flow;

(6) systems shall be designed so that the pump-off time does not exceed 30 minutes;

(7) raw sewage lift stations serving single buildings shall be designed for pump run-times between three to 10 minutes at average flow;

(8) 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

(9) all other applicable requirements for pump tanks and dosing systems in accordance with Rule .0802 and Section .1100 of this Subchapter shall also apply to raw sewage lift stations.

flow rate

clarification needed

5,6,7, >>> seem to contradict and may not be met simultaneously .. idea is to eliminate septic conditions. EHS to design this if one pump ?

History Note: *Authority G.S. 130A-335(e), (f), (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 three-inch nominal size Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or non-perforated polyethylene with a minimum fall of 1/8-inch per foot if the installation requirements of Paragraph (b) of this Rule are met.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, or alternative pipe materials described in Paragraph (c) of this Rule, may be substituted for Schedule 40 PVC between the distribution device and the dispersal field when the following installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface at a uniform grade, and with a minimum 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;

move to design criterion, max. fall pursuant to PC

minimum strength of

(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 cover is placed and compacted over the stone or gravel envelope; and

(5) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the excavation separating the trench from the distribution device.

flowing by gravity..

(c) Alternative pipe materials allowed from the distribution device to the dispersal field, when installed in accordance with Paragraph (b) of this Rule, are as follows:

consider merging b and c and e

(1) PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241; or

(2) PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034.

(d) 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.

?

(e) Alternative gravity pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. The pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule.

Size of pipe = 4 inch and six inch can not be used due to gravel limits

(f) Pipe used for gravity distribution laterals shall be corrugated plastic tubing certified as complying with ASTM F667 or smooth-wall plastic pipe certified as complying with ASTM D2729. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between ½-inch and ¾-inch 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 Section and is approved by the State.

Minimum

(g) Pump discharge piping shall be of Schedule 40 PVC or stronger material and pressure rated for water service at two times the operating pressure. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(h) Alternative pressure rated pipe materials are allowed in place of Schedule 40 PVC from the pump tank to the distribution device or dispersal field are when designed and certified by a PE. The proposed pipe shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material. 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 and shall comply with the requirements of Rule .0701(4) of this Section.

Alternatives are allowed when designed by PE, many places?

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 is proposed for adoption as follows:

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.

(2) Individual dwelling units with five bedrooms or less shall be sized based on Table XIII.

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons) without a garbage disposal	Minimum liquid capacity (gallons) with a garbage disposal
4 or less	1,000	1,250
5	1,250	1,500

recommend no garbage disposal

(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 XIV.

TABLE XIV. Septic tank capacity for facilities not listed in Table XIII

Design daily flow (gpd) (Q)*	Minimum septic tank liquid capacity (V) calculation (gallons)
Q ≤ ~~600~~ 1	V = 2Q ?
600 < Q < 1,500	V = 1.17Q + 500
1,500 ≤ Q ≤ 4,500	V = 0.75Q + 1,125
Q > 4,500	V = Q

review if this formula suggested as 6 and 7 Bedroom end of needing same tank

suggest 250 /bedroom

~~*For individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit, the minimum septic tank capacity is 1,500 gallons~~

(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. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

if tanks in series chosen ??

REVIEW with WC prespective?

upstream

no one tank.. put two.

State review required ?

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

Risers required in each in effluent end?

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second compartment of the septic tank. 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) approved effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

No State review, replace septic tank with alternative methods.

History Note: *Authority G.S. 130A-334; 130A-335(e), (f), (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 based on one of the following, but shall never be less than 1,000 gallons:

(1) equal to the required septic tank capacity in Group IV soils;

(2) equal to two-thirds of the required septic tank capacity in Group I, II, or III soils; or

(3) based on the following:

(A) pump submergence or as recommended by the pump manufacturer;

(B) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(C) flow equalization storage, if applicable; and

(D) 24-hour emergency storage above the high-water alarm activation level.

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

new requirement ?

(1) pump submergence or as recommended by the pump manufacturer;

(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(3) flow equalization storage, if applicable; and

(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this Rule.

(c) The emergency storage capacity may be calculated as the sum of ~~freeboard~~ space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

albeit correct.. ?

remove collection system

(d) The emergency storage capacity requirement shall be determined based on the following and in accordance with Table XV:

(1) type of facility served;

(2) classification of surface waters which would be impacted by a pump tank failure; and

(3) availability of standby power devices and emergency maintenance personnel.

TABLE XV. 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	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

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0803 is proposed for adoption as follows:

15A NCAC 18E .0803 GREASE TANK CAPACITY REQUIREMENTS

use ST for less than 1000 capacity, use ST with bottom open PT for more ... assume GT capacity is liquid capacity ?

typo

(a) Grease tanks or grease tanks in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. 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.

what size ? Opening depth etc..

(b) The minimum liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(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 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 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

GT >> should be Grease Trap plumbing code ???

(e) The grease tank liquid capacity shall be calculated by one of the following:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

new

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

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 and recreational areas;

0.8 if along other roads)

remove option 3. >>

watertight lids or six inches above

Access and risers reqd.?

(f) An approved grease rated effluent filter shall be in the second compartment of the grease tank. 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) approved grease rated effluent filter shall be in the compartment immediately prior to discharge; and

with intake at least 50% below of liquid level

(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank.

at least 50% of liquid depth

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

Not necessarily licensed

NEW? design approval or product approval

TRAPS and Interceptors >> Oil/Water Separators?

History Note: *Authority G.S. 130A-335(e), (f), (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), (f1);*

15A NCAC 18E .0805 is proposed for adoption as follows:

WC supports

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

(3) A concrete tank manufacturer enrolled in a third-party quality assurance and quality control program as described in Subparagraph (a)(2) of this Rule is not subject to 10 percent testing of all tanks installed.

(b) Tanks installed under the following conditions shall be leak tested at the site using leak testing methods described in this Rule:

(1) soil wetness condition is present within five feet of the elevation of the top of a mid-seam pump tank;

(2) advanced pretreatment; or

(3) PE design.

all PE design systems or Tank designed by PE not clear ? and any tank to be assembled on site.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

use method prescribed by D'Amato and Devkota, NPCA and as approved for IWWS-2015-02 Presby Environmental inc.,

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested.

(E) Tank shall be approved if there is no visible flowing leakage and the water level in the tank has not fallen after sitting for one hour.

(2) Vacuum test procedure

(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 2.5 inches of mercury.

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) 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)(17) and (e)(8) of this Subchapter marked over.

History Note: Authority G.S. 130A-335(e), (f), (f1);

Use 5 inches as proposed by D'Amato and Devkota

15A NCAC 18E .0806 is proposed for adoption as follows:

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

contradicts with 1%slope requirement

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.

level

(c) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703 of this Subchapter to prevent differential settling of the pipe and shall be level for two feet after exiting the tank.

(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.

(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

both ... bring to grade with watertight seals and sheding water

field practice lacking ?? how to get 2 feet of undisturbed soil beyond tank ?

(f) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approval material, and installed in accordance with the tank manufacturer's instructions and industry standards. When rock or other protruding obstacles are encountered, the bottom of the tank excavation shall be backfilled with sand, gravel, stone, or other approved equivalent material to three inches above rock or obstacle.

(g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section.

History note: *Authority G.S. 130A-335(e), (f), (f1);*

PT Installation/ GT /Siphon and other tanks Installation criterion ?

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 is proposed for adoption as follows:

15A NCAC 18E .0901 GENERAL DESIGN AND INSTALLATION CRITERIA FOR SUBSURFACE DISPERSAL SYSTEMS

what is trench?

bottom

Gr. I, II, III

trench bottom ... side walls are also infiltrative surfaces ?

(a) Wastewater systems shall be used on sites classified suitable in accordance with Rule .0509 of this Subchapter. The site shall meet the following criteria:

(1) 12 inches of naturally occurring soil is on the downslope side of the trench between the infiltrative surface and any limiting condition; and

(2) 18 inches of separation between the infiltrative surface and any soil wetness condition in Group I soils.

(b) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be used;

(2) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 30 inches of the ground surface (36 inches for Group I soils) or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(3) LTARs determined from Table XVII shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface;

(4) for shallow systems, the LTAR shall be based on the most limiting, naturally occurring soil horizon or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(5) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type; and

(6) the LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III of Rule .0402(a) of this Subchapter.

(c) 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 determined by dividing the design daily flow by the LTAR.

(2) The minimum trench length shall be determined by dividing the required infiltrative surface area by the trench width. The authorized agent may approve trench widths between two and three feet. The following equation shall be used to calculate the minimum line length required:

TL = (DDF ÷ LTAR) ÷ ETW

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

ETW = equivalent trench width (feet)

(3) The area occupied by step-downs and drop boxes shall not be included as part of the minimum required infiltrative surface area.

(4) The total trench length required for trench products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval.

(5) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XVI and XVII.

TABLE XVI. LTAR and mass loading rate for wastewater systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.8 – 1.2	0.00151 – 0.00227
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.6 – 0.8	0.00113 – 0.00151
		Loam		
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6	0.00057 – 0.00113
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.1 – 0.4	0.00019 – 0.00076
		Silty Clay		
		Clay		

why range 0.001 not allowed? use max. contradicts DSE values USE half rule.....

Is Agent expected to check this? Prescriptive nature conflicts somewhat? A how to use it reference information may be Appendix ###

*Mass loading rate is based on the combined load of BOD and TSS.

how? BOD or BOD5

TABLE XVII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class	LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*

I	Sands	Sand	0.6 – 0.8	0.0012 – 0.0015
		Loamy Sand	0.5 – 0.7	0.00095 – 0.0013
II	Loams	Sandy Loam	0.4 – 0.6	0.00076 – 0.0012
		Loam	0.2 – 0.4	0.00038 – 0.00076
		Silt Loam	0.1 – 0.2	0.00019 – 0.00038
III	Sandy Clay Loam**		0.05 – 0.15	0.000095 – 0.00029

*Mass loading rate is based on the combined load of BOD and TSS.

** Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

generic !!

(d) Wastewater system installation shall be in accordance with the following criteria:

(1) an engineer's level, laser level, or equivalent shall be used for the following:

(A) staking (flagging) or marking on the soil 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) 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 distance to a limiting condition along the entire trench length in accordance with Subparagraph (d)(3) of this Rule;

(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and a soil wetness condition;

or more

suggest remove down slope side

doesn't make technical point?

(4) the pipe shall be centered laterally in the trench;

where?

under trench bottom

(5) final soil cover over the dispersal field shall be to a depth of six inches after settling. The finished grade over the wastewater system shall be sloped to shed surface water. Surface water runoff, including stormwater, shall be diverted away from the wastewater system;

(6) Schedule 40 PVC or other State-approved equivalent pipe may be used as needed to connect sections of trench and overcome site limitations. The bottom area of trench where solid piping is installed shall not be included as part of the minimum area required for infiltrative surfaces;

(7) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meeting the following criteria:

distribution device ?

(A) separated by 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;

clarify ...?

downspouts, crawl space drains etc.. should be diverted as well

i, ii, iii .. a system

(8) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate that the distribution devices perform as designed;

(9) serial and sequential distribution may be used when approved by the authorized agent. The effluent in an individual trench shall be constructed to allow full utilization of the upstream trench prior to overflowing to the next downslope trench through either a stepdown or drop box in accordance with Subparagraphs (d)(10) and (d)(11) of this Rule;

step-downs

(10) step-downs shall be constructed 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 equivalent State-approved pipe. The installer shall demonstrate that the ~~drop boxes~~ perform as designed;

(11) drop boxes shall be separated from the trench by two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is one-inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed;

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(13) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

respective

dispersal area is clearer ?

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0902 is proposed for adoption as follows:

15A NCAC 18E .0902 CONVENTIONAL WASTEWATER SYSTEMS

(a) A conventional wastewater system consists, at a minimum, of an approved septic tank and a gravity distribution dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Conventional wastewater systems shall be used on sites that have been classified suitable in accordance with Rules .0509 of this Subchapter. Sites classified suitable as to soil depth may utilize shallow placement of dispersal system

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) Conventional wastewater system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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 in a single trench bottom not to exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent;

(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 not exceed three feet and trench depth shall not exceed 36 inches on the

2.5 inch per 100'

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 six inches below the pipe and two inches over the pipe; and

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregate which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregate installed.

(e) Shallow systems shall not be installed on slopes greater than 30 percent and shall be installed in accordance with Paragraph (d) of this Rule and the following:

(1) soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches, with the dispersal field crowned at one-half percent as measured from the centerline of the dispersal field; and

(2) the type and placement of soil cover shall be approved by the authorized agent. The cover material shall have not more than 10 percent by volume of fibrous organics, building rubble, rocks, or other debris and shall be Soil Groups II or III.

(f) 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 (d) 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 sized at 75 percent of the total area 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 resistant to corrosion;

(5) effluent flow diversion valves placed below finished grade shall be installed in a valve box and be operable from the ground surface;

~~(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and~~

(7) the maximum reduction in dispersal field area is 25 percent, ~~unless a greater percentage is specifically identified in a PIA approval or this Subchapter.~~

-

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

15A NCAC 18E .0903 is proposed for adoption as follows:

15A NCAC 18E .0903 BED SYSTEMS

the

Installer use CI ??

WC concern !

At Grade

34"
30"
etc

conventional and shallow perhaps needs definition

of

criterion are met

Define ??

max. reduction ?

least

respective

Future PIA ?

total reduction 25% ?(no double dip)

(a) This Rule provides for the permitting of bed systems receiving DSE. Bed systems shall be limited to 600 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter. Beds may be permitted on sites that meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) topography or available space limits the design options for the site.

other

including APT systems: define APT (RWTS, TS-I, TS-2, Re-USE)

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a conventional trench system as calculated in accordance with Rule .0901(c) of this Section.

define

(d) Bed system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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;

1.5 ft. @ 3-ft c/c

(3) laterals shall be placed on a maximum of three-foot centers;

(4) the lateral design criteria shall meet the requirements of Rule .0902(d)(3) and (4) of this Section for gravity and pressure dosed gravity distribution systems;

(5) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval;

required?

(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) if pressure dispersal is used, the pressure dispersal system shall be designed in accordance with Rules .0907(d) and (e) or .0908(c) and (e) of this Section or in accordance with a PIA approval.

required

History Note: Authority G.S. 130A-335(e), (f), (f1);

15A NCAC 18E .0904 is proposed for adoption as follows:

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch or 10-inch (inside diameter) corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

DSE ? no APT credit?

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2. To calculate trench length in accordance with Rule .0901(c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe and an equivalent trench width of two and one-half feet shall be used for 10-inch pipe.

(d) LDP ~~tubing,~~ filter wrap, and fittings shall meet the following criteria:

(1) ~~tubing~~ and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated ~~tubing~~ 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 (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated tubing shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the minimum requirements in Table XVIII; and

(6) the large diameter pipe with filter wrap shall be encased in a black polyethylene sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

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 0.5 inches of water

or per manufacturer's recommendation

(e) LDP system installations shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be 12 inches wide; or more

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet);

(3) backfill material 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 II or III; of soils

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight and 10-inch LDP shall be six feet.

6) any additional/stringent requirement by manufacturer.

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 domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2 for DSE. An equivalent trench width of six feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) PPBPS installation shall be in accordance with Rule .0901(d) of this Section, the following, and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on center;

(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;

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet; and

(5) trenches shall be constructed level in all direction with a plus or minus one-half inch tolerance from side-to-side and maximum fall in a single trench bottom shall not exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent.

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 may be used on sites originally classified unsuitable due to soil wetness, soil morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches are limited to 1,500 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply. clarification why 1500 gpd

(b) The soil and site shall meet the following criteria:

(1) texture of the receiving permeable horizon is sand, loamy sand, sandy loam, loam, or silt loam;

(2) structure of the receiving permeable horizon is classified suitable;

(3) 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 1/3 of the required thickness of the receiving permeable horizon;

(5) the naturally occurring receiving permeable horizon shall be less than 60 inches below the natural soil surface;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum separation distances to a soil wetness condition:

(A) 18 inches with 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.

(c) If a groundwater lowering system is required to meet the minimum vertical separation distance in Paragraph (b)(6) of this Rule to a soil wetness condition that is not related to lateral water movement, the following conditions apply to the groundwater lowering system:

(1) shall extend into the receiving permeable horizon;

(2) shall be prepared by a person or persons who are licensed to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, G.S. 89E, or G.S. 89F;

(3) shall have a suitable outlet accessed by the artificial drainage system. The outlet location and elevation must be shown on the artificial drainage system plan with relative water level elevations and dispersal field site elevations labeled; and

(4) all artificial drainage system components are integral to the wastewater system and subject to ownership and easement requirements of Rule .0301(b) and (c) of this Subchapter.

(d) The LTAR shall be determined in accordance with Table XIX for all DSE sand-lined trench systems. The LTAR shall be one of the following:

(1) LTAR set forth in Table XIX based on the texture of the receiving permeable horizon; or

(2) 10 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

(e) There shall be no reduction in trench length comparted to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

TABLE XIX. LTAR for sand lined trench systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**Distribution type**	**LTAR (gpd/ft$^{2)}$**
Sand or Loamy Sand	Gravity Distribution	0.3 – 0.6
	Pressure Dispersal	0.4 – 0.7
Sandy Loam or Loam	Gravity Distribution	0.2 – 0.4
	Pressure Dispersal	0.3 – 0.6

Silt Loam	Gravity Distribution	≤ 0.3*
	Pressure Dispersal	≤ 0.4*

* For Silt Loam soils, LTAR shall be field verified and no greater than 10 percent of in-situ Ksats.

(f) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(g) Sand lined trench dispersal field installation shall be in accordance with Rule .0901(d) of this Section and 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 have a center-to-center spacing three times the trench width, but no less than five feet on centers;

(3) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters: two runs within a trench between one and one half and two feet wide; and 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 six inches of sand lined trench media;

(4) the sand lined trenches shall be constructed to extend into the naturally occurring receiving permeable horizon;

(5) the infiltrative surface shall be no deeper than 24 inches below finished grade. The top of the media for a media filled trench shall be at or below the naturally occurring soil surface. Drip tubing shall be installed six inches below the natural grade;

(6) sand used to line the trench shall be sand in texture. If required by the LHD in the CA, the installer shall provide written laboratory verification of the media textural classification and quality prior to the sand lined trench being installed. When laboratory analysis is required, the material shall be determined to be clean, uncoated fine, medium, or coarse sand with 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.002 millimeters;

(7) pressure dosed gravity distribution shall be used when the total dispersal field line length exceeds 600 linear feet in a single system;

(8) pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system;

(9) if pressure dispersal is used, the pressure dispersal network shall be designed in accordance with Rules .0907(e) or .0908(e) of this Section, except that the trenches shall have a maximum width of three feet;

(10) no depressions are allowed over the dispersal field area, including no linear depressions over the trenches;

(11) finished grade shall provide for positive surface drainage away from all system components, with the dispersal field crowned at 1/2 percent as measured from the centerline of the dispersal field. The finished grade requirements shall be made a condition of the CA; and

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(h) Other sand lined trench systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) of this Subchapter.

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

4 to 7 feet WC

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 a three to six-foot pressure head to distribute effluent across the entire dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section, except for the following:

(1) LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 24 inches of the naturally occurring soil surface or to a depth of 12 inches below infiltrative surface, whichever is deeper; and

(2) Tables XX and XXI shall be used to determine the LTAR for LPP systems.

Table 20 and 21 ??

TABLE XX. LTAR for LPP systems based on Soil Group and texture

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.4 – 0.6	0.00076 – 0.0012
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.3 – 0.4	0.00057 – 0.00076
		Loam		
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3	0.00029 – 0.00057
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		

remove range Source?

IV	Clays	Sandy Clay	0.05 – 0.2	0.000095 – 0.00038
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XXI. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.3 – 0.4	0.0006 – 0.00075
		Loamy Sand	0.25 – 0.35	0.0000475 – 0.00065
II	Loams	Sandy Loam	0.2 – 0.3	0.00038 – 0.0006
		Loam	0.1 – 0.2	0.00019 – 0.0003
		Silt Loam	0.005 – 0.1	0.000095 – 0.00019

*Mass loading rate is based on the combined load of BOD and TSS.

source

(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 determined by dividing the design daily flow by the LTAR; and

(2) the minimum trench length shall be determined 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 (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

Total Trench Length Required

Line Spacing

(3) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XX and XXI.

(e) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the LPP distribution network shall be constructed of ~~small diameter pressure rated Schedule 40 PVC laterals placed in gravel or other approved media filled~~ trenches;

1.25 inch Sch 40 PVC or stronger

(2) the trench width shall be one to two feet;

(3) trenches shall be located no less than three times the trench width on centers, with a minimum spacing of five feet on centers;

conflict 12 - 24 inches

what is approved gravel #5 ASTM D-448

(4) trenches shall include eight inches of approved gravel or other approved media, with no less than six inches vertical separation distance from the discharge piping to 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 discharge rate between the first and last orifice along the lateral;

5+1.5+1.5

(B) minimum orifice size shall be 5/32-inch for 2/3 of the field lateral lines, with no orifices sized smaller than 1/8-inch in any lateral line; and

max 75 length per side

When PE reqd.

(C) 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 four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

1.5 pipe min 100 or PE

(B) specially designed and approved orifice shields; or

(C) State-approved equivalent tubing or pipe;

(7) the following additional design provisions are required for sloping sites:

(A) separately valved manifolds are 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 bottom lines 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 (pipe full) flow rate into the upper lines, relative to the lower lines, depending on the amount of elevation difference; 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, such as with State-approved automatically alternating valves, without requiring simultaneous adjustment of multiple throttling valves, or as otherwise approved by the State;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and protected with valve boxes, or approved equivalent protective access devices. Turn-ups shall terminate at or above the ground surface and be installed in a valve box or equivalent for protection and accessibility;

(9) the supply manifold shall be constructed of solvent-welded pressure rated Schedule 40 PVC;

or stronger.. Generic !

(10) the supply manifold shall be sized large enough based on the size and number of laterals served to prevent more than a 15 percent variation in discharge rate between the first and last laterals when feeding the manifold from the downhill side;

is a list of valves available?

(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;~~

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees or threaded fittings (Schedule 80 PVC only); and

(C) cleanouts shall be installed at the ends of the supply manifold and shall be enclosed in valve boxes for protection and accessibility from the ground surface;

(12) gate valves or other State approved valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length or the dispersal field is not visible from the pump tank;

(13) valves shall be installed in a valve box or other approved access device and be readily accessible from the ground surface;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the flow rate shall be based upon delivering three feet to six feet of static pressure head at the distal end of all lateral lines;

(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;

(15) the dispersal field shall be covered to a depth four inches after settling; and

(16) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval.

remove

manifold

both

this valve is inadditon to the gate valve in the PT

repeat change 4 to 7 feet

to field, prevent draining to PT by use of CHK valve

??

?

are these available

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

15A NCAC 18E .0908 is proposed for adoption as follows:

DSE

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving DES. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Drip dispersal systems shall meet the following soil and site criteria:

(1) Eighteen inches of naturally occurring suitable soil above a limiting condition, 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any unsuitable limiting condition shall be 12 inches.

(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 soil wetness exists within the first 12 inches below the naturally occurring soil surface. A groundwater lowering system may be used to meet the vertical separation distance to a soil wetness condition only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface; and

(C) minimum vertical separation distance to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any soil wetness condition.

(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 distance to any limiting condition shall be 24 inches.

(c) Tables XXII and XXIII shall be used to determine the LTAR for all DSE drip dispersal systems:

(1) Table XXII 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 XXIII 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 tubing without emitters (blank tubing) shall not count towards the minimum dripline length required; and

(5) the design daily flow shall be divided by the LTAR, determined from Table XXII or XXIII, 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 (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

TABLE XXII. LTAR for DSE drip dispersal systems based on Soil Group

Soil Group	USDA Soil Textural Class		LTAR (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 XXIII. LTAR for DSE drip dispersal systems based on Saprolite Group

Saprolite Group	Saprolite Textural Class	LTAR (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

(d) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) depth from the naturally occurring soil surface to any unsuitable soil condition 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;

(2) depth from the naturally occurring soil surface to any soil wetness condition 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;

(3) 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;

(4) depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches and Group IV soils are encountered within 18 inches of the naturally occurring soil surface;

(5) driplines are installed in new fill material and Group IV materials are encountered within 18 inches of the naturally occurring soil surface;

(6) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition and the LHD or State requires such an evaluation to

determine its projected effectiveness;

(7) verify a proposed LTAR that exceeds the LTAR assigned by the LHD;

(8) the design daily flow exceeds 1,500 gpd; and

(9) the LHD or State determines that the combination of soils conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances creates the potential for hydraulic overloading of the proposed site.

(e) 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 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 may be allowed within any contiguous section of dripline containing drip emitters;

(4) six inches of cover over the dripline shall be maintained;

(5) the requirement for 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;

(6) minimum required soil cover shall be uniform over the entire drip dispersal field;

(7) drip dispersal fields shall be graded to shed surface water;

(8) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by an appropriately licensed individual; and

(9) the drip dispersal field shall be field tested after installation in accordance with Rule .1603 of this Subchapter.

turtle back 0.5 % from center all around

landscaped to adequately to prevent surfacewater ponding

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) A fill system (including new and existing fill) is 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 slopes in all directions. The fill pad shall be constructed when the wastewater system is installed.

(b) New fill systems may be installed on sites that meet the following requirements:

(1) the first 18 inches below the naturally occurring soil surface consist of suitable soil;

(2) no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;

(3) systems shall be installed only on sites with uniform slopes less than four percent. 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 slopes in all directions.

(c) New fill system design and installation shall be in accordance with the following criteria:

(1) trenches shall be installed with 24 inches separating the infiltrative surface and any limiting condition. If pressure dispersal is used, the minimum separation distance shall be 18 inches;

(2) trenches shall be installed with 18 inches separating the infiltrative surface and any soil wetness condition. This separation requirement may be met with the use of a groundwater lowering system only in Soil Groups I and II with suitable structure. If pressure dispersal is used, the minimum separation distance shall be 12 inches;

(3) fill systems with a design daily flow greater than 480 gpd shall use pressure dispersal systems;

(4) fill material soil texture shall be classified sand or loamy sand (Soil 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) for the establishment of a vegetative cover;

(5) minimum cover shall be six inches of settled soil;

(6) additional fill may be added to facilitate drainage and accommodate landscaping requirements at the site provided the infiltrative surface is less than 30 inches below the finished grade;

(7) 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 or organic litter (O horizon) shall be removed before the additional fill material is incorporated;

(8) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;

(9) 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;

(10) the outside edge of the trench shall be located five feet horizontally from the top of the side slope;

(11) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;

(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 shall 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; and

(13) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(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 (if not readily available to the LHD) indicating that the fill material was placed on the site prior to July 1, 1977;

(2) the fill material shall have sand or loamy sand (Group I) soil texture for a 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. The fill shall not have discreet layers containing greater than 35 percent of shell fragments;

(4) if 24 inches of Group I fill material is present, additional fill with soil texture classified Group I may be added to meet the separation requirements of Subparagraph (e)(5) of this Rule;

(5) soil wetness condition, as determined by Rule .0504 of this Subchapter, 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 factors 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 design daily flow shall not exceed 480 gpd;

(2) pressure dispersal shall be used. LPP systems shall meet the requirements of Rule .0907(c), (d), and (e) of this Section. Drip dispersal systems shall meet the requirements of Rule .0908 (c) and (e) 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 distance to any limiting condition 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 shall be determined in accordance with Rule .0901(c) of this Section and the following:

(1) the LTAR shall be based on the hydraulic conductivity of 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 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 distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) Other fill systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) of this Subchapter.

is it intended?

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

15A NCAC 18E .0910 is proposed for adoption as follows:

or potential lateral flow

15A NCAC 18E .0910 ARTIFICIAL DRAINAGE SYSTEMS

(a) Artificial drainage systems are a site modification and may be proposed to reclassify sites as suitable which were originally classified unsuitable due to a soil wetness condition. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Artificial drainage systems may be used on the following sites:

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(1) Group I or II soils with suitable structure and clay mineralogy; and

(2) the artificial drainage system shall be designed to maintain the required minimum vertical separation distance to a soil wetness condition as specified in Rule .0901(d)(3) of this Section.

(c) Artificial drainage systems shall be designed in accordance with the following, as applicable.

Title

(1) 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 artificial drainage system design;

(B) artificial drainage system 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 artificial drainage 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) artificial drainage equation input parameters shall be based upon field determinations 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 North Carolina State Climate Office station. A source of these data is the WETS tables published on the Natural Resource Conservation Service Website: www.wcc.nrcs.usda.gov/climate/wedlands.html. This monthly value shall be divided by 14 to give the drainage coefficient (inches per day). For systems designed for over 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 artificial drainage system effectiveness at sites with the following conditions: three of more effective soil layers; Group III or IV soils within 36 inches of the naturally occurring soil surface; or sites requiring a pump drainage system; and

(F) the modeling procedure set forth in Rule .0504(g) of this Subchapter shall be followed.

(2) Artificial drainage 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 required in this Rule, the requirements in Section .1100 of this Subchapter are applicable 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 2.5 times the projected peak inflow rate to the station.

(3) Plans and specifications for artificial drainage systems shall include the following information in addition to the information in Subparagraphs (c)(2) and (c)(3) of this Rule:

(A) location of existing and proposed artificial 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 envelop and filter fabric detail, cover, and cleanout detail;

(C) all relevant elevations with reference to an established benchmark;

(D) specifications for all artificial drainage system materials and installation procedures;

(E) the entire artificial drainage system 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 artificial drainage systems serving two or more lots shall have adequate width, in no case less than 20 feet plus the width of the artificial drainage system.

(d) Interceptor drains shall be used on sites where soil wetness conditions are based on lateral water movement that can be intercepted and diverted to prevent saturation of the dispersal field.

(e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance documents.

Interceptor drains / Curtain Drains shall be used where lateral flow might be intercepted after the installation of the dispersal field i.e. by the lateral trenches

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) An approved privy shall consist of a pit, floor slab, and seat assembly housed in a building which affords privacy and reasonable protection from the weather and shall meet the following criteria:

(1) the pit shall consist of an excavation with a bottom surface area of 3.5 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 saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizons, or soil wetness condition;

(4) the pit bottom shall not be in a depression;

(5) the pit shall be curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In clay soils, partial curbing may be acceptable if sufficient stability can be provided;

(6) the privy floor slab shall be constructed of reinforced concrete;

(7) where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction shall be acceptable. The floor slab shall be constructed of the following:

(A) rot resistant joists covered with tight tongue-and-groove rot resistant flooring;

(B) other approved flooring materials to provide strength, durability and prevent entrance of flies and mosquitoes to the privy pit; and

(C) where wood construction is used, floors shall be anchored to the sills. The minimum sill size is four-inch by four-inch;

(8) the pit shall be vented through approved screened PVC Schedule 40 pipe or approved equal, 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) not have any bends in the pipe; and

(D) shall be black colored pipe; and

(9) 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) the privy building shall afford a reasonable degree of protection from bad weather conditions;

(2) 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 completely covered with soil; and

(3) 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 immediately adjacent shall be kept clean;

(2) a hinged seat cover shall be provided and kept closed when the privy is not in use;

(3) privy shall have a hinged door that can be locked when not in use;

(4) flies shall always be excluded from the pit;

(5) garbage and trash shall be kept out of the pit; and

(6) privy building shall not be used as a storage building.

(d) When a new pit is required, an IP, CA, and OP shall be obtained.

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

SECTION .1000 – NON-GROUND ABSORPTION SYSTEMS

15A NCAC 18E .1001 is proposed for adoption as follows:

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code.

(b) When an alternative toilet is used, the rest of the wastewater generated by any other plumbing fixture in the facility shall be discharged to a wastewater system that is approved under this Subchapter.

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

15A NCAC 18E .1002 is proposed for adoption as follows:

or irrigation

15A NCAC 18E .1002 WASTEWATER RECYCLE/REUSE

(a) Wastewater recycling systems that produce treated wastewater may be used for toilet flushing as long as the wastewater recycling system meets:

co

(1) the North Carolina Plumbing Code requirements; and

(2) 15A NCAC 02U as adopted by the Environmental Management Commission.

is this On-site WW jurisdiction

WC supports inclusion

direct

(b) Recycled wastewater shall be not used for body contact or human consumption.

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

SECTION .1100 – DOSING SYSTEMS AND CONTROLS

15A NCAC 18E .1101 is proposed for adoption as follows:

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used for discharging effluent into laterals when:

(1) total lateral length exceeds 750 linear feet in a single system; or

(2) discharging to a pressure dosed gravity distribution or pressure dispersal system.

(b) Alternating siphons or pumps shall be used and discharge to separate dispersal fields for the following:

is preferably

(1) design daily flow from a single system exceeds 3,000 gpd, or

(2) total length of trench exceeds 2,000 linear feet in a single system.

(c) If alternating pumps are not required in accordance with Paragraph (b) of this Rule, the pumps may discharge to a single dispersal field.

not required

(d) The dose volume from pressure dosed gravity distribution systems ~~shall be~~ designed to fill the installed linear footage of the laterals between 66 and 75 percent at each dosing event. The lateral capacity for trench products with a PIA approval is equivalent to the capacity of a four-inch corrugated pipe. Dose volumes for LPP systems shall be calculated in accordance with Rule .0907(e)(14)(B) of this Subchapter. Dose volumes for drip dispersal systems shall be calculated in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from dosing systems shall be designed to optimize the distribution of the effluent throughout the dispersal field.

History Note: Authority G.S. 130A-335(e), (f), (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 ½-inch solids or be a screened, high head pump designed for effluent;

(2) designed to meet the discharge rate and total dynamic head of the effluent distribution system;

(3) removable without requiring entrance into the tank; and

(4) listed by Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency, unless a PE specifies the proposed pump model.

(b) Air locking of the pump and siphoning from the pump tank when pumping downhill shall be prevented using a vent or anti-siphon holes (3/16-inch minimum). This hole must be located between Check Valve and the Pump.

(c) A pressure-rated threaded union, flange, camlock, or similar disconnect device shall be provided in each pump discharge line.

(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line back into the pump tank. These back-flow prevention devices shall be located on the pump side of the disconnect device.

(e) A shut-off 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. Shut-off 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), (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 requiring use of a pump. The panel enclosure shall be NEMA 4X or equivalent. Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency shall list the panel. The panel shall include for each pump:

(1) an independent overload protection (if not integral with the pump motor);

(2) a circuit breaker(s);

(3) a motor contactor or solid-state relay which breaks all current to the pump;

(4) a latching hand-off automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be manually deactivated;

(5) a pump run light;

(6) an elapsed time meter; and

(7) an event counter.

(b) An automatic pump sequencer shall be provided in systems requiring multiple pumps and shall remain operable whenever any pump or pump circuit 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 any other form of telemetry that allows the Management Entity to properly monitor system performance and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel shall be mounted 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible.

at least 24" to no more than 36"

bottom

(e) A NEMA 4X outside junction box shall be installed above grade on or adjacent to the pump tank access riser when the control panel is more than 10 feet from the access riser.

(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 grips, duct seal, or other suitable material or methods shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.

(g) Dual and multiple fields shall be independently dosed by separate pumps which 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 State may approve other equivalent methods of dosing dual or multiple fields.

(h) Floats or similar State approved devices designed for detecting liquid levels in DSE shall be provided to control pump cycles:

Pump Tank

(1) 18 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 sealed 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, as needed, to provide 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

OVERRIDE float ?

(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:

and

(1) be audible and visible ~~to the system users and the Management Entity;~~

(2) have a silencer button or device ~~shall~~ be visible and located on the outside of the panel enclosure;

(3) provide for manual testing, and shall enable the audible alarm to be silenced by the system user. The alarm shall automatically reset after testing and when an alarm condition has cleared;

(4) remain operable whenever the pump or pump circuit is inoperable;

(5) have an enclosure that is watertight, corrosion resistant, and rated NEMA 4X or equivalent; and

(6) be mounted outside the facility and always accessible.

(j) All pump systems shall have their performance demonstrated using clean water prior to issuance of an OP. The test shall include a demonstration and documentation of the following:

(1) pump delivery rate;

(2) float control levels;

(3) operating pressure head, when applicable; and

(4) structural integrity of the piping network.

(k) For systems designed by a PE, the PE may propose other panel construction and location criteria that meet these 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), (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 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 or otherwise designed to 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; and

(3) siphon tanks shall have a functioning high-water alarm that is audible and visible by system users and weatherproof if installed outdoors in a NEMA 4X enclosure or equivalent. 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), (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) advanced pretreatment or dispersal systems, if required by the manufacturer; or

(2) when a dosing system is required in accordance with Rule .1101 of this Section and in conjunction with an adjusted design daily flow granted in accordance with Rule .0403 of this Subchapter.

(b) Flow equalization systems designed under a PIA approval issued in accordance with Section .1700 of this Subchapter and G.S. 130A-343(i) shall incorporate timed dosing to control the maximum amount of effluent that shall be delivered to the advanced pretreatment or dispersal field in a specific period.

(c) The timed dosing system shall be integrated with the pump tank control sensors to assure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section shall be present prior to the start of any scheduled dose event.

History Note: *Authority G.S. 130A-335(e), (f), (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 among individual laterals with two feet of residual pressure head;

(2) a pressure regulating valve incorporated 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) observation ports located inside or outside of the pressure manifold box to verify flow to individual laterals; and

(6) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A dissipator box may be used to dissipate flow in a pressure dosed system designed for pressure dosed gravity dispersal of effluent in a serial or sequential manner. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, of adequate capacity, and approved by the authorized agent.

new terminology
approx. shape size
recommendaton

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

15A NCAC 18E .1201 is proposed for adoption as follows:

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a design daily flow up to 3,000 gpd shall meet the following conditions:

(1) RWTS or PIA approval in accordance with Sections .1500 or .1700 of this Subchapter;

(2) design that meets one of the effluent quality standards specified on the OP and defined in Table XXIV prior to dispersal of the effluent to the soil;

(3) compliance with the siting and sizing requirements of this Section; and

(4) compliance with Rules .1302(d) and .1709 of this Subchapter.

TABLE XXIV. Effluent quality standards for advanced pretreatment systems

Constituent	**Effluent Quality Standards**

Show Reuse std. on table, consider merging TS I and TS II with exisiting TS-II setback ... 0 setback for reuse quality

	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 high strength effluent and approved by the State on a product or project-specific basis.

30 mg/l

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1202 is proposed for adoption as follows:

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) The initial site evaluation shall be conducted and depth to limiting conditions determined in accordance with Section .0500 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) Only one of the following modifications to system siting and sizing criteria may be approved, unless otherwise identified in this Rule:

(1) reduction in depth to limiting condition and vertical separation distance;

(2) setback reduction; or

(3) LTAR increase.

(c) The minimum required vertical separation distance to a limiting condition may be reduced with the use of advanced pretreatment in accordance with Table XXV. Table XXVI provides the minimum depths and vertical separation distances 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 distance to a limiting condition is proposed in accordance with this Rule.

Table XXV Minimum vertical separation distance to soil wetness condition (SWC) or limiting condition (LC) based on effluent quality

**

Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC

Soil Group	Distribution Method	Effluent Quality 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

8

*For comparison

**12-inch vertical separation shall always be maintained to rock or tidal water

Table XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality

Minimum depth (inches)*** from naturally occurring soil surface to LC					
Type of Fill	Distribution Method		Effluent Quality Standard		
		DSE*	NSF-40	TS-I	TS-II
New Fill (≤1,500 gpd) (slope ≤ 4%)	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 (≤480 gpd)	Gravity	36 of Group I Fill/Soils			
	LPP	24 of Group I Fill/Soils			
	Drip	24 of Group I Fill/Soils			
Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					
Type of Fill	Distribution Method	Effluent Quality Standard			
		DSE*	NSF-40	TS-I	TS-II
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	24 to LC 18 to SWC	18	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

(≤480 gpd)	LPP	18	18	12	12
	Drip	18	18	12	12

*For comparison

***Minimum depth after adjustment for slope correction

(d) The LTAR may be modified when the following criteria are met:

(1) for advanced pretreatment systems meeting NSF-40 effluent quality standards the LTAR may be increased by up to a factor of 1.33 when compared to the rate assigned by the authorized agent for a new system using DSE in soils which are Group I or II with suitable structure;

(2) for advanced pretreatment systems meeting TS-I or TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.0 when compared to the rate assigned by the authorized agent for a new system using DSE when pressure dispersal is utilized;

(3) for advanced pretreatment systems meeting TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.5 when compared to the rate assigned by the authorized agent for a new system using DSE and all the following conditions are met:

(A) 36 inches of Group I soils from the naturally occurring soil surface;

(B) depth to a soil wetness condition below the naturally occurring soil surface is 24 inches;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) pressure dispersal shall be utilized;

(4) a Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when an increased LTAR for TS-I or TS-II systems is proposed in accordance with Subparagraphs (d)(2) or (d)(3) of this Rule on sites that also meet one of the following conditions:

(A) Group III or IV soils occur within three feet of the infiltrative surface; or

(B) site requires artificial drainage of Group II or III soils;

(5) the LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section;

(6) for trench dispersal products subject to a specific dispersal field area reduction when receiving DSE in accordance with the rules or a PIA approval, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule; and

(7) design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

(e) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter, as applicable, shall be met, except as shown in Table XXVII of this Rule; and

(2) when any other siting or sizing modifications are applied (reduced depth to limiting condition, vertical separation distance or increased LTAR) for a TS-I or TS-II system in accordance with

Paragraphs (c) and (d) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII.

Table XXVII: Setbacks for wastewater systems meeting NSF-40, TS-1 or TS-II effluent quality standards

Feature (structure, water source, etc.)	Setback (feet) according to Effluent Quality Standard			
	DSE*	NSF-40	TS-I	TS-II
Surface waters classified WS-I, from mean 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 pool elevation	100	70	70	50
Any other coastal water, canal, marsh, stream, perennial waterbodies, streams, or other surface waters, from mean high-water mark	50	35	35	25
Lake or pond, from flood pool elevation	50	35	35	25
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25	25	20	15
Surface water diversion, as measured on the ground surface from the edge of the diversion	15	15	10	10
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15	15	10	10
Permanent stormwater retention basin or ~~detention basin~~	50	50	35	25
Any other dispersal field except designated dispersal field repair area for project site	20	20	10	10

*For comparison

detention basin

detention basin and ret. basin : define

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1203 is proposed for adoption as follows:

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

(a) No reductions in depth to limiting condition, vertical separation distance or setback requirements shall be taken. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) The LTAR may be modified when the following criteria are met:

(1) For advanced pretreatment systems meeting TS-I or TS-II effluent quality standards, the LTAR may be increased by up to a factor of 2.0 compared to that assigned by the authorized agent for a system using DSE.

(2) For advanced pretreatment systems meeting TS-II effluent quality standards, LTAR may be increased by up to a factor of 2.5 compared to that assigned by the authorized agent for a system using DSE when the following conditions are met:

(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a soil wetness condition below the naturally occurring soil surface.

(3) When the LTAR for a system is proposed to be increased in accordance with this Rule, the following conditions shall also be met:

(A) Special Site Evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(B) pressure dispersal shall be utilized;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) 25-foot setback shall be maintained to all property lines unless one of the following criteria are met: 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.

(4) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

WC not supporting double dipping

(c) For trench dispersal products that are subject to a specific ~~percent~~ dispersal field area reduction when receiving DSE in accordance with this Subchapter or a PIA approval, when any LTAR adjustments are taken in accordance with this Rule, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when compared to a conventional wastewater system.

(d) Design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

technically ?

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1204 is proposed for adoption as follows:

Max. reduction including PIA products use reduction shall be 50% of conventional system. (conflicts with LTAR of 2.5 ?)

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) Drip dispersal systems may utilize the following siting and sizing criteria when used with advanced pretreatment and a design daily flow less than or equal to 1,500 gpd. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site characteristics shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems

(A) 18 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be 12 inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 18 inches of naturally occurring suitable soil above a limiting condition and 12 inches of naturally occurring suitable soil above a soil wetness condition; and the minimum vertical separation distance shall be 12 inches to a soil wetness condition and 18 inches for any other limiting condition; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 18 inches;

(2) TS-I Systems

(A) 15 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be nine inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 12 inches of naturally occurring suitable soil above a limiting condition; nine inches vertical separation distance to a soil wetness condition, and 12 inches vertical separation distance to any other limiting conditions; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 12 inches; and

(3) TS-II Systems

(A) 13 inches of naturally occurring suitable soil above a limiting condition and the minimum vertical separation distance to any limiting condition shall be six inches;

(B) for new fill, the requirements of Subparagraph (2)(B) of this Paragraph shall be met; or

(C) for existing fill, the requirements of Subparagraph (2)(C) of this Paragraph shall be met.

(c) Site modifications shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition 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 distance to the projected (drained) soil wetness condition shall be 12 inches. The addition of fill material shall not be used to meet this requirement; and

(2) TS-I and TS-II Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition. The minimum vertical separation distance to the projected (drained) soil wetness condition shall be 12 inches. The groundwater lowering system may be used with the following:

(A) 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

(B) on new fill sites.

(d) Table XXVIII 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 (d)(5), (d)(6), and (d)(7) of this Rule.

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

Soil Group	**USDA Soil Textural Class**		**LTAR (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 – 0.15	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(1) The LTAR shall be based on the hydraulic conductivity of 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 greater.

(2) The design daily flow shall be divided by the LTAR, determined from Table XXVIII or XXIX, 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 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 (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

(3) The minimum dripline length calculated in Subparagraph (d)(2) 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. This shall not change the minimum area required for the system calculated in Subparagraph (d)(2) of this Rule. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA approval.

(4) Sections of tubing without emitters (blank tubing) required to meet 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.

(5) LTAR adjustment limitations for NSF-40 Systems

(A) 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

(B) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(6) LTAR adjustment limitations for TS-I Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(7) LTAR adjustment limitations for TS-II Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(8) Table XXIX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the hydraulic conductivity of the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

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

Saprolite Group	**Saprolite Textural Class**	**LTAR (area basis) (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

Saprolite Group	Saprolite Textural Class	LTAR (area basis) (gpd/ft^2)	
		NSF-40	TS-I and TS-II
	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

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter shall be required to permit advanced pretreatment drip dispersal systems for the following:

(1) NSF-40 Systems

(A) 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 0.1 gpd/ft^2; or

(B) 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 0.2 gpd/ft^2 for Group IV soils.

(2) TS-I Systems

(A) site has less than 18 inches of naturally occurring soil to any unsuitable limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(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 0.12 gpd/ft^2;

(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; or

(E) system is proposed to be installed in new fill, Group IV soils are encountered within 18 inches of the naturally occurring soil surface, and the LTAR is proposed to exceed 0.05 gpd/ft^2.

(3) TS-II Systems

(A) site meets the requirements of Subparagraphs (2)(A), (B), or (E) of this Paragraph;

(B) 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 0.15 gpd/ft^2; or

(C) 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.

(f) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the required minimum depth to a limiting condition or vertical separation distance reduction is proposed compared to the requirements for DSE in Rule .1202(c) of this Section. Eighteen inches of naturally occurring soil to an unsuitable limiting condition shall be required to take setback

reductions. The following LTAR limitations shall be applicable:

(1) 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;

(2) 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

(3) for NSF-40, TS-I, and TS-II Systems, Table XXVIII may be used to determine the LTAR when only setback reductions to artificial drainage systems are taken.

(g) Drip dispersal installation shall be in accordance with Rule .0908(e) of this Subchapter.

(h) Drip dispersal systems with a design daily flow 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 limiting condition, vertical separation distance, or setback reductions 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 nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 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 receiving TS-I or TS-II effluent quality may be proposed in accordance with the requirements of this Rule. Except as otherwise required in this Rule, the requirements of Rule .0906 of this Section shall apply.

(b) The site meets the criteria in Rule .0906(b) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If artificial drainage is proposed to meet the required minimum vertical separation distance to a soil wetness condition that is not related to lateral water movement, the following conditions shall apply:

(1) site shall comply with the requirements of Rule .0906(c) of this Subchapter; and

(2) vertical separation distance requirement to a soil wetness condition may be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXX shall be used to determine the LTAR for a sand-lined trench system and shall be based on the

hydraulic conductivity of the most limiting, naturally occurring soils overlying the permeable receiving layer. The LTAR shall be one of the following:

(1) the rate set forth in Table XXX; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon or the rate set forth in Table XXX, whichever is less.

TABLE XXX. LTAR for advanced pretreatment sand lined systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**LTAR (gpd/ft^2) ***
Sand or Loamy Sand	0.6 – 1.0
Sandy Loam or Loam	0.4 – 0.8
Silt Loam	No greater than 20% of in-situ Ksats or ≤ 0.5, whichever is less

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam, and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(f) Setback reductions in accordance with Table XXVII of Rule .1202(e) of this Section may be applied with sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(g) of this Subchapter and pressure dosed gravity distribution or pressure dispersal shall be required.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1206 is proposed for adoption as follows:

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Bed systems receiving NSF-40 effluent quality, or better, on sites with a design daily flow not to exceed 600 gpd may be approved when the following requirements have been met:

(1) the soil and site shall meet the following criteria:

(A) the vertical separation distance requirements of Rule .0901(d)(3) of this Subchapter are met;

(B) soil texture is Group I, II or III; and

(C) sites limited by topography, available space, or other site constraints;

(2) Table XVI in Rule .0901(c) of this Subchapter is used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the LTAR may be increased by a factor of 1.125 with no further reduction in bed size allowed;

(3) setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used; and

(4) bed system installation shall be in accordance with Rule .0903(d) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow less than or equal to 1,500 gpd may be approved when the following requirements have been met:

(1) The soil and site meet the following criteria:

(A) 30 inches of Group I or II soils below the naturally occurring soil surface and no soil wetness condition 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 soil wetness condition 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 Soil Group I 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground 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 design daily flow 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 may be reduced by up to 25 percent when the system is designed to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality; Group I Soil is present in the first 36 inches of naturally occurring soil; no soil wetness condition exists within the first

30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom; the bed or beds shall not be located directly beneath the advanced pretreatment components, and pressure dispersal is used; effluent shall be distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there shall be 100 percent dispersal field repair area.

(3) A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter shall be required when the vertical separation distance to a limiting condition is reduced and on sites with slopes greater than two percent.

(4) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be proposed in accordance with the following:

(A) the setbacks shall be measured from the nearest edge of the gravel bed;

(B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the gravel bed sidewall, or from the projected toe of the slope that is required to meet 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 XXVII of Rule .1202(e) of this Section are allowed. No other setback reductions are allowed.

(5) Bed system installation shall be in accordance with Rule .0903(d) of this Subchapter and the following:

(A) pressure dispersal shall be used whenever effluent is distributed to a bed not located directly 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 meet the vertical separation distance requirements from the bed bottom to an unsuitable limiting condition, when all of the following conditions are met: a groundwater lowering system shall not be used to meet the vertical separation distance requirements; new fill material shall be sand or loamy sand, containing not more than 10 percent by volume fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments by volume; and the requirements of Rule.0909(c)(9) of this Subchapter, for the projected side slope of the fill shall be met, as determined beginning at a point six inches above the top edge of the gravel bed.

(d) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow greater than 1,500 gpd and less than or equal to 3,000 gpd may be permitted on the following sites:

(1) The soil and site shall meet the following criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no soil wetness condition exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation distance of 24 inches to any soil wetness condition shall be 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground 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 determined by dividing the design daily flow by the LTAR;

(B) the minimum bed size may be reduced by up to 25 percent when the system is designed and approved to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation distance to a soil wetness condition shall be maintained after accounting for projected groundwater mounding; and there shall be 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 XXVII of Rule .1202(e) 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 concentration at the property line will not exceed 10 milligrams per liter (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(d) of this Subchapter and the following criteria:

(A) two or more equally sized beds shall be used and the beds shall not be located directly beneath the advanced pretreatment components; and

(B) effluent shall be distributed to the beds by a pressure dispersal system. A timer control 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 soil wetness condition exists within 18 inches of the existing fill surface;

(2) 18 inches of vertical separation distance exists to the soil wetness condition;

(3) the design daily flow shall 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 issued in accordance with Section .1700 of this Subchapter allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, to be uniformly laid out over the bed area.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1207 is proposed for adoption as follows:

15A NCAC 18E .1207 SITE AND SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

Compliance with the effluent quality standards of Rule .1201 of this Section shall be determined as follows:

(1) an individual advanced pretreatment system at a single site shall be in compliance when all the criteria of Rule .1302(d) of this Subchapter have been met; and

(2) an approved system shall be considered in compliance when all the criteria of Rule .1710 of this Subchapter have been met.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 is proposed for adoption as follows:

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems and non-ground absorption systems shall be operated and maintained in accordance with the conditions of the OP, PIA approval, and 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 XXXI shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXI shall also be required for all Type V and VI systems existing or installed on or before July 1, 1992.

(c) Wastewater systems with multiple components shall be classified by their highest or most complex system classification type in accordance with Table XXXI to determine LHD and Management Entity responsibilities.

(d) The State shall classify wastewater systems not identified in Table XXXI after consultation with the appropriate commission governing operators of pollution control facilities.

(e) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.

(f) The system shall be maintained to meet the effluent quality standards as specified in Table XXIV of Rule .1201(a) 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 applicant may submit a written request to the LHD and State to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency.

kind of new ?

(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, this activity shall be reported to the owner and LHD within 30 days.

define procedure

No repair permit is required.

(i) All residuals shall be removed as specified in the OP, the RWTS or PIA approval, 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 et seq.

Septage

Reporting

TABLE XXXI. 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 (single family or 480 gpd or less)	N/A	Owner	N/A
IIb – Conventional system with less than 750 linear feet of trench	N/A	Owner	N/A
IIc – Conventional system with shallow placement	N/A	Owner	N/A

GT maintenance

It appears doable to group systems with Operator Requirement, Classification, grade etc...
Group 0 >> I(a) to III (h) except III(b) meaning no operator required
Group 1 >> IIIb, III i, IV a etc.... meaning subsurface operator

IId – 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	Owner	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 – Sand lined trench gravity distribution no artificial drainage	NA	Owner	NA
IIIi – Gravity groundwater lowering system	5 years	Owner	5 years
IVa – LPP distribution	3 years	Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Certified Operator	2/year
IVc –Off-site system	5 years	Certified Operator	1/year
IVg –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Certified operator	1/year
Va – Fixed media advanced pretreatment	1 year	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
Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	1 year	Certified Operator	3,000 – 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS	1 year	Certified Operator	4/year
Vd – Other mechanical, biological, or chemical treatment plants < 3,000 gpd	1 year	Certified Operator	monthly

Certified Subsurface Operator

confusing with initial/repair combo ?

IV c to IV g ?

Ve – Drip dispersal systems	1 year	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
Vf – IPWW designed by a PE and reviewed by the State and determined to be IPWW	1 year	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
Vh - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	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
Vi – Wastewater system with pump groundwater lowering systems	Yearly break into sizes	Certified operator	2/year with one visit during the wet season
VIa – Any system > 3,000 gpd with mechanical, biological, or chemical treatment plant	6 months	Certified Operator	> 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Wastewater reuse or recycle	6 months	Certified Operator	≤ 3,000 gpd – 12/year > 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week

Wastewater Service LLC +

Grade II / III WPCBWW operator

*Toilet systems serving public facilities or more than 10 users per day shall be required to have a Management Entity other than the Owner as well as annual LHD compliance inspections.

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

SS Operators can be classified further within Subsurface Operator category ?

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS approved per Sections .1500 and .1700

(a) This Rule applies to all advanced pretreatment systems approved in accordance with Sections .1500 and .1700 of this Subchapter.

(b) System management in accordance with Table XXXI of Rule .1301 of this Section shall be required for advanced pretreatment systems. The following provisions apply to the operation and maintenance contracts for advanced pretreatment systems:

(1) for systems installed after July 1, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this Section. The contract shall be renewable and the contract term shall be for one year;

(2) for systems installed prior to July 1, 2006, the manufacturer shall provide an optional renewable yearly operation and maintenance contract with the owner that fulfills the requirements for the system in accordance with this Section;

(3) prior to the issuance or re-issuance of an OP for a proprietary advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place. 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; and

min. subsurface certification required
manufacturers can authorize anyone ?

(4) the manufacturer shall notify the LHD and the State when the owner chooses to not renew an operation and maintenance contract executed in accordance with this Paragraph.

(c) 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, Rule .1709 of this Subchapter, the RWTS or PIA approval, and conditions of the OP;

(3) the Management Entity shall inspect each system twice a year 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:

discharged to the field

(A) a visual inspection and evaluation of 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) 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 seven-day and 30-day influent wastewater flow from the facility to the system shall be measured by the Management Entity prior to the visual inspection of the system in accordance with

Subparagraph (c)(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, Provisional, and Innovative System shall be undertaken as required in accordance with Rule .1709 of the 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 State certified laboratory for analyzing;

(C) complete chain of custody from sample collection to analysis for each sample collected shall be maintained; and

(D) repeat 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 State 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 and substitute out of compliance samples with compliant samples. All samples results collected shall be reported.

(d) An individual advanced pretreatment system at a single site shall be considered compliant with the effluent quality standards of Table XXIV of Rule .1201(a) of this Subchapter when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA approval indicates compliant conditions;

(2) seven-day average daily inflow shall not exceed 1.3 times the design daily flow and the 30-day average daily inflow shall not exceed the design daily flow; and

(3) arithmetic mean (geometric mean for Fecal Coliform) of each constituent across three or more consecutive sampling dates does not exceed the designated effluent quality standard in Table XXIV in Rule .1201(a) of this Subchapter. Non-compliant data may be substituted with a new data set found to meet the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results for purposes of meeting the effluent quality standard.

(4) The mass loading of the system, based on site-specific water use records and effluent sampling results may be used to document system compliance with the performance criteria in Subparagraph (d)(3) of this Rule.

(e) The Management Entity may sample influent sample to the advanced pretreatment system as needed to determine compliance with this Rule.

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 directly 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 it fails to meet one or more of the conditions of Subparagraph (a)(1) of this Rule, either continuously or intermittently, or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to satisfy these conditions. The owner shall contact the LHD when the wastewater system is malfunctioning. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued an NOV;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed to ensure proper operation of the system. The contents shall be pumped whenever the solids level (scum and sludge) is found to be more than 1/3 of the liquid depth in any compartment. The effluent filter shall be cleaned 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 et seq;

(5) grease traps and tanks shall be pumped as needed, but no less than yearly. The owner shall maintain a contract with a certified pumper. All pumping records shall be maintained onsite;

(6) appropriate 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 shall be executed between the system owner and a Management Entity prior to the issuance of an OP for a system required to be maintained by a Management Entity, as specified in Table XXXI of Rule .1301 of the Section, 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 system Management Entity;

(4) provisions that the contract shall be in effect for as long as the system is in use; and

(5) other requirements for the continued performance of the system.

Move to GT section or Table

per manufacturer recommendation and should not require cleaning less that 3 yr. if so report ?

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

Is this different Management Entity

Subsurface System is diff. classification altogether ?

15A NCAC 18E .1304 is proposed for adoption as follows:

15A NCAC 18E .1304 MANAGEMENT ENTITY RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system operated from the appropriate commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule .1301 of this Section.

(c) The Management Entity shall provide a copy of the inspection report to the owner and LHD 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 for the owner to obtain a CA for the repairs.

(e) The Management Entity shall be responsible for assuring 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 when the owner or the Management Entity chooses not to renew an operation and maintenance contract executed in accordance with this Rule.

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 XXXI in Rule .1301 of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system.

Typo ?

(b) A LHD may be the Management Entity only for systems classified Type IV, Va, and Vb and only when authorized by resolution of the local board of health.

(c) An authorized agent shall review the performance and operation reports submitted in accordance with Rule .1304(c) of this Section.

(d) An authorized agent shall perform an on-site compliance inspection of the systems as required in Table XXXI in Rule .1301 of this Section. More frequent inspections may be performed by an authorized agent if requested by the system owner or the Management Entity, or identified in the PIA approval or OP.

(e) The authorized agent may provide the owner with the option for a private Management Entity (not the owner) to perform the on-site compliance inspection for Type IIIb and IIIh systems in accordance with Table XXXI in Rule .1301 of this Section instead of the LHD. The Management Entity (not the owner) shall provide to the owner and LHD a written compliance inspection report.

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) The LHD or State shall issue a written NOV to the wastewater system owner for the following:

(1) malfunctioning wastewater system determined in accordance with Rule .1303(a)(1) and (2) of this Section;

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

(3) wastewater system that is partially or totally destroyed.

(b) The wastewater system shall be repaired within 30 days of notification by the State or LHD unless the NOV specifies a different time frame for the repair.

permitting

(c) After investigating the malfunction, the State or LHD shall use its best professional judgement in ~~requiring repairs that will enable the s~~ystem to function. restoring . System may need to be repaired thus repair permit.

(d) When necessary to protect the public health, the State 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. another treatment plant not ss

(e) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system. Prior to issuing the CA, the LHD shall receive the following information from the owner:

(1) confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 will be pumping and hauling the sewage from the pump and haul tanks;

(2) identification of the approved wastewater system that will be accepting the sewage. The wastewater system shall be approved under this Subchapter or approved by the Environmental Management Commission in accordance with 15A NCAC 02H; and

(3) approval shall be obtained from the facility receiving the sewage in addition to confirmation that the additional sewage will not result in an exceedance of the treatment capacity of the receiving wastewater system.

(f) A non-transferrable OP, valid for a period not to exceed five years, shall be issued to the pump and haul system owner.

(g) A malfunctioning wastewater system that has been disconnected from the facility for any reason shall be repaired prior to reuse.

(h) If a malfunctioning wastewater system is found to be nonrepairable, or is no longer required, the 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.

History Note: Authority G.S. 130A-335(e) and (f); 130A-291.1; 130A-291.2;

15A NCAC 18E .1307 is proposed for adoption as follows:

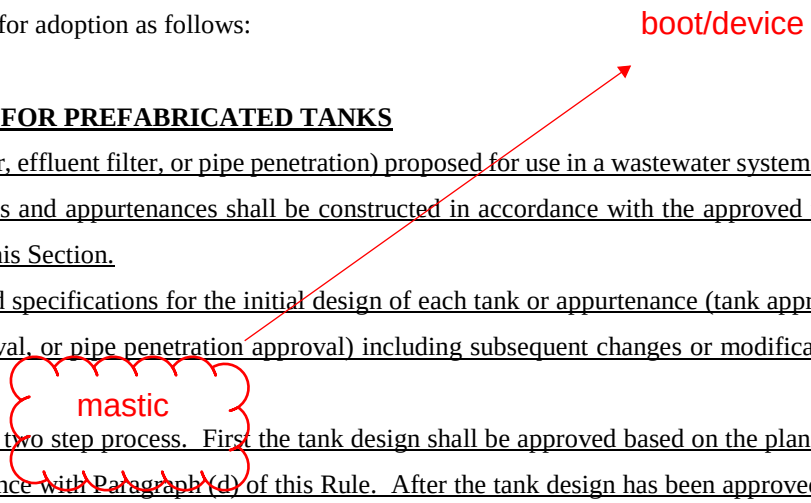
15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is found to be non-repairable or is no longer required, the system shall have the contents removed, and the components collapsed, backfilled, or otherwise secured as directed by the authorized agent to protect public health and safety.

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

SECTION .1400 – APPROVAL OF TANKS AND APPURTENANCES

15A NCAC 18E .1401 is proposed for adoption as follows:



15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be constructed in accordance with the approved plans and shall comply with all rules of this Section.

(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.

(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and a temporary identification number issued, the tank manufacturer shall conduct the structural loading requirements of Paragraph (f) of this Rule. Once third-party documentation in accordance with Paragraph (f) of this Rule has been submitted to the State, a tank approval letter will be issued to the tank manufacturer with a permanent identification number. Tanks may not be sold without a permanent identification number. The temporary identification number is for tracking purposes only.

(d) Plans and specifications for tanks with a total liquid capacity of 3,500 gallons or less shall show the design in detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) wall and slab thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall 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) liquid depth and operating capacity in gallons;

(4) pipe penetration locations and State approved pipe penetration boot;

(5) methods and material for sealing sections and forming water tight joints in tanks with multiple sections;

(6) detailed drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank; and

(7) tank manufacturer and PE requirements for installation, including bedding and recommend methods for additional sealing, as applicable.

~~(e) Plans and specifications for tanks with a total liquid capacity greater than 3,500 gallons and all tanks designed~~ for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

5 inch use D'Amato n Devkota std.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

(2) after completion of the vacuum test requirement in Subparagraph (f)(1) of this Rule, the tank shall be subject to a water test. The water test shall be conducted in accordance with Rule .0805(c)(1); and

(3) written documentation of the testing shall be provided to the State. The written documentation shall include:

(A) drawing of the tank model tested, showing dimensions and type of reinforcement used;

(B) results of the vacuum and water tests, including if there was any vacuum or water drop, surface cracking, deformation, or cracking of the tank during the test; and

(C) third-party person(s) present who witnessed the testing and their written statement of agreement with the results submitted to the State.

(g) Plans for prefabricated tanks other than those pre-approved under this Section shall be considered for tank approval on an individual basis based on the information provided by the tank manufacturer or designer to the State. The information shall indicate the tank shall perform in the same manner and to the same standard as those designed in accordance with the rules of this Section.

(h) The State 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.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1402 is proposed for adoption as follows:

is ST = GT ?, both GT Risers should be brought to grade?

two access opening and access device for filters ?

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight and ~~not subject to excessive corrosion or decay.~~

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.

(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate 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 visibly marked at finished grade.

(d) Septic tanks shall meet the following minimum design standards:

clarify

(1) minimum liquid depth of 36 inches;

(2) 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) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) length of the tank shall be twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

WC supports one each inlet and outlet end ---

(6) inlet and outlet openings shall have cast or manufactured penetration points;

(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644;

(8) 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;

(9) no pipe penetration points or openings shall be permitted below the septic tank operating liquid level;

(10) the outlet shall be through an approved effluent filter 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;

(11) invert of the outlet shall be two inches lower in elevation than the invert of the inlet;

(12) other methods of supporting the effluent filter case and for making pipe penetrations shall meet all the requirements of this Rule and shall be reviewed on a case by case basis by the State;

(13) 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;

design

(B) the partition shall be designed to remain in position when subjected to a liquid capacity in one compartment;

either

(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 leave a water passage slot four inches high for the full interior width of the tank;

(E) ~~two four-inch openings, or~~ one four-inch opening per 30 linear inches of baffle wall, ~~whichever is greater,~~ may be designed into the partition instead of the four-inch slot;

(F) the entire liquid passage shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level;

(G) there shall be no other openings in the partition wall below the water passage slot or openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

with cover tank lids

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal 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;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds; and

not clear -- to cover plastic tank .. is internal safetey required for palstic tanks per PIA

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks.

(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 six inches above finished grade;

(2) the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening;

(3) larger or multiple access risers shall be provided when two or more pumps are required;

Create a Table for ST, PT, GT dimensional requirement.

with proposed 18 inch liquid and holes below it .. second compartment can not properly vented which is more important

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain two four-inch diameter circular openings, or equivalent, located no more than 12 inches above the tank bottom; inter compartment vent at top required

(5) there shall be no requirement as to tank length, width, or shape, provided the tank satisfies all other requirements 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; seperately else ensure venting thru ST then house. Consider venting PT always.

(7) tanks shall be vented if more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be approved septic tanks with the following modifications: ST meets as is for GT as defined

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, 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;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less; venting ? GT .. and ST with all filters installed need to verified

(4) 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. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when a sanitary tee is used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tee(s) shall be provided for servicing and routine maintenance.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and Recommend Diagram for clarifications of design criterion as needed

(4) tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1403 is proposed for adoption as follows:

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks designed to hold sewage shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls. Tanks and tank lids shall be able to withstand a uniform live loading of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

(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 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;

(A) the reinforcing wire shall be lapped six inches;

(B) concrete cover shall be required for all reinforcement; and

(C) reinforcement shall be placed to maximize the structural integrity of the tank;

(3) 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;

(4) 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 State for review and tank approval;

new and excessive

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Testing shall be performed using a properly calibrated Schmidt Rebound Hammer or approved equal;

(6) 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 State approved equivalent that is waterproof, corrosion-resistant, and approved for use with concrete tanks; and

(7) tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

(c) Unless otherwise required, thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified.

(d) Glass-fiber-reinforced tanks shall meet the following material and construction requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 0.2 inches. The baffle wall shall be 3/16-inch thick; and

(2) material and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks.

(e) Cast in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

History Note: Authority G.S. 130A-335(e), (f), (f1);

15A NCAC 18E .1404 is proposed for adoption as follows:

15A NCAC 18E .1404 PLANS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

(a) Risers and riser lids shall be able to withstand a uniform live loading of 300 pounds per square foot 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.

(b) Riser plans and specifications submitted for review and riser approval shall show the design of the riser in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

(2) physical dimensions of the riser and riser cover, such as wall thickness, internal diameter, proposed casting or installation details and methods, pipe penetrations, and all other dimensions as appropriate;

(3) material type and strength including reinforcement material and location as required;

(4) documentation by a third-party of structural testing to four inches of mercury for five minutes without deformation or failure. Testing shall be done on each diameter of riser and shall be done on the greatest height of a single section that the owner is seeking approval for;

(5) for septic tank risers, a secondary lid, concrete plug, or other State approved safety device to be provided inside the riser for additional security and to prevent accidental entry;

(6) for pump tank risers, State approved primary and secondary safety mechanism shall be provided; and

(7) installation instructions, for both new and retrofit applications, for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and effluent filter approval shall show the design of the effluent filter in detail, including:

(1) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(2) sizing as to capacity and wastewater strength for all models of proposed filters to be approved; and

(3) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and pipe penetration approval shall show the design of the pipe penetration in detail, including:

(1) manufacturer's name, address, phone and fax numbers;

(2) design specifications and materials used in the manufacture of pipe penetration components;

(3) applicable testing results from third-party verification showing pull and flexibility testing;

(4) testing for watertight seal around piping including any component or device included to assure the seal, such as non-corrodible adjustable bands;

(5) documentation that the pipe penetration meets the requirements of ASTM C1644; and

(6) specifications for application, installation, operation, and maintenance.

(e) Plans for risers, effluent filters, and pipe penetrations shall be reviewed and approved by the State and assigned an Identification Number when the design is found to comply with this Section.

(f) Plans for prefabricated risers, effluent filters, and pipe penetrations other than those pre-approved under this Rule shall be considered for approval on an individual basis based on the information provided by the manufacturer or designer to the State. The information shall indicate the riser, effluent filter, or pipe penetration shall perform to the same standard as those designed in accordance with the provisions of this Section.

History Note: Authority G.S. 130A-335(e), (f), (f1); 130A-335.1;

15A NCAC 18E .1405 is proposed for adoption as follows:

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL

(a) All riser, effluent filter, and pipe penetration approvals will expire five years after the date the approval is signed. Approvals shall be re-issued when the provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued compliance with the criteria listed in Rule .1404 of this Section.

(c) The State may re-issue a riser, effluent filter, or pipe penetration approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product compliance.

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 State shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, pipe penetrations, distribution devices or other components, upon a finding that:

(1) approval is determined to be based on false, incomplete, or misleading information or the tank or tank components have been subsequently altered;

(2) experience with the product or component results in altered conclusions about system performance, reliability, or design;

(3) product or component fails to perform in compliance with performance standards established for the product or component; or

(4) product, component, or the applicant fails to comply with G.S. 130A, Article 11, this Subchapter, or conditions of the approval.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1501 is proposed for adoption as follows:

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 design daily flow less than or equal to 1,500 gpd.

(b) RWTS shall only be used with ~~domestic strength wastewater.~~

DSE ? NSF tested for 350 BOD and 350 TSS

(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.

(d) For approval of an RWTS as a Provisional or Innovative 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 State and shall include the following:

(1) manufacturer's name, address, phone number, 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 legible copies of plans and specifications, including information required to evaluate any tanks as required in accordance with Rules .1401 and .1503(3) 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 State.

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 needing to be maintained 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 any system components or maintaining system components requiring repair or maintenance.

(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 State, 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 demonstrate 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, including tracking the last seven days and 30 days, 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 half of the design daily flow 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, an approved prefabricated septic tank, or another tank specially

designed for a specific individual system and approved by the State 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 composite sampled annually for all effluent quality standards listed in Table XXIV of Rule .1201(a) of this Subchapter for NSF-40 systems, unless adjusted sampling requirements have been requested and granted in accordance with Rules .1302 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 will expire five years after the date the approval is issued. Approvals shall be re-issued when the requirements of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued certification and listing by a nationally recognized certification body, such as NSF International, as compliant with NSF Standard 40 and authorized by NSF to distribute and service products in North Carolina.

(c) The State shall re-issue a RWTS approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product certification.

(d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

History Note: Authority G.S. 130A-342;

SECTION .1600 – APPROVAL AND USE OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 is proposed for adoption as follows:

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for design daily flows less than or equal to 3,000 gpd shall be configured as a package and approved as a Provisional, Innovative, or Accepted 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 operating data logging.

(c) All components shall be integrated and designed to work together for the operation of the drip dispersal system. 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) installation specifications;

(4) operation and maintenance manuals; and

(5) design plans and specifications for all components.

(d) The system manufacturer shall provide ongoing 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, and this Section.

(f) Drip dispersal systems that are not pre-engineered packages approved in accordance with Section .1600 of this Subchapter shall be designed on a project specific basis by a PE. The drip dispersal system design shall comply with Rules .0908, .1204, Section .1300, and this Section.

(g) Drip dispersal systems for design daily flows 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 State 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 meet one of the following effluent standards: DSE, NSF-40, TS-I, or TS-II as specified in Table III of Rule .0402(a) and Table XXIV of Rule .1201(a) of this Subchapter. REUSE ?

(b) The drip dispersal system pump tank shall meet 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) sufficient capacity to accommodate projected flow and total dynamic head conditions;

(2) delivery of 10 to 60 psi of pressure during dosing events;

(3) minimum pressure as required to backwash or forward flush headworks filter;

(4) manufacturer requirements shall be followed to protect the pump intake from solids materials that may accumulate in the pump tank and for pump cooling during operation;

(5) maintenance of velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(6) maintenance of 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.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, mechanism 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 design daily flow, typically during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a 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 pretreatment unit or to a separate settling tank to allow for primary settling prior to the pump tank;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also monitor 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 0.05 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 on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be uniformly spaced 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 assure 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 may be used where unfavorable site conditions are encountered along a drip run. Blanking tubing shall be differently colored or marked tubing of the same material, specifications and diameter as the connecting dripline, or flexible PVC;

(6) manufacturer shall specify methods for dealing with drainback; 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 to manage the multifunction processes of drip dispersal systems and meet the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at regular intervals throughout the day, at a projected average flow or design daily flow (peak enable float) dose regime. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to meet system design and varying operating conditions;

(3) minimum dose volume per zone shall be set as needed so that 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) at designer and manufacturer-specified frequency and duration;

(5) provide for routine automatic forward flushing of the drip laterals (field flushing) with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) monitor pump cycles and run times;

(7) systems with a design daily flow greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system shall include telemetry in accordance with Rule .1103(c) of this Subchapter;

(8) for systems with a design daily flow 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 include an automatically rechargeable battery back-up power supply or be otherwise designed to be functional during power outages;

(9) in 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 the zones that have been taken out of service and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats in the pump tank shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field or zone.

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 the following items and any other requirements included by the system designer:

(1) all leaks in the pipe network or from emitters exhibiting excessive emission rates, as evidenced by wet spots during dosing cycles comparable to normal operating conditions, shall be repaired; and

(2) dosing and flushing flow rates shall be measured and confirmed to be in accordance with the drip system design parameters as follows:

(A) dosing pressure shall be measured at the lowest point in the supply manifold;

(B) maximum emitter pressure shall be verified to be within emitter design parameters; and

(C) flushing pressures at the ends of each zone supply and return manifold shall be measured and recorded to document system start-up conditions.

(b) All mechanical components, pumps, pump cycling, filters, valves, vents, flushing, high-water alarm, and telemetry systems shall be demonstrated to be operable and in accordance with their design.

History Note: Authority G.S. 130A-343;

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

15A NCAC 18E .1701 is proposed for adoption as follows:

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. This includes systems for which any of the following are proposed:

(1) minimum setbacks reductions;

(2) depth to limiting condition reductions;

(3) vertical separation distance requirements reductions; or

(4) LTAR increases.

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) detailed system design/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, including tracking the last seven days and 30 days of wastewater flow for advanced pretreatment systems; and

(J) start-up requirements and information;

(3) summary of the following information:

(A) pertinent 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: established by a nationally recognized certification body; a listed protocol that has been approved by the Department in accordance with G.S. 130A-343(d); a comparable evaluation protocol used for system approval in other states; or in accordance with an alternative performance evaluation protocol proposed for approval by the manufacturer;

(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 accurately monitors system compliance with effluent quality 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, 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, system classification, frequency of system inspection and monitoring in accordance with Table XXXI of Rule .1301 of this Subchapter, minimum certification/licensing requirements 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 State. Fees received are non-refundable.

(b) Provisional System applications shall include the information listed in Paragraph (a) of this Rule and the following evaluation proposal 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 proposal 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 successful completion of the Provisional System evaluation proposal.

(c) 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).

(d) Accepted Wastewater Dispersal 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).

(e) The Department may initiate review of a nonproprietary PIA system in accordance with G.S. 130A-343(i) without having received an application from a manufacturer. The system may be approved as Provisional or Innovative or the Department may recommend approval to the Commission as an Accepted system. The system shall have been shown to meet all applicable approval criteria of this Section.

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.

(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 Wastewater Dispersal 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 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 may hold technical advisory meetings to discuss PIA applications with stakeholders.

(i) 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 and specify appeal rights. The Department shall assign a unique code to the approved products for tracking purposes.

(j) 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 system shall be approved for use as a Provisional System when all of the following criteria have been met:

(1) For trench and dispersal systems documentation of one of the following:

(A) 50 installations operational and in use for 12 months, with available information indicating comparable hydraulic performance and rate of malfunction to a conventional trench system;

(B) the system's design and functional similarity to another approved system described elsewhere in this Subchapter, or to a Provisional, Innovative or Accepted System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for the following:

(i) material physical properties and chemical durability;

(ii) field installed permeable sidewall area and bottom infiltrative area;

(iii) method and manner of function for conveyance and application of effluent;

(iv) structural integrity; and

(v) 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.

(2) Documentation shall be provided that all trench and dispersal systems have been subject to and complied with AASHTO Standard H-5 and H-10 load testing that demonstrates the structural integrity to be comparable to a conventional trench system.

(3) For advanced pretreatment systems requesting Provisional approval for designs complying with TS-I or TS-II effluent quality standards, documentation of one of the following:

(A) 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section;

(B) the system's design and functional similarity 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:

(i) material physical properties and chemical durability;

(ii) structural integrity;

(iii) biological, chemical, or physical treatment processes;

(iv) method and manner of function for conveyance and transformation of wastewater and effluent through the system; and

(v) 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.

(4) Submittal of a proposed evaluation protocol to be overseen by a third-party evaluator. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative approval under G.S. 130A-343(f) and Rule .1705 of this Section is collected.

(A) For trench and dispersal systems:

(i) a total of 100 installations operational and in use for 12 months; and

(ii) sufficient information collected to evaluate the systems hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system;

(B) For advanced pretreatment systems, one of the following:

(i) 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, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall show compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable; or

(ii) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable.

(5) Manufacturers requesting Provisional approval as both an advanced pretreatment and dispersal system must 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 system shall be approved for use as an Innovative System when all of 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 shall be 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 which 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, the results of which support the proposed use of the system; or

(C) the system has been evaluated in accordance with G.S. 130A-343(g)(3).

(5) The following documentation is provided for trench and dispersal systems:

(A) the results of AASHTO Standard H-5 and H-10 load testing that demonstrate structural integrity comparable to a conventional trench system;

(B) 100 installations operational and in use for 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.

(6) For advanced pretreatment systems requesting Innovative approval for designs complying with TS-I or TS-II effluent quality standards, documentation is provided 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, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards, as applicable; or

(B) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected 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 or TS-II effluent quality standards, as applicable.

(7) 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 clear, convincing, and cogent evidence 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 300 systems installed statewide and in use as an approved Innovative System for more than five years;

(2) data and findings of all prior evaluations of the system performance as provided by the manufacturer;

(3) results of prior performance surveys of Innovative Systems in use in North Carolina for 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 .1712 of this Section. Upon request of the manufacturer, the Department and manufacturer shall meet to discuss the accuracy and validity of performance data and surveys to be considered for inclusion in the review. LHDs shall be invited to participate in the discussion;

(5) a statistically valid survey of system performance shall be performed, as follows:

(A) the manufacturer shall provide a proposed survey plan for Department concurrence prior to carrying out the survey. This plan shall specify the number of systems to be evaluated, period of evaluation, method to randomly select systems to be evaluated, methods of field and data evaluation, and proposed survey team members, including proposed cooperative arrangements to be made with Department and LHD staff. The Department shall facilitate LHD participation with any performance review or survey. The Department shall utilize the Division of Public Health's State Center for Health Statistics for assistance in evaluating the statistical validity of proposed evaluation protocols; and

(B) the survey shall include the field evaluation of 250 randomly selected Innovative Systems compared with 250 comparably aged randomly selected conventional systems, with 100 of each type of surveyed system currently in use and in operation for five years. Systems surveyed shall be distributed throughout the three physiographic regions of the state (Mountain, Piedmont and Coastal Plain) in approximate proportion to the relative usage in the three regions. The survey shall determine comparative system failure rates, with field evaluations completed during a typical wet-weather season (February through early April), with matched Innovative and conventional Systems sampled during similar time periods in each region. The petitioner shall provide a statistical analysis of the survey results showing a one-sided test where, if the failure rate in the sample of 250 Innovative Systems is five percentage points higher than the failure rate in the sample of 250 conventional systems, there is only a five percent chance that a difference this large would occur by chance (95 percent confidence level). If a statistically significant higher failure rate in the Innovative System is not detected, the Commission shall find that the Innovative System performs the same as or better than the conventional system;

(6) Other criteria for determining whether the proposed system has been in general use, and other surveys, including evaluations of different numbers of Innovative and conventional systems, designed to verify equal or superior performance of the Innovative System compared to the conventional system under actual field conditions in North Carolina shall be approved by the Department when they are demonstrated to have comparable statistical validity as described in Subparagraph (b)(5) of this Rule. The Department's review and approval of proposed alternate criteria for determining whether the system has been in general use, or of other proposed surveys are subject to review and concurrence by the Commission.

(c) The Commission shall impose any use, design, installation, operation, maintenance, monitoring, and management conditions in accordance with G.S. 130A-343.

(d) Accepted system applications for products that are approved to both treat and disperse wastewater must meet the requirements for treatment and dispersal as described in this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

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

The Department may modify, suspend, or revoke the PIA approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) The PIA approval shall be modified as necessary to comply with subsequent changes in laws or rules which affect their approval.

(2) 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, shall submit to the Department a written application. 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.

(3) The manufacturer of an approved Provisional or Innovative System shall notify the Department within 30 days if they lose their approval from any nationally recognized certification body or choose to drop their listing, as applicable.

(4) The manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria, shall submit to the Department a written application. 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 the manufacturer's demonstration provides clear, convincing, and cogent supporting evidence.

(5) The Department may modify, suspend, or revoke a PIA approval upon a finding that:

(a) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;

(b) the system fails to perform in compliance with established effluent quality standards;

(c) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

(d) the system or the system petitioner fails to comply with wastewater system laws, rules, or conditions of the PIA approval; or

(e) the manufacturer lost their approval or chooses to drop their listing by any nationally recognized certification body, if applicable.

(6) The Commission may 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. The Commission may require the manufacturer or the Department to complete a follow-up survey of a proprietary trench system such as described in this Rule if the Commission determines further information is necessary prior to rendering a final decision on modification of the status of an Accepted System.

(7) 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 EFFLUENT SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS

(a) Wastewater sampling requirements shall vary in accordance with system classification, designated effluent quality standard, system design daily flow, and system performance history.

(b) Effluent from Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent quality constituents until the system receives Innovative Approval.

(c) Effluent from an approved Innovative System shall be grab or composite sampled annually for all applicable influent and effluent quality constituents when the design daily flow is less than or equal to 1,500 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(d) Effluent from an approved Innovative System shall be grab or composite sampled twice a year for all applicable influent and effluent quality constituents when the design daily flow is greater than 1,500 gpd and less than or equal to 3,000 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(e) 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.

(f) The manufacturer of an approved Innovative System may request an adjustment in sampling requirements (constituents or frequency) based on a written application submitted to the Department that includes the following information:

(1) data from 50 separate North Carolina sites in operation for six months;

(2) written reports summarizing results of the VIPs for all North Carolina sites submitted as part of this Rule;

(3) 80 complete data sets, including all data sets that do not meet the limits. Data sets may be from the same site if collected three months apart;

(4) analysis indicating compliant system performance in accordance with Rule .1710 of this Section; and

(5) identification of the constituents for which the manufacturer requests a reduced sampling frequency.

(g) Manufacturers of proprietary advanced pretreatment systems with Innovative approval that are also certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), and are in compliance with the ongoing verification program of such body, may submit a written application with a sampling protocol that reduces the data set requirements by up to 50 percent.

(h) Manufacturers of proprietary advanced pretreatment systems that comply with Paragraphs (f) and (g) of this Rule may apply to the Department to replace the requirement for routine effluent sampling of all individual sites with routine field constituent testing that is included as part of the VIP.

(i) While routine sampling of individual sites may no longer be required in accordance with Paragraphs (b), (c), or (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(b) of this Subchapter or if required as part of an enforcement action by the LHD or the Department.

(j) Effluent may be re-sampled within 30 days from receiving laboratory results indicating non-compliance with Table XXIV of Rule .1201 of this Subchapter. Complete data sets from resampling may be substituted to meet 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 (f) of this Rule.

(k) 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 quality 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 SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent quality standards of Table XXIV of Rule .1201 of this Subchapter when all the following conditions are met:

(1) the arithmetic mean (geometric mean for Fecal Coliform) of all data collected from all sites does not exceed the designated effluent quality standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent quality standard for any applicable constituent. Non-compliant data may be substituted with a new data set meeting the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results;

(3) fifty percent of all complete data sets from all sites shall comply with the designated effluent quality standard for all applicable constituents;

(4) when determining compliance with system effluent quality standards in Items (1), (2), and (3), 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(d) of this Subchapter and sites that have been otherwise documented to have been subjected to significant abuse; and

(5) results of influent samples from all sites shall be provided to demonstrate compliance with percent reduction effluent criteria in accordance with Table XXIV 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 Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals shall be re-issued when the applicable provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request to the Department that includes the following:

(1) summary of the current status of systems permitted and installed under their approval;

(2) number of malfunctioning systems, including location, reason for malfunction, and how the system was repaired;

(3) documentation of system compliance with effluent quality standards in accordance with Rule .1710 of this Section, including analysis of all effluent data collected subsequent to the most recent system approval;

(4) documentation of compliance with all requirements in current Provisional or Innovative approval;

(5) documentation that 80 percent of the individual advanced pretreatment systems at a single site are in compliance with Rule .1302(d) of this Subchapter;

(6) current status of certification and listing by a nationally recognized certification body; and

(7) any other information the manufacturer deems necessary to support re-issuance of their PIA Approval.

(c) The Department shall re-issue a Provisional Approval for a specified additional period, not to exceed five years, when the manufacturer has demonstrated progress in completing the approved evaluation protocol; compliance with

applicable effluent quality standards; and that there is the likelihood that re-issuance of the approval will enable the evaluation protocol to be completed. A Provisional Approval may be re-issued only one time.

(d) The Department shall re-issue an Innovative Approval for a five-year period when the manufacturer's report provided in accordance with Paragraph (b) of this Rule shows system compliance with effluent quality standards and this Subchapter.

(e) The Department shall suspend or revoke a PIA approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

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) All designers, installers, and Management Entities shall be authorized in writing by the manufacturer and as defined in the PIA approval.

(b) Manufacturers of proprietary systems approved under this Section shall provide a list of manufacturer's authorized designers, installers, and Management Entities, as identified in the PIA approval, to the Department and LHDs, and update this list annually.

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; or

(b) when the Provisional System is used as a repair to an existing malfunctioning system when there are no other approved 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) Permit systems designated as approved Accepted Systems in an equivalent manner to a conventional system at the owner's request, provided the location of each trench, trench depth, or effluent

distribution method remains unchanged. The type of Accepted System installed shall be indicated on the OP.

(4) 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.

(5) Grant facilities generating high strength effluent the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to assure effluent strength equal to or better than DSE.

(6) 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.

(7) Inform the Department as well as the manufacturer or their authorized representative of any system determined to be malfunctioning.

(8) 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(d) 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 set forth further enforcement possibilities if compliance is not achieved.

(9) 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;*

General Comments:

The staff is to be commended for their efforts directed on improvement on readability of the rules and organization of information with-in the rules. The proposed rules are much better organized and consistent than the existing rules.

Wastewater treatment systems utilizing advanced pretreatment systems produce a much cleaner discharge effluent that minimizes the potential environmental and public safety impact by a tenfold or greater magnitude. As an industry, we should be encouraging the implementing of rules that make it easier to produce the highest quality effluent whenever economically possible and we should reduce the regulatory barriers that impose additional costs on systems when they do not offer a corresponding benefit to the public.

Specific Comments:

p7, .0105 Definitions

(1) Aggregate definition should include artificial sources as well

(21) Effluent is used in the rules in ways not consistent with this definition. Recommend revising the definition as follows:

“”Effluent” means the liquid discharge from a treatment tank or component”

The following terms are used in the rules and should also be defined:

- Conjunctive use
- Influent
- Media Filter
- Mobile Food Unit
- Reuse
- Settling Tank

p20, .0205(h) – Type V and Type VI systems are managed, inspected, sampled and reported. Why are these permits the only Operating Permits that expire? The performance of these systems is known. It appears that paragraph (g) already provides adequate criteria for Type V & VI operation permits and paragraph (h) is not needed.

p32, .0401(g) – Please note that condensate from HVAC and ice machines can often prove beneficial when directed to grease traps to cool dishwasher and kitchen discharges. This rule prohibits what could be a beneficial application. The discharge should be allowed when properly designed.

p32, Table II – Please note that there is no guidance for dump stations at Trailer/RV parks & campgrounds. Guidance for this design flow may be needed.

p36, Table III should clarify that the values listed are raw sewage values and not settled sewage.

p37 .0403 – The adjustments to design flow should apply only to the sizing of the dispersal/disposal component of a system. The treatment components should be designed based on the non-adjusted flows. This will assure adequate treatment components are in place to treat the actual flows and allow the reduction of the drainfield size requested by the designer. If it becomes necessary to treat larger actual flows than anticipated, drainfields can be expanded much easier than treatment components.

p 48 .0506 – The proposed rules include rules specific to saprolite. This will be helpful to designers.

p63, .0801 – The minimum septic tank volumes in Table XIV exceed the minimum volumes specified in PIA & RWTS system approvals. As an example, a manufacturer may recommend a primary tank volume of one Q with their treatment system while the rules require 1.17 Q + 500 gal of septic tank.
A recommended revision would be to add a paragraph as follows:
.0801(a)(4) Septic tanks for PIA and RWTS systems shall be sized in accordance with the manufacturer's approval.

p64, .0802 – It is an improvement to include flow equalization volume when determining minimum pump tank volumes

p67, .0805 – Why are tanks installed as part of an advanced pretreatment system or engineered system held to a different standard of leak testing than those for LPP, aerobic drip, and conventional systems? While leak testing is an admirable goal in practice the leak testing requirements place an additional cost and time element only on those systems which acts to discourage their use. All tanks assembled in the field should be leak tested after installation regardless of type of system.

p68, .0806 – Risers to grade should be required over every effluent filter. An effluent filter without access will not be maintained.
Add the following:
(a)(4) A riser brought to grade shall be installed to provide access to the effluent filter for removal and maintenance.

p82, .0908 – Note that it appears that these drip rules are only for anaerobic drip systems.

p91, .1002 – The section covering Wastewater Recycle/Reuse should be expanded to provide guidance for wastewater reuse for landscaping applications, sod production, use in product manufacturing (concrete, asphalt), conjunctive uses and other potential reuse applications. The reuse of treated

wastewater will be of greater importance in our industry as society focus more on sustainability in our development planning and the rules should anticipate this to be proactive and not reactive.

p93, .1103 - The section for control panels has a number of issues as follows:
(a)(7) – It does not appear that an event counter provides information useful to the operator or regulator that is not provided by the elapsed time meter. Please consider removing this requirement from the rules
(d) – This requires control panels to always be accessible. Often control panels are placed inside buildings or otherwise secured from public access. Recommend revising as follows:
"The control panels shall always be accessible to the system operator and LHD."
(h)(1) – Requires a minimum of 18" of effluent be maintained in pump tanks. The next line, (h)(2), requires the pump to remain submerged which makes this volume requirement excessive and redundant. It should be deleted.

p95, .1105(c) – Timed dosing is used for flow equalization for treatment systems as well as for field disposal systems. The language as written is applicable only to field dosing systems. Recommend revising rule as follows to identify the application to field dosing systems:
"The timed field dosing system shall be ……"

p97, Table XXIV Effluent quality standards
The standard for Total Nitrogen for TS-II of 20 mg/l may be unattainable with the higher influent TKN values seen from DSE sources without complicated additional processes. The reduction of nitrogen is an important goal and should be incorporated into rules but setting a target that can't be reached is counter-productive. Recommend the following tiered standard be incorporated into the TS-II standard for total nitrogen (TN):
0 – 3,000 gpd; TN ≤ 30 mg/l
3,001 – 10,000 gpd; TN ≤ 20 mg/l
≥10,001 gpd; TN ≤ 10 mg/l

The standard for Fecal Coliform limits does not appear to be necessary for subsurface discharge systems with advanced pretreatment. Studies confirm the movement of pathogens through unsaturated soils is measured in centimeters.
In fact, the first paragraph of the new Subchapter 18E rules states that the scope of the rules is that "*The wastewater system shall be designed to not discharge effluent to the land surface, surface waters, or directly to groundwater*". Soil investigations are required that are specifically targeted at placing discharge systems in unsaturated conditions which makes the need for disinfection moot.
(also see sec .1303(a)(1)). It is interesting to note that only systems that are managed by certified operators, visited on a specified schedule, have alarms with automatic notifications, and have sampling requirements have a fecal limitation imposed but the systems that do not have all that attention do not. The inclusion of a fecal limitation imposes additional installation and maintenance costs to the owner

but provide very little benefit to the public or environment. For these reasons please consider deleting the Fecal Coliform limits from Table XXIV for both TS-I and TS-II systems.

p98, Table XXVI – Vertical Separation Requirements for Fill Systems
The benefits listed in the table for TS-II treatment are identical to those for TS-I treatment. TS-II requires an additional 33% removal rate of BOD and TSS, a thousand fold reduction of fecal coliform plus requires denitrification process. The benefits in the required vertical separation should be reduced by 3 inches (as listed in Table XXV) to account for the additional treatment being provided.

p99, .1202(d)(3) – The LTAR increase for TS-II systems should be by a factor of 2.5 when supported by the required Special Site Evaluation and when pressure distribution and time dosing is used. The conditions listed in (A), (B), (C) are not needed. The additional treatment provided by TS-II systems (listed above) justifies this LTAR increase in all soils when supported by the SSE.

p99, .1202 (d)(7) – Adding pretreatment to an existing system provides a significant improvement to the discharge effluent and should provide a benefit to the owner. Recommend revising the rule by adding the following to the end of the sentence:
"… without a hydraulic and organic loading analysis demonstrating the increase in flow will not overload the existing system."

p113, Table XXXI – The system classification for Type Va systems should include other attached growth systems and not be limited only to those with a fixed media. Media filters work primarily through attached growth biological processes and not physical filtration. The minimum inspection frequency should be the same for fixed and moving attached growth systems.
Recommend revising the Type Va description as follows:
"Attached growth media advanced pretreatment"

p115, .1302 Multiple comments for this section as follow
sec .1302(b)(1) – This rule requires the manufacturer of a system to be responsible for the operation and maintenance of a system they have provided after the sale of the system. With this stipulation has the state abdicated its authority to determine who can and cannot be designated to operate a manufacturer's system? Wouldn't the manufacturer have the sole responsibility to determine who represents the manufacturer as the operator? The rules already require that manufacturers train and certify operators of their systems. The classifications of system operator by the state do not include training on proprietary advanced pretreatment systems. The operator of the collection and dispersal components of a treatment system would have to hold a subsurface operator certification applicable to those components.

sec .1302(c)(4) – This calls for advanced treatment systems to measure and record the 7 day and 30 day flows preceding the visual inspection of a system. The implementation of this requirement was a response to issues identified in 2004 in response to system manufacturers claimed that their systems

were being overloaded to explain system failures. The 7 day and 30 day flow information has not provided any useful data for operators, owners, LHD or the branch as far as has been reported. It is a superfluous requirement with no apparent benefit. For this reason the requirement should be deleted here and in sec(d)(2). Also see sec .1503(9) for additional rules related to this requirement.

p116, .1302(d)(4) – The inclusion of mass loading as a parameter to determine system compliance is a great positive step by the department. This allows for compliance to be measured by the system performance measured against the design goals. I do recommend the department publish a guide document to provide an example of compliance documentation calculations.

p121, .1401(f)(1) – This section requires vacuum testing of prefabricated tanks to 4 inches of mercury but the standard for installed tanks in .0805(c)(2) is only 2.5 inches of mercury. What justification is there for the difference?

p122, .1402(d)(10) – Recommend adding the following language to require access risers over effluent filters:
(d)(10)(a) "A watertight access riser with removable cover shall be located over the effluent filter. The access riser shall extend to 6 inches above grade."

p122, .1404(d)(5) – This rule mandates that every septic tank have 3 inlet openings. This should be a manufacturer's decision. Multiple sources can be combined in a manhole or with plumbing preceding the septic tank. Requiring every tank to have 3 inlets and requiring every inlet penetration to be cast with a flexible sleeve will result in unnecessary tank penetrations that have to be sealed. Tanks should be required to have only a single inlet on the tank end and allowed up to have inlets on the sidewalls if desired.

p126, .1404(b)(5) – Why do the rules require a secondary lid over effluent filters in septic tanks? The effluent filter itself will prevent accidental entry. The language in this rule should be revised.

p129, .1503(11) – The liquid capacity of the required settling tank for RWTS systems is specified to be half of the design flow. Since these systems are restricted to design flows $\leq$ 1,500 gpd the maximum settling (septic) tank volume is 750 gal. This is substantially less than the minimum volume required for other types of systems:

- Sec .0801(a)(1) specifies a minimum septic volume of 1,000 gal.
- Sec .0801 Table XIII requires a septic tank volume of 1,000 gal for a 4 bedroom application and 1,250 gal for a 5 bedroom application.
- Sec .0801 Table XIV requires a septic tank volume of 1.17Q+500 for residential flows from 600 gpd to 1500 gpd. (this would be 1342 gal to 2255 gal).

The requirement for RWTS septic tanks should be consistent with the rules for minimum septic tanks. `

p147, .1711 – Instituting a renewal requirement for these approvals is one of those things that looks good in theory but the renewal requirements for Provisional and Innovative Approvals is a new requirement with the burden being placed on system manufacturers and system operators to provide all the information. The data being requested is data that has been previously submitted to the department or LHD by system operators and the department is already aware of any issues with systems installed under the approvals. The renewal process could be an opportunity for the department to have an informal conference with a manufacturer on a regular basis to review and discuss all issues with systems installed under their approval and the manufacturer's course of actions. If the department is not satisfied with the manufacturer's responses then the process for revoking an approval is available.

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This concludes my written comments. These comments and recommendations are intended to be a helpful review from an industry perspective and is in no way a criticism of the state and those who developed the proposed rules.

SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

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

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 not discharge effluent to the land surface, surface waters, or directly to groundwater.

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

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

15A NCAC 18E .0102 APPLICABILITY

(a) The provisions of this Subchapter shall not apply to functioning wastewater systems in use prior to July 1, 1977, unless the wastewater strength changes or design daily flow increases.

(b) If the existing facility's design daily flow increases or wastewater strength changes, the owner shall submit an application in accordance with Rule .0202 of this Subchapter. The owner shall submit this application to the LHD prior to any change of flow or wastewater strength.

(c) All wastewater systems shall comply with Section .1300 of this Subchapter, except for the wastewater systems that meet the requirements of Paragraph (a) of this Rule.

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, and contact information for where a copy of the documents may be obtained from.

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

United States Department of Agriculture – Natural Resources Conservation Service (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	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	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	
C890	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
C990	Forty dollars ($40.00) each plus six dollars and ten cents ($6.10) shipping and handling

C1644	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D448	Thirty nine dollars ($39.00) each plus six dollars and ten cents ($6.10) shipping and handling
D1784	Thirty nine ($39.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D1785	Fifty dollars ($50.00) plus six dollars and ten cents ($6.10) shipping and handling
D2241	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2466	Forty four ($44.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D2564	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2729	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2774	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D3034	Fifty dollars ($50.00) each plus six dollars and ten cents ($6.10) shipping and handling
D6913	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
D7928	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
F667	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O	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 02C	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	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	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 02U	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 13B	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
NSF International PO Box 130140, Ann Arbor, MI 48105 http://www.nsf.org/	
Standard 40	One hundred five dollars ($105.00) each plus shipping and handling
International Association of Plumbing and Mechanical Officials (IAPMO) 4755 E Philadelphia St, Ontario, CA 91761 http://www.iapmo.org/Pages/IAPMOgroup.aspx	
IAPMO/ANSI Z1000	One hundred dollars ($100.00) each
Canadian Standards Association 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
North Carolina Plumbing Code	
	Available at no charge at:

	http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/2012_NCBuildingCode_amendments/PlumbingCode-2012NCAmendments100517.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
American Association of State and Highway Transportation Officials (AASHTO) 444 North Capital Street, NW, Suite 249, Washington, DC 20001 https://www.transportation.org/	
Standard Specifications for Highway Bridges (AASHTO H5 and H10)	Three hundred eighty dollars ($380.00) each plus shipping and handling

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

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

15A NCAC 18E .0104 ABBREVIATIONS

As used in this Subchapter, the following abbreviations mean:

(1) ABS: Acrylonitrile-Butadiene-Styrene;
(2) ACEC: Apparent Cation Exchange Capacity;
(3) ANSI: American National Standards Institute;
(4) ASTM: American Society for Testing and Materials;
(5) ATO: Authorization to Operate;
(6) BOD: Biochemical Oxygen Demand;
(7) CA: Construction Authorization;
(8) CBOD: Carbonaceous Biochemical Oxygen Demand;
(9) CFR: Code of Federal Regulations;
(10) CSA: Canadian Standards Association;
(11) DDF: Design Daily Flow;
(12) DEQ: Department of Environmental Quality;
(13) DIP: Ductile Iron Pipe;
(14) DOT: Department of Transportation;
(15) DSE: Domestic Strength Effluent;
(16) EOP: Engineer Option Permit;
(17) FOG: Fats, Oil, and Grease;
(18) gpd: Gallons per Day:

(19) IP: Improvement Permit;
(20) IPWW: Industrial Process Wastewater;
(21) LC: Limiting Condition;
(22) LDP: Large Diameter Pipe;
(23) LG: Licensed Geologist;
(24) LHD: Local Health Department;
(25) LPP: Low Pressure Pipe;
(26) LSS: Licensed Soil Scientist;
(27) LTAR: Long Term Acceptance Rate;
(28) mg/L: Milligrams/Liter;
(29) NEMA: National Electrical Manufacturers Association;
(30) NH_3: Total Ammonia Nitrogen;
(31) NOI: Notice of Intent to Construct;
(32) NOV: Notice of Violation;
(33) NSF: NSF International;
(34) OP: Operation Permit;
(35) PE: Professional Engineer;
(36) PIA: Provisional, Innovative, and Accepted;
(37) PPBPS: Prefabricated Permeable Block Panel System;
(38) psi: Pounds per square inch;
(39) PVC: Poly Vinyl Chloride;
(40) RV: Recreational Vehicle;
(41) RWTS: Residential Wastewater Treatment Systems;
(42) SDR: Standard Dimension Ratio;
(43) SWC: Soil Wetness Condition;
(44) TKN: Total Kjeldahl Nitrogen;
(45) TL: Trench Length;
(46) TN: Total Nitrogen;
(47) TSS: Total Suspended Solids;
(48) TW: Trench Width;
(49) USDA-NRCS: United States Department of Agriculture – Natural Resources Conservation Service;
(50) VIP: Visual Inspection Protocol; and
(51) WS: Water Supply Class.

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

Commented [MAH1]: Include MLR (mass loading rate) and incorporate thruout

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

15A NCAC 18E .0105 DEFINITIONS

The following definitions shall apply throughout this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material (crushed rock or gravel) screened to size for various uses.

(2) "Apparent Cation Exchange Capacity" (ACEC) means the sum of exchangeable bases plus total soil acidity at a pH of 7.0. ACEC is expressed in milliequivalents per 100 grams of soil (meq/100g of soil) or centimoles per kilogram of soil (cmols/kg of soil). The apparent soil ACEC is calculated by determining the ACEC using the neutral normal ammonium acetate method, pH of 7.0 neutral normal, and then dividing by the percent clay as determined by particle size distribution (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.

(3) "Approved" means that which the State 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 soil wetness condition or intercept lateral flowing ground or surface water. Artificial drainage systems include the following: groundwater lowering system, interceptor drain, foundation drain, and surface water diversion.

(5) "Authorized agent of the LHD" referred to as authorized agent, means a person who has been authorized by the State 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) "Bed" means an excavation with a width greater than three feet containing dispersal media and one or more laterals.

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

(9) "Berm" means a raised drainage feature used to divert stormwater runoff.

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

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes ~~from the sanitary building drain or building sewer to and~~ within a wastewater system.

Commented [MAH2]: change!!!!

(12) "Complete data set" means analytical results for all required influent and effluent constituents (as specified in the effluent quality 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.

(13) "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.

(14) "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 dosing activation elevation settings.

(15) "Design daily flow" means the 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.

(16) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater design daily flows are based. Multiple design units can comprise a facility.

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

(18) "Dispersal media" means the media used to provide void space through which effluent flows and is stored prior to infiltration (e.g., washed gravel or crushed stone, polystyrene aggregate, chambers, pipe, drip tubing with emitters, etc.).

(19) "Dose volume" means an amount of effluent delivered during a dosing event as determined by the activation levels in a demand dosing system or by a timer in a time dosing system.

(20) "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.

(21) "Effluent" means the liquid discharge from a pretreatment component.

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

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

(24) "Flood pool elevation" means the maximum water surface elevation of a reservoir, equal to the elevation of the spillway.

(25) "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.

(26) "Full kitchen" means all the appliances in a warming kitchen plus a warewashing machine or equipment.

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

(28) "Gravity distribution" means gravity delivery of effluent to and within each lateral.

(29) "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 distance beneath a dispersal field.

(30) "Horizon" means a layer of soil, approximately 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.

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

(32) "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.

(33) "Interceptor drain" means subsurface 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. Interceptor drains are a type of artificial drainage.

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

(35) "Jurisdictional wetland" means land established as a wetland by DEQ or the US Army Corp of Engineers under Section 404 of the Federal Clean Water Act.

(36) "Ksat" or saturated hydraulic conductivity, means the value of water flow (flux) 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.

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

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

(39) "Limiting condition" means soil conditions (morphology, wetness, depth, restrictive horizon, or organic matter content) or site features (topography, slope, landscape position, or available space) that restrict design options or prohibit permitting a wastewater system.

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

(41) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil or saprolite in a wastewater system after long-term use. The LTAR, in units of gallons per day per square foot (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.

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

(43) "Management Entity" means the person, entity, company, or firm designated by the owner of the 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 can 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.

(44) "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.

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

(46) "Mean high-water mark" or normal 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 most stringent high-water mark shall be applied.

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

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

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

(50) "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.

(51) "NSF-40 systems" means individual residential wastewater treatment systems (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.

(52) "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.

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

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

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

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

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

(58) "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 formed artificially.

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

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

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

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

(63) "Public management entity" means a city (G.S. 160A, Article 16), county (G.S. 153A, Article 15), interlocal contract (G.S. 153A, Article 16), joint management agency (G.S. 160A, Articles 461 and 462), county service district (G.S. 153A, Article 16), county water and sewer district (G.S. 162A, Article 6), sanitary district (G.S. 130A, Article 2), water and sewer authority (G.S. 162A, Article 1), metropolitan water district (G.S. 162A, Article 4), metropolitan sewerage district (G.S. 162A, Article 5), public utility [G.S. 62-3(23)], county or district health department (G.S. 130A, Article 2), or other public entity legally authorized to operate and maintain wastewater systems.

(64) "Redoximorphic features" means a color pattern of a horizon due to a loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation and reduction of iron (Fe) coupled with its removal, translocation, or accrual, or a soil matrix color controlled by the presence of Fe^{+2}.

(65) "Repair area" means an area that has been classified suitable consistent with the rules in this Subchapter. The repair area 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.

(66) "Residential Wastewater Treatment Systems," referred to as RWTS, means approved individual advanced pretreatment systems which are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable rules in this Subchapter.

(67) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent. Restrictive horizons may occur as:

(a) physical root restrictions due to high bulk density;

(b) strong pedogenic cementation or induration, physically root restrictive;

(c) plinthite; or

(d) fragipan characteristics.

The horizon suffixes d, m, and x from the USDA-NRCS Field Book for Describing and Sampling Soils can be used to describe restrictive horizons. Restrictive horizons are recognized by their resistance in excavation or in using a soil auger.

(68) "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.

(69) "Saprolite" means the body of porous material formed in place by weathering of rock that has a massive, rock-controlled structure and retains the fabric (arrangement of minerals) of its parent rock in 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.

(70) "Septic tank" means a water-tight, covered receptacle designed for primary treatment of wastewater and 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.

(71) "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 relief line or device to the succeeding trench at a lower elevation. All trenches are fed through the proximal end.

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

(73) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level and passes through a relief line or device to the succeeding trench, in a single uninterrupted flow path.

(74) "Soil" means the naturally occurring body of porous 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 (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.

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

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

(77) "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 aggregates.

(78) "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 (2.0 - 0.05 mm in size), silt (less than 0.05 mm or greater than 0.002 mm in size), and clay (less than 0.002 mm in size) particles.

(79) "State" means the Department of Health and Human Services, Division of Public Health, Environmental Health Section, On-Site Water Protection Branch. The mailing address for the State is as follows: 1642 Mail Service Center, Raleigh, NC 27699-1642.

(80) "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.

(81) "Suitable" means classification of a specific site evaluation parameter or the site. A site is classified suitable for a wastewater system when all site evaluation parameters are suitable.

(82) "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, interceptor drains, foundation drains, swales, and ditches. Surface water diversions are a type of artificial drainage.

(83) "Swales" mean natural or constructed elongated, sloped depressional drainage features used to collect runoff and direct the flow to an effective outlet to prevent surface water convergence downslope. Swales can be used in conjunction with a berm.

(84) "TS-I systems" means advanced pretreatment systems which are approved in accordance with TS-I effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(85) "TS-II systems" means advanced pretreatment systems which are approved in accordance with TS-II effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(86) "Third-party" means a person or body 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 body has knowledge of the subject area based upon relevant training and experience.

(87) "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.

(88) "Treatment media" means the non- or slowly-degradable media used for physical, chemical, and biological treatment in a wastewater treatment component.

(89) "Trench" means an excavation with a width of three feet or less containing dipsersal media and one or more laterals.

(90) "Unstable slopes" means areas showing indications of mass downslope movement.

(91) "Unsuitable" means classification of a specific site evaluation parameter or the site. A site is classified unsuitable for a wastewater system when any one site evaluation parameter is unsuitable.

(92) "Vertical separation distance" means the vertical measurement from the infiltrative surface to a limiting condition.

(93) "Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

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

SECTION .0200 – PERMITS

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

15A NCAC 18E .0201 GENERAL

Wastewater system permits issued in accordance with the rules of this Subchapter shall be a three-tier process. Upon receipt from the owner of an application which includes a site plan or plat, the LHD shall perform a soil and site evaluation to determine if the site is suitable or unsuitable in accordance with Section .0500 of this Subchapter. If the site is classified suitable, the LHD shall issue an IP which states that a specific trench type can be installed in a specific location on the site, based on the proposed facility type listed in the application. The LHD shall issue a CA with the design details for the wastewater system. After the wastewater system has been installed, the LHD shall inspect the wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP. A PE, LSS, or LG may be needed to perform the soil and site evaluation, geologic or hydrogeologic evaluation, or wastewater system design if required in G.S. 89C, 89E, or 89F.

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

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

15A NCAC 18E .0202 APPLICATION

(a) Any person owning or controlling a facility ~~containing water using fixtures connected to a water supply source~~ shall discharge all wastewater directly to an approved wastewater system permitted for that specific use.

Commented [MAH3]: Trench product is used 9 times but not defined. Trench media is used 3 times. Media is used 20 some times. Change product to media or define…

Commented [MAH4]: in accordance with Section

Commented [MAH5]: in accordance with Section

Commented [MAH6]: in accordance with Section

Commented [MAH7]: in accordance with Section

Commented [MAH8]: (a) Should be moved to first sentence of .0201 not appropriate for 0202

Commented [MAH9]: deleted to include non-ground absorption systems

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

(c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

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

(e) 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 design daily flow; 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) site for the 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) all existing and proposed artificial drainage;

(4) designation of the permit requested: five-year expiration (with site plan) or non-expiring (with plat);

(5) location, Parcel Identification Number or other property identification, 911 address (if known), acreage, and general directions to the property;

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

(7) information needed to determine design daily flow and effluent strength of the facility(s) served including number and function of individual design units, number of bedrooms, or number of occupants;

(8) notification if the property contains any of the following, when applicable:

(A) previously identified jurisdictional wetlands;

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

(C) site is subject to approval by other public agencies, such as the Coastal Area Management Act, U.S. Army Corp of Engineers, etc.; and

(9) signature of owner.

(f) The application for a CA shall contain:

(1) the information required in Paragraph (e) of this Rule;

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

(3) the proposed wastewater system type in accordance with Table XXXI of Rule .1301 of this Subchapter specified by the owner.

(g) 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, 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 design daily flow of the facility served including number and function of individual design units, number of bedrooms, or number of occupants; and

(5) signature of owner.

(h) The application shall state that submittal of a signed application constitutes right of entry to the property.

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, a 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 that includes the items contained in G.S. 130A-336(a)(1) through (6) and the following information:

(1) a site plan or plat as defined in G.S. 130A-334 showing the location of the initial wastewater system and repair area including dimensions from two fixed reference points;

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

(3) location(s) of existing and proposed public or private water supplies, including private drinking water wells and springs and associated water lines;

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

(5) design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(6) the proposed initial wastewater system and repair system types in accordance with Table XXXI of Rule .1301 of this Subchapter, including LTARs for each system;

(7) required effluent quality standard - DSE, NSF-40, TS-I, or TS-II in accordance with Table III of Rule .0402 and Table XXIV of Rule .1201 of this Subchapter;

(8) easements, rights-of-way, encroachments agreements, as applicable; and

(9) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

(c) When the site is classified unsuitable, the IP application shall be denied and 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, this information shall be included in the report.

(d) An IP for which a plat is provided shall be valid without expiration. An IP for which a site plan is provided shall be valid for five years from the date of issue.

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

(f) An IP shall be ~~revoked or suspended if~~:

(1) suspended or revoked if the information submitted in the application is found to be false, incorrect, or altered;

(2) suspended or revoked if the site is altered and the permitted system cannot be installed or operated as permitted;

(3) suspended or revoked if conditions of the IP or the rules of this Subchapter cannot be met; or

(4) suspended if a new application for an IP or NOI is filed for the same proposed design unit ~~on the same property~~.

(5) revoked prior to issuing a new IP or NOI is approved for the same design unit.

(g) An IP shall be applicable to both initial and repair dispersal field areas identified and approved on the IP.

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) The CA shall contain 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;

Commented [MAH10]: The way this reads we can **revoke** a permit if we receive an **application** for ….. I tried to correct this but there may be better way to do that.

(C) pump requirements;

(D) advanced pretreatment;

(E) distribution devices; and

(F) trench widths, lengths, and depth on the downslope side of the trench;

(3) if a Management Entity is 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.

(d) 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 until CAs for all wastewater system components serving the facility have been issued.

(e) 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 the LHD for approval. 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.

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

(1) wastewater system serving a condominium or other multiple-ownership ~~development~~facility; or

(2) off-site system.

(g) The CA shall be valid for a period equal to the period of validity of the IP.

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

(i) A CA shall be ~~revoked or suspended if~~:

(1) suspended or revoked if if the information submitted in the application is found to be false, incorrect, or altered;

(2) suspended or revoked if if the site is altered and the permitted system cannot be installed or operated as permitted;

(3) suspended or revoked if if conditions of the CA or the rules of this Subchapter cannot be met; or

(4) suspended if a new application for an IP, CA or NOI is filed for the same design unit ~~on the same property~~.

(5) revoked prior to issuing a new CA or an NOI is approved for the same design unit and a differen.

(j) Upon written request of the owner, revised CAs shall be issued for sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance.

Commented [MAH11]: Suspension? we cannot revoke upon receipt of an application

Commented [MAH12]: I know this is to help with off-site systems. But those are a small portion of the systems that cross property lines.

Commented [MAH13]: 4 as written or 4-5 here could cause problems by sending out multiple appeal letters on basically the same application. Is this worth the issues?

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 and the authorized agent has inspected the system prior to the system being covered and determined that the system has been installed in accordance with this Subchapter and any conditions of the IP, CA.

(b) If the wastewater system has been permitted and approved in accordance with G.S. 130A-336.1 and Rule .0207 of the Section, an ATO shall be issued by the authorized agent.

Commented [MAH14]: To improve the use of "shall" in this sentence.

(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXI of Rule .1301 of this Subchapter and the system code assigned under Rule .1713(9) of this Subchapter;

(2) facility description including design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength;

(3) a site plan or plat showing the location of the proposed or existing facility, the entire wastewater system as installed from two fixed reference points, including the location and dimensions of the repair area;

(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; and

(8) approved engineered plans and specifications if required in Rule .0303(b) 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 designed by an authorized designer or PE, the information in Rule .0303(e) of this Subchapter shall be provided to the authorized agent prior to issuance of the OP.

(f) When an authorized agent determines that the system installation does 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. 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 Revoke the IP and CA. A copy of the report shall be provided to the owner and the installer.

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

(1) wastewater strength and design daily flow remain unchanged;

(2) the system is operated and maintained in accordance the G.S. 130A, Article 11, and 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) OP has not expired or been revoked.

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

(i) At the compliance inspection frequency specified in Table XXXI of Rule .1301 of this Subchapter, an authorized agent shall determine whether a system complies with the conditions of the OP, this Subchapter, and G.S. 130A, Article 11.

(j) An authorized agent may 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 as specified in G.S. 130A, Article 11, this Subchapter, and all conditions imposed by the OP.

(#) Prior to providing written confirmation for the ATO an authorized agent shall revoke any applicable OP.

Commented [MAH15]: I don't know that the violations listed for revoking an OP include EOP….shouldn't that be something that is possible from our department.

(k) When an OP expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, OP, or existing system authorization.

(l) All documentation related to a wastewater system shall be maintained in the county where the permit is issued.

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

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;

(2) reuse of an existing system; or

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

(b) Approvals for reconnecting a facility to or resuming use of an existing system which has a valid OP or to which Rule .0102 of this Subchapter applies, shall be issued upon determination of the following:

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(1) the site complies with its OP or Rule .0102 of this Subchapter;

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

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

(4) the facility meets required setbacks; 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 which do not increase design flow or change wastewater strength and require the issuance of a building permit, an authorization shall be issued upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.

(d) For authorizations issued in accordance with this Rule the authorized agent shall provide written documentation to the owner that describes the site modification, system use and design flow, number of bedrooms, number of occupants and includes 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 ENGINEER OPTION PERMIT

(a) An owner choosing to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 shall employ the services of a PE to prepare signed and sealed drawings, specifications, plans, and reports for the design, construction, operation, and maintenance of the wastewater system.

(b) Prior to the submittal of an NOI for an EOP system as required by G.S. 130A-336.1(b), an LSS shall conduct soil and site evaluations and, as applicable, an LG shall evaluate geologic and hydrogeologic conditions. These evaluations shall be in accordance with the rules of this Subchapter.

(c) The NOI for an EOP System shall be submitted by the owner or a PE to the LHD in the county where the facility is located. The NOI shall be submitted on the common form provided by the State. The common form is available by accessing the State's website at http://ehs.ncpublichealth.com/rules.htm#oswprules. It shall include all the information specified in G.S. 130A-336.1(b) and the following:

(1) the LSS's, LG's, and installer's name, license number, address, e-mail address, and telephone number;

(2) information required in Rule .0201 of this Subchapter 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 shall reference any existing permit issued for a private drinking water supply, public water supply, 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, LG, and installer, as applicable.

(d) The PE design shall incorporate findings 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(k)(1). 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 manufacturers endorsement of the proposed use.

(e) 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, or the LHD fails to act within 15 business days.

(f) If the owner chooses to increase the design daily flow or change the wastewater strength discharging to the wastewater system prior to construction, a new NOI shall be submitted to the LHD. The owner shall request in writing that the PE invalidate the prior NOI with a signed and sealed letter sent to the owner and LHD.

(g) 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. The owner shall be responsible for preventing modifications or alterations of the site for the wastewater system or the system repair area due to any construction activities for the facility before or after construction of the wastewater system, unless approved by the PE, LSS, or LG, as applicable.

(h) Prior to providing written confirmation for the ATO, the PE shall submit the following to the LHD:

(1) documentation that all reporting requirements identified in G.S. 130A-336.1(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; and

(5) record drawings.

The LHD shall use the common form for written confirmation.

(i) The owner of the wastewater system approved in accordance with the EOP 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) and Section .1300 of this Subchapter.

(j) For repair of a malfunctioning EOP system, this Rule shall be followed in conjunction with Rule .1306 of this Subchapter. The Management Entity shall notify the LHD within 48 hours of the system malfunction.

(k) The owner of an EOP system who wishes to change the use of the facility shall contact the PE, LSS, LG, and installer, as applicable, to determine whether the current system would continue to meet the requirements of the rules of this Section for the proposed change of use. The PE, LSS, LG, or installer shall determine what, if any, modifications shall be necessary for the wastewater system to continue to meet the requirements of the rules of this Section following the proposed change of use. A NOI reflecting the change of use and any required modifications to the system shall be submitted to the LHD and follow the EOP permitting process.

(l) The LHD is responsible for the following activities related to the EOP system:

(1) file all EOP documentation consistent with current permit filing procedures at the LHD;

(2) submit a copy to the State of the NOI common form and written confirmation of ATO;

(3) review the performance and operation reports submitted in accordance with Rule .1305(c) and Table XXXI of Rule .1301 of this Subchapter;

(4) perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(d) and Table XXXI of Rule .1301 of this Subchapter;

(5) investigate complaints regarding EOP systems;

(6) 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 a NOI for repairs; and

(7) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

(m) The Owner may contract with another licensed professional to complete an EOP project. A revised NOI shall be submitted to the LHD.

(n) 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 as provided for in accordance with G.S. 130A-336.1 and the applicable statues for their respective professions.

History Note: *Authority G.S. 130A-335; 130A-336.1;*

SECTION .0300 – RESPONSIBILITIES

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

15A NCAC 18E .0301 OWNERS

(a) The owner shall:

Commented [MAH16]: Steve Barry: or what??

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State 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;

(9) prevent encroachment on the initial wastewater system and repair area by utilities, structures, vehicular traffic areas, etc.;

(10) provide necessary records of title to the LHD when seeking an exemption for a lot or tract of land from the minimum setback requirements in Rule .0601(a) of this Subchapter; and

(11) 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 person owning or controlling the system. An easement or encroachment agreement shall be required for the permitting of the following wastewater system installations:

(1) common area with other wastewater systems;

(2) area with multiple or third-party ownership or control;

(3) proposed off-site area; or

(4) system and the facility are located on different lots or tracts of land and cross a property line or right-of-way.

(c) Necessary easements, rights-of-way, or encroachment agreements, as applicable, shall be obtained prior to the issuance of an IP. Terms of the easement, right-of-way, or encroachment agreement shall provide that the easement, right-of-way, or encroachment agreement meets the following criteria:

(1) appurtenant to described property, runs with the land, and is not affected by change of ownership or control;

(2) valid for as long as the wastewater system is required for the facility that it is designed to serve;

(3) describes and specifies the uses being granted and shall include ingress, egress, and regress, system installation, operation, maintenance, monitoring, 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;

(4) specified in a deed by metes and bounds description and attached survey map, the area or site required for the wastewater system and repair area, including collection sewers, tankage or raw sewage lift stations, distribution devices, and dispersal fields; and

(5) shall be recorded with the register of deeds in the county (or counties) 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 STATE

(a) The permitting of a wastewater system shall be the responsibility of agents authorized by the State in accordance with G.S. 130A, Article 4 and 15A NCAC O10 .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.

(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 State shall review and approve the wastewater system design layout, including plans and specifications for all wastewater systems, which serve a facility with a design daily flow greater than 3,000 gpd, as determined in Section .0400 of this Subchapter. The State 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(b)(13) of this Section;

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

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

(d) State review is not required when the design daily flow for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and all the following are met:

(1) individual ground absorption system(s) serving individual design units with a design daily flow less than or equal to 1,500 gpd;

(2) initial and repair dispersal fields for each individual ground absorption system(s) are 20 feet from any other individual wastewater system;

(3) total design daily flow for all ground absorption system(s) on a lot or tract of land is less than 1,500 gpd per acre.

(e) State review is not required when a PE calculates the proposed design daily flow 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. In accordance with S.L. 2013-413 and S.L. 2014-120, neither the State nor any LHD shall be liable for a system approved or permitted in accordance with this Paragraph.

(f) For systems that require State 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 State. 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 State.

(g) The State will provide technical assistance to the LHD as may be 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 130A-335;*

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

15A NCAC 18E .0303 LICENSED OR CERTIFIED PROFESSIONALS

(a) Prior to the issuance of an IP or CA, plans and specifications shall be required by the authorized agent where there is a limiting condition and a groundwater lowering system is required. These plans and specifications shall be prepared by a person or persons who are licensed or registered to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, 89E or 89F.

(b) Any wastewater system which meets one or more of the following conditions shall be designed by a PE if required in G.S. 89C and plans and specifications shall comply with Rule .0304 of this Section:

(1) the system has a design daily flow 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 other than a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) the system requires pumping more than 1,000 feet horizontally;

(4) elevation head is greater than 100 feet;

(5) 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;

(6) the pump system has one intermediate high point greater than five feet relative elevation;

(7) the system includes a pressure sewer receiving effluent from two or more pump tanks;

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

(9) the system requires use of sewage pumps prior to the septic tank or other treatment system, except for systems subject to 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;

(10) an individual system uses more than one pump or siphon in a single pump tank;

(11) the system includes a collection sewer prior to the septic tank or other treatment system serving two or more buildings, except for systems subject to the North Carolina Plumbing Code;

(12) the system includes structures which have not been pre-engineered;

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

(A) the State has determined that the wastewater generated by the proposed facility has a pollutant strength which is lower than or equal to domestic wastewater and does not require specialized treatment or management; or

(B) the State has pre-approved a predesigned treatment system or process and management method proposed by the facility owner which shall enable the IPWW to have a pollutant strength which is lower than or equal to domestic wastewater;

(14) 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;

(15) 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; and

(16) any other system so specified by the LHD.

(c) 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 appropriate Level according to the system design specifications as required by G.S. 90A-72;

(2) notification to the LHD upon completion of the system installation or 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 when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter; and

(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(d) 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.

(e) 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 is based on periodic observations of construction and a final inspection for design compliance.

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

(a) Plans and specifications required to be prepared by a LSS, PE, or other North Carolina licensed professional shall contain the information necessary for construction of the wastewater system in accordance with G.S. 130A, Article 11, and this Subchapter, and shall include the information in Paragraphs (b) through (d) of this Rule, and any other information, determined to be applicable by the LHD or the State.

(b) Applicant information and design daily flow determination:

(1) 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;

(2) name, address, and phone number for owner and all consultants; and

(3) design daily flow and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed design daily flow and wastewater strength.

(c) Special Site Evaluation including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:

(1) 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:

(A) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;

(B) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;

(C) soil and site based criteria for dispersal field design and site modifications;

(D) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(e) of this Subchapter; and

(E) recommended effluent quality standard for proposed initial and repair dispersal field areas with justification; and

(2) hydraulic assessment reports on site-specific field information which shall include, as applicable:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation and at every distinct horizon within and beneath the treatment zone;

(B) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;

(C) groundwater mounding analysis (level sites) or lateral flow analysis (sloping sites) in accordance with Rule .0510(d) of this Subchapter; and

(D) contaminant transport assessment showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property; and

(3) site evaluation plan showing:

(A) site topography;

(B) proposed site modifications;

(C) location of existing and proposed site features listed in Rule .0601 of this Subchapter;

(D) proposed facility location;

(E) location and proposed initial and repair dispersal field area and type; and

(F) location of LSS soil pits, hand auger borings, deep borings, and in-situ Ksat tests as appropriate; and

(4) site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the information listed in Subparagraph (3) of this Rule and the following:

(A) 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;

(B) existing and proposed private wells or water supply sources within 200 feet of existing or proposed system component locations;

(C) 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;

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

(E) 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;

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

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

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

(1) collection systems and sewers:

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

(B) proximity to utilities and pertinent features;

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

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

(2) tank information:

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

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

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

(D) identification number for State approved tanks;

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

(F) anti-buoyancy calculations and provisions; and

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

(A) information required in Subparagraph (d)(2) of this Rule;

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

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

(D) control panel, float switches and settings, and high-water alarm components, location, and operational description under normal and high-water conditions;

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

(F) lighting, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (d)(2) and (3) of this Rule;

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

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

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

(A) 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);

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

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

(D) flow distribution device design;

(E) artificial drainage system locations, elevations, discharge points and design details;

(F) site preparation procedures;

(G) construction and system testing phasing; and

(H) final landscaping and compliance with erosion control requirements; and

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

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

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

Wastewater systems with a design daily flow less than or equal to 3,000 gpd that are required to be prepared by a LSS, PE, or other North Carolina licensed professional shall include the following information in the plans and specifications:

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

(2) Rules .0304(c)(1) through (c)(3) of this Section for Special Site Evaluations and submittals prepared under Rule .0510 of this Subchapter; and

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

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

SECTION .0400 DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

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

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum design daily flow for dwelling units shall be based on:

(1) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit;

(2) 60 gpd per person when occupancy exceeds two persons per bedroom; or

(3) greater of Subparagraphs (1) or (2) of this Paragraph.

(b) The minimum design daily flow for dwelling units with one bedroom, no more than two occupants, and 400 square feet of living space or less is 175 gpd.

(c) Table II shall be used to determine design daily flows for facilities other than dwelling units.

(d) The minimum design daily flow from any facility other than a dwelling unit shall be 100 gpd. For facilities with multiple design units, the minimum design daily flow shall be 100 gpd per design unit. The design daily flow of the facility is the sum of all design unit flows.

(e) Design of wastewater systems for 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 one.

(f) Unless otherwise noted in Table II, the design daily flow for laundry facilities is not included. Where laundry is not specified for a facility in Table II, but is proposed to be provided, the design daily flow shall be adjusted to account for the proposed usage and machine water capacity. Applicant shall provide cut-sheets for laundry machines proposed for use in facilities.

(g) HVAC unit or ice machine condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system, unless otherwise approved by the LHD.

Commented [MAH17]: Ice to grease trap, steve barry

(h) Unless otherwise noted in Table II, the design daily flow per unit includes employees.

(i) Food service facilities and other facilities that are projected to generate wastewater with constituent levels greater than domestic strength, as defined in Rule .0402 of this Section, are identified in Table II. Any facility which has a food service component that contributes 50 percent of the design daily flow shall be considered to generate high strength wastewater. Determination of wastewater strength is based on projected or measured levels of one or more of the following: BOD, TSS, FOG, or TN. Table III identifies the constituent limits for DSE. Excess concentrations of other constituents may result in a high strength wastewater classification on a site-specific basis.

TABLE II. Design daily flow for Facilities

Facility type	**Design daily flow**
Commercial	
Airport, 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, booth, or bowl
Bed and breakfast homes and inns	Dwelling unit design daily flow 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*	2 gal/person with toilets and hand sinks; 3 gal/person with addition of a warming kitchen; 5 gal/person with full kitchen

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Markets open less than four days/week	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 (slips on dock) 5 gal/boat slip, dry storage (warehouse)
Motels/hotels	120 gal/room includes the following: No cooking facilities in individual rooms 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/ hour 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 (not retails 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, food preparation not included
Camps/Campgrounds	
Summer camps (overnight stay)**	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 multi use service; or 3 gal/meal served with single-service articles
Temporary Labor Camp or Migrant Housing Camp (overnight stay)**	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/RV in an RV park**	120 gal/space

Recreational Park Trailer (Park Model) in an RV park**	175 gal/space
Bathhouse for campsites and RV park sites with no water and sewer hook ups (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 for the following: Open 6 hrs/day or less Add 2.5 gpd/seat for every additional hour open
Food Establishments with single service articles**	20 gal/seat or 20 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less Add 2.0 gpd/seat for every additional hour open
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/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/≤ 12 hr shift with the following: No food preparation Warming kitchen only Single service articles No laundry Add 1 gal/person/hr for more than 12 hr shift
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 hours/day Food preparation not included Retail space not included
	325 gal/toilet or urinal meeting the following: Open 16 to 24 hours/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 larger
Country club/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, stadiums*, and other similar facilities	250 gal/toilet or urinal; or 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 as 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 sanctuary	2 gal/seat with no kitchen, school, day care, or camp ~~3 gal/seat with warming kitchen; no school, day care, or camp~~ ~~5 gal/seat with full kitchen~~
Public or private assembly halls used for worship, recreation, regularly scheduled meetings, events, or amusement – building occupancy* (for churches, flow should be in addition to sanctuary 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

Commented [MAH19]: these are either contradicted or already covered in the next cell…

*Designer may alternately use the maximum building occupancy assigned by the local fire marshal in determining design daily flow.

**Facility has potential to generate high strength wastewater

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

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

15A NCAC 18E .0402 EFFLUENT CHARACTERISTICS

(a) Effluent quality standards are listed in Table III.

Table III. Effluent quality standards for domestic strength effluent

Constituent	**DSE (maximum) mg/L**
BOD	≤ 350
TSS	≤ 200
TN*	≤ 100
FOG	≤ 30

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

(b) Wastewater systems with an adjusted design daily flow in accordance with Rule .0403 of this Section or a design daily flow greater than or equal to 1,500 gpd, and with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Section or otherwise determined by the State, authorized agent, or

licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, shall utilize advanced pretreatment to produce DSE prior to dispersal. Alternately, a licensed consultant may justify not using advanced pretreatment by providing the following:

(1) mass loading calculations based on site-specific projected or measured effluent characteristics and water use data. Calculations shall demonstrate that the soil loading rate does not exceed the mass loading rate identified in Table XVI or Table XVII of Rule .0901 or Table XX or Table XXI of Rule .0907 of this Subchapter; and

(2) site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

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 and the State may approve a proposed adjusted design daily flow relative to the values in Table II. The water use information provided to support the proposed adjusted design daily flow shall meet the requirements of Paragraphs (b) or (c) of this Rule.

(b) Documented data from the facility or a comparable facility justifying an adjusted design daily flow and meeting the following criteria:

(1) the submitted data shall consist 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;

(2) a hydraulic peaking factor shall be derived by dividing the highest monthly flow from the 12 monthly readings by the sum of 30 consecutive daily water consumption readings;

(3) the adjusted design daily flow shall be determined by taking the numerical average of the greatest 10 percent of the daily readings and multiplying that average by the hydraulic peaking factor; and

(4) an alternative method of determining the adjusted design daily flow is to multiply the highest monthly flow from the 12 monthly readings by 1.5 and then divide by the number of days in the month.

(c) Proposed use of extreme water-conserving fixtures shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from the proposed facility. Cut sheets of the proposed fixtures shall be provided.

(d) The proposed adjusted design daily flow calculations in accordance with Paragraphs (b) or (c) of this Rule shall account for projected increased constituent concentrations in accordance with Rule .0402(b) of this Section.

(e) In accordance with S.L. 2013-413 and S.L. 2014-120, a PE can propose an adjusted design daily flow in accordance with the following:

(1) design daily flows less than those listed in Rule .0401 of this Section that are achieved through engineering design which 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 projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;

(4) proposed adjusted design daily flows for wastewater systems determined to be less than 3,000 gpd shall not require State review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and

(5) neither the State nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE can propose and the State approve an adjusted design daily flow for a facility made up of individual dwelling units when the following criteria are met:

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

(2) adjusted design daily 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 design daily flows based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The design daily flow from Table II shall be used to determine minimum pretreatment component capacities.

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

SECTION .0500 – SOIL AND SITE EVALUATION

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

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site to determine if a wastewater system can be installed. 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) horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) soil wetness;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability and LTAR for each profile description; and

(7) available space.

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation.

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

(1) 48 inches from the ground surface; or

(2) to an unsuitable soil condition determined in accordance with this Section.

(d) Owners may be required to dig pits when necessary for evaluation of the site as determined by the authorized agent.

(e) Soil profiles shall be excavated and described to reflect variations in soil and site characteristics across both initial and repair areas.

(f) Site evaluations shall be completed in accordance with this Section. Based on the evaluation of the soil and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable (S) or unsuitable (U).

(g) A limiting condition initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(c), (d), or (e) of this Section are met.

(h) The authorized agent shall specify the overall site classification and suitability in accordance with Rule .0509 of this Section.

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

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 considered suitable with respect to topography.

(b) Unstable slopes shall be considered unsuitable with respect to topography.

(c) Slopes greater than 65 percent shall be considered unsuitable with respect to topography.

(d) Areas subject to surface water convergence ~~shall~~ may be considered unsuitable with respect to topography, unless the surface water can be diverted from the site.

(e) Slope patterns (topography) that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system shall be considered unsuitable with respect to topography.

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(f) Depressions shall be considered unsuitable with respect to landscape position except when, with site modifications, the site complies with the requirements of this Section and is approved by an authorized agent.

(g) A jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ shall be considered unsuitable with respect to landscape position, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ.

(h) For all sites, except where a drip dispersal system is proposed, additional required soil depth (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 (inches)

MSD = minimum soil depth (inches)

TW = actual trench width (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 by an authorized agent in accordance with the following:

(1) Texture – The texture of each soil horizon in a profile shall be classified into four general groups and 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 are 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

In place of field testing, the LHD or the State may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified granular, blocky, platy, prismatic, and absence of structure and suitability determined based on 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	**Size (diameter)**	**Classification**
Granular	N/A	suitable
Blocky	≤ 1 inches (2.5 cm)	suitable
	> 1 inches (2.5 cm)	unsuitable
Platy	N/A	unsuitable
Prismatic	≤ 2 inches (5 cm)	suitable
	> 2 inches (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 suitability shall be determined based on Table VI.

Table VI. Clay mineralogy (consistence) field method results, associated mineralogy, and suitability classification

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 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 must be greater than 35 percent and the organic matter component must be less than 0.5 percent.

Table VII. Clay mineralogy laboratory method results, mineralogy, and associated suitability classification

ACEC (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 48 hours before samples are to be taken by the licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F. The authorized agent and the consultant 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 consultant 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 CONDITIONS

(a) Soil wetness conditions 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 evaluation for soil wetness indicators and

field observations, and may be further characterized by well monitoring, computer modeling, or a combination of monitoring and modeling as required by this Rule. All sites shall be evaluated by an authorized agent using Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule.

(b) Basic Field Evaluation Procedures:

(1) A soil wetness condition shall be determined by the indication of colors of chroma 2 or less (Munsell Color System) at greater than or equal to two percent of soil volume in mottles or matrix of a horizon. Colors of chroma 2 or less that are lithochromic shall not be considered indicative of a soil wetness condition; or

(2) A soil wetness condition shall be determined by the periodic observation or indication of saturated soils or 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 of chroma 2 or less. A soil wetness condition resulting from saturated soils or a perched water table shall be confirmed to persist for three consecutive days.

(3) The shallowest depth to soil wetness condition determined by Subparagraph (b)(1) or (b)(2) of this Rule shall take precedence.

(c) Site Suitability as to Soil Wetness: Initial suitability of the site as to soil wetness shall be determined based upon the findings of the Basic Field Evaluation Procedures made in accordance with Paragraph (b) of this Rule. Sites where the soil wetness condition is less than 12 inches below the naturally occurring soil surface shall be considered unsuitable with respect to soil wetness.

(d) Alternative Procedures for Soil Wetness Determination: The owner shall have the opportunity to submit documentation that the soil wetness condition and resultant site classification be alternately determined and reclassified by monitoring, computer modeling, or a combination of monitoring and modeling, in accordance with Direct Monitoring Procedure, Monitoring and Modeling Procedure, or Modeling Procedure made in accordance with Paragraphs (e), (f), or (g) of this Rule. This determination shall take precedence over the determination made in accordance with the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule, when the conditions of Paragraphs (e), (f), or (g) of this Rule are met. Determination by one of these Monitoring or Modeling procedures shall also be required when:

(1) the Owner proposes to use a wastewater system requiring a deeper depth to a soil wetness condition than the depth determined by the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule; or

(2) the Owner proposes to use sites with Group III or IV soil within 36 inches of the naturally occurring soil surface and where artificial drainage systems are existing or are proposed or on such sites when fill is proposed to be used in conjunction with artificial drainage systems. Final determination of soil wetness condition for these sites shall be made in accordance with the Modeling Procedure in Paragraph (g) of this Rule.

(e) Direct Monitoring Procedure: Soil wetness conditions may be determined by observation of the water surface in wells during periods of high-water elevations utilizing the following monitoring procedures and interpretation method.

(1) The owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal that includes a site plan, well and soil profile at each monitoring location, and a monitoring plan no later than 30 days prior to the start of the monitoring period. Soil wetness and rainfall monitoring shall be conducted by a third-party consultant or by the owner. A third-party consultant is qualified when licensed or registered in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, if required. The Owner shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the LHD.

(2) The owner shall submit a site plan showing proposed sites for wastewater systems, shall provide the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the soil wetness conditions, and specify any proposed fill and drainage modifications.

(3) The owner shall submit a monitoring plan indicating the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well, and proposed method of analysis. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a design daily flow greater than 600 gpd shall have one additional well per 600 gpd increment.

(4) The authorized agent shall be given the opportunity to conduct a site visit and verify the appropriateness of the proposed plan. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil/site conditions. Prior to installation of the wells the authorized agent shall approve the plan. If the plan is disapproved, the authorized agent shall include specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend five feet below the naturally occurring soil surface, or existing soil surface for fill installed prior to July 1, 1977 meeting the requirements for consideration of a site with existing fill in accordance with G.S. 130A-341 and the rules of this Subchapter. However, a well or wells which extend(s) down only 40 inches may be used if they provide a continuous record of the water table for half of the monitoring period, and one or more shallower wells may be required on sites where shallow lateral water movement or perched soil wetness conditions are anticipated.

(6) 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). A rain (precipitation) gauge is required within one-half mile of the site. Daily rainfall shall be recorded beginning no later than December 1 through April 30 (the end of the well monitoring period).

(7) Interpretation Method for Direct Monitoring Procedure: The following method of determining depth to soil wetness condition from water surface observations in wells shall be used when the 60-day weighted rainfall index for the January through April monitoring period equals or exceeds the site's long-term (historic) 60-day weighted rainfall index for January to April rainfall with a 30 percent recurrence frequency (wetter than the 9th driest year of 30, on average). The 60-day weighted rainfall index for the monitoring period and historic rainfall record shall be computed as:

$WRI_{60} = 0.5P_D + P_J + P_F + P_M + 0.5P_A$

Where WRI_{60} = 60-day weighted rainfall index for January to April

P_D = Total December rainfall (inches)

P_J = Total January rainfall (inches)

P_F = Total February rainfall (inches)

P_M = Total March rainfall (inches)

P_A = Total April rainfall (inches)

The State shall prepare contour maps for each county where this interpretation procedure is proposed. Contours shall be prepared following standard interpolation procedures using normalized data collected from all National Weather Service Stations, or equivalent, from which appropriate data are available, prior to February 1 of the monitoring season. Data from each station shall be normalized by fitting a 2-parameter gamma distribution to the 60-day weighted rainfall index computed for the most recent three decades of historic data, in accordance with procedures outlined in Chapter 18 of the National Engineering Handbook, USDA-NRCS. From this fitted distribution, the 60-day weighted rainfall index for January through April rainfall with a 30 percent, 50 percent, 70 percent and 80 percent recurrence frequency shall be computed for each Station, to provide the raw data points from which the contour maps shall be prepared. From these maps, the site's 60-day weighted rainfall index for the January through April monitoring period shall be compared to the long-term (historic) January to April 60-day weighted rainfall index at different expected recurrence frequencies. The soil wetness condition shall be determined as the highest level that is continuously saturated for the number of consecutive days during the January through April monitoring period shown in Table VIII.

TABLE VIII. Weighted rainfall index related to number of consecutive days of continuous saturation

Recurrence Frequency Range January to April 60-Day Weighted Rainfall Index	**Number of Consecutive Days of Continuous Saturation for Soil Wetness Condition**
30% to 49.9%	3 days or 72 hours
50% to 69.9%	6 days or 144 hours
70% to 79.9%	9 days or 216 hours
80% to 100%	14 days or 336 hours

(8) If monitoring well data is collected during monitoring periods that span multiple years, the year which yields the highest (shallowest) soil wetness condition shall be applicable.

(f) Monitoring and Modeling Procedure: A combination of monitoring and modeling may be used to determine a soil wetness condition utilizing the following monitoring procedures and interpretation method.

(1) The procedures described for the Direct Monitoring Procedure in Subparagraphs (e)(1) through (e)(6) of this Rule shall be used to monitor water surface elevation and precipitation for determining soil wetness conditions by a combination of direct observation and modeling, except that the rainfall gauge and each monitoring well shall use a recording device and a data file (DRAINMOD compatible) shall be submitted with the report to the LHD (devices shall record rainfall hourly and well water level daily).

(2) The groundwater simulation model DRAINMOD shall be used to predict daily water levels over a 30-year historic time period after the model is calibrated using the water surface and rainfall observations made on-site during the monitoring period. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(A) Weather input files, required to run the DRAINMOD, shall be developed from hourly rainfall gauge data taken within a half-mile of the site and from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants. Daily maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for 30 days prior to this 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 Users Guide, and guidance is also available in Reports 333 and 342 of the University of North Carolina Water Resources Research Institute. DRAINMOD soil data files on file with the State shall be made available upon request to the owner or owner’s consultants.

(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 least squares analysis of the daily observations over the whole monitoring period (mean absolute deviation between measured and predicted values no greater than eight inches), and to achieve the best possible match between the highest water table depth during the monitoring period (measured vs predicted) that is saturated for 14 consecutive days.

(D) For sites intended to receive over 1,500 gpd, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(E) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD or Owner may request a technical review by the State prior to approval of the soil wetness condition determination.

(g) Modeling Procedure: A soil wetness condition may be determined by application of DRAINMOD to predict daily water levels over a 30-year historic time period after all site-specific input parameters have been obtained, as outlined in the DRAINMOD Users Guide. This modeling procedure shall be used when a groundwater lowering system is proposed for a site with Group III or IV soils within 36 inches of the naturally occurring soil surface. This procedure shall also be used to evaluate sites with Group III or IV soils within 36 inches of the naturally occurring soil surface, where the soil wetness condition was initially determined using a procedure described in Paragraphs (e) or (f) of this Rule and where artificial drainage systems are proposed or when fill is proposed to be used in conjunction with artificial drainage systems. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(1) Weather input files, required to run DRAINMOD, shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants.

(2) 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 proposed drainage features and surface storage and drainage parameters, shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide. DRAINMOD soils data files on file with the State shall be made available upon request to the owner or owner's consultants. Inputs shall include:

(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, or other accepted values consistent with the simulation model; and

(F) A sensitivity analysis shall be conducted for the following model parameters: soil input files for 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 soil wetness condition. 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 soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(4) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD shall submit the groundwater simulation analysis to the State for technical review prior to approval of the soil wetness condition determination.

(h) A report of the investigations made for the Direct Monitoring Procedure, Monitoring and Modeling Procedure or Modeling Procedure in accordance with Paragraphs (e), (f), or (g) of this Rule shall be prepared prior to approval of the soil wetness condition determination. Reports prepared by a licensed professional shall bear the professional seal of the person(s) whom conducted the investigation. A request for technical review of the report by the State shall include digital copies of monitoring data and digital copies of 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 TO ROCK, SAPROLITE, OR PARENT MATERIAL

(a) Soil depths to saprolite, rock, or parent material 18 inches or greater shall be considered suitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(b) Soil depths to saprolite, rock, or parent material less than 18 inches shall be considered unsuitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(c) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

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 as to depth to saprolite may be reclassified suitable in accordance with this Rule.

(b) A 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable soil condition. If any of the vertical separation is suitable soil, then one-inch of suitable soil equals two inches of saprolite.

(c) An investigation of the site using pits, at locations approved by the authorized agent, shall be conducted. The following physical properties and characteristics shall be present in the 24 inches (or less if combined with soil) of saprolite below the proposed infiltrative surface:

(1) 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;

(2) clay mineralogy shall be suitable in accordance with Rule .0503(3) of this Section;

(3) greater than 2/3 of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

(4) the saprolite wet consistence shall be nonsticky or slightly sticky and nonplastic or slightly plastic;

(5) the saprolite shall be in an undisturbed, naturally occurring state;

(6) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock; and

(7) lab determinations may be used to supplement field determinations. Split samples shall be made available to the LHD when requested.

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

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 located at depths less than 18 inches below the naturally occurring soil surface shall be considered unsuitable as to depth to restrictive horizons.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 18 inches below the naturally occurring soil surface shall be considered suitable as to depth to restrictive horizons.

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 sufficient 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 shell meet all required setbacks in Section .0600 of the Subchapter and provide access for operation and maintenance activities.

(b) The dispersal field repair area shall not be altered so that the specified area would be classified unsuitable per Rule .0509. ~~system cannot be installed or function as permitted.~~

(c) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to determine that initial and repair dispersal field 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 distance to a limiting condition along the entire trench length in accordance with Rule .0901(d)(3) of this Subchapter.

(d) 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) design daily flow is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(4) designed for DSE.

(e) Repair area shall be required for any proposed additional flow ~~from an existing facility meeting the requirements~~ to an existing system permitted under the exemption of Paragraph (d) of this Rule.

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(f) Repair area shall be required when any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Paragraph (d) of this Rule was previously utilized.

(g) Although a lot or tract of land is exempted under Paragraph (d) of this Rule from the repair area requirement of Paragraph (a) of this Rule, the maximum feasible area, as determined by the authorized agent, shall be allocated for a repair area and documented on the IP, CA, and OP.

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

15A NCAC 18E .0509 is proposed for adoption as follows:

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most limiting condition determined in Rules .0502 through .0508 of this Section shall be used to determine the overall site classification as suitable or unsuitable. The overall site shall be classified suitable if there is sufficient soil and area for a wastewater system that complies with the minimum vertical separation distance to a limiting condition consistent with this Subchapter.

(b) The minimum depth from the original ground surface to ~~vertical separation distance to~~ any limiting conditions shall be 18 inches.

(c) Sites classified unsuitable due to soil wetness conditions may be reclassified suitable when modifications are made to meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation distance to the water table.

(d) Sites classified unsuitable due to soil wetness conditions because of the presence of lateral water movement may be reclassified suitable as to soil wetness conditions when such water is intercepted and diverted to prevent saturation of the wastewater system.

(e) A site classified unsuitable may be approved for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. A Special Site Evaluation in accordance with Rule .0510 of this Section shall be provided to the authorized agent that demonstrates that the proposed system can be expected to overcome the unsuitable soil or site conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by individuals qualified by training and experience and licensure in North Carolina in accordance with G.S. 89C, G.S. 89E, and G.S. 89F, to consult, investigate and evaluate soil and rock characteristics, groundwater hydrology, design artificial drainage systems, or design wastewater systems. The proposed wastewater system or artificial drainage system shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review the substantiating data if requested by the LHD.

(f) 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 adversely impact ground and surface water quality. Any site for a wastewater system that is proposed with one or more of the following shall require a Special Site Evaluation by a person or persons who are licensed or registered to consult, investigate, or evaluate soil characteristics and hydrologic and hydraulic testing and analysis in accordance with G.S. 89F or G.S. 89E:

(1) proposal submitted in accordance with Rule .0504(h) of this Section;

(2) proposal submitted in accordance with Rule .0509(e) of this Section;

(3) advanced pretreatment is required for any of the following:

(A) vertical separation distance to a limiting condition is proposed to be reduced. The vertical separation distance to rock or tidal water shall not be reduced to less than 12 inches;

(B) less than 18 inches of naturally occurring soil to an unsuitable soil condition, excluding soil wetness;

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(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 which requires artificial drainage of Group II or III soils;

(E) proposed use of a groundwater lowering system to meet vertical separation distance requirements to a soil wetness condition;

(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent;

(G) bed systems with a design daily flow greater than 1,500 gpd; or

(H) increased LTAR is proposed on a site with a design daily flow greater than 1,500 gpd;

(4) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the design daily flow is greater than 600 gpd; or when the texture of the receiving permeable horizon is silt loam;

(5) DSE drip dispersal systems meeting the following soil and site conditions:

(A) depth from the naturally occurring soil surface to any unsuitable soil condition 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 soil wetness condition 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 depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches;

(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and driplines are installed in new fill material;

(F) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition;

(G) proposed LTAR exceeds that assigned by the LHD;

(H) design daily flow exceeds 1,500 gpd; or

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(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 limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(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 within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper; or

(9) site-specific nitrogen migration analysis is required to verify that the nitrate concentration at the property line will not exceed groundwater standards;

(10) LHD or State determines that the combination of soil conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances will potentially result in hydraulic overload; or

(11) design daily flow greater than 3,000 gpd, unless the requirements of Rule .0302(d) of this Subchapter are met.

(b) If the adjusted design daily flow is less than or equal to 3,000 gpd, a Special Site Evaluation is not required.

(c) The Special Site Evaluation shall include hydrologic and hydraulic testing and analysis, in accordance with Rule .0304(c)(2) of this Subchapter.

(d) For sites serving systems with a design daily flow 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 (level sites) and the rate of lateral and vertical flow away from the trenches (sloping sites). The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, and in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the State. The site shall be considered unsuitable if the data indicate any of the following:

(1) the groundwater mound which 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 assessment indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

History Note: *Authority G.S. 89E; 89F; 130A-335(a1), (e) and (f);*

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

15A NCAC 18E .0601 is proposed for adoption as follows:

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 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 (feet)
Any public or private water supply source, including a private drinking water well or spring*	100
Surface waters classified Water Supply Class I (WS-I), from mean high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal pool elevation	100
Lake, pond, or stormwater detention pond, from flood pool elevation	50
Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
Any water line, including fire protection and irrigation water lines	10
Geothermal wells – open or closed loop vertical bore	50
Geothermal wells – horizontal closed loop system	10
Building foundation with artificial drainage	15
Building or other foundation without artificial drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	15
Above ground swimming pool	5

Top of slope of embankment or cuts of two feet or more vertical height	15
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25
Surface water diversion, as measured on the ground surface from the edge of the diversion	15
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15
Permanent stormwater retention basin or sediment detention basin	50
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
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	15
Utility transformer, ground-surface mounted	10

(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:

(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or

(2) the private water supply is a well for which a variance for a reduced separation has been issued.

(c) The wastewater system sited in accordance with Paragraph (b) of this Rule shall be located the maximum feasible distance and never less than 50 from the private water supply.

(d) Wastewater systems shall not be located closer than 100 feet to springs and uncased wells located downslope from the dispersal field and used as a source of drinking water.

(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source.

(f) 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.

(g) If effluent is conveyed under areas subject to vehicular traffic or areas subject to soil disturbance or compaction, one of the following shall be used:

(1) DIP;

(2) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DIP;

(3) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DOT traffic rated culvert pipe;

(4) Schedule 40 pipe (PVC, Polyethylene, or ABS) with 30 inches of compacted cover 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.

(h) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed design daily flow 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 X.

TABLE X. Minimum setbacks from wastewater systems greater than 3,000 gpd to site features*

Feature	Setback (feet)
Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer	500
Any other public water supply source, unless a confined aquifer	200
Any private water supply source, unless a confined aquifer	100
Surface water classified WS- I, from mean high-water mark	200
Surface waters classified WS-II, WS-III, B, or SB, from mean high-water mark	100
Waters classified SA, from mean high-water mark	200
Any property line	25

*Increased setbacks for separate dispersal fields that are part of wastewater systems with a design daily flow greater than 3,000 gpd shall not apply to one or more field(s) that are designed for less than 1,500 gpd when a Special Site Evaluation in accordance with Rule .0510 of this Subchapter demonstrates that the wastewater system will comply with the performance requirements in Rule .0510(d) of this Subchapter.

(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.

TABLE XI. Minimum setbacks from collection sewers to site features

Feature	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft*

Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 ft*
Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10
Permanent stormwater retention basin or sediment detention basin	10
Bio-retention area, injection well, or infiltration gallery	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
Utility transmission and distribution line poles and towers, including guy wires	5
Utility transformer, ground-surface mounted	5

*Pipe materials other than DIP 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.

(j) The minimum setback from water lines to collection sewers shall be 10 feet. If a 10-foot setback is not maintained, the following criteria shall be met:

(1) 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) 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 maximum setback from the water line.

(k) Crossings of collection sewers and a water line may occur with the following:

(1) 18 inches clear vertical separation distance is maintained, with the sewer line passing under the water line; or

(2) the water line crosses under the sewer line or 18 inches clear vertical separation distance is not maintained and the following criteria are met:

(A) collection sewer shall be constructed of DIP with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

(B) water line shall be constructed of ferrous materials and with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(l) Collection sewers may cross a storm drain if:

(1) 12 inches clear vertical separation distance is maintained;

(2) collection sewer is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) collection sewer is encased in concrete or DIP for five feet on either side of the crossing.

(m) Collection sewers may cross a stream if:

(1) 36 inches of stable cover is maintained;

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) sewer line is encased in concrete or DIP for 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.

(n) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints. Pipe shall be anchored for 10 feet on either side of the crossing.

(o) Septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems shall not be located in areas subject to frequent flooding (areas inundated at a 10-year or less frequency), unless designed and installed to be watertight and to remain operable during a 10-year storm. Mechanical or electrical components of treatment systems shall be above the 100-year flood level or otherwise protected against a 100-year flood.

History Note: *Authority G.S. 130A-334; 130A-335(e) and (f);*

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, or 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 design daily flow 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, or other instrument conveying fee title or that is described in a recorded plat;

(2) insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basement, property lines, or 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 as determined by an authorized agent shall be required. The minimum setbacks in Table XII shall be required in all cases.

TABLE XII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	Minimum setback (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 those lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, and the wastewater system will be installed in Group I soils, the wastewater system shall be located as far as possible, but not less than 10 feet from any other wastewater system.

(d) For those lots or tract of land which, on July 1, 1982, are specifically described in a deed or recorded plat and the minimum horizontal setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems cannot be met, the maximum feasible horizontal distance as determined by the authorized agent shall be required. The minimum setback shall not be less than 10 feet

(e) Any rules and regulations of the Commission for Public Health or any local board of health in effect on June 30, 1977, which establish greater minimum distance 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);*

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, AND PIPE MATERIALS

15A NCAC 18E .0701 is proposed for adoption as follows:

15A NCAC 18E .0701 COLLECTION SEWERS

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 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 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) Three-foot minimum cover shall be provided for all collection sewers, except as provided for in Rule .0601(g) 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 traffic-bearing loads.

(7) Manholes shall be used for collection sewers at any bends, junctions, and every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation difference exceeds 2.5 feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water supply source, or within 50 feet of any private water supply 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 buildings, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required 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) Collection sewers may require additional ventilation provisions. Air relief valves shall be provided as needed for force mains.

History Note: *Authority G.S. 130A-335(e), (f), (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 Rule .0601(a) of this Subchapter. If the raw sewage lift station is a sealed, watertight chamber the setbacks requirements for collection sewers in Rule .0601(i) of this Subchapter shall apply.

(b) Raw sewage lift stations shall meet the following design and construction standards:

(1) sealed, watertight chamber shall be a prefabricated unit with a sealed top cover, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent;

(2) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;

(3) pumps shall be listed by Underwriter's Laboratories or an equivalent third-party electrical testing and listing agency;

(4) pumps shall be grinder pumps or solids-handling pumps capable of handling 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;

(5) minimum pump operating flow rate shall be 2.5 times the average design daily flow;

(6) systems shall be designed so that the pump-off time does not exceed 30 minutes;

(7) raw sewage lift stations serving single buildings shall be designed for pump run-times between three to 10 minutes at average flow;

(8) 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

(9) all other applicable requirements for pump tanks and dosing systems in accordance with Rule .0802 and Section .1100 of this Subchapter shall also apply to raw sewage lift stations.

History Note: Authority G.S. 130A-335(e), (f), (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 three-inch nominal size Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or non-perforated polyethylene with a minimum fall of 1/8-inch per foot if the installation requirements of Paragraph (b) of this Rule are met.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, or alternative pipe materials described in Paragraph (c) of this Rule, may be substituted for Schedule 40 PVC between the distribution device and the dispersal field when the following installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface at a uniform grade, and with a minimum 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 cover is placed and compacted over the stone or gravel envelope; and

(5) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the excavation separating the trench from the distribution device.

(c) Alternative pipe materials allowed from the distribution device to the dispersal field, when installed in accordance with Paragraph (b) of this Rule, are as follows:

(1) PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241; or

(2) PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034.

(d) 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.

(e) Alternative gravity pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. The pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule.

(f) Pipe used for gravity distribution laterals shall be corrugated plastic tubing certified as complying with ASTM F667 or smooth-wall plastic pipe certified as complying with ASTM D2729. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between ½-inch and ¾-inch 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 Section and is approved by the State.

(g) Pump discharge piping shall be of Schedule 40 PVC or stronger material and pressure rated for water service at two times the operating pressure. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(h) Alternative pressure rated pipe materials are allowed in place of Schedule 40 PVC from the pump tank to the distribution device or dispersal field are when designed and certified by a PE. The proposed pipe shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material. 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 and shall comply with the requirements of Rule .0701(4) of this Section.

History Note: Authority G.S. 130A-335(e), (f), (f1);

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 is proposed for adoption as follows:

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.

(2) Individual dwelling units with five bedrooms or less shall be sized based on Table XIII.

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons) without a garbage disposal	Minimum liquid capacity (gallons) with a garbage disposal
4 or less	1,000	1,250
5	1,250	1,500

(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 XIV.

TABLE XIV. Septic tank capacity for facilities not listed in Table XIII

Design daily flow (gpd) (Q)*	Minimum septic tank liquid capacity (V) calculation (gallons)
$Q \leq 600$	$V = 2Q$
$600 < Q < 1,500$	$V = 1.17Q + 500$
$1,500 \leq Q \leq 4,500$	$V = 0.75Q + 1,125$
$Q > 4,500$	$V = Q$

*For individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit, the minimum septic tank capacity is 1,500 gallons

(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. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second compartment of the septic tank. 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) approved effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

History Note: Authority G.S. 130A-334; 130A-335(e), (f), (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 based on one of the following, but shall never be less than 1,000 gallons:

(1) equal to the required septic tank capacity in Group IV soils;

(2) equal to two-thirds of the required septic tank capacity in Group I, II, or III soils; or

(3) based on the following:

(A) pump submergence or as recommended by the pump manufacturer;

(B) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(C) flow equalization storage, if applicable; and

(D) 24-hour emergency storage above the high-water alarm activation level.

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

(1) pump submergence or as recommended by the pump manufacturer;

(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(3) flow equalization storage, if applicable; and

(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this Rule.

(c) The emergency storage capacity may be calculated as the sum of freeboard space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

(d) The emergency storage capacity requirement shall be determined based on the following and in accordance with Table XV:

(1) type of facility served;

(2) classification of surface waters which would be impacted by a pump tank failure; and

(3) availability of standby power devices and emergency maintenance personnel.

TABLE XV. 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	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	All surface waters	No standby power	12 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	8 hours

and all other systems		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours

History Note: *Authority G.S. 130A-335(e), (f), (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 in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. 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 liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(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 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 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(e) The grease tank liquid capacity shall be calculated by one of the following:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

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 and recreational areas;

0.8 if along other roads)

(f) An approved grease rated effluent filter shall be in the second compartment of the grease tank. 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) approved grease rated effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank.

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

History Note: Authority G.S. 130A-335(e), (f), (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), (f1);

15A NCAC 18E .0805 is proposed for adoption as follows:

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

(3) A concrete tank manufacturer enrolled in a third-party quality assurance and quality control program as described in Subparagraph (a)(2) of this Rule is not subject to 10 percent testing of all tanks installed.

(b) Tanks installed under the following conditions shall be leak tested at the site using leak testing methods described in this Rule:

(1) soil wetness condition is present within five feet of the elevation of the top of a mid-seam pump tank;

(2) advanced pretreatment; or

(3) PE design.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested.

(E) Tank shall be approved if there is no visible flowing leakage and the water level in the tank has not fallen after sitting for one hour.

(2) Vacuum test procedure

(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 2.5 inches of mercury.

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) 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)(17) and (e)(8) of this Subchapter marked over.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0806 is proposed for adoption as follows:

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.

(c) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703 of this Subchapter to prevent differential settling of the pipe and shall be level for two feet after exiting the tank.

(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.

(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

(f) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approval material, and installed in accordance with the tank manufacturer's instructions and industry standards. When rock or other protruding obstacles are encountered, the bottom of the tank excavation shall be backfilled with sand, gravel, stone, or other approved equivalent material to three inches above rock or obstacle.

(g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section.

History note: Authority G.S. 130A-335(e), (f), (f1);

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 is proposed for adoption as follows:

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 site shall meet the following criteria:

(1) 12 inches of naturally occurring soil is on the downslope side of the trench between the infiltrative surface and any limiting condition; and

(2) 18 inches of separation between the infiltrative surface and any soil wetness condition in Group I soils.

(b) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be used;

(2) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 30 inches of the ground surface (36 inches for Group I soils) or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(3) LTARs determined from Table XVII shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface;

(4) for shallow systems, the LTAR shall be based on the most limiting, naturally occurring soil horizon or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(5) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type; and

(6) the LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III of Rule .0402(a) of this Subchapter.

(c) 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 determined by dividing the design daily flow by the LTAR.

(2) The minimum trench length shall be determined by dividing the required infiltrative surface area by the trench width. The authorized agent may approve trench widths between two and three feet. The following equation shall be used to calculate the minimum line length required:

TL = (DDF ÷ LTAR) ÷ ETW

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

ETW = equivalent trench width (feet)

(3) The area occupied by step-downs and drop boxes shall not be included as part of the minimum required infiltrative surface area.

(4) The total trench length required for trench products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval.

(5) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XVI and XVII.

TABLE XVI. LTAR and mass loading rate for wastewater systems based on Soil Group and texture class

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.8 – 1.2	0.00151 – 0.00227
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.6 – 0.8	0.00113 – 0.00151
		Loam		
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6	0.00057 – 0.00113
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		

IV	Clays	Sandy Clay	0.1 – 0.4	0.00019 – 0.00076
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XVII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	**Saprolite Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate ($lbs/day/ft^2$)***
I	Sands	Sand	0.6 – 0.8	0.0012 – 0.0015
		Loamy Sand	0.5 – 0.7	0.00095 – 0.0013
II	Loams	Sandy Loam	0.4 – 0.6	0.00076 – 0.0012
		Loam	0.2 – 0.4	0.00038 – 0.00076
		Silt Loam	0.1 – 0.2	0.00019 – 0.00038
III	Sandy Clay Loam**		0.05 – 0.15	0.000095 – 0.00029

*Mass loading rate is based on the combined load of BOD and TSS.

** Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

(d) Wastewater system installation shall be in accordance with the following criteria:

(1) an engineer's level, laser level, or equivalent shall be used for the following:

(A) staking (flagging) or marking on the soil 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) 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 distance to a limiting condition along the entire trench length in accordance with Subparagraph (d)(3) of this Rule;

(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and a soil wetness condition;

(4) the pipe shall be centered laterally in the trench;

(5) final soil cover over the dispersal field shall be to a depth of six inches after settling. The finished grade over the wastewater system shall be sloped to shed surface water. Surface water runoff, including stormwater, shall be diverted away from the wastewater system;

(6) Schedule 40 PVC or other State-approved equivalent pipe may be used as needed to connect sections of trench and overcome site limitations. The bottom area of trench where solid piping is installed shall not be included as part of the minimum area required for infiltrative surfaces;

(7) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meeting the following criteria:

(A) separated by 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;

(8) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate that the distribution devices perform as designed;

(9) serial and sequential distribution may be used when approved by the authorized agent. The effluent in an individual trench shall be constructed to allow full utilization of the upstream trench prior to overflowing to the next downslope trench through either a stepdown or drop box in accordance with Subparagraphs (d)(10) and (d)(11) of this Rule;

(10) step-downs shall be constructed 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 equivalent State-approved pipe. The installer shall demonstrate that the drop boxes perform as designed;

(11) drop boxes shall be separated from the trench by two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is one-inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed;

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(13) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0902 is proposed for adoption as follows:

15A NCAC 18E .0902 CONVENTIONAL WASTEWATER SYSTEMS

(a) A conventional wastewater system consists, at a minimum, of an approved septic tank and a gravity distribution dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Conventional wastewater systems ~~shall~~ may be used on sites that have been classified suitable in accordance with Rules .0509 of this Subchapter. Sites classified suitable as to soil depth may utilize shallow placement of dispersal system

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) Conventional wastewater system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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 in a single trench bottom not to exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent;

(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 not exceed three feet and trench depth shall not exceed 36 inches on the downslope side of the trench, except as approved by an authorized agent but in no case over 48 inches unless otherwise approved utilizing Rules .0906 or .1306(c);

Commented [MAH24]: Maybe too late in the game to suggest but….

(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 six inches below the pipe and two inches over the pipe; and

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregate which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregate installed.

(e) Shallow systems shall not be installed on slopes greater than 30 percent and shall be installed in accordance with Paragraph (d) of this Rule and the following:

(1) soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches, with the dispersal field crowned at one-half percent as measured from the centerline of the dispersal field; and

(2) the type and placement of soil cover shall be approved by the authorized agent. The cover material shall have not more than 10 percent by volume of fibrous organics, building rubble, rocks, or other debris and shall be Soil Groups II or III.

(f) 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 (d) 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 sized at 75 percent of the total area 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 resistant to corrosion;

(5) effluent flow diversion valves placed below finished grade shall be installed in a valve box and be operable from the ground surface;

(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(7) the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter.

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

15A NCAC 18E .0903 is proposed for adoption as follows:

15A NCAC 18E .0903 BED SYSTEMS

(a) This Rule provides for the permitting of bed systems receiving DSE. Bed systems shall be limited to 600 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter. Beds may be permitted on sites that meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) topography or available space limits the design options for the site.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a conventional trench system as calculated in accordance with Rule .0901(c) of this Section.

(d) Bed system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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 a maximum of three-foot centers;

(4) the lateral design criteria shall meet the requirements of Rule .0902(d)(3) and (4) of this Section for gravity and pressure dosed gravity distribution systems;

(5) trench 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) if pressure dispersal is used, the pressure dispersal system shall be designed in accordance with Rules .0907(d) and (e) or .0908(c) and (e) of this Section or in accordance with a PIA approval.

History Note: Authority G.S. 130A-335(e), (f), (f1);

15A NCAC 18E .0904 is proposed for adoption as follows:

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch or 10-inch (inside diameter) corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2. To calculate trench length in accordance with Rule .0901(c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe and an equivalent trench width of two and one-half feet shall be used for 10-inch pipe.

(d) LDP tubing, filter wrap, and fittings shall meet the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated tubing 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 (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated tubing shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the minimum requirements in Table XVIII; and

(6) the large diameter pipe with filter wrap shall be encased in a black polyethylene sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

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 0.5 inches of water

(e) LDP system installations shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be 12 inches wide;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet);

(3) backfill material 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 II or III;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight and 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 domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2 for DSE. An equivalent trench width of six feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) PPBPS installation shall be in accordance with Rule .0901(d) of this Section, the following, and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on center;

(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;

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet; and

(5) trenches shall be constructed level in all direction with a plus or minus one-half inch tolerance from side-to-side and maximum fall in a single trench bottom shall not exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent.

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 may be used on sites originally classified unsuitable due to soil wetness, soil

morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches are limited to 1,500 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site shall meet the following criteria:

(1) texture of the receiving permeable horizon is sand, loamy sand, sandy loam, loam, or silt loam;

(2) structure of the receiving permeable horizon is classified suitable;

(3) 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 1/3 of the required thickness of the receiving permeable horizon;

(5) the naturally occurring receiving permeable horizon shall be less than 60 inches below the natural soil surface;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum separation distances to a soil wetness condition:

(A) 18 inches with 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.

(c) If a groundwater lowering system is required to meet the minimum vertical separation distance in Paragraph (b)(6) of this Rule to a soil wetness condition that is not related to lateral water movement, the following conditions apply to the groundwater lowering system:

(1) shall extend into the receiving permeable horizon;

(2) shall be prepared by a person or persons who are licensed to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, G.S. 89E, or G.S. 89F;

(3) shall have a suitable outlet accessed by the artificial drainage system. The outlet location and elevation must be shown on the artificial drainage system plan with relative water level elevations and dispersal field site elevations labeled; and

(4) all artificial drainage system components are integral to the wastewater system and subject to ownership and easement requirements of Rule .0301(b) and (c) of this Subchapter.

(d) The LTAR shall be determined in accordance with Table XIX for all DSE sand-lined trench systems. The LTAR shall be one of the following:

(1) LTAR set forth in Table XIX based on the texture of the receiving permeable horizon; or

(2) 10 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

(e) There shall be no reduction in trench length comparted to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

TABLE XIX. LTAR for sand lined trench systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	Distribution type	LTAR (gpd/ft$^{2)}$
Sand or Loamy Sand	Gravity Distribution	0.3 – 0.6
	Pressure Dispersal	0.4 – 0.7
Sandy Loam or Loam	Gravity Distribution	0.2 – 0.4
	Pressure Dispersal	0.3 – 0.6
Silt Loam	Gravity Distribution	≤ 0.3*
	Pressure Dispersal	≤ 0.4*

* For Silt Loam soils, LTAR shall be field verified and no greater than 10 percent of in-situ Ksats.

(f) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(g) Sand lined trench dispersal field installation shall be in accordance with Rule .0901(d) of this Section and 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 have a center-to-center spacing three times the trench width, but no less than five feet on centers;

(3) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters: two runs within a trench between one and one half and two feet wide; and 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 six inches of sand lined trench media;

(4) the sand lined trenches shall be constructed to extend into the naturally occurring receiving permeable horizon;

(5) the infiltrative surface shall be no deeper than 24 inches below finished grade. The top of the media for a media filled trench shall be at or below the naturally occurring soil surface. Drip tubing shall be installed six inches below the natural grade;

(6) sand used to line the trench shall be sand in texture. If required by the LHD in the CA, the installer shall provide written laboratory verification of the media textural classification and quality prior

to the sand lined trench being installed. When laboratory analysis is required, the material shall be determined to be clean, uncoated fine, medium, or coarse sand with 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.002 millimeters;

(7) pressure dosed gravity distribution shall be used when the total dispersal field line length exceeds 600 linear feet in a single system;

(8) pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system;

(9) if pressure dispersal is used, the pressure dispersal network shall be designed in accordance with Rules .0907(e) or .0908(e) of this Section, except that the trenches shall have a maximum width of three feet;

(10) no depressions are allowed over the dispersal field area, including no linear depressions over the trenches;

(11) finished grade shall provide for positive surface drainage away from all system components, with the dispersal field crowned at 1/2 percent as measured from the centerline of the dispersal field. The finished grade requirements shall be made a condition of the CA; and

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(h) Other sand lined trench systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) 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 a three to six-foot pressure head to distribute effluent across the entire dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section, except for the following:

(1) LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 24 inches of the naturally occurring soil surface or to a depth of 12 inches below infiltrative surface, whichever is deeper; and

(2) Tables XX and XXI shall be used to determine the LTAR for LPP systems.

TABLE XX. LTAR for LPP systems based on Soil Group and texture

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.4 – 0.6	0.00076 – 0.0012
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.3 – 0.4	0.00057 – 0.00076
		Loam		
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3	0.00029 – 0.00057
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.05 – 0.2	0.000095 – 0.00038
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XXI. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.3 – 0.4	0.0006 – 0.00075
		Loamy Sand	0.25 – 0.35	0.0000475 – 0.00065
II	Loams	Sandy Loam	0.2 – 0.3	0.00038 – 0.0006
		Loam	0.1 – 0.2	0.00019 – 0.0003
		Silt Loam	0.005 – 0.1	0.000095 – 0.00019

*Mass loading rate is based on the combined load of BOD and TSS.

(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 determined by dividing the design daily flow by the LTAR; and

(2) the minimum trench length shall be determined 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 (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

(3) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XX and XXI.

(e) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the LPP distribution network shall be constructed of small diameter pressure rated Schedule 40 PVC laterals placed in gravel or other approved media filled trenches;

(2) the trench width shall be one to two feet;

(3) trenches shall be located no less than three times the trench width on centers, with a minimum spacing of five feet on centers;

(4) trenches shall include eight inches of approved gravel or other approved media, with no less than six inches vertical separation distance from the discharge piping to 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 discharge rate between the first and last orifice along the lateral;

(B) minimum orifice size shall be 5/32-inch for 2/3 of the field lateral lines, with no orifices sized smaller than 1/8-inch in any lateral line; and

(C) 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 four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

(B) specially designed and approved orifice shields; or

(C) State-approved equivalent tubing or pipe;

(7) the following additional design provisions are required for sloping sites:

(A) separately valved manifolds are 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 bottom lines 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 (pipe full) flow rate into the upper lines, relative to the lower lines, depending on the amount of elevation difference; 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, such as with State-approved automatically alternating valves, without

requiring simultaneous adjustment of multiple throttling valves, or as otherwise approved by the State;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and protected with valve boxes, or approved equivalent protective access devices. Turn-ups shall terminate at or above the ground surface and be installed in a valve box or equivalent for protection and accessibility;

(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 15 percent variation in discharge rate between the first and last laterals when feeding the manifold from the downhill side;

(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;

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees or threaded fittings (Schedule 80 PVC only); and

(C) cleanouts shall be installed at the ends of the supply manifold and shall be enclosed in valve boxes for protection and accessibility from the ground surface;

(12) gate valves or other State approved valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length or the dispersal field is not visible from the pump tank;

(13) valves shall be installed in a valve box or other approved access device and be readily accessible from the ground surface;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the flow rate shall be based upon delivering three feet to six feet of static pressure head at the distal end of all lateral lines;

(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;

(15) the dispersal field shall be covered to a depth four inches after settling; and

(16) 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) 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 DES. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Drip dispersal systems shall meet the following soil and site criteria:

(1) Eighteen inches of naturally occurring suitable soil above a limiting condition, 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any unsuitable limiting condition shall be 12 inches.

(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 soil wetness exists within the first 12 inches below the naturally occurring soil surface. A groundwater lowering system may be used to meet the vertical separation distance to a soil wetness condition only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface; and

(C) minimum vertical separation distance to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any soil wetness condition.

(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 distance to any limiting condition shall be 24 inches.

(c) Tables XXII and XXIII shall be used to determine the LTAR for all DSE drip dispersal systems:

(1) Table XXII 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 XXIII 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 tubing without emitters (blank tubing) shall not count towards the minimum dripline length required; and

(5) the design daily flow shall be divided by the LTAR, determined from Table XXII or XXIII, 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 (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

TABLE XXII. LTAR for DSE drip dispersal systems based on Soil Group

Soil Group	USDA Soil Textural Class		LTAR (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 XXIII. LTAR for DSE drip dispersal systems based on Saprolite Group

Saprolite Group	Saprolite Textural Class	LTAR (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

(d) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) depth from the naturally occurring soil surface to any unsuitable soil condition 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;

(2) depth from the naturally occurring soil surface to any soil wetness condition 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;

(3) 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;

(4) depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches and Group IV soils are encountered within 18 inches of the naturally occurring soil surface;

(5) driplines are installed in new fill material and Group IV materials are encountered within 18 inches of the naturally occurring soil surface;

(6) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition and the LHD or State requires such an evaluation to determine its projected effectiveness;

(7) verify a proposed LTAR that exceeds the LTAR assigned by the LHD;

(8) the design daily flow exceeds 1,500 gpd; and

(9) the LHD or State determines that the combination of soils conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances creates the potential for hydraulic overloading of the proposed site.

(e) 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 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 may be allowed within any contiguous section of dripline containing drip emitters;

(4) six inches of cover over the dripline shall be maintained;

(5) the requirement for 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;

(6) minimum required soil cover shall be uniform over the entire drip dispersal field;

(7) drip dispersal fields shall be graded to shed surface water;

(8) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by an appropriately licensed individual; and

(9) the drip dispersal field 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) A fill system (including new and existing fill) is 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 slopes in all directions. The fill pad shall be constructed when the wastewater system is installed.

(b) New fill systems may be installed on sites that meet the following requirements:

(1) the first 18 inches below the naturally occurring soil surface consist of suitable soil;

(2) no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;

(3) systems shall be installed only on sites with uniform slopes less than four percent. 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 slopes in all directions.

(c) New fill system design and installation shall be in accordance with the following criteria:

(1) trenches shall be installed with 24 inches separating the infiltrative surface and any limiting condition. If pressure dispersal is used, the minimum separation distance shall be 18 inches;

(2) trenches shall be installed with 18 inches separating the infiltrative surface and any soil wetness condition. This separation requirement may be met with the use of a groundwater lowering system only in Soil Groups I and II with suitable structure. If pressure dispersal is used, the minimum separation distance shall be 12 inches;

(3) fill systems with a design daily flow greater than 480 gpd shall use pressure dispersal systems;

(4) fill material soil texture shall be classified sand or loamy sand (Soil 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) for the establishment of a vegetative cover;

(5) minimum cover shall be six inches of settled soil;

(6) additional fill may be added to facilitate drainage and accommodate landscaping requirements at the site provided the infiltrative surface is less than 30 inches below the finished grade;

(7) 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 or organic litter (O horizon) shall be removed before the additional fill material is incorporated;

(8) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;

(9) 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;

(10) the outside edge of the trench shall be located five feet horizontally from the top of the side slope;

(11) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;

(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 shall 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; and

(13) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(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 (if not readily available to the LHD) indicating that the fill material was placed on the site prior to July 1, 1977;

(2) the fill material shall have sand or loamy sand (Group I) soil texture for a 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. The fill shall not have discreet layers containing greater than 35 percent of shell fragments;

(4) if 24 inches of Group I fill material is present, additional fill with soil texture classified Group I may be added to meet the separation requirements of Subparagraph (e)(5) of this Rule;

(5) soil wetness condition, as determined by Rule .0504 of this Subchapter, 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 factors 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 design daily flow shall not exceed 480 gpd;

(2) pressure dispersal shall be used. LPP systems shall meet the requirements of Rule .0907(c), (d), and (e) of this Section. Drip dispersal systems shall meet the requirements of Rule .0908 (c) and (e) 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 distance to any limiting condition 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 shall be determined in accordance with Rule .0901(c) of this Section and the following:

(1) the LTAR shall be based on the hydraulic conductivity of 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 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 distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) Other fill systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) 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 which were originally classified unsuitable due to a soil wetness condition. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Artificial drainage systems may be used on the following sites:

(1) Group I or II soils with suitable structure and clay mineralogy; and

(2) the artificial drainage system shall be designed to maintain the required minimum vertical separation distance to a soil wetness condition as specified in Rule .0901(d)(3) of this Section.

(c) Artificial drainage systems shall be designed in accordance with the following, as applicable.

(1) 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 artificial drainage system design;

(B) artificial drainage system 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 artificial drainage 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) artificial drainage equation input parameters shall be based upon field determinations 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 North Carolina State Climate Office station. A source of these data is the WETS tables published on the Natural Resource Conservation Service Website: www.wcc.nrcs.usda.gov/climate/wedlands.html. This monthly value shall be divided by 14 to give the drainage coefficient (inches per day). For systems designed for over 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 artificial drainage system effectiveness at sites with the following conditions: three of more effective soil layers; Group III or IV soils within 36 inches of the naturally occurring soil surface; or sites requiring a pump drainage system; and

(F) the modeling procedure set forth in Rule .0504(g) of this Subchapter shall be followed.

(2) Artificial drainage 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 required in this Rule, the requirements in Section .1100 of this Subchapter are applicable 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 2.5 times the projected peak inflow rate to the station.

(3) Plans and specifications for artificial drainage systems shall include the following information in addition to the information in Subparagraphs (c)(2) and (c)(3) of this Rule:

(A) location of existing and proposed artificial 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 envelop and filter fabric detail, cover, and cleanout detail;

(C) all relevant elevations with reference to an established benchmark;

(D) specifications for all artificial drainage system materials and installation procedures;

(E) the entire artificial drainage system 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 artificial drainage systems serving two or more lots shall have adequate width, in no case less than 20 feet plus the width of the artificial drainage system.

(d) Interceptor drains shall be used on sites where soil wetness conditions are based on lateral water movement that can be intercepted and diverted to prevent saturation of 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) An approved privy shall consist of a pit, floor slab, and seat assembly housed in a building which affords privacy and reasonable protection from the weather and shall meet the following criteria:

(1) the pit shall consist of an excavation with a bottom surface area of 3.5 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 saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizons, or soil wetness condition;

(4) the pit bottom shall not be in a depression;

(5) the pit shall be curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In clay soils, partial curbing may be acceptable if sufficient stability can be provided;

(6) the privy floor slab shall be constructed of reinforced concrete;

(7) where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction shall be acceptable. The floor slab shall be constructed of the following:

(A) rot resistant joists covered with tight tongue-and-groove rot resistant flooring;

(B) other approved flooring materials to provide strength, durability and prevent entrance of flies and mosquitoes to the privy pit; and

(C) where wood construction is used, floors shall be anchored to the sills. The minimum sill size is four-inch by four-inch;

(8) the pit shall be vented through approved screened PVC Schedule 40 pipe or approved equal, 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) not have any bends in the pipe; and

(D) shall be black colored pipe; and

(9) 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) the privy building shall afford a reasonable degree of protection from bad weather conditions;

(2) 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 completely covered with soil; and

(3) 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 immediately adjacent shall be kept clean;

(2) a hinged seat cover shall be provided and kept closed when the privy is not in use;

(3) privy shall have a hinged door that can be locked when not in use;

(4) flies shall always be excluded from the pit;

(5) garbage and trash shall be kept out of the pit; and

(6) privy building shall not be used as a storage building.

(d) When a new pit is required, an IP, CA, and OP shall be obtained.

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

SECTION .1000 – NON-GROUND ABSORPTION SYSTEMS

15A NCAC 18E .1001 is proposed for adoption as follows:

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code.

(b) When an alternative toilet is used, the rest of the wastewater generated by any other plumbing fixture in the facility shall be discharged to a wastewater system that is approved under this Subchapter.

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

15A NCAC 18E .1002 is proposed for adoption as follows:

15A NCAC 18E .1002 WASTEWATER RECYCLE/REUSE

(a) Wastewater recycling systems that produce treated wastewater may be used for toilet flushing as long as the wastewater recycling system meets:

(1) the North Carolina Plumbing Code requirements; and

(2) 15A NCAC 02U as adopted by the Environmental Management Commission.

(b) Recycled wastewater shall be not used for body contact or human consumption.

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

SECTION .1100 – DOSING SYSTEMS AND CONTROLS

15A NCAC 18E .1101 is proposed for adoption as follows:

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used for discharging effluent into laterals when:

(1) total lateral length exceeds 750 linear feet in a single system; or

(2) discharging to a pressure dosed gravity distribution or pressure dispersal system.

(b) Alternating siphons or pumps shall be used and discharge to separate dispersal fields for the following:

(1) design daily flow from a single system exceeds 3,000 gpd, or

(2) total length of trench exceeds 2,000 linear feet in a single system.

(c) If alternating pumps are not required in accordance with Paragraph (b) of this Rule, the pumps may discharge to a single dispersal field.

(d) The dose volume from pressure dosed gravity distribution systems shall be designed to fill the installed linear footage of the laterals between 66 and 75 percent at each dosing event. The lateral capacity for trench products with a PIA approval is equivalent to the capacity of a four-inch corrugated pipe. Dose volumes for LPP systems shall be calculated in accordance with Rule .0907(e)(14)(B) of this Subchapter. Dose volumes for drip dispersal systems shall be calculated in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from dosing systems shall be designed to optimize the distribution of the effluent throughout the dispersal field.

History Note: *Authority G.S. 130A-335(e), (f), (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 ½-inch solids or be a screened, high head pump designed for effluent;

(2) designed to meet the discharge rate and total dynamic head of the effluent distribution system;

(3) removable without requiring entrance into the tank; and

(4) listed by Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency, unless a PE specifies the proposed pump model.

(b) Air locking of the pump and siphoning from the pump tank when pumping downhill shall be prevented using a vent or anti-siphon holes (3/16-inch minimum).

(c) A pressure-rated threaded union, flange, camlock, or similar disconnect device shall be provided in each pump discharge line.

(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line back into the pump tank. These back-flow prevention devices shall be located on the pump side of the disconnect device.

(e) A shut-off 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. Shut-off 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), (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 requiring use of a pump. The panel enclosure shall be NEMA 4X or equivalent. Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency shall list the panel. The panel shall include for each pump:

(1) an independent overload protection (if not integral with the pump motor);

(2) a circuit breaker(s);

(3) a motor contactor or solid-state relay which breaks all current to the pump;

(4) a latching hand-off automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be manually deactivated;

(5) a pump run light;

(6) an elapsed time meter; and

(7) an event counter.

(b) An automatic pump sequencer shall be provided in systems requiring multiple pumps and shall remain operable whenever any pump or pump circuit 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 any other form of telemetry that allows the Management Entity to properly monitor system performance and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel shall be mounted 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible.

(e) A NEMA 4X outside junction box shall be installed above grade on or adjacent to the pump tank access riser when the control panel is more than 10 feet from the access riser.

(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 grips, duct seal, or other suitable material or methods shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.

(g) Dual and multiple fields shall be independently dosed by separate pumps which 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 State may approve other equivalent methods of dosing dual or multiple fields.

(h) Floats or similar State approved devices designed for detecting liquid levels in DSE shall be provided to control pump cycles:

(1) 18 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 sealed 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, as needed, to provide 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 device shall be visible and located on the outside of the panel enclosure;

(3) provide for manual testing, and shall enable the audible alarm to be silenced by the system user. The alarm shall automatically reset after testing and when an alarm condition has cleared;

(4) remain operable whenever the pump or pump circuit is inoperable;

(5) have an enclosure that is watertight, corrosion resistant, and rated NEMA 4X or equivalent; and

(6) be mounted outside the facility and always accessible.

(j) All pump systems shall have their performance demonstrated using clean water prior to issuance of an OP. The test shall include a demonstration and documentation of the following:

(1) pump delivery rate;

(2) float control levels;

(3) operating pressure head, when applicable; and

(4) structural integrity of the piping network.

(k) For systems designed by a PE, the PE may propose other panel construction and location criteria that meet these 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), (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 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 or otherwise designed to 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; and

(3) siphon tanks shall have a functioning high-water alarm that is audible and visible by system users and weatherproof if installed outdoors in a NEMA 4X enclosure or equivalent. 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), (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) advanced pretreatment or dispersal systems, if required by the manufacturer; or

(2) when a dosing system is required in accordance with Rule .1101 of this Section and in conjunction with an adjusted design daily flow granted in accordance with Rule .0403 of this Subchapter.

(b) Flow equalization systems designed under a PIA approval issued in accordance with Section .1700 of this Subchapter and G.S. 130A-343(i) shall incorporate timed dosing to control the maximum amount of effluent that shall be delivered to the advanced pretreatment or dispersal field in a specific period.

(c) The timed dosing system shall be integrated with the pump tank control sensors to assure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section shall be present prior to the start of any scheduled dose event.

History Note: *Authority G.S. 130A-335(e), (f), (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 among individual laterals with two feet of residual pressure head;

(2) a pressure regulating valve incorporated 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) observation ports located inside or outside of the pressure manifold box to verify flow to individual laterals; and

(6) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A dissipator box may be used to dissipate flow in a pressure dosed system designed for pressure dosed gravity dispersal of effluent in a serial or sequential manner. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, of adequate capacity, and approved by the authorized agent.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

15A NCAC 18E .1201 is proposed for adoption as follows:

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a design daily flow up to 3,000 gpd shall meet the following conditions:

(1) RWTS or PIA approval in accordance with Sections .1500 or .1700 of this Subchapter;

(2) design that meets one of the effluent quality standards specified on the OP and defined in Table XXIV prior to dispersal of the effluent to the soil;

(3) compliance with the siting and sizing requirements of this Section; and

(4) compliance with Rules .1302(d) and .1709 of this Subchapter.

TABLE XXIV. Effluent quality standards for advanced pretreatment systems

Constituent	**Effluent Quality 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 high strength effluent and approved by the State on a product or project-specific basis.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1202 is proposed for adoption as follows:

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) The initial site evaluation shall be conducted and depth to limiting conditions determined in accordance with Section .0500 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) Only one of the following modifications to system siting and sizing criteria may be approved, unless otherwise identified in this Rule:

(1) reduction in depth to limiting condition and vertical separation distance;

(2) setback reduction; or

(3) LTAR increase.

(c) The minimum required vertical separation distance to a limiting condition may be reduced with the use of advanced pretreatment in accordance with Table XXV. Table XXVI provides the minimum depths and vertical separation distances 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 distance to a limiting condition is proposed in accordance with this Rule.

Table XXV. Minimum vertical separation distance to soil wetness condition (SWC) or limiting condition (LC) based on effluent quality

Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					
Soil Group	**Distribution Method**	**Effluent Quality 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 XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality

Minimum depth (inches)* from naturally occurring soil surface to LC**					
Type of Fill	**Distribution Method**		**Effluent Quality Standard**		
		DSE*	**NSF-40**	**TS-I**	**TS-II**
New Fill (≤1,500 gpd) (slope ≤ 4%)	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 (≤480 gpd)	Gravity	36 of Group I Fill/Soils			
	LPP	24 of Group I Fill/Soils			
	Drip	24 of Group I Fill/Soils			
Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					

Type of Fill	Distribution Method	Effluent Quality Standard			
		DSE*	NSF-40	TS-I	TS-II
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	24 to LC 18 to SWC	18	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 (≤480 gpd)	Gravity	36	36	36	36
	LPP	18	18	12	12
	Drip	18	18	12	12

*For comparison

***Minimum depth after adjustment for slope correction

(d) The LTAR may be modified when the following criteria are met:

(1) for advanced pretreatment systems meeting NSF-40 effluent quality standards the LTAR may be increased by up to a factor of 1.33 when compared to the rate assigned by the authorized agent for a new system using DSE in soils which are Group I or II with suitable structure;

(2) for advanced pretreatment systems meeting TS-I or TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.0 when compared to the rate assigned by the authorized agent for a new system using DSE when pressure dispersal is utilized;

(3) for advanced pretreatment systems meeting TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.5 when compared to the rate assigned by the authorized agent for a new system using DSE and all the following conditions are met:

(A) 36 inches of Group I soils from the naturally occurring soil surface;

(B) depth to a soil wetness condition below the naturally occurring soil surface is 24 inches;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) pressure dispersal shall be utilized;

(4) a Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when an increased LTAR for TS-I or TS-II systems is proposed in accordance with Subparagraphs (d)(2) or (d)(3) of this Rule on sites that also meet one of the following conditions:

(A) Group III or IV soils occur within three feet of the infiltrative surface; or

(B) site requires artificial drainage of Group II or III soils;

(5) the LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section;

(6) for trench dispersal products subject to a specific dispersal field area reduction when receiving DSE in accordance with the rules or a PIA approval, the dispersal field area or trench length, as applicable,

shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule; and

(7) design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

(e) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter, as applicable, shall be met, except as shown in Table XXVII of this Rule; and

(2) when any other siting or sizing modifications are applied (reduced depth to limiting condition, vertical separation distance or increased LTAR) for a TS-I or TS-II system in accordance with Paragraphs (c) and (d) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII.

Table XXVII: Setbacks for wastewater systems meeting NSF-40, TS-1 or TS-II effluent quality standards

Feature (structure, water source, etc.)	**Setback (feet) according to Effluent Quality Standard**			
	DSE*	**NSF-40**	**TS-I**	**TS-II**
Surface waters classified WS-I, from mean 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 pool elevation	100	70	70	50
Any other coastal water, canal, marsh, stream, perennial waterbodies, streams, or other surface waters, from mean high-water mark	50	35	35	25
Lake or pond, from flood pool elevation	50	35	35	25
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25	25	20	15
Surface water diversion, as measured on the ground surface from the edge of the diversion	15	15	10	10
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15	15	10	10
Permanent stormwater retention basin or detention basin	50	50	35	25
Any other dispersal field except designated dispersal field repair area for project site	20	20	10	10

*For comparison

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

Commented [MAH25]: Lots of comments

15A NCAC 18E .1203 is proposed for adoption as follows:

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

(a) No reductions in depth to limiting condition, vertical separation distance or setback requirements shall be taken. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) The LTAR may be modified when the following criteria are met:

(1) For advanced pretreatment systems meeting TS-I or TS-II effluent quality standards, the LTAR may be increased by up to a factor of 2.0 compared to that assigned by the authorized agent for a system using DSE.

(2) For advanced pretreatment systems meeting TS-II effluent quality standards, LTAR may be increased by up to a factor of 2.5 compared to that assigned by the authorized agent for a system using DSE when the following conditions are met:

(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a soil wetness condition below the naturally occurring soil surface.

(3) When the LTAR for a system is proposed to be increased in accordance with this Rule, the following conditions shall also be met:

(A) Special Site Evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(B) pressure dispersal shall be utilized;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) 25-foot setback shall be maintained to all property lines unless one of the following criteria are met: 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.

(4) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

(c) For trench dispersal products that are subject to a specific percent dispersal field area reduction when receiving DSE in accordance with this Subchapter or a PIA approval, when any LTAR adjustments are taken in accordance with this Rule, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when compared to a conventional wastewater system.

(d) Design daily flow 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-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1204 is proposed for adoption as follows:

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) Drip dispersal systems may utilize the following siting and sizing criteria when used with advanced pretreatment and a design daily flow less than or equal to 1,500 gpd. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site characteristics shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems

(A) 18 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be 12 inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 18 inches of naturally occurring suitable soil above a limiting condition and 12 inches of naturally occurring suitable soil above a soil wetness condition; and the minimum vertical separation distance shall be 12 inches to a soil wetness condition and 18 inches for any other limiting condition; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 18 inches;

(2) TS-I Systems

(A) 15 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be nine inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 12 inches of naturally occurring suitable soil above a limiting condition; nine inches vertical separation distance to a soil wetness condition, and 12 inches vertical separation distance to any other limiting conditions; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 12 inches; and

(3) TS-II Systems

(A) 13 inches of naturally occurring suitable soil above a limiting condition and the minimum vertical separation distance to any limiting condition shall be six inches;

(B) for new fill, the requirements of Subparagraph (2)(B) of this Paragraph shall be met; or

(C) for existing fill, the requirements of Subparagraph (2)(C) of this Paragraph shall be met.

(c) Site modifications shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems may utilize a groundwater lowering system to meet the vertical separation distance

requirements to a soil wetness condition 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 distance to the projected (drained) soil wetness condition shall be 12 inches. The addition of fill material shall not be used to meet this requirement; and

(2) TS-I and TS-II Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition. The minimum vertical separation distance to the projected (drained) soil wetness condition shall be 12 inches. The groundwater lowering system may be used with the following:

(A) 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

(B) on new fill sites.

(d) Table XXVIII 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 (d)(5), (d)(6), and (d)(7) of this Rule.

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

Soil Group	**USDA Soil Textural Class**		**LTAR (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 – 0.15	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(1) The LTAR shall be based on the hydraulic conductivity of 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 greater.

(2) The design daily flow shall be divided by the LTAR, determined from Table XXVIII or XXIX, 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 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 (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

(3) The minimum dripline length calculated in Subparagraph (d)(2) 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. This shall not change the minimum area required for the system calculated in Subparagraph (d)(2) of this Rule. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA approval.

(4) Sections of tubing without emitters (blank tubing) required to meet 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.

(5) LTAR adjustment limitations for NSF-40 Systems

(A) 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

(B) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(6) LTAR adjustment limitations for TS-I Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(7) LTAR adjustment limitations for TS-II Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(8) Table XXIX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the hydraulic conductivity of the most

limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

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

Saprolite Group	Saprolite Textural Class	LTAR (area basis) (gpd/ft²)	
		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

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter shall be required to permit advanced pretreatment drip dispersal systems for the following:

(1) NSF-40 Systems

(A) 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 0.1 gpd/ft²; or

(B) LTAR is proposed to exceed 0.8 gpd/ft² for Group I soils, 0.5 gpd/ft² for Group II soils, 0.25 gpd/ft² for Group III soils, or 0.2 gpd/ft² for Group IV soils.

(2) TS-I Systems

(A) site has less than 18 inches of naturally occurring soil to any unsuitable limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(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 0.12 gpd/ft²;

(D) LTAR is proposed to exceed 1.0 gpd/ft² for Group I soils, 0.6 gpd/ft² for Group II soils, 0.3 gpd/ft² for Group III soils, or 0.12 gpd/ft² for Group IV soils; or

(E) system is proposed to be installed in new fill, Group IV soils are encountered within 18 inches of the naturally occurring soil surface, and the LTAR is proposed to exceed 0.05 gpd/ft².

(3) TS-II Systems

(A) site meets the requirements of Subparagraphs (2)(A), (B), or (E) of this Paragraph;

(B) 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 0.15 gpd/ft²; or

(C) 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.

(f) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the required minimum depth to a limiting condition or vertical separation distance reduction is proposed compared to the requirements for DSE in Rule .1202(c) of this Section. Eighteen inches of naturally occurring soil to an unsuitable limiting condition shall be required to take setback reductions. The following LTAR limitations shall be applicable:

(1) 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;

(2) 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

(3) for NSF-40, TS-I, and TS-II Systems, Table XXVIII may be used to determine the LTAR when only setback reductions to artificial drainage systems are taken.

(g) Drip dispersal installation shall be in accordance with Rule .0908(e) of this Subchapter.

(h) Drip dispersal systems with a design daily flow 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 limiting condition, vertical separation distance, or setback reductions 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 nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 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 receiving TS-I or TS-II effluent quality may be proposed in accordance with the requirements of this Rule. Except as otherwise required in this Rule, the requirements of Rule .0906 of this Section shall apply.

(b) The site meets the criteria in Rule .0906(b) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If artificial drainage is proposed to meet the required minimum vertical separation distance to a soil wetness condition that is not related to lateral water movement, the following conditions shall apply:

(1) site shall comply with the requirements of Rule .0906(c) of this Subchapter; and

(2) vertical separation distance requirement to a soil wetness condition may be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXX shall be used to determine the LTAR for a sand-lined trench system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soils overlying the permeable receiving layer. The LTAR shall be one of the following:

(1) the rate set forth in Table XXX; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon or the rate set forth in Table XXX, whichever is less.

TABLE XXX. LTAR for advanced pretreatment sand lined systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**LTAR (gpd/ft^2)***
Sand or Loamy Sand	0.6 – 1.0
Sandy Loam or Loam	0.4 – 0.8
Silt Loam	No greater than 20% of in-situ Ksats or ≤ 0.5, whichever is less

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam, and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(f) Setback reductions in accordance with Table XXVII of Rule .1202(e) of this Section may be applied with sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(g) of this Subchapter and pressure dosed gravity distribution or pressure dispersal shall be required.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1206 is proposed for adoption as follows:

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Bed systems receiving NSF-40 effluent quality, or better, on sites with a design daily flow not to exceed 600 gpd may be approved when the following requirements have been met:

(1) the soil and site shall meet the following criteria:

(A) the vertical separation distance requirements of Rule .0901(d)(3) of this Subchapter are met;

(B) soil texture is Group I, II or III; and

(C) sites limited by topography, available space, or other site constraints;

(2) Table XVI in Rule .0901(c) of this Subchapter is used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the LTAR may be increased by a factor of 1.125 with no further reduction in bed size allowed;

(3) setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used; and

(4) bed system installation shall be in accordance with Rule .0903(d) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow less than or equal to 1,500 gpd may be approved when the following requirements have been met:

(1) The soil and site meet the following criteria:

(A) 30 inches of Group I or II soils below the naturally occurring soil surface and no soil wetness condition 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 soil wetness condition exists within the first 12 inches below the naturally occurring soil surface;

(C) the requirement for 30 inches of Group I or II soils or 36 inches of Soil Group I 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;

(D) 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

(E) 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground 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 design daily flow 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 may be reduced by up to 25 percent when the system is designed to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality; Group I Soil is present in the first 36 inches of naturally occurring soil; no soil wetness condition exists within the first 30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom; the bed or beds shall not be located directly beneath the advanced pretreatment components, and pressure dispersal is used; effluent shall be distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there shall be 100 percent dispersal field repair area.

(3) A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter shall be required when the vertical separation distance to a limiting condition is reduced and on sites with slopes greater than two percent.

(4) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be proposed in accordance with the following:

(A) the setbacks shall be measured from the nearest edge of the gravel bed;

(B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the gravel bed sidewall, or from the projected toe of the slope that is required to meet 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 XXVII of Rule .1202(e) of this Section are allowed. No other setback reductions are allowed.

(5) Bed system installation shall be in accordance with Rule .0903(d) of this Subchapter and the following:

(A) pressure dispersal shall be used whenever effluent is distributed to a bed not located directly 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 meet the vertical separation distance requirements from the bed bottom to an unsuitable limiting condition, when all of the following conditions are met: a groundwater lowering system shall not be used to meet the vertical separation distance requirements; new fill material shall be sand or loamy sand, containing not more than 10

percent by volume fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments by volume; and the requirements of Rule.0909(c)(9) of this Subchapter, for the projected side slope of the fill shall be met, as determined beginning at a point six inches above the top edge of the gravel bed.

(d) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow greater than 1,500 gpd and less than or equal to 3,000 gpd may be permitted on the following sites:

(1) The soil and site shall meet the following criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no soil wetness condition exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation distance of 24 inches to any soil wetness condition shall be 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground 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 determined by dividing the design daily flow by the LTAR;

(B) the minimum bed size may be reduced by up to 25 percent when the system is designed and approved to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation distance to a soil wetness condition shall be maintained after accounting for projected groundwater mounding; and there shall be 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 XXVII of Rule .1202(e) 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 concentration at the property line will not exceed 10 milligrams per liter (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(d) of this Subchapter and the following criteria:

(A) two or more equally sized beds shall be used and the beds shall not be located directly beneath the advanced pretreatment components; and

(B) effluent shall be distributed to the beds by a pressure dispersal system. A timer control 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 soil wetness condition exists within 18 inches of the existing fill surface;

(2) 18 inches of vertical separation distance exists to the soil wetness condition;

(3) the design daily flow shall 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 issued in accordance with Section .1700 of this Subchapter allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, to be uniformly laid out over the bed area.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1207 is proposed for adoption as follows:

15A NCAC 18E .1207 SITE AND SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

Compliance with the effluent quality standards of Rule .1201 of this Section shall be determined as follows:

(1) an individual advanced pretreatment system at a single site shall be in compliance when all the criteria of Rule .1302(d) of this Subchapter have been met; and

(2) an approved system shall be considered in compliance when all the criteria of Rule .1710 of this Subchapter have been met.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 is proposed for adoption as follows:

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems and non-ground absorption systems shall be operated and maintained in accordance with the conditions of the OP, PIA approval, and 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 XXXI shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXI shall also be required for all Type V and VI systems existing or installed on or before July 1, 1992.

(c) Wastewater systems with multiple components shall be classified by their highest or most complex system classification type in accordance with Table XXXI to determine LHD and Management Entity responsibilities.

(d) The State shall classify wastewater systems not identified in Table XXXI after consultation with the appropriate commission governing operators of pollution control facilities.

(e) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.

(f) The system shall be maintained to meet the effluent quality standards as specified in Table XXIV of Rule .1201(a) 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 applicant may submit a written request to the LHD and State to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency.

(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, this activity shall be reported to the owner and LHD within 30 days.

(i) All residuals shall be removed as specified in the OP, the RWTS or PIA approval, 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 et seq.

TABLE XXXI. 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 (single family or 480 gpd or less)	N/A	Owner	N/A
IIb – Conventional system with less than 750 linear feet of trench	N/A	Owner	N/A
IIc – Conventional system with shallow placement	N/A	Owner	N/A
IId – 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	Owner	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 – Sand lined trench gravity distribution no artificial drainage	NA	Owner	NA
IIIi – Gravity groundwater lowering system	5 years	Owner	5 years
IVa – LPP distribution	3 years	Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Certified Operator	2/year
IVc –Off-site system	5 years	Certified Operator	1/year
IVg –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Certified operator	1/year
Va – Fixed media advanced pretreatment	1 year	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

Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	1 year	Certified Operator	3,000 – 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS	1 year	Certified Operator	4/year
Vd – Other mechanical, biological, or chemical treatment plants < 3,000 gpd	1 year	Certified Operator	monthly
Ve – Drip dispersal systems	1 year	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
Vf – IPWW designed by a PE and reviewed by the State and determined to be IPWW	1 year	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
Vh - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	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
Vi – Wastewater system with pump groundwater lowering systems	Yearly	Certified operator	2/year with one visit during the wet season
VIa – Any system > 3,000 gpd with mechanical, biological, or chemical treatment plant	6 months	Certified Operator	> 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Wastewater reuse or recycle	6 months	Certified Operator	≤ 3,000 gpd – 12/year > 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week

*Toilet systems serving public facilities or more than 10 users per day shall be required to have a Management Entity other than the Owner as well as annual LHD compliance inspections.

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

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS

(a) This Rule applies to all advanced pretreatment systems approved in accordance with Sections .1500 and .1700 of this Subchapter.

(b) System management in accordance with Table XXXI of Rule .1301 of this Section shall be required for advanced pretreatment systems. The following provisions apply to the operation and maintenance contracts for advanced pretreatment systems:

(1) for systems installed after July 1, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this Section. The contract shall be renewable and the contract term shall be for one year;

(2) for systems installed prior to July 1, 2006, the manufacturer shall provide an optional renewable yearly operation and maintenance contract with the owner that fulfills the requirements for the system in accordance with this Section;

(3) prior to the issuance or re-issuance of an OP for a proprietary advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place. 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; and

(4) the manufacturer shall notify the LHD and the State when the owner chooses to not renew an operation and maintenance contract executed in accordance with this Paragraph.

(c) 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, Rule .1709 of this Subchapter, the RWTS or PIA approval, and conditions of the OP;

(3) the Management Entity shall inspect each system twice a year 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 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) 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 seven-day and 30-day influent wastewater flow from the facility to the system shall be measured by the Management Entity prior to the visual inspection of the system in accordance with Subparagraph (c)(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, Provisional, and Innovative System shall be undertaken as required in accordance with Rule .1709 of the 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 State certified laboratory for analyzing;

(C) complete chain of custody from sample collection to analysis for each sample collected shall be maintained; and

(D) repeat 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 State 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 and substitute out of compliance samples with compliant samples. All samples results collected shall be reported.

(d) An individual advanced pretreatment system at a single site shall be considered compliant with the effluent quality standards of Table XXIV of Rule .1201(a) of this Subchapter when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA approval indicates compliant conditions;

(2) seven-day average daily inflow shall not exceed 1.3 times the design daily flow and the 30-day average daily inflow shall not exceed the design daily flow; and

(3) arithmetic mean (geometric mean for Fecal Coliform) of each constituent across three or more consecutive sampling dates does not exceed the designated effluent quality standard in Table XXIV in Rule .1201(a) of this Subchapter. Non-compliant data may be substituted with a new data set found to meet the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results for purposes of meeting the effluent quality standard.

(4) The mass loading of the system, based on site-specific water use records and effluent sampling results may be used to document system compliance with the performance criteria in Subparagraph (d)(3) of this Rule.

(e) The Management Entity may sample influent sample to the advanced pretreatment system as needed to determine compliance with this Rule.

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 directly 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 it fails to meet one or more of the conditions of Subparagraph (a)(1) of this Rule, either continuously or intermittently, or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to satisfy these conditions. The owner shall contact the LHD when the wastewater system is malfunctioning. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued an NOV;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed to ensure proper operation of the system. The contents shall be pumped whenever the solids level (scum and sludge) is found to be more than 1/3 of the liquid depth in any compartment. The effluent filter shall be cleaned 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 et seq;

(5) grease traps and tanks shall be pumped as needed, but no less than yearly. The owner shall maintain a contract with a certified pumper. All pumping records shall be maintained onsite;

(6) appropriate 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 shall be executed between the system owner and a Management Entity prior to the issuance of an OP for a system required to be maintained by a Management Entity, as specified in Table XXXI of Rule .1301 of the Section, 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 system Management Entity;
(4) provisions that the contract shall be in effect for as long as the system is in use; and
(5) other requirements for the continued performance of the system.

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) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system operated from the appropriate commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.
(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule .1301 of this Section.
(c) The Management Entity shall provide a copy of the inspection report to the owner and LHD 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 for the owner to obtain a CA for the repairs.
(e) The Management Entity shall be responsible for assuring 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 when the owner or the Management Entity chooses not to renew an operation and maintenance contract executed in accordance with this Rule.

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 XXXI in Rule .1301 of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system.
(b) A LHD may be the Management Entity only for systems classified Type IV, Va, and Vb and only when authorized by resolution of the local board of health.

(c) An authorized agent shall review the performance and operation reports submitted in accordance with Rule .1304(c) of this Section.

(d) An authorized agent shall perform an on-site compliance inspection of the systems as required in Table XXXI in Rule .1301 of this Section. More frequent inspections may be performed by an authorized agent if requested by the system owner or the Management Entity, or identified in the PIA approval or OP.

(e) The authorized agent may provide the owner with the option for a private Management Entity (not the owner) to perform the on-site compliance inspection for Type IIIb and IIIh systems in accordance with Table XXXI in Rule .1301 of this Section instead of the LHD. The Management Entity (not the owner) shall provide to the owner and LHD a written compliance inspection report.

(f) The LHD or State may issue a written NOV to the wastewater system owner for systems found not be in compliance with its OP or with this Subchapter.

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) The LHD or State shall issue a written NOV to the wastewater system owner for the following:

(1) malfunctioning wastewater system determined in accordance with Rule .1303(a)(1) and (2) of this Section;

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

(3) wastewater system that is partially or totally destroyed.

(b) The wastewater system shall be repaired within 30 days of notification by the State or LHD unless the NOV specifies a different time frame for the repair.

(c) After investigating the malfunction, the State or LHD shall use its best professional judgement in requiring repairs that will enable the system to function.

(d) When necessary to protect the public health, the State 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.

(e) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system.

(1) Prior to issuing the CA, the LHD shall receive the following information from the owner:

a ~~(1)~~ confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 will be pumping and hauling the sewage from the pump and haul tanks;

Commented [MAH26]: We should discuss this with the AG office. Currently we can only issue NOVs for malfunctions. This addition broadens the potential usage to reflect what is more standard practice. For instance: expired OPs, illegal system installs. But this wording **could** be used for things like too many occupants and we do not want to go down that road (but do we want the option). We need to be sure about the liits we have and/or this expansion.

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b ~~(2)~~ identification of the approved wastewater system that will be accepting the sewage. The wastewater system shall be approved under this Subchapter or approved by the Environmental Management Commission in accordance with 15A NCAC 02H; and

c ~~(3)~~ approval shall be obtained from the facility receiving the sewage ~~in addition to~~including confirmation that the additional sewage will not result in an exceedance of the treatment capacity of the receiving wastewater system.

(~~2~~f) A non-transferrable OP, valid for a period not to exceed five years, shall be issued to the pump and haul system owner.

(~~f~~g) A malfunctioning wastewater system that has been disconnected from the facility for any reason shall be repaired prior to reuse.

(~~g~~h) If a malfunctioning wastewater system is found to be nonrepairable, or is no longer required, the 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.

History Note: Authority G.S. 130A-335(e) and (f); 130A-291.1; 130A-291.2;

15A NCAC 18E .1307 is proposed for adoption as follows:

15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is found to be non-repairable or is no longer required, the system shall have the contents removed, and the components collapsed, backfilled, or otherwise secured as directed by the authorized agent to protect public health and safety.

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

SECTION .1400 – APPROVAL OF TANKS AND APPURTENANCES

15A NCAC 18E .1401 is proposed for adoption as follows:

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be constructed in accordance with the approved plans and shall comply with all rules of this Section.

(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.

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(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and a temporary identification number issued, the tank manufacturer shall conduct the structural loading requirements of Paragraph (f) of this Rule. Once third-party documentation in accordance with Paragraph (f) of this Rule has been submitted to the State, a tank approval letter will be issued to the tank manufacturer with a permanent identification number. Tanks may not be sold without a permanent identification number. The temporary identification number is for tracking purposes only.

(d) Plans and specifications for tanks with a total liquid capacity of 3,500 gallons or less shall show the design in detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) wall and slab thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall 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) liquid depth and operating capacity in gallons;

(4) pipe penetration locations and State approved pipe penetration boot;

(5) methods and material for sealing sections and forming water tight joints in tanks with multiple sections;

(6) detailed drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank; and

(7) tank manufacturer and PE requirements for installation, including bedding and recommend methods for additional sealing, as applicable.

(e) Plans and specifications for tanks with a total liquid capacity greater than 3,500 gallons and all tanks designed for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

(2) after completion of the vacuum test requirement in Subparagraph (f)(1) of this Rule, the tank shall be subject to a water test. The water test shall be conducted in accordance with Rule .0805(c)(1); and

(3) written documentation of the testing shall be provided to the State. The written documentation shall include:

(A) drawing of the tank model tested, showing dimensions and type of reinforcement used;

(B) results of the vacuum and water tests, including if there was any vacuum or water drop, surface cracking, deformation, or cracking of the tank during the test; and

(C) third-party person(s) present who witnessed the testing and their written statement of agreement with the results submitted to the State.

(g) Plans for prefabricated tanks other than those pre-approved under this Section shall be considered for tank approval on an individual basis based on the information provided by the tank manufacturer or designer to the State. The information shall indicate the tank shall perform in the same manner and to the same standard as those designed in accordance with the rules of this Section.

(h) The State 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.

History Note: Authority G.S. 130A-335(e), (f), (f1);

15A NCAC 18E .1402 is proposed for adoption as follows:

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight and not subject to excessive corrosion or decay.

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.

(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate 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 visibly marked at finished grade.

(d) Septic tanks shall meet the following minimum design standards:

(1) minimum liquid depth of 36 inches;

(2) 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) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) length of the tank shall be twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

(6) inlet and outlet openings shall have cast or manufactured penetration points;

(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644;

(8) 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;

(9) no pipe penetration points or openings shall be permitted below the septic tank operating liquid level;

(10) the outlet shall be through an approved effluent filter 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;

(11) invert of the outlet shall be two inches lower in elevation than the invert of the inlet;

(12) other methods of supporting the effluent filter case and for making pipe penetrations shall meet all the requirements of this Rule and shall be reviewed on a case by case basis by the State;

(13) 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 to remain in position when subjected to a liquid capacity in one compartment;

(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 leave a water passage slot four inches high for the full interior width of the tank;

(E) two four-inch openings, or one four-inch opening per 30 linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;

(F) the entire liquid passage shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level;

(G) there shall be no other openings in the partition wall below the water passage slot or openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal 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;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds; and

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks.

(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 six inches above finished grade;

(2) the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening;

(3) larger or multiple access risers shall be provided when two or more pumps are required;

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain two four-inch diameter circular openings, or equivalent, 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 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 more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be approved septic tanks with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, 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;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less;

(4) 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. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when a sanitary tee is used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tee(s) shall be provided for servicing and routine maintenance.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and

(4) tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1403 is proposed for adoption as follows:

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks designed to hold sewage shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls. Tanks and tank lids shall be able to withstand a uniform live loading of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

(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 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;

(A) the reinforcing wire shall be lapped six inches;

(B) concrete cover shall be required for all reinforcement; and

(C) reinforcement shall be placed to maximize the structural integrity of the tank;

(3) 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;

(4) 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 State for review and tank approval;

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Testing shall be performed using a properly calibrated Schmidt Rebound Hammer or approved equal;

(6) 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 State approved equivalent that is waterproof, corrosion-resistant, and approved for use with concrete tanks; and

(7) tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

(c) Unless otherwise required, thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified.

(d) Glass-fiber-reinforced tanks shall meet the following material and construction requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 0.2 inches. The baffle wall shall be 3/16-inch thick; and

(2) material and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks.

(e) Cast in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

History Note: Authority G.S. 130A-335(e), (f), (f1);

15A NCAC 18E .1404 is proposed for adoption as follows:

15A NCAC 18E .1404 PLANS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

(a) Risers and riser lids shall be able to withstand a uniform live loading of 300 pounds per square foot 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.

(b) Riser plans and specifications submitted for review and riser approval shall show the design of the riser in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

(2) physical dimensions of the riser and riser cover, such as wall thickness, internal diameter, proposed casting or installation details and methods, pipe penetrations, and all other dimensions as appropriate;

(3) material type and strength including reinforcement material and location as required;

(4) documentation by a third-party of structural testing to four inches of mercury for five minutes without deformation or failure. Testing shall be done on each diameter of riser and shall be done on the greatest height of a single section that the owner is seeking approval for;

(5) for septic tank risers, a secondary lid, concrete plug, or other State approved safety device to be provided inside the riser for additional security and to prevent accidental entry;

(6) for pump tank risers, State approved primary and secondary safety mechanism shall be provided; and

(7) installation instructions, for both new and retrofit applications, for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and effluent filter approval shall show the design of the effluent filter in detail, including:

(1) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(2) sizing as to capacity and wastewater strength for all models of proposed filters to be approved; and

(3) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and pipe penetration approval shall show the design of the pipe penetration in detail, including:

(1) manufacturer's name, address, phone and fax numbers;

(2) design specifications and materials used in the manufacture of pipe penetration components;

(3) applicable testing results from third-party verification showing pull and flexibility testing;

(4) testing for watertight seal around piping including any component or device included to assure the seal, such as non-corrodible adjustable bands;

(5) documentation that the pipe penetration meets the requirements of ASTM C1644; and

(6) specifications for application, installation, operation, and maintenance.

(e) Plans for risers, effluent filters, and pipe penetrations shall be reviewed and approved by the State and assigned an Identification Number when the design is found to comply with this Section.

(f) Plans for prefabricated risers, effluent filters, and pipe penetrations other than those pre-approved under this Rule shall be considered for approval on an individual basis based on the information provided by the manufacturer or designer to the State. The information shall indicate the riser, effluent filter, or pipe penetration shall perform to the same standard as those designed in accordance with the provisions of this Section.

History Note: Authority G.S. 130A-335(e), (f), (f1); 130A-335.1;

15A NCAC 18E .1405 is proposed for adoption as follows:

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL

(a) All riser, effluent filter, and pipe penetration approvals will expire five years after the date the approval is signed. Approvals shall be re-issued when the provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued compliance with the criteria listed in Rule .1404 of this Section.

(c) The State may re-issue a riser, effluent filter, or pipe penetration approval for a new five-year period when the manufacturer’s re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product compliance.

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 State shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, pipe penetrations, distribution devices or other components, upon a finding that:

(1) approval is determined to be based on false, incomplete, or misleading information or the tank or tank components have been subsequently altered;

(2) experience with the product or component results in altered conclusions about system performance, reliability, or design;

(3) product or component fails to perform in compliance with performance standards established for the product or component; or

(4) product, component, or the applicant fails to comply with G.S. 130A, Article 11, this Subchapter, or conditions of the approval.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1501 is proposed for adoption as follows:

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 design daily flow less than or equal to 1,500 gpd.

(b) RWTS shall only be used with domestic strength wastewater.

(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.

(d) For approval of an RWTS as a Provisional or Innovative 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 State and shall include the following:

(1) manufacturer's name, address, phone number, 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 legible copies of plans and specifications, including information required to evaluate any tanks as required in accordance with Rules .1401 and .1503(3) 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 State.

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 needing to be maintained 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 any system components or maintaining system components requiring repair or maintenance.

(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 State, 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 demonstrate 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, including tracking the last seven days and 30 days, 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 half of the design daily flow 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, an approved prefabricated septic tank, or another tank specially designed for a specific individual system and approved by the State 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 composite sampled annually for all effluent quality standards listed in Table XXIV of Rule .1201(a) of this Subchapter for NSF-40 systems, unless adjusted sampling requirements have been requested and granted in accordance with Rules .1302 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 will expire five years after the date the approval is issued. Approvals shall be re-issued when the requirements of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued certification and listing by a nationally recognized certification body, such as NSF International, as compliant with NSF Standard 40 and authorized by NSF to distribute and service products in North Carolina.

(c) The State shall re-issue a RWTS approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product certification.

(d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

History Note: Authority G.S. 130A-342;

SECTION .1600 – APPROVAL AND USE OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 is proposed for adoption as follows:

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for design daily flows less than or equal to 3,000 gpd shall be configured as a package and approved as a Provisional, Innovative, or Accepted 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 operating data logging.

(c) All components shall be integrated and designed to work together for the operation of the drip dispersal system. 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) installation specifications;

(4) operation and maintenance manuals; and

(5) design plans and specifications for all components.

(d) The system manufacturer shall provide ongoing 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, and this Section.

(f) Drip dispersal systems that are not pre-engineered packages approved in accordance with Section .1600 of this Subchapter shall be designed on a project specific basis by a PE. The drip dispersal system design shall comply with Rules .0908, .1204, Section .1300, and this Section.

(g) Drip dispersal systems for design daily flows 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 State 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 meet one of the following effluent standards: DSE, NSF-40, TS-I, or TS-II as specified in Table III of Rule .0402(a) and Table XXIV of Rule .1201(a) of this Subchapter.

(b) The drip dispersal system pump tank shall meet 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) sufficient capacity to accommodate projected flow and total dynamic head conditions;

(2) delivery of 10 to 60 psi of pressure during dosing events;

(3) minimum pressure as required to backwash or forward flush headworks filter;

(4) manufacturer requirements shall be followed to protect the pump intake from solids materials that may accumulate in the pump tank and for pump cooling during operation;

(5) maintenance of velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(6) maintenance of 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.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, mechanism 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 design daily flow, typically during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a 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 pretreatment unit or to a separate settling tank to allow for primary settling prior to the pump tank;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also monitor 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 0.05 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 on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be uniformly spaced 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 assure 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 may be used where unfavorable site conditions are encountered along a drip run. Blanking tubing shall be differently colored or marked tubing of the same material, specifications and diameter as the connecting dripline, or flexible PVC;

(6) manufacturer shall specify methods for dealing with drainback; 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 to manage the multifunction processes of drip dispersal systems and meet the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at regular intervals throughout the day, at a projected average flow or design daily flow (peak enable float) dose regime. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to meet system design and varying operating conditions;

(3) minimum dose volume per zone shall be set as needed so that 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) at designer and manufacturer-specified frequency and duration;

(5) provide for routine automatic forward flushing of the drip laterals (field flushing) with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) monitor pump cycles and run times;

(7) systems with a design daily flow greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system shall include telemetry in accordance with Rule .1103(c) of this Subchapter;

(8) for systems with a design daily flow 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 include an automatically rechargeable battery back-up power supply or be otherwise designed to be functional during power outages;

(9) in 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 the zones that have been taken out of service and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats in the pump tank shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field or zone.

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 the following items and any other requirements included by the system designer:

(1) all leaks in the pipe network or from emitters exhibiting excessive emission rates, as evidenced by wet spots during dosing cycles comparable to normal operating conditions, shall be repaired; and

(2) dosing and flushing flow rates shall be measured and confirmed to be in accordance with the drip system design parameters as follows:

(A) dosing pressure shall be measured at the lowest point in the supply manifold;

(B) maximum emitter pressure shall be verified to be within emitter design parameters; and

(C) flushing pressures at the ends of each zone supply and return manifold shall be measured and recorded to document system start-up conditions.

(b) All mechanical components, pumps, pump cycling, filters, valves, vents, flushing, high-water alarm, and telemetry systems shall be demonstrated to be operable and in accordance with their design.

History Note: *Authority G.S. 130A-343;*

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

15A NCAC 18E .1701 is proposed for adoption as follows:

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. This includes systems for which any of the following are proposed:

(1) minimum setbacks reductions;

(2) depth to limiting condition reductions;

(3) vertical separation distance requirements reductions; or

(4) LTAR increases.

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) detailed system design/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, including tracking the last seven days and 30 days of wastewater flow for advanced pretreatment systems; and

(J) start-up requirements and information;

(3) summary of the following information:

(A) pertinent 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: established by a nationally recognized certification body; a listed protocol that has been approved by the Department in accordance with G.S. 130A-343(d); a comparable evaluation protocol used for system approval in other states; or in accordance with an alternative performance evaluation protocol proposed for approval by the manufacturer;

(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 accurately monitors system compliance with effluent quality 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, 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, system classification, frequency of system inspection and monitoring in accordance with Table XXXI of Rule .1301 of this Subchapter, minimum certification/licensing requirements 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 State. Fees received are non-refundable.

(b) Provisional System applications shall include the information listed in Paragraph (a) of this Rule and the following evaluation proposal 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 proposal 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 successful completion of the Provisional System evaluation proposal.

(c) 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).

(d) Accepted Wastewater Dispersal 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).

(e) The Department may initiate review of a nonproprietary PIA system in accordance with G.S. 130A-343(i) without having received an application from a manufacturer. The system may be approved as Provisional or Innovative or the Department may recommend approval to the Commission as an Accepted system. The system shall have been shown to meet all applicable approval criteria of this Section.

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.

(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 Wastewater Dispersal 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 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 may hold technical advisory meetings to discuss PIA applications with stakeholders.

(i) 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 and specify appeal rights. The Department shall assign a unique code to the approved products for tracking purposes.

(j) 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 system shall be approved for use as a Provisional System when all of the following criteria have been met:

(1) For trench and dispersal systems documentation of one of the following:

(A) 50 installations operational and in use for 12 months, with available information indicating comparable hydraulic performance and rate of malfunction to a conventional trench system;

(B) the system's design and functional similarity to another approved system described elsewhere in this Subchapter, or to a Provisional, Innovative or Accepted System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for the following:

(i) material physical properties and chemical durability;

(ii) field installed permeable sidewall area and bottom infiltrative area;

(iii) method and manner of function for conveyance and application of effluent;

(iv) structural integrity; and

(v) 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.

(2) Documentation shall be provided that all trench and dispersal systems have been subject to and complied with AASHTO Standard H-5 and H-10 load testing that demonstrates the structural integrity to be comparable to a conventional trench system.

(3) For advanced pretreatment systems requesting Provisional approval for designs complying with TS-I or TS-II effluent quality standards, documentation of one of the following:

(A) 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section;

(B) the system's design and functional similarity 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:

(i) material physical properties and chemical durability;

(ii) structural integrity;

(iii) biological, chemical, or physical treatment processes;

(iv) method and manner of function for conveyance and transformation of wastewater and effluent through the system; and

(v) 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.

(4) Submittal of a proposed evaluation protocol to be overseen by a third-party evaluator. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative approval under G.S. 130A-343(f) and Rule .1705 of this Section is collected.

(A) For trench and dispersal systems:

(i) a total of 100 installations operational and in use for 12 months; and

(ii) sufficient information collected to evaluate the systems hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system;

(B) For advanced pretreatment systems, one of the following:

(i) 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, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded

from the field sampling sites. The data sets shall show compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable; or

(ii) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable.

(5) Manufacturers requesting Provisional approval as both an advanced pretreatment and dispersal system must 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 system shall be approved for use as an Innovative System when all of 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 shall be 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 which 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, the results of which support the proposed use of the system; or

(C) the system has been evaluated in accordance with G.S. 130A-343(g)(3).

(5) The following documentation is provided for trench and dispersal systems:

(A) the results of AASHTO Standard H-5 and H-10 load testing that demonstrate structural integrity comparable to a conventional trench system;

(B) 100 installations operational and in use for 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.

(6) For advanced pretreatment systems requesting Innovative approval for designs complying with TS-I or TS-II effluent quality standards, documentation is provided 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, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards, as applicable; or

(B) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected 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 or TS-II effluent quality standards, as applicable.

(7) 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 clear, convincing, and cogent evidence 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 300 systems installed statewide and in use as an approved Innovative System for more than five years;

(2) data and findings of all prior evaluations of the system performance as provided by the manufacturer;

(3) results of prior performance surveys of Innovative Systems in use in North Carolina for 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 .1712 of this Section. Upon request of the manufacturer, the Department and manufacturer shall meet to discuss the accuracy and validity of performance data and surveys to be considered for inclusion in the review. LHDs shall be invited to participate in the discussion;

(5) a statistically valid survey of system performance shall be performed, as follows:

(A) the manufacturer shall provide a proposed survey plan for Department concurrence prior to carrying out the survey. This plan shall specify the number of systems to be evaluated, period of evaluation, method to randomly select systems to be evaluated, methods of field and data evaluation, and proposed survey team members, including proposed cooperative arrangements to be made with Department and LHD staff. The Department shall facilitate LHD participation with any performance review or survey. The Department shall utilize the Division of Public Health's State Center for Health Statistics for assistance in evaluating the statistical validity of proposed evaluation protocols; and

(B) the survey shall include the field evaluation of 250 randomly selected Innovative Systems compared with 250 comparably aged randomly selected conventional systems, with 100 of each type of surveyed system currently in use and in operation for five years. Systems surveyed shall be distributed throughout the three physiographic regions of the state (Mountain, Piedmont and Coastal Plain) in approximate proportion to the relative usage in the three regions. The survey shall determine comparative system failure rates, with field evaluations completed during a typical wet-weather season (February through early April), with matched Innovative and conventional Systems sampled during similar time periods in each region. The petitioner shall provide a statistical analysis of the survey results showing a one-sided test where, if the failure rate in the sample of 250 Innovative Systems is five percentage points higher than the failure rate in the sample of 250 conventional systems, there is only a five percent chance that a difference this large would occur by chance (95 percent confidence level). If a statistically significant higher failure rate in the Innovative

System is not detected, the Commission shall find that the Innovative System performs the same as or better than the conventional system;

(6) Other criteria for determining whether the proposed system has been in general use, and other surveys, including evaluations of different numbers of Innovative and conventional systems, designed to verify equal or superior performance of the Innovative System compared to the conventional system under actual field conditions in North Carolina shall be approved by the Department when they are demonstrated to have comparable statistical validity as described in Subparagraph (b)(5) of this Rule. The Department's review and approval of proposed alternate criteria for determining whether the system has been in general use, or of other proposed surveys are subject to review and concurrence by the Commission.

(c) The Commission shall impose any use, design, installation, operation, maintenance, monitoring, and management conditions in accordance with G.S. 130A-343.

(d) Accepted system applications for products that are approved to both treat and disperse wastewater must meet the requirements for treatment and dispersal as described in this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

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

The Department may modify, suspend, or revoke the PIA approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) The PIA approval shall be modified as necessary to comply with subsequent changes in laws or rules which affect their approval.

(2) 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, shall submit to the Department a written application. 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.

(3) The manufacturer of an approved Provisional or Innovative System shall notify the Department within 30 days if they lose their approval from any nationally recognized certification body or choose to drop their listing, as applicable.

(4) The manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria, shall submit to the Department a written application. 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 the manufacturer's demonstration provides clear, convincing, and cogent supporting evidence.

(5) The Department may modify, suspend, or revoke a PIA approval upon a finding that:

(a) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;

(b) the system fails to perform in compliance with established effluent quality standards;

(c) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

(d) the system or the system petitioner fails to comply with wastewater system laws, rules, or conditions of the PIA approval; or

(e) the manufacturer lost their approval or chooses to drop their listing by any nationally recognized certification body, if applicable.

(6) The Commission may 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. The Commission may require the manufacturer or the Department to complete a follow-up survey of a proprietary trench system such as described in this Rule if the Commission determines further information is necessary prior to rendering a final decision on modification of the status of an Accepted System.

(7) 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 EFFLUENT SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS

(a) Wastewater sampling requirements shall vary in accordance with system classification, designated effluent quality standard, system design daily flow, and system performance history.

(b) Effluent from Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent quality constituents until the system receives Innovative Approval.

(c) Effluent from an approved Innovative System shall be grab or composite sampled annually for all applicable influent and effluent quality constituents when the design daily flow is less than or equal to 1,500 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(d) Effluent from an approved Innovative System shall be grab or composite sampled twice a year for all applicable influent and effluent quality constituents when the design daily flow is greater than 1,500 gpd and less than or equal to 3,000 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(e) 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.

(f) The manufacturer of an approved Innovative System may request an adjustment in sampling requirements (constituents or frequency) based on a written application submitted to the Department that includes the following information:

(1) data from 50 separate North Carolina sites in operation for six months;

(2) written reports summarizing results of the VIPs for all North Carolina sites submitted as part of this Rule;

(3) 80 complete data sets, including all data sets that do not meet the limits. Data sets may be from the same site if collected three months apart;

(4) analysis indicating compliant system performance in accordance with Rule .1710 of this Section; and

(5) identification of the constituents for which the manufacturer requests a reduced sampling frequency.

(g) Manufacturers of proprietary advanced pretreatment systems with Innovative approval that are also certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), and are in compliance with the ongoing verification program of such body, may submit a written application with a sampling protocol that reduces the data set requirements by up to 50 percent.

(h) Manufacturers of proprietary advanced pretreatment systems that comply with Paragraphs (f) and (g) of this Rule may apply to the Department to replace the requirement for routine effluent sampling of all individual sites with routine field constituent testing that is included as part of the VIP.

(i) While routine sampling of individual sites may no longer be required in accordance with Paragraphs (b), (c), or (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(b) of this Subchapter or if required as part of an enforcement action by the LHD or the Department.

(j) Effluent may be re-sampled within 30 days from receiving laboratory results indicating non-compliance with Table XXIV of Rule .1201 of this Subchapter. Complete data sets from resampling may be substituted to meet 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 (f) of this Rule.

(k) 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 quality 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 SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent quality standards of Table XXIV of Rule .1201 of this Subchapter when all the following conditions are met:

(1) the arithmetic mean (geometric mean for Fecal Coliform) of all data collected from all sites does not exceed the designated effluent quality standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent quality standard for any applicable constituent. Non-compliant data may be substituted with a new data set meeting the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results;

(3) fifty percent of all complete data sets from all sites shall comply with the designated effluent quality standard for all applicable constituents;

(4) when determining compliance with system effluent quality standards in Items (1), (2), and (3), 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(d) of this Subchapter and sites that have been otherwise documented to have been subjected to significant abuse; and

(5) results of influent samples from all sites shall be provided to demonstrate compliance with percent reduction effluent criteria in accordance with Table XXIV 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 Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals shall be re-issued when the applicable provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request to the Department that includes the following:

(1) summary of the current status of systems permitted and installed under their approval;

(2) number of malfunctioning systems, including location, reason for malfunction, and how the system was repaired;

(3) documentation of system compliance with effluent quality standards in accordance with Rule .1710 of this Section, including analysis of all effluent data collected subsequent to the most recent system approval;

(4) documentation of compliance with all requirements in current Provisional or Innovative approval;

(5) documentation that 80 percent of the individual advanced pretreatment systems at a single site are in compliance with Rule .1302(d) of this Subchapter;

(6) current status of certification and listing by a nationally recognized certification body; and

(7) any other information the manufacturer deems necessary to support re-issuance of their PIA Approval.

(c) The Department shall re-issue a Provisional Approval for a specified additional period, not to exceed five years, when the manufacturer has demonstrated progress in completing the approved evaluation protocol; compliance with applicable effluent quality standards; and that there is the likelihood that re-issuance of the approval will enable the evaluation protocol to be completed. A Provisional Approval may be re-issued only one time.

(d) The Department shall re-issue an Innovative Approval for a five-year period when the manufacturer's report provided in accordance with Paragraph (b) of this Rule shows system compliance with effluent quality standards and this Subchapter.

(e) The Department shall suspend or revoke a PIA approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

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) All designers, installers, and Management Entities shall be authorized in writing by the manufacturer and as defined in the PIA approval.

(b) Manufacturers of proprietary systems approved under this Section shall provide a list of manufacturer's authorized designers, installers, and Management Entities, as identified in the PIA approval, to the Department and LHDs, and update this list annually.

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; or

(b) when the Provisional System is used as a repair to an existing malfunctioning system when there are no other approved 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) Permit systems designated as approved Accepted Systems in an equivalent manner to a conventional system at the owner's request, provided the location of each trench, trench depth, or effluent distribution method remains unchanged. The type of Accepted System installed shall be indicated on the OP.

(4) 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.

(5) Grant facilities generating high strength effluent the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to assure effluent strength equal to or better than DSE.

(6) 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.

(7) Inform the Department as well as the manufacturer or their authorized representative of any system determined to be malfunctioning.

(8) 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(d) 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 set forth further enforcement possibilities if compliance is not achieved.

(9) 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;*

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October 30, 2017

Mr. Chris Hoke,
1931 Mail Service Center,
PO Box 2368
Raleigh, NC 27699-1961

Re: Comments relative to the proposed 18E Rules Revisions
NCHHS, Environmental Health Section, N.C. North Carolina

Dear Mr. Hoke:

I would like to begin my comments with the recognition that these rule revisions have been expertly researches and written. My comments primarily focus on the interface between soils and aquifer hydrology.

I have two brief comments pertaining to Definitions:

1) There is reference to "perched water table." Just a technicality, I don't believe there are perched water table aquifers in North Carolina. Perched Water Table is generally a permanent feature with an aquifer underlain by unsaturated zones and a second aquifer deeper (Arizona hydrology). The technical term for what is labeled perched water table, should be Temporary Water table, which sometimes dries or drains to a lower surficial aquifer, typically seasonal in North Carolina.

I understand that for all practical purposes, most people in North Carolina refer to Temporary Water Table as Perched Water Table, therefore, you may want to leave as is.

2) You may want to define "Surficial Aquifer" as the saturated water bearing formation, extending from the water table surface to the first confining clay layer beneath. This aquifer controls all on-site systems, once the wastewater has been dispersed into this aquifer. Knowledge of this aquifer and relationship to drains (see other definitions) defines the basis for mounding analysis.

3) **Paragraph (4)(E...) 15A NCAC 18E .0304** There needs to be some reference in the rules to analysis of the water table surface and the associated surficial aquifer. This can be only accomplished if the LSS, PE or LG uses water level monitoring during the evaluation. Sufficient number of piezometers (water level monitoring wells) to define shape, gradients (slope) and direction of groundwater flow for potential mounding analysis calibration, fate of flow, and monitoring well location. These data point will need to be surveyed by a licensed surveyor.

4) **15A NCAC 18E .0504 SOIL WETNESS CONDITIONS**

There is reference to DRAINMOD as the tool for soil wetness predictions. At this time, I agree that this should be preferred in North Carolina. However, there are other simulation algorithms that provide the same analytic capabilities with other benefits. These are in two groups, based on computational algorithms, which are, Finite Element and Finite Difference models. An example of a Finite Element model is FEFLOW (predominantly European), which associated with MIKE (river, estuarine and other surface adaptation simulations) can refine the temporal (time vs. historical rainfall…) relationship analyzed in DRAINMOD laterally to complex surface (drains, creeks, seeps, etc.) geometries as the site and neighboring areas change. An example of a Finite Difference model is the USGS MODFLOW, which associated with SURFACT, can also refine the relationship analyzed in DRAINMOD, laterally to include complex surface (complex drains, creeks, seeps, etc.) geometries as well as changes of aquifer characteristics. Basically, with today's computer technology, it would be simpler to use DRAINMOD as a primarily transient analysis. Complex transient and spatial analyses such as MODFLOW and FEFLOW may be too cumbersome to run on today's computers. However, at the rate computing technology is changing, there should be flexibility to use these and other future models.

Generally, the 18E is well written and thorough, these comments are offered as suggestions only. Please contact me if you have any questions, I will be glad to discuss (919) 306 – 3069..

Thank you for the opportunity to help with this rules revision.

Very truly yours,
Edwin Andrews & Associates, P.C.

Edwin E. Andrews III, N.C.L.S.S., L.G.
Consulting Hydrogeology and Soil Science

A. R. Rubin, Professor Emeritus
North Carolina State University, Biological and Agricultural Engineering
Box 7625
Raleigh, NC, 27695-7625

Chris Hoke, Esq.
NCDHHS
1931 Mail Service Center
Raleigh, NC, 27699-1961

Dear Mr. Hoke;

Subject: .1900 Rule comments

Thank you and the staff from NC DHHS DEH for an excellent job of developing effective rules for siting, sizing, design, operation, maintenance, reporting and overall management of land based, subsurface wastewater treatment systems. The rule revisions proposed offer opportunities to improve professional practice in the on-site wastewater program. Rules have improved dramatically since the initial onsite rules were proposed in the mid-1970's.

I am very supportive of the rules proposed in
Chapter 18 – Environmental Health,
Subchapter 18A – Sanitation,
Section .1900 – Sewage Treatment and Disposal Systems

My comments are limited to a few sections of the proposed rule. These are:

1. Type IV, V and VI listed in Table XXX1, Rule .1301 are issued operations permits. I believe these should be referenced as Renewable Operations Permits provided system is assessed as operable and ownership is documented.
2. .0403 Adjustments to Design Flow: this section adds tremendously to the benefit of the rule proposed.
3. .0601 setbacks: wastewater systems employing advanced treatment (reuse quality as defined through NCAC .02U or SB 163 v 6) should be allowed a variance to these setback requirements.
4. .0902 conventional wastewater systems: conventional system includes a variety of dispersal options in addition to the standard gravel trench. This section of the rule is ambiguous concerning the spacing requirement (.0902(2) and .0902(3)) where products other than the standard, accepted gravel trench are used. Trench width should be defined as excavated trench
5. .0904 large diameter pipe: Line spacing in the previous section defined appears to be based on the excavated trench. Where LDP installations are utilized on steeply sloping sites in the mountains, the spacing could be adjusted downward based on excavated trench width to provide regulatory

agency personnel and installers greater flexibility in the installation. Specifically the 8 inch and 10 inch LDP statement could read: "the 8 inch and 10 inch LDP shall be installed on six foot spacing except when the lines are installed on sloping sites and the trenches are excavated and backfilled by hand and no mechanical equipment is used during the excavation process., then spacing required is a minimum of 5 feet." This proposed wording would provide flexibility for challenging sites.

6. .1201 advanced pretreatment system standards: Table XXIV should be expanded to include wastewater pretreatment devices capable of achieving reclaimed water standards as defined in NCAC .02U Rule, NSF 350, and as discussed in SB 163 for reclaimed water systems. Utilization of these high levels of treatment should be addressed in these rules to allow reductions in buffer requirements (.0601) and indoor reuse as listed in the ICC Building Code (chapter 7 and 9) and as accepted in NC Plumbing Code.
7. .1207 Compliance criteria: should reuse quality be recognized as suited for indoor uses, plumbing systems will require assurance that there are effective controls in place for backflow prevention. Further, a new section may be required titled: Site and System Compliance Criteria for Reclaimed/Reuse Pretreatment Systems.

Thank you most sincerely for your work on these standards and special thanks to the staff in NCDHHS DEH for the very high quality work on these rule revisions and the associated fiscal analysis. Please consider these suggestions,, especially those associated with SB 163, as an opportunity to improve water management efforts in North Carolina.

Respectfully Submitted



A. R. Rubin

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1-800-345-3132

October 31, 2017

Chris Hoke
Chief, Office of Regulatory and Legal Affairs
Commission for Public Health
North Carolina Department of Health and Human Services
1931 Mail Service Center,
Raleigh, NC 27699-1961

Dear Mr. Hoke,

Thank you for the opportunity to comment on the proposed SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS. Please consider my following comments.

This effort is a huge undertaking, and a long time in coming. The entire staff of On-Site Water Protection Branch, and in particular the Chief Nancy Deal, and staff Environmental Engineer Trish Angoli, are to be commended for the thorough and professional manner, accessibility, and communication in which they have, and continue to maintain in this process.

For the most part the proposed rules represent the current state of science, engineering, and practice.

In particular, I applaud bringing drip dispersal into the rule, specifically SECTION .1600 – APPROVAL AND USE OF PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS.

I have worked for a manufacturer for 20 years that has one of the original proprietary innovative approvals, the American Manufacturing (AMC) Perc Rite™ Drip Dispersal System. My entire professional career, coming up on 40 years, has been in the field on on-site wastewater. I am an Environmental Health Specialist (NEHA) and a Licensed Professional Soil Scientist in Virginia. I continue to be a field practitioner performing site evaluations, "hydraulic assessments", and system designs. My first professional visits with to North Carolina began in 1994.

In a market development and regulatory relations capacity with AMC, I have the opportunity to interface with many state regulators, primarily in the Mid Atlantic, South, Northeast, and Middle West. All eyes have been and continue to be on North Carolina as a refence and in some cases of a program example.

North Carolina has always and continues to emphasize the characterization of the site and soil as being the most fundamental and important component of the on-site system. Maintaining emphasis on this program attribute is very important. Many states programs have allowed soil / site characterization to receive less emphasis. The soil treatment unit elements are increasingly set aside by embracing advanced treatment and dispersal as the panacea for all site conditions…characterized or not.

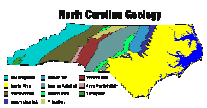
To a certain extent, these rules are a reflection of that current attitude. As someone (and AMC) who has always emphasized the "site" in my review of the rules, I am somewhat confused regarding the myriad of site suitability criteria, qualifiers, decision trees etc. with four treatment qualities coupled with Gravity, Pressure Manifold to Gravity, Low Pressure Pipe, and Drip Dispersal methods.

We are now literally talking about inches of difference in site suitability / prescriptive solution "calls". For Septic Tank Effluent LPP total soil depth is now apparently 21 – 23", drip is as always 18" total soil depth, and there is currently an expanding innovative approval for gravity dispersal with septic tank effluent. Pretreatment separations to certain limiting features are further reduced, as are the total soil depths.

It has been and continues to be difficult to ascertain equity between the dispersal approaches. Especially, considering we are talking about inches in very restrictive sites in terms of total soil depth to conditions of concern. I truly believe, as many do throughout the industry, that drip dispersal by far the best method of dispersal of effluent into the soil treatment unit. However, the technology is for the most part relegated to the sites with the severest limitations.

Public domain dispersal such as gravity, pressure manifold to gravity, and LPP have blanket maximum percentage loading rate increases for pretreated effluent as well as special site evaluation criteria. Drip Dispersal has separate loading rate charts and special site evaluation thresholds….I *think* it all reconciles that is Drip Dispersal is for the most part equivalent to LPP…but I'm not sure. I can't help but wonder if I am the only one running various comparative design scenarios.

The requirements; sizing, depth criteria's, and special site evaluation qualifiers is spread throughout the document.



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Some of this is a reflection of the length of time since the last compressive rule revision. Understandably there is a desire to embodied in the rule what has been policy. Policy statement and detailed conditions of individual proprietary approvals to me clutter the rule. I don't know what to do about it…I guess it is the nature of the beast.

And we are talking about inches.

Tank testing is a huge step. Some states have placed it in their rules without adequate program support. The only places I have seen success is in certain suburbanizing counties with the resources to implement properly. Very tough in the beginning, resistance from tank manufacturer's, contractors, builder's and the local regulators. However, in most cases after a couple of years folks remark positively.

Review and reissuance of proprietary listing every five years. As feeling I am one of the "good guys", I guess I'm ok with it. I'm just not sure what it means, what the criteria is, and the expectations.

Will my listing be revised with additional conditions…in response to failings in other listings? Program, implementation and / or resource issues? The action of others?

Drip criteria addressing hardware mechanics function, and process requirements, is proposed to be in the rules. The requirements for listing, in the case of the American Manufacturing (AMC) Perc Rite™ Drip Dispersal System represent twenty years of application as an innovative system in North Carolina. These criteria are robust, comprehensive and reflect the elements out lined in the standard "Subsurface Drip Dispersal Systems" issued in 2006 by the National On-Site Wastewater Recycling Association (2006). Considering the proposed single source "Pre-Engineered Package" listing approach, manufacturer hardware packages approved would be expected to function as required. The critical elements of American Manufacturing (AMC) Perc Rite™ Drip Dispersal System has not changed other than to reflect advancements in supporting technology.

Criteria addressing loading rates and offsets to limiting soil conditions specific to drip dispersal are proposed to be in the rule. Proper application of drip dispersal, particularly the characterization of and design reflecting the soil treatment unit is by private and public-sector individual's.

There really isn't the type compliance monitoring as is in the case of treatment unit performance.

Some basic statements on my part.

> All sites with <24" total soil depth with or without pretreatment should require pressure dispersal.
>
> All sites at some threshold, let's say <24" total soil depth should require a detailed site characterization by a LSS. Proper evaluation of these receiver sites is very critical. Missed soil calls that appear to meet the general regulation pass / fail criteria typically have immediate ramifications. One-inch decisions with significant economic ramifications should not be the responsibility of the local Environmental Health Specialist.
>
> Regarding special site evaluations, assignment of pass / fail threshold's, particularly percentages, should not be in rule and are best addressed in policy.

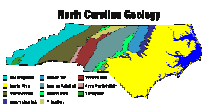
Once again thank-you for this opportunity to comment.

If you have any questions, please feel free to get in touch.

Sincerely,

Tom W. Ashton, R.E.H.S., L.P.S.S.

Cc: Robert B. Mayer, American Manufacturing Co., Inc.
Bryan Allen, American Manufacturing Co., Inc.



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SECTION .0510 SPECIAL SITE EVALUATIONS

PAGES 52 – 53
(a) (5),(6),(7),(8)
PAGE 52
Lines 4 - 37
PAGE 53
Lines 1-6

COMMENT: A near as I can tell these requirements are repeated fully on pages 84 (Lines 5 – 21) and 85 (1-6) regarding DES DRIP DISPERSAL SYSTEMS and on page 105 (lines 2 – 28) regarding ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS.

On page 53, (8) (B) Line 6.
The “or” at the end infers that this requirement is specific to drip dispersal systems.

SECTION .0906 SAND LINED TRENCH SYSTEMS

PAGE 78

Lines 14 -18 (g) (3)
Utilizing drip dispersal as a fluid handling system in sand lined trenches is an excellent application providing flow monitoring, equal distribution small dose volume average / peak flow time dosing with flow equalization, 115 micron filtration, and automatic dispersal network maintainance.

The technology may accommodate uneven trench lengths as long as within an individual absorption are system design, assuming all trenches are the same width, there is the same number of runs in all trenches.

I suggest allowing for 3 – 4 tubing runs in trenches 2 – 3’ wide to allow for designs where tubing laterals may supply and return from the same size of the system.

Lines 24 – 28 (G) (6)
In my experience, sand specifications are expressed as an effective diameter, a uniformity coefficient range, and a restriction on percent of fines passing through a 200 mesh screen. Typically ASTM C-33 concrete sand may be suitable for single pass application.



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SECTION .0907 LOW PRESSURE PIPE SYSTEMS

PAGE 79

(c) (1) Lines 21 – 24

This portion is apparently the traditional language.

PAGE 81

Lines 1- 2 (e)(4) This criteria appears to provide for LPP with as little as 21 – 23" total soil depth as stated (I think) by S. Berkowitz at this years NCSU conference.

Refering to pages 98, Table XXV and table XXVI…how / or does the above effect the values for LPP?

Drip tubing placed in standard gravel trenches, within gravity lines should be considered as an appropriate fluid handling system meeting LPP criteria.

SECTION .1105 TIMED DOSING

PAGE 95

Lines 35 - 37 (C)

Recommend "controls and *sensors* (floats) are to be *configured* to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field *and to provide that a full dose is delivered.*

SECTION .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

Page 103

Lines 9 – 10, TABLE XXVII

Under Group IV Soils, NSF-49 the LATAR range is shown to be .05 to .15 gal/ft^2/d. The maximum should be .2 gal/ft^2/d.

See Table XXII on page 84, specific to DDS DRIP DISPERSAL SYSTEMS, the maximum loading rate in this category is .2 gal/ft^2/d.

SECTION .1303 OWNER'S RESPONSIBILITIES FOR WASTE WATER SYSTEM OPERATION ANS MAINTENANCE

PAGE 117

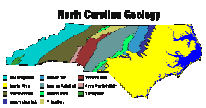
Lines 1 – 11

(a)(1), (A),(B),(C)

Lines 12 - 17

(a)(2)

This section says that (a)(1), (A),(B),(C) above is the definition of a malfunction. My biggest concern is with "(C)".



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First in SECTION 1700 – ARROVAL AN PERMITTING OF WASTEWATER SYSTEM SYSTEMS, TECHNOLOGIES, COMPONANTS, OR DEVICES there is several references to “malfunction”. Reporting performance in different states may be difficult regarding “(C)”.

More importantly this definition has been applied in pass / fail performance decisions regarding a recent controlled demonstration for gravity septic tank effluent systems install at less than 24”, specifically 20”.

I think I understand why “(C)” is there, likely is in response to an individual enforcement action. However, when applied to a 1 – 2 year demonstration I think it is not appropriate critera for long term performance, particully considering that in many cases that the criteria may not be appropriate, acceptable for a real estate transfer.

PAGE 130

SECTION .1600 – APPROVAL AND USE OF PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

PAGE 131

Lines 20-21
.1601 (d)
Not sure what “ongoing” means

PAGE 132

Lines 20 - 22
.1602 (d) (6)
I think this is criteria from the continuous flush controlled demonstration criteria, and as such is non-applicable and of concern. Assuming automatic forward flushing at some appropriate, required frequency, returning to the head of the treatment train, if a pump has the ability to provide for flushing at 2 fps, why throttle it down to 1 fps in normal operation?

Zone supply lines should be sized to provide 2 fps during field flushing.

Lines 26 – 28
.1602 (d) ((1)
Referring to comment directly above, if filtration is required to accommodate field flushing flow then why throttle down to the lower velocity?

Lines 33 – 34 .1602 (d) (4)
Returning the filter cleaning and field flush residuals to a separate tank for primary settling prior to discharge to the pump tank is an appropriate practice for DSE effluents. It is not appropriated for pretreated effluents due to the potential for compromising the effluent quality discharged to the soil treatment unit.

These Section .1602 (d) as written, could be interpreted to allow for pretreated drip systems configured with continuous filter washing and continuous tubing network forward flushing with the residuals to de-



positing directly into the dosing chamber downstream from the treatment unit by way of an intermediary "primary settling chamber" for dispersal to the soil treatment unit…. downstream from the secondary treatment unit.

Lines 35 – 36 .1602 (d) (5)

Recommend "The meter shall also be ***utilized*** to monitor flow rates during dosing and flushing events.."

PAGE 133
Lines 4 – 6 .1602 (e)
Although pre-engineered systems should be able to provide for zones to be separately dosed, in larger flows and in the case of very high loading rates there may be a need to dual zone dose to reduce the total pump run time and / or provide for a more optimum operating point. Zones would be routinely forward flushed on an individual basis.

Lines 9-10 .1602 (e) (1) COEFFICIENT OF VARIATION
Does this criteria allow for the currently approved Netifim and Geoflow pressure compensating emitter?

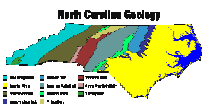
Lines 14 - 17 .1602 (e) (2)
Section 1600 addresses APPROVAL AND USE OF PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS. Why the concept of "project specific" approval regarding non-pressure compensating emitters in the rule? Engineers may propose what they want in the project specific arenia. To my knowledge non-pressure compensating emitters have not been demonstrated or evaluated in NC, and if so not nearly to the extent that pressure compensating emitters have.

Lines 31 – 37 .1602 (e) (7)
COMMENT: In this section, SECTION .1600 – APPROVAL AND USE OF PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS requirements for the approval of a pre-engineered proprietary system has elements of the "use" of drip dispersal systems that maybe cons crewed to mean that certain program elements and standards of practice would be the responsibility of the manufacturer of the system. Items (b) & (e) of this section regarding manifold cleanouts and isolation valves are examples.

PAGE 134
Lines 6 - 8 .1602 (f) (1)
Recommend…."a projected average flow and accommodate the design daily flow".

Lines 10 - 11 .1602 (f) (3)
This criterion is an absolute minimum and is a design criteria. Maybe some minimum volume (3.5x) of the tubing and this criteria? Each dose is a redistribution event. I recommend a statement such as in .1602 (e) (3) regarding appropriate dose volumes in consideration of "instantaneous emitter loading rates that do not exceed the hydraulic capacity of the receiving infiltrative surfaces".

Lines 12 - 13 .1602 (f) (4)
What is NC experience? For a PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEM at < 3000 GPD, with minimal operator oversite, filter flushing should be at the be at the beginning of each dose



run. Larger systems, with pretreated effluent maybe able to backwash on volume dosed, or at pressure loss across the filtration assembly, but that is a project specific consideration.

Lines 14 - 15 .1602 (f) (5)
Again, what is NC experience? For a PREENGINEERED PACKAGE DRIP DISPERSAL SYSTEM at < 3000 GPD, with minimal operator oversite, minimum field network flush frequency should be required to adjustable at a minimum of one time per week. Larger systems, with pretreated effluent may be able to forward flush at a lesser frequency, at the manufacturer's concurrence, but that is a project specific consideration.

Lines 20 - 23 .1602 (f) (5)
Recommend "for systems with a daily design flow greater than 3,000 gpd the controller shall monitor the flow to each zone, providing separate adjustable pressurized flow variation monitoring for standard doing operational conditions and provide for dosing disengagement for catastrophic conditions.

Lines 27 - 28 .1602 (f) (10)
Recommend "controls and *sensors* (floats) are to be *configured* to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field *and to provide that a full dose is delivered.*



Piedmont ENVIRONMENTAL ASSOCIATES, PA

10/1/2017

Comments for proposed 18E rules:

Rule 18E .0503 Soil Morphology

(1) Last sentence reads: "In place of field testing, the LHD or the State may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928."

This rule should also allow for the applicant to request that the same laboratory methods be used when the applicant disagrees with the LHD or State's field determination.

(2) Structure

Recently the regional representatives for the State have described soils as having "compound structure". In many cases the compound structure has included both unsuitable and suitable soil structure. Some mention as to how compound structure will be treated should be identified in the rules. As it is in this rule both unsuitable and suitable structure can exist. The mentality that the unsuitable characteristic should always yield to in this case would not take into account the scientific processes that had to have been present to form the suitable structure.

In my opinion soils with compound structure should be used if the smaller structure is suitable. Most of my experience has been with agricultural settings where platy structure parts to sub-angular blocky structure. The agricultural process has altered water movement both into and out of the soil horizon. I would hope that some inclusion of which structure would outweigh the other would be mentioned in the rules.

(3) Clay Mineralogy

Table VII shows that soils with an apparent CEC of 16.3 milliequivalents or more per 100 grams of clay then the soil shall be classified as expansive. Soils with this, the lowest class of clay activity are classified as "kandic". Three other groups also appear in Soil Taxonomy which are "subactive" "semiactive" and "superactive". I have included the table from Keys to Soil Taxonomy below.

8004 Linville Road Suite C2 • Oak Ridge, NC 27310 • 336-215-8820

Key to Cation-Exchange Activity Classes

A. Soils that are not Histosols, Histels, or Oxisols, that are not in "kandi" or "kanhap" great groups or subgroups of Alfisols and Ultisols, that are in either a mixed or siliceous mineralogy class, that are not in a fragmental, sandy, or sandy-skeletal particle-size class or any substitute for a particle-size class, and that have a ratio of cation-exchange capacity (by NH_4OAc at pH 7) to clay (percent by weight) of:

1. 0.60 or more. **Superactive**
2. 0.40 to 0.60. **Active**
3. 0.24 to 0.40. **Semiactive**
4. Less than 0.24. **Subactive**

or

I would propose that if all other soil characteristics are either suitable or provisionally suitable that clays that have between 16.3 and 24 milliequivalents per 100 grams of clay (subactive) be usable and the LTAR be established with additional testing such as Ksat results.

15 NCAC 18E SOIL WETNESS CONDITIONS

(b) (2)
A soil wetness condition shall be determined by the periodic observation or indication of saturated or open excavation above a less permeable horizon, that may occur without the presence of colors of chroma 2 or less. A soil wetness condition resulting from saturated soils or a perched water table shall be confirmed to persist for three consecutive days.

This amount of time is too short. Image if a hurricane hits eastern North Carolina. This rule would prohibit the use of the majority of land across the State that were evaluated with this for the followng weeks. This rule was not founded on any scientific basis and can only hinder any scientific process that would determine the true SHWT. Is the State willing to also agree that if gray mottles do occurr and the water level within a borehole or excavation does not contain perched water for three consecutive days that that soil could be used?

30 15A NCAC 18E .0506 SAPROLITE

31 (a) Sites classified unsuitable as to depth to saprolite may be reclassified suitable in accordance with this Rule.

32 (b) A 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable soil condition.

33 If any of the vertical separation is suitable soil, then one-inch of suitable soil equals two inches of saprolite.

Many studies have shown that the water movement in saprolite moves through the micropores until saturated. Once saturated I'm sure water movement would be faster but with no higher increase than in soils. Comparing water movement rates through saprolite to our more coarse textured soils we see no increased threat to compromising water quality. I would propose that saprolite be required to have the same vertical separation restrictions as soil, no more.

(1) 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;

With the confusion of textures and Soil –vs – Saprolite why not include finer textured saprolites. Many field discussions have taken place when the LHD calls a horizon a sandy clay loam saprolite. This makes the horizon unsuitable. Many times the correct taxonomic designation should have not been to call the horizon soaprolite at all. I would also recommend that all saprolite material regardless of texture be used without any pre-treatment requirements. There is no evidence that pre-treatment should be required on finer textured saprolites.

15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

This rule treats all components of the wastewater system as though they were the trenches. I feel that some parts of the system such as the supply lines should be allowed to be installed much closer than 50 feet to a well. For example, in a subdivision with community water the water supply line is often just outside the utility easement and located within its own dedicated easement. These proposed rules would allow the septic system trenches to be installed within TEN FEET of the water line which is PVC pipe. Common sense would suggest that if the effluent is being transmitted through PVC pipe and the well is grouted this would be a safer situation than what the rules would allow with the community water line and trench illustration.

I would suggest that PVC pressurized components be allowed to be placed within 25 feet of a private well.

Section (e) of this rule requires a separation of 100 feet from dispersal fields using saprolite to a private drinking water source. With the lack of any scientific evidence that this would endanger the public and with all of the well/system relationships that were historically permitted with the perc test. I feel that there is no reason to require more of a steback when using saprolite than when coarser textured soils are used in the coastal plane.

In conclusion, I would like to thank the staff and volunteers that have worked on this proposed revision. Although the hard copy of these rules is double the size of the existing rules it hopefully eliminates the unprinted "interpretations" "preferences" "policies" and "proceedures" that are currently being inforced without uniformity across the State. Our entire industry has felt the need for a rules update for over ten years. We need this rules change to happen! But, it needs to be our best effort. It needs to eliminate as much need for interpretation as possible.

Respectfully submitted,



CARTERET COUNTY HEALTH DEPARTMENT
Environmental Health Division
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G. David Jenkins, MPA
Health Director

October 31, 2017

Mr. Chris Hoke
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Raleigh, NC 27699-1961

Proposed 18E Rule Comments – Carteret County Environmental Health Department

.0105 – Definitions
p.8- line 26 - (21) Effluent – means the liquid discharge from a primary treatment or a pretreatment component.(Add primary treatment since the septic tank definition does not indicate it is "pretreatment".)

p.9- lines 28-30, (39) – Limiting Condition – use of term throughout the rules is not always consistent with definition.
For example: .0909 (c)(1 and 2) (pg. 86) Definition for limiting condition (.0105(39)) includes soil wetness condition. .0901(1) states "trenches shall be installed with 24" separating the infiltrative surface and any ***limiting condition***." .0901(2) states "trenches shall be installed with 18 inches separating the infiltrative surface and any ***soil wetness condition***." The limiting condition definition should not include soil wetness if soil wetness will be separated out, as in the above section.

.0202 – Application
p.15- line 3 - (c) IP, CA, Existing System application expire after 12 months. Good addition to the rules because there are times when the owner does not complete the requirements (I.e. site specific study, easements, requests for visits from regional specialists, and in support of .0509(c)) in a denial letter to obtain the IP or the CA. Sometimes its years down the road. Without an expiration date, the original application can still be used in response to the denial letter and conditions. An expired application would require a new application be made.

p.15 – line 26 (e) (7) – Insert "and" in place of "or" on line 26. The number of bedrooms and the number of occupants are required on the application.

p.16 – line 11 (g) (4) – Insert "and" in place of "or" on line 11. The number of bedrooms and the number of occupants are required on the application.

.0203 Improvement Permit
p.17 – line 16 (f) (4) – add to the end of sentence "if a new Improvement Permit is issued". There is no reason to revoke until a new IP can be issued.

.0204 – Construction Authorization
p.18 – line 27 (i)(4) – add to end of sentence "if a new Construction Authorization Permit is issued". There is no reason to revoke until a new CA is issued.

.0205 – Operation Permit
p.19-line 24 (e) – insert “required to be” prior to “designed by an authorized designer or PE”

.0206 – Existing System Approvals for Reconnections and Property Additions
p. 20 - line 24 (b) – “which has a valid OP” What if permits are not available or can’t be located any longer and the systems have been in use for years and .0102 does not apply. Add “or has been documented to be in use by LHD records or tax records”.

.0301 – Owners
Very easy to read, good format, great to have all responsibilities of owner in one place.

p.24 - (c) line 9 – 10, Easement must be obtained prior to issuance of IP. This would require the permit to be denied and the denial letter conditioned for the easement to get an IP. If this is not done within the 12 month expiration of the application, the owner would have to reapply. Some clarification is needed to indicate how this information is provided to applicant that legally meets the “permit or denial” requirements when acting on an application.

.0303 – Licensed or Certified Professionals
p.25 (a) lines 35-37 – Confusion over this requirement among staff. Needs to more clearly specify that “only groundwater lowering systems” are required to be designed by a professional. Does not include interceptor drainage.
(b)(8) – Does this imply that only a system designed by a PE can use “adjusted design daily flow with low-flow fixtures or low-flow technologies?

.0401 – Design Daily Flow
p.32 Table II
-Beauty Shop – 125 gal/per chair, booth, or bowl
Too many options – need to specify which item or items to use. May have 2 bowls with 6 chairs????
Chairs regulate how many operators.

-Markets – define what markets are

p.33 -Motels/hotels – define cooking facilities – not microwave and mini fridge intended?

p.35 – Under Institutions: Churches and Public or private assembly halls. Break out churches and any appurtenances associated with religious facilities into one category. If specifying Sanctuary for church – say Sanctuary not Church.
Churches and other religious institutions
Sanctuary only – 2 gal/seat
With warming kitchen – 3 gal/seat
With full kitchen - 5 gal/seat
Assembly hall or family life type centers – add 2 gal/ building occupancy.

.0403 Adjustments to Design Daily Flows
p.37 (c) – lines 21-23 – Required to be provided by a P.E? Who takes responsibility?

p.37 (e) Unclear whether the S.L. is specific to proposed or existing systems. We’ve only seen it used on existing residential systems. Does this include single family residential systems?

The Guidance document seems to indicate that systems permitted under the S.L. are required to be designed by a P.E.. Does that mean non-engineered systems can't use the S.L.?
Does this only apply to systems designed in compliance with the design flows in the rules? For example, a repaired system may not have adequate space for the full design flow and therefore under designed – would this be exempt from low flow engineering?
Making these items clearer would be helpful.

.0509 Site Suitability and Classification
p.50 - (b) line 28 – limiting condition, (add) except for wetness, Only a 12 inch wetness is required except in Group I soil.

.0510 Special Site Evaluations
p. 51 - (a)(3)(F) – add "except in a Group I soil with a wetness greater than 36 inches"

.0602 Applicability of Setbacks
Much clearer!

.0801 Septic Tank Capacity Requirements
p. 63 Table XIV chart is excellent!

(c) Much needed rule!

.0803 Grease Tank Capacity Requirements
p. 66 lines 1-4 – Not clear – does this mean a grease interceptor is also required when the grease tank is required? Or only in high FOG conditions? Is a grease tank still required for all food service facilities, not just where the accumulation of FOG may cause premature failure?

.0805 Tanks Structural Integrity and Leak Testing Requirements
p. 67 – line 14-15 –(a) testing 10% of all tanks is not feasible for most counties. Delete
p. 67 – line 36 (C) Leak testing procedure (let it site 1 hour after refilling) – are we supposed to sit there for an hour and wait? Not feasible. Delete

.0901 General Design and Installation Criteria for Subsurface Dispersal Systems
p. 71 - (d)(3)line 15-17 – "If a site has six inches of Group I soils, trenches shall be installed with 18" of naturally occurring suitable soil between the downslope side of the infiltrative surface and a SWC." Where does this six inches of Group I soil have to occur within the soil profile to require the 18" separation? Change to: If six inches or more of Group I soil occurs below the downslope side of the infiltrative surface and a soil wetness condition, a minimum 18 inches of naturally occurring suitable soil separation to wetness shall be maintained.

.0902 Conventional Wastewater Systems
p.73 lines 6-8 (d)(5) – bill of lading required on jobs with rock. Some installers stockpile rock and a bill of lading may not be available. It may also discourage them from using rock if this is required. Delete

.0903 Bed Systems
p. 74- line 14 (d)(2) – "laterals shall be one and on-half feet from the side of the bed". Current rules states "nitrification lines shall be ***at least*** 18" from the side of the bed…" Then .0903(3) states "laterals shall be placed on a maximum of three-foot centers". This sounds like it would mean that the laterals could be unequally spaced or less than 3' on centers within the bed. Would this rule allow for

bed widths that are ***not*** multiples of 3? Such as 10' wide beds? Keep the spacing as designated in current rules "at least 18" from side of bed and on 3' centers".

.0906 Sand Lined Trench Systems
p. 77 – lines 3-6 (b) (6) Much improved and clearer!

.0907 Low Pressure Pipe Systems
p.79 line 16 – (a) glad to see minimum pressure head at 3 feet! Great improvement.

p.80 line 22 – (e)(1) – "small diameter pressure rated Schedule 40 PVC" – size range of pipe is no longer specified and opens up designs to a wide range of options. This can be a problem when a designer unfamiliar with LPP's doesn't have guidelines. Add "1" – 2" diameter".

.0909 Fill Systems
p.85 line 32 – (a) "The fill pad shall be constructed when the wastewater system is installed". Not clear as to the time line between the fill pad and the system installation. What is to prevent the fill pad from being installed and the system not installed? What are the ramifications or consequences? The CA would have to be conditioned to install fill pad first and approved. Can this be added?

.1305 Local Health Department Responsibilities with Wastewater System Operation and Maintenance
p.11- line 2-(e) IIIh should be IIIi

Submitted for Carteret County Environmental Health by Len Gilstrap, REHS

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October 31, 2017

Chris G. Hoke, JD
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Dear Mr. Hoke,

I represent Clearstream Wastewater Systems, Inc., a manufacturer of advanced wastewater treatment systems. Clearstream has provided advanced treatment technologies for more than 40 years, with installations throughout the U.S., including North Carolina. We are familiar with state and local approval requirements in many jurisdictions and believe we are uniquely qualified to provide constructive and supportive comments to the proposed rule changes in North Carolina: **15A NCAC 18E .0101-.1713: Wastewater Treatment and Dispersal Systems**

There exists today in the U.S. a well-established model of how residential wastewater treatment systems (RWTS), also referred to as Advanced Treatment Units (ATU), are evaluated and approved for use by regulatory agencies. This model generally includes (1) American national consensus product standards developed by technical committees, including representation and participation from North Carolina, which establish detailed, comprehensive test procedures and acceptance criteria; (2) accredited independent testing laboratories that evaluate treatment systems to those standards using specialized test facilities; (3) accredited independent certification bodies that ensure the system as tested and evaluated is the same as what is manufactured, both initially and long-term, as required of published policies and contractual terms; and (4) accreditation bodies that evaluate the standards development organizations, laboratories and certification bodies for compliance with proper procedures and criteria. It is a dynamic model, with standards and policies being reviewed and updated regularly through broad stakeholder involvement.

The majority (more than 90%) of state and local regulatory agencies in the U.S. utilize all or part of the above model and associated resources to form the basis of their approval decision and product acceptance. Similarly, the majority of ATU sold at a national level in the U.S. are manufactured by companies that have demonstrated compliance with the American national consensus product standards and associated requirements of certification, including Clearstream Wastewater Systems, Inc. It is a public/private sector relationship that has helped to serve all parties, including private industry, regulatory agencies, and property owners.

Based on the above, we question the value obtained from the significant, additional costs to the citizens of North Carolina when adding further requirements for demonstration of product performance, including extensive field sampling. Product performance evaluations through demonstrated compliance with American national standards, and continued compliance with the requirements of certification should meet fully the product approval requirements of North

Carolina as they do for the majority of the U.S. Additional sampling and testing of systems in the field, and the requirement for approval renewals are redundant and add significant, unnecessary costs.

While we oppose field sampling and testing for the reasons stated, we are strong proponents for the rule requirements related to long-term RWTS/ATU operation and maintenance by North Carolina licensed maintenance entities to inspect and maintain RWTS/ATU. We support the requirements for field inspection, maintenance and monitoring of treatment systems, including immediate, automatic notification of system malfunction and verification of maintenance. There are affordable technologies available today and already in use and mandated by other regulatory agencies that provide for this valuable service.

More specifically, our recommendation is that any RWTS/ATU permitted for installation in North Carolina be properly equipped to participate in the RMSYS (formerly NSF International) web-based onsite monitoring program, or such other program deemed by the Department to be equivalent, to assure that maintenance is provided for the life of the system. A recommended model is that the RWTS/ATU manufacturer provide the necessary equipment and include the cost for participation in the first two years with the price of the RWTS/ATU. After the initial two years the maintenance provider contracted to operate and maintain the system will be responsible for participation. Such a system provides (1) electronic notification and record of system malfunction, (2) electronic notification and record of required routine maintenance and inspection as well as verification of site visit and time onsite by the licensed maintenance personnel, whether routine or non-routine, and (3) an electronic record accessible by the maintenance provider, homeowner, and regulatory agency to verify proper maintenance for long-term system performance.

We appreciate the opportunity to provide comment, and to offer suggestions that we believe will enhance the product approval process while lowering costs and enhancing the availability of advanced treatment systems in the state of North Carolina.

Sincerely,



Bill Lloyd

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State .1800 Rules Comments

Wake County Environmental Services

10/2/2017

Definitions Pg: 7

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

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

(9) "Berm" means a raised drainage feature used to divert stormwater runoff.

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

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

As defined in the Statutes ?

this is defined as per current rules, but defined as collection system by others i.e. CIDWT , perhaps creates conflicts on setbacks from forcemain/supply line, PM etc...

Definitions Pg: 9

Include definition Certified Installer, Certified Contractor

(29) "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 distance beneath a dispersal field.

(30) "Horizon" means a layer of soil, approximately 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.

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

(32) "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.

(33) "Interceptor drain" means subsurface 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. Interceptor drains are a type of artificial drainage.

Pg: 10

Public Management Entity with Certified Operator?

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

(43) "Management Entity" means the person, entity, company, or firm designated by the owner of the 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 can 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.

LLC incorporation ?

(44) "Mass loading" means the total mass of one or more organic or inorganic effluent constituents

mechanical toilets, composting toilets, chemical toilets, and recycling systems.

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

including a single lot which is continuous but joined by a narrow portion land separating wastewater system and the facility it serves.

Pg. 11

the disintegrated rock material usually unconsolidated and unchanged or only slightly changed that underlies and generally gives rise to the true soil by the natural process of soil development — called also source material >>> this definition from Webster...clearer ?

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

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

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

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

(58) "Ped" means a unit of soil structure, such as blocky, granular, prismatic, or platy formed by natural

Page 12

The upper boundary of rock is saprolite, soil, or the land surface/in some cases water?.

(66) "Residential Wastewater Treatment Systems," referred to as RWTS, means approved individual advanced pretreatment systems which are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable rules in this Subchapter.

(67) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent. Restrictive horizons may occur as:

(a) physical root restrictions due to high bulk density;

(b) strong pedogenic cementation or induration, physically root restrictive;

(c) plinthite; or

(d) fragipan characteristics.

The horizon suffixes d, m, and x from the USDA-NRCS Field Book for Describing and Sampling Soils can be used to describe restrictive horizons. Restrictive horizons are recognized by their resistance in excavation or in using a soil auger.

(68) "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.

(69) "Saprolite" means the body of porous material formed in place by weathering of rock that has a

Pg. 13

relocation.

(81) "Suitable" means classification of a specific site evaluation parameter or the site. A site is classified suitable for a wastewater system when all site evaluation parameters are suitable.

limiting condition.

Break Room Kitchen?

(93) "Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

all or any of

domestic level only dishwasher (no commercial dishwasher) or one sink, one stove /200 people is the way to define this ????

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

SECTION .0200 – PERMITS

Definiitions Pg: 14

wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an

OP. A PE, LSS, or LG may be needed to perform the soil and site evaluation, geologic or hydrogeologic evaluation, or wastewater system design if required in G.S. 89C, 89E, or 89F.

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

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

or combination

Pg. 15

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

(c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

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

(e) 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;

WC supports

(9) signature of owner.

(f) The application for a CA shall contain:

(1) the information required in Paragraph (e) of this Rule;

(2) identification of the proposed use of a garbage disposal, grinder pump, ~~or~~ sewage pump; and

perhaps difficult to figure out

solids handling ?

Page 17

(7) required effluent quality standard - DSE, NSF-40, TS-I, or TS-II in accordance with Table III of Rule .0402 and Table XXIV of Rule .1201 of this Subchapter;

(8) easements, rights-of-way, encroachments agreements, as applicable; and

(9) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

Consider a form that has all these information?

ıen the site is classified unsuitable, the IP application shall be denied and a signed, written report shall be d to the owner describing the unsuitable site characteristics and citing the applicable rule(s). If modifications ıatives are available to support site reclassification, this information shall be included in the report.

IP for which a plat is provided shall be valid without expiration. An IP for which a site plan is provided shall

Page 19

(a) The owner shall obtain an OP after the wastewater system has been installed and the authorized agent has inspected the system prior to the system being covered and determined that the system has been installed in accordance with this Subchapter and any conditions of the IP, CA.

(b) If the wastewater system has been permitted in accordance with G.S. 130A-336.1 and Rule .0207 of the Section, an ATO shall be issued by the authorized agent

suggest to move to last or reword ??

(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXI of Rule .1301

Page 21 /22

15A NCAC 18E .0207 ENGINEER OPTION PERMIT

(a) An owner choosing to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 shall employ the services of a PE to prepare signed and sealed drawings, specifications, plans, and reports for the design, construction, operation, and maintenance of the wastewater system.

(b) Prior to the submittal of an NOI for an EOP system as required by G.S. 130A-336.1(b), an LSS shall conduct soil and site evaluations and, as applicable, an LG shall evaluate geologic and hydrogeologic conditions. These evaluations shall be in accordance with the rules of this Subchapter.

(c) The NOI for an EOP System shall be submitted by the owner or a PE to the LHD in the county where the facility is located. The NOI shall be submitted on the common form provided by the State. The common form is available by accessing the State's website at http://ehs.ncpublichealth.com/rules.htm#oswprules. It shall include all the information specified in G.S. 130A-336.1(b) and the following:

(see appendix: EOP common form)

(1) the LSS's, LG's, and installer's name, license number, address, e-mail address, and telephone

recorded in accordance with Rule .0301(b) and (c) of this Subchapter; and

(5) record drawings,

reflecting all changes made in the specifications and working drawings including location of all elements, setbacks etc.. per NCBELS guidelines (or define record drawing?)

installer, as applicable, to determine whether the current system would continue to meet the requirements of the rules

using defined term as bold/italics etc... helpful

the Certified Installer / Certified Contractor

Pg: 23

15A NCAC 18E .0301 OWNERS

(a) The owner shall:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State 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;

defined word .. capitalized? Artificial Drainage, Installer, Certified Contractors etc... ??

as required

Pg: 23

(7) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

common form

(m) The Owner may contract with another licensed professional to complete an EOP project. A revised NOI shall be submitted to the LHD.

(n) 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 as provided for in accordance with G.S. 130A-336.1 and the applicable statues for their respective professions.

History Note: Authority G.S. 130A-335; 130A-336.1;

SECTION .0300 – RESPONSIBILITIES

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

15A NCAC 18E .0301 OWNERS

defined word .. capitalized? Artificial Drainage, Installer, Certified Contractors etc... ??

(a) The owner shall:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State in accordance with Rule .0501 of this Subchapter;

(7) provide for system operation, maintenance, monitoring, and reporting, including access for system maintenance;

as required

(8) maintain artificial drainage systems;

Pg: 23

SECTION .0300 – RESPONSIBILITIES

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

defined word .. capitalized? Artifi
Drainage, Installer, Certified
Contractors etc... ??

15A NCAC 18E .0301 OWNERS

(a) The owner shall:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State 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;

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(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.

for compliance and approval

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

Facility

(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(b)(13) of this Section;

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

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

(d) State review is not required when the design daily flow for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and all the following are met:

(1) individual ground absorption system(s) serving individual design units with a design daily flow less than or equal to 1,500 gpd;

(2) initial and repair dispersal fields for each individual ground absorption system(s) are 20 feet from any other individual wastewater system;

(3) total design daily flow for all ground absorption system(s) on a lot or tract of land is less than 1,500 gpd per acre.

(similar but 1250 gpd/40,000 sft.. is more restrictive)

(e) State review is not required when a PE calculates the proposed design daily flow to be less than or equal to 3,000

Pg: 26

in G.S. 89C and plans and specifications shall comply with Rule .0304 of this Section:

(1) the system has a design daily flow 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;

perhaps simplify?

(2) the system requires advanced pretreatment or drip dispersal other than a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) the system requires pumping more than 1,000 feet horizontally;

(4) elevation head is greater than 100 feet;

(5) 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;

one or more

(6) the pump system has one intermediate high point greater than five feet relative elevation;

(7) the system includes a pressure sewer receiving effluent from two or more pump tanks;

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

solids handling

(9) the system requires use of sewage pumps prior to the septic tank or other treatment system, except for systems subject to 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;

except when pumps media dosing and recir pumping

(10) an individual system uses more than one pump or siphon in a single pump tank;

(11) the system includes a collection sewer prior to the septic tank or other treatment system serving two or more buildings, except for systems subject to the North Carolina Plumbing Code;

(12) the system includes structures which have not been pre-engineered;

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(14) 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;

should NCBELS policy apply then?

(15) 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; and

(16) any other system so specified by the LHD.

(c) 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 appropriate Level according to the system design specifications as required by G.S. 90A-72;

(2) notification to the LHD upon completion of the system installation or 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 when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter; and

(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(d) 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.

(e) 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 is based on periodic observations of construction and a final inspection for design compliance.

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Make a form for submittal and completion >>> one form

(1) 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;

(2) name, address, and phone number for owner and all consultants; and

(3) design daily flow and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed design daily flow and wastewater strength.

(c) Special Site Evaluation including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:

(1) 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:

(A) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;

(B) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;

(C) soil and site based criteria for dispersal field design and site modifications;

(D) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(e) of this Subchapter; and

(E) recommended effluent quality standard for proposed initial and repair dispersal field areas with justification; and

(2) hydraulic assessment reports on site-specific field information which shall include, as applicable:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation and at every distinct horizon within and beneath the treatment zone;

(B) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;

(C) groundwater mounding analysis (level sites) or lateral flow analysis (sloping sites) in accordance with Rule .0510(d) of this Subchapter; and

(D) contaminant transport assessment showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property; and

(3) site evaluation plan showing:

see guidance document : appendix ##

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pumping and maintenance; and

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

collection system and collection sewers diff..

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

(1) collection ~~systems and~~ sewers:

collection sewers ?

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

need clarifications .. profile dia., length, supply lines etc....

FORM!

(B) proximity to utilities and pertinent features;

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

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

(2) tank information:

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

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

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

(D) identification number for State approved tanks;

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

(F) anti-buoyancy calculations and provisions; and

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

define

Pg: 30

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

(D) control panel, float switches and settings, and high-water alarm components, location, and operational description under normal and high-water conditions;

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

ventilation ?

(F) lighting, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (d)(2) and (3) of this Rule;

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

Supply Lines?

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

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

(A) final field layout, including ground elevations based on field measurements at a maximum

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for the proposed usage and machine water capacity. Applicant shall provide cut-sheets for laundry machines proposed for use in facilities.

(g) HVAC unit or ice machine condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system. 130A-345 == conflict?

(h) Unless otherwise noted in Table II, the design daily flow per unit includes employees.

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/≤ 12 hr shift with the following: No food preparation Warming kitchen only Single service articles

WC supports

two = 8 hours shifts
multiply by two

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15A NCAC 18E .0402 EFFLUENT CHARACTERISTICS

(a) Effluent quality standards are listed in Table III. "Effluent" means the liquid discharge from a pretreatment component.

Table III. Effluent quality standards for domestic strength effluent (DSE)

Constituent	DSE (maximum) mg/L
BOD	≤ 350
TSS	≤ 200
TN*	≤ 100
FOG	≤ 30

Use BOD5 250
TSS 125
TN 60
FOG 30
ST-out or ST-in .. what is thought here

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

In the event of flow a reduction

(b) Wastewater systems with an adjusted design daily flow in accordance with Rule .0403 of this Section or a design daily flow greater than or equal to 1,500 gpd, and with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Section or otherwise determined by the State, authorized agent, or licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, shall utilize advanced pretreatment to produce DSE prior to dispersal. Alternately, a licensed consultant may justify not using advanced pretreatment by providing the following:

(1) mass loading calculations based on site-specific projected or measured effluent characteristics and water use data. Calculations shall demonstrate that the soil loading rate does not exceed the mass loading rate identified in Table XVI or Table XVII of Rule .0901 or Table XX or Table XXI of Rule .0907 of this Subchapter; and

(2) site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

exceed every parameter ? or any.. FOG is met by GT and BMP. up to 40% TSS and BOD is reduced by using additional ST and effluent filter . simple recirculation reducing N 40%. remove 1,500 gpd. What triggers needing DSE data other than ADF ?

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

Define Adjusted Design Daily Flow

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

for initial flows <= 3k — submitted by others or own design?

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

(a) The authorized agent and the State may approve a proposed adjusted design daily flow relative to the values in Table II. The water use information provided to support the proposed adjusted design daily flow shall meet the requirements of Paragraphs (b) or (c) of this Rule.

(b) Documented data from the facility or a comparable facility justifying an adjusted design daily flow and meeting the following criteria:

ADF for existing systems.. capacity expansion : fully developed ?

(1) the submitted data shall consist 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;

(2) a hydraulic peaking factor shall be derived by dividing the highest monthly flow from the 12 monthly readings by the sum of 30 consecutive daily water consumption readings;

not less than 1.0

(3) the adjusted design daily flow shall be determined by taking the numerical average of the greatest 10 percent of the daily readings and multiplying that average by the hydraulic peaking factor; and

(4) an alternative method of determining the adjusted design daily flow is to multiply the highest monthly flow from the 12 monthly readings by 1.5 and then divide by the number of days in the month.

(c) Proposed use of extreme water-conserving fixtures shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from the proposed facility. Cut sheets of the proposed fixtures shall be provided.

This should be above and beyond required fixtures per current Plumbing Code

(d) The proposed adjusted design daily flow calculations in accordance with Paragraphs (b) or (c) of this Rule shall account for projected increased constituent concentrations in accordance with Rule .0402(b) of this Section.

(e) In accordance with S.L. 2013-413 and S.L. 2014-120, a PE can propose an adjusted design daily flow in accordance with the following:

(1) design daily flows less than those listed in Rule .0401 of this Section that are achieved through engineering design which utilizes low-flow fixtures and low-flow technologies;

(2) comparison of flow from proposed fixtures and technologies to flow from conventional fixtures and technologies;

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(4) soil depth;

(5) restrictive horizons;

(6) the suitability and LTAR for each profile description; and

(7) available space.

define?

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation.

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

(1) 48 inches from the ground surface; or

make provisions to

(2) to an unsuitable soil condition determined in accordance with this Section.

(d) Owners may be required to dig pits when necessary for evaluation of the site as determined by the authorized agent.

(e) Soil profiles shall be excavated and described to reflect variations in soil and site characteristics across both initial and repair areas.

(f) Site evaluations shall be completed in accordance with this Section. Based on the evaluation of the soil and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable (S) or unsuitable (U).

(g) A limiting condition initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(c), (d), or (e) of this Section are met.

(h) The authorized agent shall specify the overall site classification and suitability in accordance with Rule .0509 of this Section.

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

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

up to 30% is considered suitable and may be conisdered suitable up to 65% in case by case basis.

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 considered suitable with respect to topography.

(b) Unstable slopes shall be considered unsuitable with respect to topography.

(c) Slopes greater than 65 percent shall be considered unsuitable with respect to topography.

(d) Areas subject to surface water convergence shall be considered unsuitable with respect to topography, unless the surface water can be diverted from the site.

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15A NCAC 18E .0505 SOIL DEPTH TO ROCK, SAPROLITE, OR PARENT MATERIAL

(a) Soil depths to saprolite, rock, or parent material 18 inches or greater shall be considered suitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(b) Soil depths to saprolite, rock, or parent material less than 18 inches shall be considered unsuitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(c) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

saprolite, parent material, or rock

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

Denial of lots where APT can make it suitable allows owner to get permit for surface discharge? >> comment - no position !

15A NCAC 18E .0506 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 located at depths less than 18 inches below the naturally occurring soil surface shall be considered unsuitable as to depth to restrictive horizons.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 18 inches below the naturally occurring soil surface shall be considered suitable as to depth to restrictive horizons.

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 sufficient 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 Section .0600 of the Subchapter and provide access for operation and maintenance activities.

Repair Area

(b) The ~~dispersal field~~ repair area shall not be altered so that the specified system cannot be installed or function as permitted.

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15A NCAC 18E .0508 AVAILABLE SPACE

(a) Sites shall have sufficient 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 Section .0600 of the Subchapter and provide access for operation and maintenance activities.

Repair Area

(b) The ~~dispersal field~~ repair area shall not be altered so that the specified system cannot be installed or function as permitted

the exemption in Paragraph (d) of this Rule was previously utilized.

(g) Although a lot or tract of land is exempted under Paragraph (d) of this Rule from the repair area requirement of Paragraph (a) of this Rule, the maximum feasible area, as determined by the authorized agent, shall be allocated for a repair area and documented on the IP, CA, and OP.

Repair Area still seem to address only dispersal area ..

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

Plans (CA) for repair system not required but suitability of Repair Area required at the time

15A NCAC 18E .0509 is proposed for adoption as follows:

sometimes larger tanks to account for repair dosing needs is installed up front ?

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most limiting condition determined in Rules .0502 through .0508 of this Section shall be used to determine the overall site classification as suitable or unsuitable. The overall site shall be classified suitable if there is sufficient soil and area for a wastewater system that complies with the minimum vertical separation distance to a limiting condition consistent with this Subchapter.

suitable soil depth or vertical separation w/o APT?

(b) The minimum ~~vertical separation distance to any~~ limiting conditions shall be 18 inches.

(c) Sites classified unsuitable due to soil wetness conditions may be reclassified suitable when modifications are made to meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation distance to the water table.

(d) Sites classified unsuitable due to soil wetness conditions because of the presence of lateral water movement may be reclassified suitable as to soil wetness conditions when such water is intercepted and diverted to prevent saturation

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conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by individuals qualified by training and experience and licensure in North Carolina in accordance with G.S. 89C, G.S. 89E, and G.S. 89F, to consult, investigate and evaluate soil and rock characteristics, groundwater hydrology, design artificial drainage systems, or design wastewater systems. The proposed wastewater system or artificial drainage system shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review the substantiating data if requested by the LHD.

(f) An IP shall not be issued for a site which is classified unsuitable.

simplification possible?

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 adversely impact ground and surface water quality. Any site for a wastewater system that is proposed with one or more of the following shall require a Special Site Evaluation by a person or persons who are licensed or registered to consult, investigate, or evaluate soil characteristics and hydrologic and hydraulic testing and analysis in accordance with G.S. 89F or G.S. 89E:

(1) proposal submitted in accordance with Rule .0504(b) of this Section;

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WW systems definition from General Statutes ?

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA approval.

wastewater systems = all components
or tankage and fields? supply lines, PM manifolds etc??

TABLE IX. Minimum setbacks from all wastewater systems to site features

	Site Features	
1	Any pu drinkin	
2 3	Surface mean h	
	Waters	
4	Any Cl	
	Lake, p	
	Lake, pond, or ~~stormwater detention pond,~~ from flood pool elevation (stormwater retention pond)	50
	Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
	Any water line, including fire protection and irrigation water lines	10
	~~Geothermal wells~~ – open or closed loop vertical bore	50
	~~Geothermal wells~~ – horizontal closed loop system	10
	Building foundation ~~with artificial~~ drainage	15
	Building or other foundation without ~~artificial~~ drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
	Any basement, cellar, or in-ground swimming pool	15
	Buried storage tank or basin, except stormwater	15
	Above ground swimming pool	5
	~~Top of slope of embankment or cuts of two feet or more vertical height~~ (Top of vertical cuts or Embankment of 2 ft. or more)	15
	Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25
	Surface water diversion, as measured on the ground surface from the edge of the diversion	15
	Any stormwater conveyance (pipe or open channel) or ephemeral stream	15

top slope/down slope?
confusing with artificial drainage def....

other than building drains

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(Define)retention basin has permanent pool .. drains from top
detention basin has temp. pool .. drains from bottom

25 feet

~~Permanent~~ stormwater ~~retention basin or sediment detention basin~~ detention basin	~~50~~
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
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	15
Utility transformer, ground-surface mounted	10

WC supports 25 feet

Driveway = 3 feet from all direction,

(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following

feasible distance and never less than 50 from the private water supply.

(d) Wastewater systems shall not be located closer than 100 feet to springs and uncased wells located downslope from the dispersal field ~~and used as a source of drinking water.~~ or from tankage

(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source

one of the following shall be used:

(1) DIP;

(2) Schedule 40 pipe (PVC, Polyethylene, or A

(3) Schedule 40 pipe (PVC, Polyethylene, or A

(4) Schedule 40 pipe (PVC, Polyethylene, or A the crown of the pipe; or

(5) other pipe materials may be proposed when by the LHD.

or stronger

perhaps a generic def. SCH 40 also implies any stronger pipe of same material

55

Evaluation in accordance with Rule .0510 of this Subchapter demonstrates that the wastewater system will comply with the performance requirements in Rule .0510(d) of this Subchapter.

revise definition

(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.

by def. includes forcemain, supply lines, any other component --- conflict

TABLE XI. Minimum setbacks from collection sewers to site features

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appears a combined chart/Table for IX, X, XI
Illustrative diagrams for tankage would be helpful

Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5 keep 10 feet
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10 5 feet horizontal ?

horizontal

(j) The minimum setback from water lines to collection sewers shall be 10 feet. ~~If a 10-foot setback is not maintained, the following criteria shall be met:~~

~~(1) 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) 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~~

Alternatively, vertical separation of 18" with water line on top is provided in a benched trenches or in separate trenches

57

pool	
Top of slope of embankment or cuts of two feet or more vertical height	5 keep 10 feet
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10 5 feet horizontal ?
Permanent stormwater retention basin or	10

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conflict with gravity sewer / supply line / force main >>>> collection system is defined as collection sewer

~~18 inches above the top of the collection sewer. The collection sewer shall be located the maximum setback from the water line.~~

(k) Crossings of ~~collection sewers~~ and a water line may occur with the following:

(1) 18 inches clear vertical separation distance is maintained, with the sewer line passing under the water line; or

(2) the water line crosses under the sewer line ~~or 18~~ inches clear vertical separation distance is not maintained and the following criteria are met:

(A) collection sewer shall be constructed of DIP with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

PWS Rules 15A NCAC 18C Water Supplies

standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(l) Collection sewers may cross a storm drain if:

(1) 12 inches clear vertical separation distance is maintained; or

(2) collection sewer is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) collection sewer is encased in concrete or DIP for five feet on either side of the crossing.

storm sewers (same installation requirement like WL in same trench ?)

(m) Collection sewers may cross a stream if:

(1) 36 inches of stable cover is maintained; or

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) sewer line is encased in concrete or DIP for 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.

under

1 only or 1, and 2 or 3

make joints watertight whenever Storm and SL cross

min. 6" cover

not clear!

and

water main std.

(n) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints. Pipe shall be anchored for 10 feet on either side of the crossing.

provide detail

Pg: 58 PWS & 2T rule for reference

History Note: Authority G.S. 130A-334; 130A-335(e) and (f);

15A NCAC 18E .0602 is proposed for adoption as follows:

PWS Rule

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS

(c) Crossing a Water Main Under a Sewer. Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

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(f) The following minimum separations shall be provided for the sewer system except as allowed by Paragraph (g) of this Rule:

Storm sewers and other utilities not listed below (vertical)	24 inches
Water mains (vertical-water over sewer including in benched trenches)	18 inches
or (horizontal)	10 feet
Reclaimed water lines (vertical – reclaimed over sewer)	18 inches
or (horizontal)	2 feet
Any private or public water supply source, including any wells, WS-I waters or Class I or Class II impounded reservoirs used as a source of drinking water	100 feet
Waters classified WS (except WS-I or WS-V), B, SA, ORW, HQW, or SB from normal high water (or tide elevation) and wetlands	50 feet
Any other stream, lake, impoundment, or ground water lowering and surface drainage ditches	10 feet
Any building foundation	5 feet
Any basement	10 feet
Top slope of embankment or cuts of 2 feet or more vertical height	10 feet
Drainage systems and interceptor drains	5 feet
Any swimming pool	10 feet
Final earth grade (vertical)	36 inches

(g) Alternatives where separations in Paragraph (f) of this Rule cannot be achieved. Nothing in this Paragraph shall

Pg: 60

material.

(3) Gravity sewers shall be designed to maintain 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 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.

provide testing outline

(5) Three-foot minimum cover shall be provided for all collection sewers, except as provided for in Rule .0601(g) of this Subchapter.

or .1700 as in off-site system

(6) Ferrous material pipe or other pipe designed and bedded for traffic-bearing loads shall be provided where collection sewers are subject to traffic-bearing loads.

(7) Manholes shall be used for collection sewers at any bends, junctions, and every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation difference exceeds 2.5 feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water supply source, or within 50 feet of any private water supply 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 buildings, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required 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.

Design Unit?

or as determined by EHS when it can be easily cleaned/snaked thru the bends.

(9) Collection sewers may require additional ventilation provisions. Air relief valves shall be provided as needed for force mains.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

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(4) pumps shall be grinder pumps or solids-handling pumps capable of handling 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;

(5) minimum pump operating flow rate shall be 2.5 times the average design daily flow;

(6) systems shall be designed so that the pump-off time does not exceed 30 minutes;

(7) raw sewage lift stations serving single buildings shall be designed for pump run-times between three to 10 minutes at average flow;

(8) 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

(9) all other applicable requirements for pump tanks and dosing systems in accordance with Rule .0802 and Section .1100 of this Subchapter shall also apply to raw sewage lift stations.

History Note: *Authority G.S. 130A-335(e), (f), (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 three-inch nominal size Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or non-perforated polyethylene with a minimum fall of 1/8-inch per foot if the installation requirements of Paragraph (b) of this Rule are met.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, or alternative pipe materials described in Paragraph (c) of this Rule, may be substituted for Schedule 40 PVC between the distribution device and the dispersal field when the following installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface at a uniform grade, and with a minimum 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;

flow rate

clarification needed

5,6,7, >>> seem to contradict and may not be met simultaneously .. idea is to eliminate septic conditions. EHS to design this if one pump ?

move to design criterion, max. fall pursuant to PC

minimum strength of

Pg: 62

(4) six inches of soil cover is placed and compacted over the stone or gravel envelope; and

(5) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the excavation separating the trench from the distribution device.

flowing by gravity..

(c) Alternative pipe materials allowed from the distribution device to the dispersal field, when installed in accordance with Paragraph (b) of this Rule, are as follows:

consider merging b and c and e

(1) PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241; or

(2) PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034.

(d) 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.

?

(e) Alternative gravity pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. The pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule.

Size of pipe = 4 inch and six inch can not be used due to gravel limits

(f) Pipe used for gravity distribution laterals shall be corrugated plastic tubing certified as complying with ASTM F667 or smooth-wall plastic pipe certified as complying with ASTM D2729. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between ½-inch and ¾-inch 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 Section and is approved by the State.

Minimum

(g) Pump discharge piping shall be of Schedule 40 PVC or stronger material and pressure rated for water service at two times the operating pressure. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(h) Alternative pressure rated pipe materials are allowed in place of Schedule 40 PVC from the pump tank to the distribution device or dispersal field are when designed and certified by a PE. The proposed pipe shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material. 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 and shall comply with the requirements of Rule .0701(4) of this Section.

Alternatives are allowed when designed by PE, many places?

History Note: Authority G.S. 130A-335(e), (f), (f1);

Pg: 63

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons) without a garbage disposal	Minimum liquid capacity (gallons) with a garbage disposal
4 or less	1,000	1,250
5	1,250	1,500

recommend no garbage disposal

(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 XIV.

TABLE XIV. Septic tank capacity for facilities not listed in Table XIII

Design daily flow (gpd) (Q)*	Minimum septic tank liquid capacity (V) calculation (gallons)
Q < 600	V = 2Q
600 < Q < 1,500	V = 1.17Q + 500
1,500 ≤ Q ≤ 4,500	V = 0.75Q + 1,125
Q > 4,500	V = Q

review if this formula suggested as 6 and 7 Bedroom end of needing same tank

?

suggest 250 /bedroom

~~*For individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit, the minimum septic tank capacity is 1,500 gallons.~~

(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. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

if tanks in series chosen ??

REVIEW with WC prespective?

upstream

no one tank.. put two.

Pg:64

State review required ?

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

Risers required in each in effluent end?

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second compartment of the septic tank. 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) approved effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

No State review, replace septic tank with alternative methods.

History Note: *Authority G.S. 130A-334; 130A-335(e), (f), (f1);*

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

(1) pump submergence or as recommended by the pump manufacturer;

(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(3) flow equalization storage, if applicable; and

(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this Rule.

new requirement ?

(c) The emergency storage capacity may be calculated as the sum of ~~freeboard~~ space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

albeit correct.. ?

remove collection system

Pg: 66

typo

use ST for less than 1000 capacity, use ST with bottom open PT for more ... assume GT capacity is liquid capacity ?

(a) Grease tanks or grease tanks in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. 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.

what size ? Opening depth etc..

(b) The minimum liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(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 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 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(e) The grease tank liquid capacity shall be calculated by one of the following:

GT >> should be Grease Trap

plumbing code ???

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

new

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

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 and recreational areas;

remove option 3. >>

watertight lids or six inches above

Access and risers reqd.?

Pg: 66

(f) An approved grease rated effluent filter shall be in the second compartment of the grease tank. 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) approved grease rated effluent filter shall be in the compartment immediately prior to discharge; and with intake at least 50% below of liquid level

(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank. at least 50% of liquid depth

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

TRAPS and Interceptors >> Oil/Water Separators?

Not necessarily licensed

NEW? design approval or product approval

Pg: 67

15A NCAC 18E .0805 is proposed for adoption as follows:

WC supports

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance tank;

(2) advanced pretreatment; or

(3) PE design.

all PE design systems or Tank designed by PE not clear ? and any tank to be assembled on site.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

use method prescribed by D'Amato and Devkota, NPCA and as approved for IWWS-2015-02 Presby Environmental inc.,

Pg: 68

inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) 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)(17) and (e)(8) of this Subchapter marked over.

History Note: Authority G.S. 130A-335(e), (f), (f1);

Use 5 inches as proposed by D'Amato and Devkota

15A NCAC 18E .0806 is proposed for adoption as follows:

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

contradicts with 1%slope requirement

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.

level

(c) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703 of this Subchapter to prevent differential settling of the pipe and shall be level for two feet after exiting the tank.

(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.

(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

both ... bring to grade with watertight seals and sheding water

field practice lacking ?? how to get 2 feet of undisturbed soil beyond tank ?

Pg: 69

History note: *Authority G.S. 130A-335(e), (f), (f1);*

PT Installation/ GT /Siphon and other tanks Installation criterion ?

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 is proposed for adoption as follows:

15A NCAC 18E .0901 GENERAL DESIGN AND INSTALLATION CRITERIA FOR SUBSURFACE DISPERSAL SYSTEMS

what is trench?

bottom

Gr. I, II, III

trench bottom ... side walls are also infiltrative surfaces ?

(a) Wastewater systems shall be used on sites classified suitable in accordance with Rule .0509 of this Subchapter. The site shall meet the following criteria:

(1) 12 inches of naturally occurring soil is on the downslope side of the trench between the infiltrative surface and any limiting condition; and

(2) 18 inches of separation between the infiltrative surface and any soil wetness condition in Group I soils.

(b) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be used;

(2) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 30 inches of the ground surface (36 inches for Group I soils) or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(3) LTARs determined from Table XVII shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface;

(4) for shallow systems, the LTAR shall be based on the most limiting, naturally occurring soil horizon or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(5) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type; and

(6) the LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III of Rule .0402(a) of this Subchapter.

(c) 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 determined by dividing the design daily flow by the LTAR.

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(5) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XVI and XVII.

TABLE XVI. LTAR and mass loading rate for wastewater systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.8 – 1.2	0.00151 – 0.00227
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.6 – 0.8	0.00113 – 0.00151
		Loam		
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6	0.00057 – 0.00113
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.1 – 0.4	0.00019 – 0.00076
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

why range 0.001 not allowed? use max. contradicts DSE values USE half rule.....

Is Agent expected to check this? Prescriptive nature conflicts somewhat? A how to use it reference information may be Appendix ###

how? BOD or BOD5

Pg: 71

(d) Wastewater system installation shall be in accordance with the following criteria:

(1) an engineer's level, laser level, or equivalent shall be used for the following:

(A) staking (flagging) or marking on the soil 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) 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 distance to a limiting condition along the entire trench length in accordance with Subparagraph (d)(3) of this Rule;

(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and a soil wetness condition;

(4) the pipe shall be centered laterally in the trench;

(5) final soil cover over the dispersal field shall be to a depth of six inches after settling. The finished grade over the wastewater system shall be sloped to shed surface water. Surface water runoff, including stormwater, shall be diverted away from the wastewater system;

(6) Schedule 40 PVC or other State-approved equivalent pipe may be used as needed to connect sections of trench and overcome site limitations. The bottom area of trench where solid piping is installed shall not be included as part of the minimum area required for infiltrative surfaces;

(7) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meeting the following criteria:

(A) separated by 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;

generic !!

or more

suggest remove down slope side

doesn't make technical point?

where?

under trench bottom

distribution device ?

clarify ...?

downspouts, crawl space drains etc.. should be diverted as well

i, ii, iii .. a system

Pg: 72

overflowing to the next downslope trench through either a stepdown or drop box in accordance with Subparagraphs (d)(10) and (d)(11) of this Rule;

(10) step-downs shall be constructed 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 equivalent State-approved pipe. The installer shall demonstrate that the ~~drop boxes~~ perform as designed;

(11) drop boxes shall be separated from the trench by two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is one-inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed;

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(13) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0902 is proposed for adoption as follows:

(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 in a single trench bottom not to exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent;

(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 not exceed three feet and trench depth shall not exceed 36 inches on the

step-downs

respective

dispersal area is clearer ?

2.5 inch per 100'

Pg: 73

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 six inches below the pipe and two inches over the pipe; and

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregate which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregate installed.

Installer use CI ??

WC concern !

At Grade

34"
30"
etc

(e) Shallow systems shall not be installed on slopes greater than 30 percent and shall be installed in accordance with Paragraph (d) of this Rule and the ~~following~~:

conventional and shallow perhaps needs definition

(1) soil cover above the original grade shall be placed over the entire dispersal field and shall extend

shall have not more than 10 percent by volume of fibrous organics, building rubble, rocks, or other debris and shall be Soil Groups II or III.

of

(f) 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 (d) of this Rule and the following:

criterion are met

(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 sized at 75 percent of the total area required;

Define ?? max. reduction ? least

(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 resistant to corrosion;

(5) effluent flow diversion valves placed below finished grade shall be installed in a valve box and be operable from the ground surface;

~~(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and~~

respective

~~(7) the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter.~~

Future PIA ?

total reduction 25% ?(no double dip)

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

Pg: 74

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter. Beds may be permitted on sites that meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) topography or available space limits the design options for the site.

other

including APT systems: define APT (RWTS, TS-I, TS-2, Re-USE)

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a conventional trench system as calculated in accordance with Rule .0901(c) of this Section.

define

(d) Bed system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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;

1.5 ft. @ 3-ft c/c

(3) laterals shall be placed on a maximum of three-foot centers;

(4) the lateral design criteria shall meet the requirements of Rule .0902(d)(3) and (4) of this Section for gravity and pressure dosed gravity distribution systems;

(5) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval;

required?

(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) if pressure dispersal is used, the pressure dispersal system shall be designed in accordance with Rules .0907(d) and (e) or .0908(c) and (e) of this Section or in accordance with a PIA approval.

required

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

DSE ? no APT credit?

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

Pg: 75

(d) LDP ~~tubing~~, filter wrap, and fittings shall meet the following criteria:

(1) ~~tubing~~ and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated ~~tubing~~ 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 (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated tubing shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon

Pipe

LDP

Trapezoid Tear Strength	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 0.5 inches of water

or per manufacturer's recommendation

(e) LDP system installations shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be 12 inches wide; or more

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet);

(3) backfill material 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 II or III; of soils

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight and 10-inch LDP shall be six feet.

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

6) any additional/stringent requirement by manufacturer.

Pg: 76/79

(a) Sand lined trench systems may be used on sites originally classified unsuitable due to soil wetness, soil morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches are limited to 1,500 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

clarification why 1500 gpd

(b) The soil and site shall meet the following criteria:

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

4 to 7 feet WC

(a) LPP systems utilize a network of small diameter pipes with a three to six-foot pressure head to distribute effluent across the entire dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section, except for the following:

(1) LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 24 inches of the naturally occurring soil surface or to a depth of 12 inches below infiltrative surface, whichever is deeper; and

(2) Tables XX and XXI shall be used to determine the LTAR for LPP systems.

Table 20 and 21 ??

TABLE XX. LTAR for LPP systems based on Soil Group and texture

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft²)	Mass Loading Rate (lbs/day/ft²)*
I	Sands	Sand Loamy Sand	0.4 – 0.6	0.00076 – 0.0012
II	Coarse Loams	Sandy Loam Loam	0.3 – 0.4	0.00057 – 0.00076
III	Fine Loams	Sandy Clay Loam Silt Loam Clay Loam Silty Clay Loam Silt	0.15 – 0.3	0.00029 – 0.00057

remove range Source?

Pg: 80

*Mass loading rate is based on the combined load of BOD and TSS.

source

(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 determined by dividing the design daily flow by the LTAR; and

(2) the minimum trench length shall be determined 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 (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

Total Trench Length Required

Line Spacing

(3) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XX and XXI.

(c) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the LPP distribution network shall be constructed of ~~small diameter pressure rated Schedule 40 PVC laterals placed in gravel or other approved media filled~~ trenches;

1.25 inch Sch 40 PVC or stronger

(2) the trench width shall be one to two feet;

(3) trenches shall be located no less than three times the trench width on centers, with a minimum spacing of five feet on centers;

conflict 12 - 24 inches

Pg: 81

what is approved gravel #5 ASTM D-448

(4) trenches shall include eight inches of approved gravel or other approved media, with no less than six inches vertical separation distance from the discharge piping to 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 discharge rate between the first and last orifice along the lateral;

5+1.5+1.5

(B) minimum orifice size shall be 5/32-inch for 2/3 of the field lateral lines, with no orifices sized smaller than 1/8-inch in any lateral line; and

max 75 length per side

When PE reqd.

(C) 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 four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

1.5 pipe min 100 or PE

(B) specially designed and approved orifice shields; or

(C) State-approved equivalent tubing or pipe;

exceed 10 feet unless the flow is uniformly divided using multiple pumps or split between subfield segments, such as with State-approved automatically alternating valves, without requiring simultaneous adjustment of multiple throttling valves, or as otherwise approved by the State;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and protected with valve boxes, or approved equivalent protective access devices. Turn-ups shall terminate at or above the ground surface and be installed in a valve box or equivalent for protection and accessibility;

(9) the supply manifold shall be constructed of solvent-welded pressure rated Schedule 40 PVC;

or stronger.. Generic

(10) the supply manifold shall be sized large enough based on the size and number of laterals served to prevent more than a 15 percent variation in discharge rate between the first and last laterals when feeding the manifold from the downhill side;

is a list of valves available?

Pg: 82

(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;~~

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees or threaded fittings (Schedule 80 PVC only); and

(C) cleanouts shall be installed at the ends of the supply manifold and shall be enclosed in valve boxes for protection and accessibility from the ground surface;

(12) gate valves or other State approved valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length or the dispersal field is not visible from the pump tank;

(13) valves shall be installed in a valve box or other approved access device and be readily accessible from the ground surface;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the flow rate shall be based upon delivering three feet to six feet of static pressure head at the distal end of all lateral lines;

(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;

(15) the dispersal field shall be covered to a depth four inches after settling; and

(16) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval.

remove

manifold

both

this valve is inadditon to the gate valve in the PT

repeat change 4 to 7 feet

to field, prevent draining to PT by use of CHK valve

??

?

are these available

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

15A NCAC 18E .0908 is proposed for adoption as follows:

DSE

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving DFS. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply

Pg: 83/85

DDF	=	design daily flow (gpd)
LTAR	=	in gpd/ft^2
DL	=	dripline length (feet)
LS	=	two-foot line spacing

settling, of suitable Group II or III soil over the drip field;

(6) minimum required soil cover shall be uniform over the entire drip dispersal field;

(7) drip dispersal fields shall be graded to shed surface water;

(8) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by an appropriately licensed individual; and

(9) the drip dispersal field shall be field tested after installation in accordance with Rule .1603 of this Subchapter.

turtle back 0.5 % from center all around

landscaped to adequately to prevent surfacewater ponding

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

Pg: 88

for gravity distribution of 0.3 gpd/ft² for pressure dispersal systems.

(g) Other fill systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) of this Subchapter.

is it intended?

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

15A NCAC 18E .0910 is proposed for adoption as follows:

or potential lateral flow

15A NCAC 18E .0910 ARTIFICIAL DRAINAGE SYSTEMS

(a) Artificial drainage systems are a site modification and may be proposed to reclassify sites as suitable which were originally classified unsuitable due to a soil wetness condition. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Artificial drainage systems may be used on the following sites:

r

(1) Group I or II soils with suitable structure and clay mineralogy; and

(2) the artificial drainage system shall be designed to maintain the required minimum vertical separation distance to a soil wetness condition as specified in Rule .0901(d)(3) of this Section.

(c) Artificial drainage systems shall be designed in accordance with the following, as applicable.

(1) Groundwater lowering systems shall be designed in accordance with the following:

Title

(A) substantiating information, calculations and data shall be provided justifying the

Pg: 88 (suggested)

a) Artificial drainage systems are a site modification that may be used to overcome surface water flow, lateral sub-surface water flow, or a high water table.
b) Groundwater Lowering Systems
    a. May be used on the following sites
        i. Sites where the water table is of unsuitable depth
        ii. Group I and II soils are present to a depth of ?
    b. Must be design in accordance with the following
    c. When a pump is utilized, must be designed according to the following
    d. Must contain the following plans and specification in addition to above
c) Interceptor Drains
d) Other artificial drainage systems

Pg: 90 /91

width of the artificial drainage system.

(d) Interceptor drains shall be used on sites where soil wetness conditions are based on lateral water movement that can be intercepted and diverted to prevent saturation of the dispersal field.

(e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance documents.

Interceptor drains / Curtain Drains shall be used where lateral flow might be intercepted after the installation of the dispersal field i.e. by the lateral trenches

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

15A NCAC 18E .0911 is proposed for adoption as follows:

15A NCAC 18E .1002 is proposed for adoption as follows:

or irrigation

15A NCAC 18E .1002 WASTEWATER RECYCLE/REUSE

(a) Wastewater recycling systems that produce treated wastewater may be used for toilet flushing as long as the wastewater recycling system meets:

co

(1) the North Carolina Plumbing Code requirements; and

(2) 15A NCAC 02U as adopted by the Environmental Management Commission.

is this On-site WW jurisdiction

WC supports inclusion

Pg: 92/93

direct

(b) Recycled wastewater shall be not used for body contact or human consumption.

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

SECTION .1100 – DOSING SYSTEMS AND CONTROLS

15A NCAC 18E .1101 is proposed for adoption as follows:

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used for discharging effluent into laterals when:

(1) total lateral length exceeds 750 linear feet in a single system; or

(2) discharging to a pressure dosed gravity distribution or pressure dispersal system.

(b) Alternating siphons or pumps shall be used and discharge to separate dispersal fields for the following:

(1) design daily flow from a single system exceeds 3,000 gpd, or

(2) total length of trench exceeds 2,000 linear feet in a single system.

(c) If alternating pumps are not required in accordance with Paragraph (b) of this Rule, the pumps may discharge to a single dispersal field.

not required

is preferably

(d) The dose volume from pressure dosed gravity distribution systems ~~shall be~~ designed to fill the installed linear

(b) Air locking of the pump and siphoning from the pump tank when pumping downhill shall be prevented using a vent or anti-siphon holes (3/16-inch minimum).

This hole must be located between Check Valve and the Pump.

(c) A pressure-rated threaded union, flange, camlock, or similar disconnect device shall be provided in each pump discharge line.

conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel shall be mounted 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible.

at least 24" to no more than 36"

bottom

Pg: 94

a separate valve chamber outside the pump tank. The State may approve other equivalent methods of dosing dual or multiple fields.

Pump Tank

(h) Floats or similar State approved devices designed for detecting liquid levels in DSE shall be provided to control pump cycles:

(1) 18 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 sealed 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, as needed, to provide 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

OVERRIDE float ?

(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:

and

(1) be audible and visible ~~to the system users and the Management Entity;~~

(2) have a silencer button or device ~~shall be~~ visible and located on the outside of the panel enclosure;

(3) provide for manual testing, and shall enable the audible alarm to be silenced by the system user.

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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 among individual laterals with two feet of residual pressure head;

(2) a pressure regulating valve incorporated 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) observation ports located inside or outside of the pressure manifold box to verify flow to individual laterals; and

(6) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A dissipator box may be used to dissipate flow in a pressure dosed system designed for pressure dosed gravity dispersal of effluent in a serial or sequential manner. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, of adequate capacity, and approved by the authorized agent.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

new terminology
approx. shape size
recommendaton

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

Pg: 97

Show Reuse std. on table, consider merging TS I and TS II with exisiting TS-II setback ... 0 setback for reuse quality

	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 high strength effluent and approved by the State on a product or project-specific basis.

30 mg/l

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

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Paragraphs (c) and (d) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII.

Table XXVII: Setbacks for wastewater systems meeting NSF-40, TS-1 or TS-II effluent quality standards

Feature (structure, water source, etc.)	Setback (feet) according to Effluent Quality Standard			
	DSE*	NSF-40	TS-I	TS-II
Surface waters classified WS-I, from mean 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 pool elevation	100	70	70	50
Any other coastal water, canal, marsh, stream, perennial waterbodies, streams, or other surface waters, from mean high-water mark	50	35	35	25
Lake or pond, from flood pool elevation	50	35	35	25
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25	25	20	15
Surface water diversion, as measured on the ground surface from the edge of the diversion	15	15	10	10
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15	15	10	10
Permanent stormwater retention basin ~~or detention basin~~	50	50	35	25
Any other dispersal field except designated dispersal field repair area for project site	20	20	10	10

detention basin

*For comparison

detention basin and ret. basin : define

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

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system is used.

(4) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

WC not supporting double dipping

(c) For trench dispersal products that are subject to a specific ~~percent~~ dispersal field area reduction when receiving DSE in accordance with this Subchapter or a PIA approval, when any LTAR adjustments are taken in accordance with this Rule, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when compared to a conventional wastewater system.

(d) Design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

technically ?

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1204 is proposed for adoption as follows:

Max. reduction including PIA products use reduction shall be 50% of conventional system. (conflicts with LTAR of 2.5 ?)

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

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processing facilities, IPWW, and other systems as specified in the PIA approval or OP.

(g) The applicant may submit a written request to the LHD and State to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency.

kind of new ?

(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, this activity shall be reported to the owner and LHD within 30 days. No repair permit is required.

define procedure

(i) All residuals shall be removed as specified in the OP, the RWTS or PIA approval, 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 et seq.

Septage

Reporting

TABLE XXXI. 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

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It appears doable to group systems with Operator Requirement, Classification, grade etc...
Group 0 >> I(a) to III (h) except III(b) meaning no operator required
Group 1 >> IIIb, III i, IV a etc.... meaning subsurface operator

IId – 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	Owner	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

system			
IVa – LPP distribution	3 years	Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Certified Operator	2/year
IVc –Off-site system	5 years	Certified Operator	1/year
IVg –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Certified operator	1/year
Va – Fixed media advanced pretreatment	1 year	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

Certified Subsurface Operator

confusing with initial/repair combo ?

IV c to IV g ?

Pg: 114

			> 10,000 gpd – 1/week
Vi – Wastewater system with pump groundwater lowering systems	Yearly	Certified operator	2/year with one visit during the wet season
VIa – Any system > 3,000 gpd with mechanical, biological, or chemical treatment plant	6 months	Certified Operator	> 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Wastewater reuse or recycle	6 months	Certified Operator	< 3,000 gpd – 12/year > 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week

break into sizes

Wastewater Service LLC +

Grade II / III WPCBWW operator

*Toilet systems serving public facilities or more than 10 users per day shall be required to have a Management Entity other than the Owner as well as annual LHD compliance inspections.

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

SS Operators can be classified further within Subsurface Operator category ?

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS approved per Sections .1500 and .1700

Pg: 115

(3) prior to the issuance or re-issuance of an OP for a proprietary advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place. 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; and

(4) the manufacturer shall notify the LHD and the State when the owner chooses to not renew an operation and maintenance contract executed in accordance with this Paragraph.

(c) 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, Rule .1709 of this Subchapter, the RWTS or PIA approval, and conditions of the OP;

(3) the Management Entity shall inspect each system twice a year 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 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

min. subsurface certification required
manufacturers can authorize anyone ?

discharged to the field

Pg: 117

(2) the system shall be considered to be malfunctioning when it fails to meet one or more of the conditions of Subparagraph (a)(1) of this Rule, either continuously or intermittently, or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to satisfy these conditions. The owner shall contact the LHD when the wastewater system is malfunctioning. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued an NOV;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed to ensure proper operation of the system. The contents shall be pumped whenever the solids level (scum and sludge) is found to be more than 1/3 of the liquid depth in any compartment. The effluent filter shall be cleaned 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 et seq;

(5) grease traps and tanks shall be pumped as needed, but no less than yearly. The owner shall maintain a contract with a certified pumper. All pumping records shall be maintained onsite;

(6) appropriate 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 shall be executed between the system owner and a Management Entity prior to the issuance of an OP for a system required to be maintained by a Management Entity, as specified in Table XXXI of Rule .1301 of the Section, 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 system Management Entity;

(4) provisions that the contract shall be in effect for as long as the system is in use; and

(5) other requirements for the continued performance of the system.

Move to GT section or Table

per manufacturer recommendation and should not require cleaning less that 3 yr. if so report ?

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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) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system operated from the appropriate commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule

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 XXXI in Rule .1301 of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system.

(b) A LHD may be the Management Entity only for systems classified Type IV, Va, and Vb and only when authorized

Is this different Management Entity

Subsurface System is diff. classification altogether ?

Typo ?

Pg: 119/120

Section.

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

(3) wastewater system that is partially or totally destroyed.

(b) The wastewater system shall be repaired within 30 days of notification by the State or LHD unless the NOV specifies a different time frame for the repair.

permitting

(c) After investigating the malfunction, the State or LHD shall use its best professional judgement in ~~requiring repairs that will enable the~~ system to function.

restoring . System may need to be repaired thus repair permit.

(d) When necessary to protect the public health, the State 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.

another treatment plant not ss

(e) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system. Prior to issuing the CA, the LHD shall receive the following information from the owner:

(1) confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 will

15A NCAC 18E .1401 is proposed for adoption as follows:

boot/device

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be constructed in accordance with the approved plans and shall comply with all rules of this Section.

(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.

mastic

(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and

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for additional sealing, as applicable.

(e) Plans and specifications for tanks with a total liquid capacity greater than 3,500 gallons and all tanks designed for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

5 inch

use D'Amato n Devkota std.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

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15A NCAC 18E .1402 is proposed for adoption as follows:

is ST = GT ?, both GT Risers should be brought to grade?

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight and ~~not subject to excessive corrosion or decay.~~

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.

two access opening and access device for filters ?

(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate 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 visibly marked at finished grade.

(d) Septic tanks shall meet the following minimum design standards:

(1) minimum liquid depth of 36 inches;

clarify

(2) 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) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) length of the tank shall be twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

WC supports one each inlet and outlet end ---

(6) inlet and outlet openings shall have cast or manufactured penetration points;

(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644;

(8) inlet penetrations shall be greater than or equal to four inches in diameter and outlet penetrations

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the length of the tank from the inlet end; design

(B) the partition shall be designed to remain in position when subjected to a liquid capacity in one compartment;

either

(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 leave a water passage slot four inches high for the full interior width of the tank;

(E) ~~two four-inch openings, or~~ one four-inch opening per 30 linear inches of baffle wall, ~~whichever is greater,~~ may be designed into the partition instead of the four-inch slot;

(F) the entire liquid passage shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level;

(G) there shall be no other openings in the partition wall below the water passage slot or openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

with cover tank lids

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal 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;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds; and

not clear -- to cover plastic tank .. is internal safetey required for palstic tanks per PIA

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or

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Create a Table for ST, PT, GT dimensional requirement.

with proposed 18 inch liquid and holes below it .. second compartment can not properly vented which is more important

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain two four-inch diameter circular openings, or equivalent, located no more than 12 inches above the tank bottom; inter compartment vent at top required

(5) there shall be no requirement as to tank length, width, or shape, provided the tank satisfies all other requirements 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; seperately else ensure venting thru ST then house. Consider venting PT always.

(7) tanks shall be vented if more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume. ST meets as is for GT as defined

(f) Grease tanks shall be approved septic tanks with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, 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;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less; venting ? GT .. and ST with all filters installed need to verified

(4) 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. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when a sanitary tee is used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tee(s) shall be provided for servicing and routine maintenance.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and Recommend Diagram for clarifications of design criterion as needed

Pg: 125/128

(4) 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 State for review and tank approval;

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength

new and excessive

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 design daily flow less than or equal to 1,500 gpd.

(b) RWTS shall only be used with ~~domestic strength wastewater.~~

DSE ? NSF tested for 350 BOD and 350 TSS

(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

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(a) Drip dispersal systems shall be preceded by pretreatment designed to meet one of the following effluent standards: DSE, NSF-40, TS-I, or TS-II as specified in Table III of Rule .0402(a) and Table XXIV of Rule .1201(a) of this Subchapter.

REUSE ?

(b) The drip dispersal system pump tank shall meet 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

Rule Review conducted by: Lee Rashkin, Vice President, Presby Environmental, Inc.; Fred Vengrouskie, Government Relations Representative, Presby Environmental, Inc.
(Name)

Rule Number	Page Number	Line Number	Comment	Suggested changes based on comment *(Alternate language, suggested definition, etc.)*	Suggest Terminology (ADD, CHANGE, or REPLACE)
0.0102	9	26	Needs line break/new paragraph between definition (49) and "(48) 'public management entity'"	Add line break/new paragraph between two definitions	AD: line break
0.0102	9	26	Public management entity should be (50), not (49)	Re-number in accordance with public management entity's new number 50	CH: numbering of definitions
0.0102	10/ ongoing	3/ ongoing	Re-number (50) Redoximorphic features to (51) and so on	Re-number all remaining definitions to be in line with "public management entity"'s new number 50	CH: numbering of definitions
0.0102	13	77/ ongoing	the word "UNSUITABLE" is used throughout - why is it in all caps, and should there be a definition associated with it?	Define unsuitable and perhaps remove it from all caps	CH: un-capitalize, define
0.201	13/ ongoing	28/ ongoing	controlling facility containing / First example of other errors in grammar/Regulations need to be reviewed by a English language-grammar expert	Review and Correct grammar problems throughout. Makes reviewing difficult!	ADD/CH: Example: add an "a" in the first sentence "any person owning or controlling A facility containing water-using..."
0.0202	15	19	Sentence placement is odd - should it be a (number) or (letter) or refer to (c) in line 11 or (2) in line 20?	Label/indent line so it is clear what subsection the section refers to	CH: move or label sentence
0.0203	16	1	the word "SUITABLE" is used throughout - why is it in all caps, and should there be a definition associated with it?	Define suitable and perhaps remove it from all caps	CH: un-capitalize, define
0.0206	20	3	written authorization for a manufactured home to be connected to an existing system /Why are manufactured homes singled out?	Manufactured homes are considered single family dwellings	CH/RE: Change all language specifically regarding manufactured homes to single family dwellings
0.0205	20	18	Sentence placement is odd - should it be a (number) or (letter) or refer to (b) in line 14 or (F) in line 9?	Label/indent line so it is clear what subsection the section refers to	CH: move or label sentence
0.0207	22	13	improper grammar - should be a possessive "manufacturer's" instead of a plural "manufacturers"	Change to manufacturer's to indicate possessive use of word	RE: replace "manufacturers" with "manufacturer's"
0.0207	23	9	Sentence placement is odd - should it be a (number) or (letter) or refer to (2) in line 23 of page 52 or (5) in line 8?	Label/indent line so it is clear what subsection the section refers to	CH: move or label sentence
0.304	30	4 and 5	and other information determined to be necessary by the LHD or the State/Be specific/rule is open to a different interpretation from each person reading it	remove arbitrary language that is left open to interpretation of the reader	CH/RE: Change language or replace
0.0305	31	2	KSAT - it is customary to spell out an abbreviation the first time it is used in regulations	Spell out abbreviations the first time they are used. Makes reading difficult otherwise	ADD/CH: Example: "saturated hydraulic conductivity (KSAT)" when first used in regulations
0.0504	53	13	Sentence placement is odd - should it be a (number) or (letter) or refer to (h) in line 29 of page 22 or (5) in line 8?		
0.0508	55	20	add in "wastewater systems" after "repair" so that it both mirrors (a) in line 17 and makes it clear that "initial and repair ***systems*** can be installed"	incomplete/unclear sentence - need to revise so its consistent and precise	ADD: the word "system" after "repair"
0.508	55	28	design daily flow is no more than 480 gallons for a single family dwelling unit or a single	Simplify the rules by deciding on a single GPD and linear footage limit requirement for all systems-not something different for each system category.	CH/RE: Change language or replace
0.601	59	3	Dispersal fields and repair areas shall not be located under impervious surfaces, areas subject to vehicular traffic, or areas subject to soil disturbance or compaction	Introduce H-10 and H-20 loading guide language	CH/RE: Change language or replace
0.904	79	1	one or more trenches	Broaden the rule language to incorporate beds and other disposal methods or remove the reference to trenches	CH: remove "one or more trenches" from the language
0.904	80	12 to 18	If pressure dispersal is used, (Used twice)	Vertical separation distance breaks from restrictive layers should be based on the quality of effluent entering the ground not the method of disposal	CH/RE: remove reference to pressure dispersal and replace with secondary treatment effluent quality standards
0.904	80	19	The rule states that "Fill systems with a design daily flow greater than 480 gallons per day shall use pressure dispersal systems." Pressure distribution is being used to restrict innov	Broaden the rule language to incorporate other methods of disposal. Why are there so many different and various sizing restrictions for the different categories of systems in the rules? This is not necessary and the rules can be simplified!	CH/RE: remove the "pressure dispersal method" reference and replace with a method of wastewater distribution. The language used should allow for other options beside just pressure dispersal. Simplify the rules by deciding on a single GPD and linear footage limit requirement for all system-not something different for each category of system.
0.904	80	6 to 9	The LTAR shall not exceed 1.0 gallons per day per square foot for gravity distribution or 0.5 gallons per day per square foot for pressure dispersal system	Not consistent - In other cases the LTAR is increased for pressure distribution	CH: Remove different LTAR rates for gravity and pressure and base on soil structure and treatment
0.904	81	17	The design daily flow shall not exceed 480 gallons per day.	Simplify the rules by deciding on a single GPD and linear footage limit requirement for all system-not something different for each system	CH/RE: Change language or replace
0.904	81	18 and 19	Pressure dispersal shall be used and shall meet all the requirements of Rule .0910 except Rule .1910(b).	Broaden the rule language to incorporate other methods of disposal.	CH/RE: remove the "pressure dispersal method" reference and replace with a method of wastewater distribution. The language used should allow for other options beside just pressure dispersal.
0.904	81	20	The LTAR shall not exceed 0.5 gallons per day per square foot.	Soil texture is the major soil characteristic that determines the LTAR for any given soil	CH: Remove different LTAR rate for all fill systems and base on soil structure and treatment
0.904	81	21 to 26	Existing fill sites with 48 inches of Group I soils may use conventional trenches with a maximum LTAR of 1.0 gallons per day per square foot in lieu of a pressure dispersal system. The minimum separation distance between the infiltrative surface and any UNSUITABLE soil horizon, characteristic, or material shall be 24 inches for pressure dispersal systems and 48 inches for conventional systems.	Vertical separation distance breaks from restrictive layers should be based on the quality of effluent entering the ground not the method of disposal	CH/RE: Change language or replace
0.905	82	4 and 5	Bed systems shall be limited to 600 gallons per day design daily flow. What is the basis for 600 gpd? The flow and linear footage requirements throughout the rules are random and appear to be arbitrary. Simplify the rules by establishing one standard.	Simplify the rules by deciding on a single GPD and linear footage limit requirement for all system-not something different for each system category.	CH/RE: Change language or replace
0.905	82	9 to11	LTAR: Table XIII in Rule .0901(c) shall be used to determine the initial LTAR for a bed system. The number of square feet of bottom area required shall be increased by 50 percent over that required for a trench system. Remove the second sentence.	This rule increases the LTAR of the soil based on the configuration of the disposal field. An increase in LTAR should be based on the quality of effluent entering the soil. The disposal of secondary effluent should decide if the LTAR increases not the disposal field configuration.	CH: Remove the increase by 50 percent language from the rule. If you are going to use LTAR to restrict sizing it must be based on the ability of the soil to accept wastewater not system configuration.
0.905	82	13 to 16	Laterals shall be at least one and a half feet from the side of the bed. Remove	Bed technologies have a history of functioning properly using a different installation standard. These standards are obsolete.	CH: Remove these standards from the rule.
0.905	82	13 to 16	Laterals shall be on three foot centers. Remove	Bed technologies have a history of functioning properly using a different installation standard. These standards are obsolete.	CH: Remove these standards from the rule.
0.905	82	13 to 16	The bottom of the bed shall be excavated level, plus or minus one half inch, in all directions. Remove or modify language.	Bed technologies have a history of functioning properly using a different installation standard. These standards are obsolete.	CH: Remove these standards from the rule.
0.906	84	3	design flow is greater than 600 gallons per day; or	Simplify the rules by deciding on a single GPD and linear footage limit requirement for all systems-not something different for each system category.	CH/RE: Change language or replace
0.906	82	32	Sand lined trenches are limited to 1,000 gallons per day design daily flow.	Simplify the rules by deciding on a single GPD and linear footage limit requirement for all systems-not something different for each system category.	CH/RE: Change language or replace
0.906	83	20	The 18 inch separation requirement may be reduced to 12 inches when pressure dispersal is used. This rule needs to be changed. Pressure distribution has nothing to do with the quality of effluent and should consequently have nothing to do with setbacks or separation distances.	Separation distance breaks should be based more soil texture and structure and on the quality of effluent entering the ground not the method of disposal	CH/RE: remove reference to pressure dispersal and replace with secondary treatment effluent quality standards
0.906	84	12	**TABLE XV.** LTAR for sand line trench systems based on soil group and texture class. Add a category for Advanced treatment products	This table increases the LTAR of the soil based on the configuration of the disposal field. An increase in LTAR should be based on soil texture and the quality of effluent entering the soil. The quality of effluent in relation to LTAR should be given consideration like the disposal field configuration.	AD: add a LTAR category for NSF -40 secondary treatment products
0.906	85	8 and 9	Pressure distribution shall be used when the total dispersal field line length exceeds 600 linear feet in a single system. Which rule applies?	Broaden the rule language to incorporate other methods of disposal.	CH: remove the "pressure dispersal" reference and open the regulations to other methods of wastewater distribution. The language used should allow for other options beside just pressure dispersal. Simplify the rules by deciding on a single GPD and linear footage limit requirement for all system-not something different for each category.

0.906	85	10 and 11	Pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system.	Broaden the rule language to incorporate other methods of disposal.	CH: remove the "pressure dispersal" reference and open the regulations to other methods of wastewater distribution. The language used should allow for other options beside just pressure dispersal. Simplify the rules by deciding on a single GPD and linear footage limit requirement for all system-not something different for each category.
0.906	84	21	are installed shall be no deeper than 24 inches below finished grade.	This rule restricts system depth on all sites. Some Piedmont soils improve with depth.	CH: Change language or replace/Look at grammar
0.1201	103	10 and 11	(d) When using advanced treatment systems, one of the following modifications to system siting and sizing criteria may be approved pursuant to Rules of this Section:	Change the word "one" to all	RE: Change "one" to "all"
0.1202	103	26	**Table XXII.** Minimum usable soil depth and vertical separation to SWC* or USC** for systems 1,500 /Gives advantages to LPP over gravity	All advantages given should be based on effluent quality not disposal method	CH/RE: Change language or replace
0.1202	104		**Table XXIII.** Minimum usable soil depth and vertical separation to SWC* or USC** for systems less than or equal to 1500 gallons per day/Gives advantages to LPP over gravity	All advantages given should be based on effluent quality not disposal method	CH/RE: Change language or replace
0.1203	105	20	4) Pressure dispersal shall be utilized.	Broaden the rule language to incorporate other methods of disposal.	CH/AD: remove the "pressure dispersal" reference and broaden the regulations to include other methods of wastewater distribution. The language used should allow for other disposal options beside just pressure dispersal.
0.1203	106	1	Pressure dispersal shall be utilized. Same as above	Broaden the rule language to incorporate other methods of disposal.	CH/AD: remove the "pressure dispersal" reference and broaden the regulations to other methods of wastewater distribution. The language used should allow for other disposal options beside just pressure dispersal.
0.1203	106	13	LTAR shall not be increased when advanced treatment is added to an existing wastewater system.	Rule should be written to encourage the use of advanced treatment	CH/RE: Change language or replace
0.1205	107	18	**15A NCAC 18E .1205 Pressure dispersal shall be utilized.**	Pressure dispersal should not be the only option. The rule should be broadened to encourage innovation and the use of other disposal methods.	CH/RE: Change language or replace
0.1205	108	10 and 11	shall not be reduced by more than 50 percent when compared to a conventional wastewater system.	Rule should not limit the reduction limit without knowing what technology is to be used. Rule should not limit innovation.	Change language
0.1205	108	12	LTAR shall not be increased when advanced treatment is added to an existing wastewater system.	Rule should be written to encourage the use of advanced treatment	CH/RE: Change language or replace
0.1207	114	27 to 29	Pressure dispersal shall be utilized.	Pressure dispersal should not be the only option. The rule should be broadened to encourage innovation and the use of other disposal methods.	CH/RE: Change language or replace
0.1208	115	16 and 17	on sites with a design flow not to exceed 600 gallons per day may be permitted	Bed systems shall be limited to 600 gallons per day design daily flow. What is the basis for 600 gpd? The flow and linear footage requirements throughout the rules are random and appear to be arbitrary. Simplify the rules by establishing one standard.	CH: Simplify the rules by establishing one standard for flow and linear footage requirements
0.1208	118	9 to 11	**15A NCAC 18E .1208 the bed or beds shall not be located directly beneath the treatment components, and a pressure dispersal system is utilized to distribute flow uniformly throughout the bed area;**	Change language to allow for combined treatment and disposal	CH/RE: Change language or replace
0.1208	116	22	In no case shall the slope exceed 10 percent.	Increase the percent slope allowed	CH: 25% slope limit is recommended for a bed utilizing treatment
0.1208	120	1 to 3	Effluent shall be distributed to the beds by a pressure dispersal system.	Pressure dispersal should not be the only option. The rule should be broadened to encourage innovation and the use of other disposal methods.	CH/RE: Change language or replace
0.1208	120	9	The design daily flow shall not exceed 480 gallons	Establish some consistency with various flow rates	CH: We recommend using 1500 gpd
0.1208	120	10	pressure dispersal is used.	Pressure dispersal should not be the only option. The rule should be broadened to encourage innovation and the use of other disposal methods.	CH/RE: Change language or replace
0.1208	116	3	**15A NCAC 18E .1208 On sites where the soil texture is Group I or II the LTAR may be increased by a factor of 1.125, with no further reduction in bed size allowed**	*Reference 15A NCAC 18A.1957(c)(5)© The LTAR for ATUs may be increased 25percent for Group I or Group II soils.*	CH: Why are the LTAR recommendations from Reference 15A not being adhered to for ATU's like the other products. It appears that ATU's are being held to a stricter standard. Why?
0.1208	117	32	The LTAR shall not exceed 1.0 gallons per day per square foot.	Soil texture is the major soil characteristic that determines the LTAR for any given soil	CH: Base the LTAR on soil texture or other LTAR criteria. We do not recommend a one size fits all situations standard in this case.

[15A NCAC 18E .0904 is proposed for adoption as follows: [CPP10/22/2017]

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of 8-inch, and 10-inch (inside diameter) corrugated, polyethylene tubing installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 1.0 gpd/ft^2. To calculate trench length in accordance with Rule .0901 (c) of this Section, an equivalent trench 36-inch width of two feet shall be used for eight-inch pipe, and an equivalent trench width of two and one-half feet shall be used for ten-inch pipe.

(d) LDP tubing shall be backfilled with concrete sand to the spring line or horizontal midpoint or factory enclosed in a filter wrap. Corrugated tubing, perforations, and fittings shall meet the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667.

(2) The corrugated tubing shall have two rows of holes, each hole to be between three-eights inch and one-half inch in diameter, located 10 degrees apart along the bottom half of the pipe (each 60 degrees from the bottom center line and staggered so that one hole is present in the valley of each corrugation;

(3) The tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) When the LDP is not installed in concrete sand the corrugated tubing shall be covered with a filter wrap at the factory;

(5) filter wrap, when used, shall be spunbonded, or spunlaced nylon, polyester, or nylon/polyester blend filter wrap meeting the minimum requirements in Table XVIII;

(6) the large diameter pipe with filter wrap, when used, shall be encased in a black polyethylene plastic sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

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 0.5 inches of water

(e) LDP system installed in Soil Group I Soils shall be backfilled with concrete sand in compliance with ASTM C-33 to the midpoint or spring line of the LDP system and in other soils where the LDP System is not fabric wrapped,

(f) LDP system installations shall be in accordance with Rule .0901(d) of this Section, the manufacturer's specifications and the following:

(1) trenches shall shall be excavated to a minimum width of the outside diameter of the LDP system;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet) and the trench bottom shaped to match the circumference of the LDP system;

(3) the LDP system shall be backfilled with native soil that is free of trash or debris;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight-inch, 10-inch, shall be six feet except when dispersal trenches are excavated by hand and without mechanical equipment when the minimum spacing shall be 5 feet on centers.

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

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[15A NCAC 18E .0904 is proposed for adoption as follows: [CPP10/22/2017]

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

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(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 1.0 gpd/ft^2. To calculate trench length in accordance with Rule .0901 (c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe, and an equivalent trench width of two and one-half feet shall be used for ten-inch pipe.

(d) LDP tubing shall be backfilled with concrete sand to the spring line or horizontal midpoint or factory enclosed in a filter wrap. Corrugated tubing, perforations, and fittings shall meet the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667.

(2) The corrugated tubing shall have two rows of holes, each hole to be between three-eights inch and one-half inch in diameter, located 10 degrees apart along the bottom half of the pipe (each 60 degrees from the bottom center line and staggered so that one hole is present in the valley of each corrugation;

(3) The tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) When the LDP is not installed in concrete sand the corrugated tubing shall be covered with a filter wrap at the factory;

(5) filter wrap, when used, shall be spunbonded, or spunlaced nylon, polyester, or nylon/polyester blend filter wrap meeting the minimum requirements in Table XVIII;

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(e) LDP system installed in Soil Group I Soils shall be backfilled with concrete sand in compliance with ASTM C-33 to the midpoint or spring line of the LDP system and in other soils where the LDP System is not fabric wrapped,

(f) LDP system installations shall be in accordance with Rule .0901(d) of this Section, the manufacturer's specifications and the following:

(1) trenches shall shall be excavated to a minimum width of the outside diameter of the LDP system;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet) and the trench bottom shaped to match the circumference of the LDP system;

(3) the LDP system shall be backfilled with native soil that is free of trash or debris;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for LDP shall be six feet except when dispersal trenches are excavated by hand and without mechanical equipment when the minimum spacing shall be 5 feet on centers.

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

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DELAWARE

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DIVISION OF WATER

GROUNDWATER DISCHARGES SECTION

Statutory Authority

7 **Delaware Code** Chapter 60

REGULATIONS GOVERNING THE DESIGN, INSTALLATION AND OPERATION OF ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

ADOPTED: January 4, 1985

EFFECTIVE: January 4, 1985 Sections 1.00000, 2.00000, 3.00000, 7.00000, 9.00000 and Exhibits
May 1, 1985 Section 4.00000
July 10, 1985 Sections 5.00000, 6.00000, 8.00000 and 10.00000

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August 15, 1986
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9 General Lysimeter Construction and Sampling Guidelines

FOREWORD

The Delaware Department of Natural Resources and Environmental Control (the Department) finds that a substantial portion of the State's population lives where centralized water supplies or wastewater treatment services are limited. It is the intent of the Department to aid and assist the public in the installation of on-site wastewater treatment and disposal systems, where possible, by utilizing the best information, techniques and soil evaluations for the most suitable system that site and soil conditions permit.

Statewide regulations governing the installation and operation of wastewater treatment and disposal systems have existed since 1968. Inappropriate installations and poor operation and maintenance practices have resulted in treatment and disposal system malfunctions. Inadequately renovated wastewater has contaminated the State's groundwater and is presenting a threat to the public health, safety, and welfare. Corrective measures require the replacement of water supply and wastewater systems, sometimes at a very high cost, which is sometimes borne by the general public. As such the Department's regulations governing the site evaluation, siting density, installation, operation and maintenance of on-site wastewater treatment and disposal systems have been identified as requiring revisions.

Through a process that included considerable staff research, consultant studies, the development of background "working papers", interaction with public/private sector on-site wastewater industry professionals, public meetings and presentations, public workshops, a public hearing and a hearing officer's report along with draft versions of this Regulation were prepared, reviewed and revised. This final version is the result of those various activities, and incorporates, as best as possible, all valid concerns into its provisions.

They are based on the best information available and include the establishment of a process for updating this Regulation as information changes. They include what are considered to be the best engineered design standards for on-site systems, as determined by research and practical experience. These Regulations seek to require the use of on-site wastewater treatment and disposal systems and slow rate land treatment systems that will function according to their performance criteria without causing the State's groundwater resources to violate U. S. Environmental Protection Agency Drinking Water Standards on an average annual basis.

This document also provides for the planning, design, and operation of slow rate land treatment systems for wastewaters in Delaware. The term slow rate land treatment as used in these regulations refers to the advanced treatment of wastewater by irrigation onto land to support vegetative growth. These systems are designed and operated so there is no direct discharge to surface waters. The irrigated wastewater evaporates and transpires to the atmosphere or enters the groundwater through percolation. Organic constituents in the wastewater are stored in the soil or stabilized by soil bacteria. Properly designed and operated wastewater irrigation systems produce a percolate water of high quality and thus protect ground and surface water resources.

The proper siting of wastewater treatment and disposal systems is addressed by the establishment of various soil criteria and hydrogeologic criteria which lead to the selection of the most suitable on-site wastewater treatment and disposal system for local conditions. System selection and sizing are determined using the results of the site specific soil evaluations, infiltrometer tests and/or hydrogeologic suitability investigations. Soil evaluation and system selection, design, installation, operation and maintenance are required to be performed by individuals licensed under these Regulations.

Although it has not been possible to include every method of on-site treatment and disposal, the Department's policy is to encourage development of new systems, processes and techniques which may benefit significant numbers of people within Delaware. It is expected that these Regulations will be reviewed and revised periodically and that standards for future methods of wastewater treatment and disposal will be evaluated as more experience and research data become available. The Regulations contain provisions that enable that process to occur.

1.0 AUTHORITY AND SCOPE

1.1 These Regulations are adopted by the Secretary of the Department of Natural Resources and Environmental Control under and pursuant to the authority set forth in 7 **Del.C.** Ch. 60.

1.2 These Regulations shall apply to all aspects of:

1.2.1 The planning, design, construction, operation, maintenance, rehabilitation, replacement, inspection and modification of on-site wastewater treatment and disposal systems within the boundaries of the State of Delaware; and

1.2.2 The planning, design, construction and operation and maintenance of on-site wastewater holding tanks within the boundaries of the State of Delaware; and

1.2.3 The licensing of percolation testers, on-site wastewater treatment and disposal system designers, soil scientists, on-site wastewater treatment and disposal system contractors, system inspectors and liquid waste haulers within the boundaries of the State of Delaware.

1.3 These Regulations shall supersede and replace the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems and the Guidance and Regulations Governing the Land Treatment of Wastes, Part II. With respect to the other provisions of the Regulations Governing the Control of Water Pollution these Regulations shall supersede such Regulations only to the extent of any inconsistency. These Regulations shall apply throughout the State of Delaware.

1.4 The Department has the authority to establish and collect fees for the defraying of expenses incurred by the Department for facilities and services needed to provide for the administration of its programs. The authority is contained within 68 **Del. Laws C.** 86 §14, which also contains the schedule of fees.

2.0 DEFINITIONS

2.1 The following words and terms, when used in this Regulation, shall have the following meaning unless the text clearly indicates otherwise:

"**Absorption facility**" means a system of open jointed or perforated piping, alternative distribution units or other seepage systems for receiving the flow from septic tanks or other treatment facilities and designed to distribute effluent for oxidation and absorption by the soil within the zone of aeration.

"**Advanced treatment unit**" means any process designed to produce an effluent of higher quality than normally achieved by secondary treatment processes or containing unit operations not normally found in secondary treatment which also incorporates nutrient removal processes that achieve PSN3 requirements.

"**Affidavit of Ownership**" means a formal sworn statement of ownership, signed by the declarant (who is called the affiant or deponent) and witnessed (as to the veracity of the affiant's signature) by a taker of oaths, such as a notary public.

"**Aggregate-free chambers**" means a buried structure used to create an enclosed unobstructed soil bottom absorption area and side-wall absorption area for infiltration and treatment of wastewater which can be used to replace the filter aggregate and distribution pipe in an absorption facility.

"Agricultural land" means land cultivated for the production of crops or used for raising livestock.

"Agricultural wastes" means wastes normally associated with the production and processing of food and fiber on farms, feedlots, ranches, ranges, and forests which may include animal manure, crop residues, and dead animals; also agricultural chemicals, fertilizers and pesticides which may find their way into surface and subsurface water.

"**Agricultural well**" means a non-potable well used for watering livestock, aquaculture, or watering household yards and gardens, or for other purposes related to farming but not for irrigating lands or crops.

"**Alternating system**" means two or more disposal fields, equal in size with dosing provided alternatively to each field.

"**Applicant**" means the owner or legally authorized agent of the owner as evidenced by sufficient written documentation who has submitted an application to the Department for review and approval.

"**Authorization to use existing system permit**" means a written document issued by the Department which states that an on-site wastewater treatment and disposal system appears adequate to serve the purpose for which a particular application is made and that the system may be placed into operation.

"**Aquifer**" means a part of a formation, a formation, or a group of formations that contains sufficient saturated permeable material to yield economically useful quantities of water to wells and springs.

"**Authorized agent**" means a person given the authority to act on the owner's behalf for filing an application with the Department either to sign on behalf of the owner or to act as the contact person to receive all correspondence.

"**Backfill**" means a soil which is clean and free of foreign debris, placed over the disposal area and fill extensions.

"**Biosolids**" means the nutrient-rich organic materials resulting from the treatment of sewage sludge: the solid, semisolid or liquid untreated residue generated during the treatment of domestic sewage in a treatment facility.
"**Blackwater**" means waste carried off by toilets, urinals, and kitchen drains.
"**BOD_5**" means biochemical oxygen demand which is the amount of oxygen required by bacteria to stabilize decomposable organic matter under aerobic conditions.
"**Building drain**" means the piping coming from inside a building that extends five (5) feet beyond the exterior walls of the building and conveys wastewater to the building sewer.
"**Building sewer**" means piping which carries wastewater from a building drain to the first component of the treatment and disposal system.
"**Capping fill gravity**" means a gravity fed on-site wastewater treatment and disposal system which maintains a minimum 36 inches of separation distance above the limiting zone where the trench or bed is installed between 12 and 23 inches into the natural soil below a soil cap of a specified depth and texture.
"**Certified service provider**" means any of the following responsible parties:

- An individual representative of a manufacturer/supplier who holds a DNREC Class E System Contractor or Class H System Inspector license; or,
- A Class E System Contractor who is certified, through DNREC approved training, on the operation and maintenance of the advanced treatment unit or system; or,
- A Class H System Inspector who has become certified through DNREC approved training on the operation and maintenance of the advanced treatment unit or system; or,
- A Homeowner who has obtained DNREC individual homeowner service provider certification and has been certified through DNREC approved training on the operation and maintenance of the advanced treatment unit or system. The DNREC homeowner certification allows the homeowner to operate and maintain their Innovative/Alternative system at their primary residence only.

"**Cesspool**" means a covered pit, with a porous lining, into which wastewater is discharged and allowed to seep or leach into the surrounding soils with or without an absorption facility. **Note:** Cesspools cannot be certified for real estate transfers.
"**Class H inspection**" means the inspection of an existing OWTDS by an individual licensed as Class H system inspector by the Department to inspect, investigate and collect data detailing the current operating condition and type of system on Department authorized forms as observed on a specific date and time.
"**Commercial facility**" means any structure or building, or any portion therefore, other than a residential dwelling.
"**Community system**" means an on-site wastewater treatment and disposal system which serves more than three (3) lots, parcels, condominium units or units of a planned unit development.
"**Completed application**" means the application form is properly completed in full, is signed by the applicant, is accompanied by all required documents, exhibits, detailed plans and specifications, and required fee.
"**Confined aquifer**" means a saturated layer of permeable geologic material bounded above and below by confining layers, and in which water pressures are greater than atmospheric.

"**Confining layer**" means a stratum of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.
"**Construction permit**" means a permit issued by the Department for the construction, repair or replacement of an on-site wastewater treatment and disposal system.
"**Construction report**" means a Department approved form prepared by the contractor and submitted to the Department within 10 calendar days after the absorption facility has been completely installed.
"**Conventional on-site wastewater treatment and disposal systems (OWTDS)**" means those small systems which are referred to as; gravity, low pressure pipe, pressure-dosed, Wisconsin at-grade and elevated sand mound.
"**Crops**" means a plant growing where it is desired for man and his welfare as opposed to weeds which interfere with the activities of man, his welfare and are growing where it is undesirable.
"Crops for direct human consumption" means crops that are consumed by humans without processing to minimize pathogens before distribution to the consumer.
"**Declaration of Covenants & Restrictions**" means a legal obligation imposed by the seller upon the buyer of real estate.
"**Department**" means the Department of Natural Resources and Environmental Control of the State of Delaware (DNREC).
"**Developer**" means a person, persons, partnership, firm, corporation or cooperative enterprise undertaking and/or participating in the development of a subdivision, manufactured home community, or multi-unit housing project.
"**Director**" means the Director of the Division of Water for the State of Delaware or his/her authorized representative.
"Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of wastewater, other liquid waste, or any constituent of it on or in the land, the air or any waters, including groundwater, and includes any method of utilization that involves reuse of the nutrients at greater than agronomic rates.
"**Disposal area**" means the entire area used for the absorption facility.
"**Distributed wastewater**" means treated and filtered wastewater provided for disposal, reuse or any other purpose consistent with the intent of these Regulations.
"**Distribution box**" means a box for distributing wastewater equally to separate distribution laterals of the absorption facility by means of gravity.
"**Distribution system**" means piping or other devices used in the distribution of wastewater within the absorption facility (also referred to as distribution laterals).
"**Domestic waste**" means solid waste, composed of garbage and rubbish, which normally originates in a private home or apartment house and may contain toxic or hazardous waste.
"**Dosing**" means the pumped or regulated flow of wastewater to the absorption facility.
"**Dosing chamber**" means a tank/receptacle for retaining effluent until pumped by timing and/or measured volumes to the pressurized absorption facility.
"**Down gradient**" means an area that has a lower potentiometric surface (hydraulic head) than a comparative reference point.

"**Dwelling**" means any structure or building, or any portion thereof which is used, intended, or designed to be occupied for human living purposes including, but not limited to, houses, houseboats, boathouses, mobile homes, manufactured homes, travel trailers, hotels, motels, apartments and condominiums.

"**Easement**" means an interest in land owned by another that entitles its holder to a specific limited use or enjoyment.

"**Effluent**" means the wastewater flow from a tank or treatment process.

"**Effluent filter**" means a device placed in the outlet compartment of a septic tank which conforms to ANSI/NSF Standard 46 for the purpose of removing particulate matter before the effluent enters the absorption facility.

"**Effluent line**" means the pipe beginning at the treatment unit or septic tank and terminating at the absorption facility.

"**Elevated sand mound**" means an on-site wastewater treatment and disposal system which maintains a minimum 36 inches of separation distance above the limiting zone in which wastewater is pressurized into suitable fill material constructed above existing grade.

"**Emergency permit**" means a permit allowing a repair and/or replacement of a broken system component on an emergency basis where immediate action is necessary to protect public health. Repairs/replacements of this kind are considered emergencies occurring when Department offices are closed. Repairs and/or component replacements to cesspools, seepage pits or tank(s) associated with cesspools/seepage pits are not permitted unless approved by the Department.

"**Encumbrance**" means anything non-financial that affects or limits the area available to site, design and install an OWTDS on a property such as easements, right of ways and restrictions. The Department also includes, but is not limited to, these physical encumbrances; dwellings, outbuildings, driveways, or concrete pads.

"**Engineered sandy fill**" means sand that must have a uniformity coefficient of < 5. A minimum of 95% by weight must pass through a #4 sieve and a maximum of 10% by weight through a #100 sieve.

"**Escarpment**" means any naturally occurring slope greater than 30% which extends vertically six (6) feet or more as measured from top to toe, and which is characterized by a long cliff or steep slope which separates two (2) or more comparatively level or gently sloping surfaces, and may intercept one (1) or more layers that limit soil depth.

"**Existing on-site wastewater treatment and disposal system**" means any installed on-site wastewater treatment and disposal system constructed in conformance with the rules, laws and local ordinances in effect at the time of construction or which would have conformed satisfactorily to the system design provided for in Department regulations.

"**Fill**" means soil material which has been transported to and placed over the original soil or bedrock and is characterized by a lack of distinct horizons or color patterns as found in naturally developed, undisturbed soils.

"**Filter aggregate**" means washed gravel or crushed stone ranging in size from $^{3}/_{4}$" to $2^{1}/_{2}$" in any dimension and clean and free of fine materials (dust) and meeting grading specifications in Section 5.4.2.

"**Filter fabric**" means any material approved by the Department which is permeable but does not allow soil particles to pass through for the purpose of protecting the filter aggregate or aggregate free chambers within the absorption facility.

"Food chain crops" means tobacco, crops grown for human consumption, and crops grown to feed animals whose products are consumed by humans.

"Free liquids" means liquids which readily separate from the solid portion of a waste under the following tests:

- EPA Plate Test. Place a 1 to 5 kilogram (2.2 to 11.0 lbs.) sample of waste on a level or slightly sloping plate of glass or other similarly flat and smooth solid material for at least 5 minutes. If a liquid phase separation is observed, the waste contains free liquids.
- EPA Gravity Test. The test protocol calls for a 100 ml representative sample of the waste from a container to be placed in a 400 micron conical paint filter for 5 minutes. The filter specified is a standard paint filter which is commonly available at hardware and paint stores. The filter is to be supported by a funnel on a ring stand with a beaker or cylinder below the funnel to capture any free liquid that passes through the filter. If any amount of free liquid passes through the filter, the waste is considered to hold free liquids.

"**Full depth gravity**" means a gravity fed on-site wastewater treatment and disposal system which maintains a minimum of 36 inches of separation distance above the limiting zone where the trench or bed is generally installed 24 inches into the natural soil.

"**Governmental appointee**" means any state, county, municipal employee or someone contracted by any of these agencies for the purpose of doing official business for the business aspects of the State.

"**Governmental unit**" means the state, any county, municipality, or any part thereof.

"**GPD**" means gallons per day.

"**Grade**" means the inclination or slope of a conduit, ground or plane surface.

"**Greywater**" means the untreated wastewater that has not come into contact with toilet waste. Greywater includes wastewater from bathtubs, showers, bathroom wash basins, clothes washing machines, laundry tubs and other wastewater which does not present a threat from contamination by unhealthy processing, manufacturing or operating wastes. It does not include wastewater from kitchen sinks or dishwashers.

"**Grease trap**" means a watertight tank for the collection and retention of grease which is accessible for periodic removal.

"**Groundwater**" means any water naturally found under the surface of the earth.

"**High potential for phosphorus mobility**" means an area where:

- The site's soils have a Fertility Index Value (FIV) of greater than 100 for phosphorus or a soil test value of over 100 parts per million (ppm) by the Mehlich 3 soil test; and
- The groundwater phosphorus content is above 0.034 mg/L and there is an indication that groundwater is anoxic due to low dissolved oxygen or oxidation reduction potential below 200 mV; and
- The disposal area contains soils with a seasonal high water table above 27 inches.

"**Holding tank**" means a watertight receptacle used to store wastewater prior to being removed by a licensed waste hauler.

"**Hydraulic conductivity**" means a specific mathematical coefficient (quantitative) that relates the rate of water movement to the hydraulic gradient. A term of Darcy's

law Q = KAi where K represents hydraulic conductivity and is the current standard for measuring a soils ability to transmit water.

"Hydrogeologic suitability report (HSR)" means a report that characterizes the hydrogeologic properties present on a given site through direct observations and computer modeling.

"**Impervious strata and formation**" means an underground or surface layer of soil or rock which will not allow water to pass through it at a rate permissible for subsurface disposal and having a percolation rate > 120 minutes per inch.

"**Infiltrometer**" means a device for measuring the rate of entry of liquid into soil; single or double rings that may be read by falling or constant head methods.

"**Innovative/Alternative treatment and disposal system**" means a wastewater treatment and/or disposal system not specified in these regulations which has been proven to provide at least an equivalent level of treatment as the conventional systems as defined in these regulations. Also referred to as alternative technologies.

"**Interceptor drain**" means a gravel trench excavated and installed to collect and remove groundwater. The trench is typically placed across a contour of a slight to moderate sloping area to intercept groundwater at a higher elevation than an on-site wastewater treatment and disposal system.

"**Invert**" means the floor, bottom or lowest portion of the internal cross section of a closed conduit or structure.

"**Isolation distance**" means the horizontal distance between a system component and selected site features or structures.

"Land application" means the placement of liquid waste or treated liquid waste within two (2) feet below the surface of land used to support vegetative growth.

"Land treatment" means a technology for the intimate mixing or dispersion of wastes into the upper zone of the plant-soil system with the objective of microbial stabilization, immobilization, selective dispersion, or crop recovery leading to an environmentally acceptable assimilation of the waste.

"**Large system**" means any on-site wastewater treatment and disposal system with a projected wastewater design flow rate greater than or equal to 2,500 gallons per day.

"**Lease**" means an agreement by which an owner of property (lessor) transfers the possession, control, use, or enjoyment of the property to another (lessee) for a specified term.

"**Lessee**" means a person who holds the right to possession, control, use, or enjoyment of property by means of an agreement (lease) with the property owner.

"**Lift package**" means a pre-engineered package which includes pump, filter, floats and alarm that is specifically designed to be installed in the liquid (effluent) side of a standard septic tank.

"**Lift station**" means a pre-engineered tank/receptacle package which includes pump, filter, floats and alarm or pre-engineered "lift package" inserted into the liquid (effluent) side of a standard septic tank. The lift station is designed to overcome slope differentials for pumping effluent to another system component for gravity distribution.

"**Limited public access**" means public access is limited to specific periods of time and spraying activities occur when the public is excluded from accessing the site.

"**Limiting zone**" means any horizon or condition in the soil profile or underlying strata which includes:

- The presence of seasonal or perennial saturation in some part or all of the soil matrix as evidenced by redoximorphic features or direct measurement of piezometers and/or observation wells; or
- Layers with a measured or estimated percolation rate of 120 mpi or slower; or
- Rock with open joints, fractures or solution channels, masses of loose rock fragments, or loose weathered rock, including gravel, with insufficient fine soil to fill the voids between the fragments; or
- Geologic stratum or soil zone in which the permeability of the stratum or zone effectively limits the movement of water
    - For large systems – maximum height of the projected seasonal high groundwater mound

"Liquid waste" means any waste which is not a solid waste as defined for the purposes of these Regulations.

"**Lot**" means a portion of a subdivision or parcel of land.

"**Low pressure pipe capping fill**" means a pressurized on-site wastewater treatment and disposal system which is installed as trenches and maintains a minimum 18 inches of separation distance above the limiting zone. Trenches are installed between 9-17 inches into natural soil below a soil cap of a specified depth and texture.

"**Low pressure pipe full depth**" means a pressurized on-site wastewater treatment and disposal system which is installed as trenches and maintains a minimum 18 inches of separation distance above the limiting zone. Trenches are installed 18 inches into natural soil.

"**Lysimeter**" means an instrument (pore-liquid sampler) for sampling the water percolating through soils that will be used to determine the nutrients and their levels dissolved in the water percolate.

"**Malfunctioning system**" means a system which is not adequately renovating or hydraulically eliminating the wastewater it is receiving as evidenced by, but not limited to, the following conditions:

- Failure of a system to accept wastewater discharge or the backup of wastewater into the structure served by the system.
- Direct discharge of wastewater to the surface of the ground, surface water, or groundwater without adequate renovation.

"**Manifold**" means a pipe with numerous branches to convey effluent between a large pipe and several smaller pipes, or to permit choice of diverting flow from one of several sources or to one of several discharge points.

"**Manufactured home**" means a home built entirely in the factory under a federal building code administered by the Department of Housing and Urban Development (HUD). Manufactured homes may be single or multi-sectioned and are transported to the site and installed.

"**Mineral soil**" means a soil that is saturated with water less than 30 days (cumulative) per year in normal years and contains less than 20% (by weight) organic carbon; or is saturated for greater than 30 days or more cumulative in normal years, and has an organic carbon content (by weight) of less than 18% if the mineral fraction contains 60% or more clay; or less than 12% if the mineral fraction contains no clay.

"**Monitor well**" means a non-potable well used primarily for collecting groundwater samples.

"**Mottling**" means a soil irregularly marked with spots of different colors that vary in number and size which may indicate seasonal or perennial saturation in some part or all of the soil matrix and geogenic in nature.

"**Non-Hazardous liquid waste**" means any industrial waste or sewage or other wastes or any combination thereof which may potentially alter the chemical, physical or biological integrity of water from its natural state. For the purpose of this regulation this includes septage, sewage, grease trap/cooking oil waste, municipal or industrial biosolids, biosolids from package treatment plants, etc.

"**New system**" means a proposed system which has not started the initial steps of the permitting process (e.g. site evaluation for small and letter of intent for large). Note: An expansion of an existing (in place) system, including any modification of treatment or disposal methodologies, is not considered a new system.

"**Observation well**" means a non-pumping, non-potable well used for measuring groundwater levels or potentiometric surface.

"**Offset**" means compensating for the loading of a pollutant of concern from a point or nonpoint source with a reduction in the loading from a different source or sources, in a manner consistent with meeting water quality standards.

"**On-site wastewater treatment and disposal system**" means conventional or innovative/alternative wastewater treatment and disposal systems installed or proposed to be installed on land of the owner or on other land to which the owner has the legal right to install the system.

"**On-site regulations**" means the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems.

"**On-site system advisory board (Board)**" means a panel of licensee's representing the on-site industry, asked to serve by the Secretary, on all matters pertaining to the issuance, suspension, discipline and revocation of all on-site licenses and licensees.

"**Owner**" means the person who has a vested legal or equitable title to real or personal property, including an on-site wastewater treatment and disposal system.

"**Percolation rate**" means the rate of water movement through a soil. Percolation rate is usually measured and assigned on the basis of elapsed time per unit volumetric water level drop. The most commonly used unit for expressing percolation rate is minutes per inch (mpi).

"**Performance standard nitrogen level 1 (PSN1)**" means where total nitrogen levels achieve either:

• An average annual concentration of 5 mg/L (parts per million (ppm)) total nitrogen in effluent sampled at the end-of-pipe of the advanced treatment unit; or

• A 90% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration; or

• An average annual concentration of 5 mg/L beneath any permitted on-site wastewater treatment and disposal system as verified by in-field monitoring provided that the design percolate concentration does not exceed 5 mg/L on an average annual basis.

"**Performance standard nitrogen level 2 (PSN2)**" means where total nitrogen levels achieve either:

• An average annual concentration of 10 mg/L (ppm) total nitrogen in effluent sampled at the end-of-pipe of the advanced treatment unit; or

• An 80% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration; or

• An average annual concentration of 10 mg/L beneath any permitted on-site wastewater treatment and disposal system as verified by in-field monitoring provided that the design percolate concentration does not exceed 10 mg/L on an average annual basis.

"**Performance standard nitrogen level 3 (PSN3)**" means where total nitrogen levels achieve either:

• An average annual concentration of 20 mg/L (ppm) total nitrogen in effluent sampled at the end-of-pipe of the advanced treatment unit; or

• A 50% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration at the end-of-pipe of the advanced treatment unit; or

• A 50% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration beneath any permitted on-site wastewater treatment and disposal system as verified by in-field monitoring or third party test results.

"**Performance standard phosphorus level 1 (PSP1)**" means where total phosphorus levels achieve either:

• An average annual concentration of 4 mg/L (ppm) total phosphorus in effluent sampled at the end-of-pipe of the advanced treatment unit; or

• A 75% reduction in effluent total phosphorous concentration when compared to the influent total phosphorus; or

• An average annual concentration of 4 mg/L beneath any permitted on-site wastewater treatment and disposal system as verified by in-field monitoring provided that the design percolate concentration does not exceed 4 mg/L on an annual average basis.

"**Performance standard phosphorus level 2 (PSP2)**" means where total phosphorus levels achieve:

• An average annual concentration of 8 mg/L (ppm) total phosphorus in effluent sampled at the end-of-pipe of the advanced treatment unit; or

• A 50% reduction in effluent total phosphorous concentration when compared to the influent total phosphorus; or

• An average annual concentration of 8 mg/L beneath any permitted on-site wastewater treatment and disposal system as verified by in-field monitoring provided that the design percolate concentration does not exceed 8 mg/L on an annual average basis.

"**Permeability**" means the property of a soil horizon that enables the soil to transmit gases, liquid, or other substances.

"**Permit**" means the written document approved by the Department which authorizes the installation of a system or any part thereof, which may also require operation and maintenance of the system.

"**Permittee**" means any individual, partnership, corporation, association, institution, cooperative enterprise, agency, municipality, commission, political subdivision or duly established entity to which a permit is issued.

"**Person(s)**" means any individual, trust, firm, joint stock company, federal agency, partnership, corporation (including a government corporation), association, state, municipality, commission, political subdivision of a state, any interstate body and other legal and commercial entities.

"**Piezometer**" means an alternative word for an observation well.

"**Platy structure**" means soil aggregates that are developed predominantly along the horizontal axis, laminated and flaky; commonly used to indicate compaction on many coastal plain soils.

"**Pollution or water pollution**" means any alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.

"**Potentiometric surface**" means a surface that represents the level to which water will rise in tightly cased wells.

"**Pressure-dosed capping fill**" means a pressurized on-site wastewater treatment and disposal system which maintains a minimum 36 inches of separation distance above the limiting zone where the trench or bed is installed between 12 and 23 inches into the natural soil below a soil cap of a specified depth and texture.

"**Pressure-dosed full depth**" means a pressurized on-site wastewater treatment and disposal system which maintains a minimum 36 inches of separation distance above the limiting zone where the trench or bed is installed 24 inches into the natural soil.

"**Pressurized distribution**" means a network of piping with orifices designed to evenly distribute wastewater under pressure through the entire absorption facility.

"**Primary treatment**" means a wastewater treatment process that takes place in a tank and allows those substances in wastewater that readily settle or float to be separated from the water being treated.

"**Professional engineer**" means a person registered by the Delaware Association of Professional Engineers to practice professional engineering in the State of Delaware.

"**Professional geologist**" means a person registered by the Delaware State Board of Professional Regulation to practice professional geology in the State of Delaware.

"**Professional soil scientist**" means a person registered by the ARCPACS (a federation of certifying boards in Agriculture, Biology, Earth and Environmental Sciences) to practice professional soil science in the State of Delaware.

"**Project site**" means the total area within the property lines of an individual lot or within the division lines of a parcel or subdivision.

"**Public health hazard**" means a condition whereby there are sufficient types and amounts of biological, chemical or physical, including radiological, agents relating to water or sewage which are likely to cause human illness, disorders or disability. These include, but are not limited to, pathogens, viruses, bacteria, parasites, toxic chemicals, and radioactive isotopes.

"**Public service commission**" means an agency created to regulate investor-owned public utilities. The Delaware Public Service Commission (PSC) works to ensure

safe, reliable and reasonably priced cable, electric, natural gas, wastewater, water and telecommunications services for Delaware consumers.

"Rapid infiltration basins" means earthen basins designed for a repetitive cycle of flooding, infiltration/percolation, and drying of treated wastewater.

"**Redoximorphic features**" means characteristic soil patterns formed by the reduction, translocation and oxidation of iron and manganese oxides. The occurrence of these features may be indicative of seasonal or perennial saturation in some part or the entire soil matrix.

"**Reducing condition**" means a geochemical condition where dissolved oxygen is depleted (< 1 mg/L).

"**Regeneration water**" means all water consumed in the regeneration steps: backwash, regeneration (brining), dilution (and brine displacement), and rinse. Raw water or treated water may be used for the rinse down.

"**Regional wastewater treatment and disposal facility**" means a large on-site wastewater treatment and disposal system which serves any entity within the designated service area(s) approved by the Public Service Commission.

"**Repair**" means any modification to an existing on-site wastewater treatment and disposal system necessary to fix a problem or malfunction.

"**Replacement system**" means a new on-site wastewater treatment and disposal system to replace the existing on-site wastewater treatment and disposal system.

"**Responsible party**" means the person, corporation, owner, utility or other entity that will assume full financial and operational control of the facility.

"**Sand**" means individual mineral particles in a soil that range in diameter from the upper limit of silt (0.05 millimeters to 2.0 millimeters).

"**Sand-lined system**" means a type of seepage trench or seepage bed absorption facility constructed in the sandy fill material below the natural soil surface and may require pressurization. The sandy fill material is used to replace a natural impermeable or slowly permeable soil layer or to completely remove an existing absorption facility.

"**Sandy fill**" means materials that consist of medium sand, sandy loam, loamy sand/sandy loam mixtures.

"**Scarifying**" means scraping or loosening the bottom and sidewall soil surfaces in the preparation of percolation test holes, seepage trenches, beds, or similar excavations.

"**Scum**" means a mass of sewage solids floating at the surface of effluent and buoyed up by entrained gas, grease or other substances.

"**Seasonal high water table**" means the highest zone of soil or rock that is seasonally or permanently saturated by a perched or shallow water table. A planar surface, below which all pores in rock or soil (whether primary or secondary) that is seasonally or permanently saturated.

"**Secondary treatment**" means a combination of unit processes that will consistently remove 85% or more of the organic and suspended material in domestic wastewater and produce an effluent of sufficient quality to satisfy the following requirements; monthly average effluent BOD_5 and TSS concentrations of 30 mg/L; daily maximum effluent BOD_5 and TSS concentrations of 45 mg/L.

"**Secretary**" means the Secretary of the Department of Natural Resources and Environmental Control or a duly authorized designee.

"**Seepage bed**" means an absorption facility consisting of an area from which the entire earth contents have been removed and replaced with a network of perforated pipe, filter aggregate or aggregate-free chambers and covered with suitable backfill material.

"**Seepage pit**" means a covered pit with a porous lining into which wastewater is discharged and allowed to seep or leach into the surrounding soil and is preceded by a septic tank. **Note:** seepage pits cannot be certified for real estate transfers.

"**Seepage trench**" means an absorption facility consisting of ditches with vertical sides and flat bottoms partially filled with filter aggregate and containing perforated pipe or aggregate-free chambers and covered with suitable backfill material.

"**Septage**" means the liquid and solid contents of a septic tank.

"**Septic tank**" means a watertight receptacle which receives the discharge of wastewater from a structure or part thereof and is designed and constructed so as to permit settling of solids from the liquid, digestion of the organic matter by detention, and discharge of the liquid portion into an absorption facility.

"Sewage" means water-carried human or animal wastes from septic tanks, water closets, residences, buildings, industrial establishments, or other places, together with such groundwater infiltration, subsurface water, admixture of industrial wastes or other wastes as may be present.

"Sewage sludge" means sludges which derive in whole or in part from sewage.

"**Single family dwelling**" means a residence intended for single family residential use.

"**Site evaluation**" means the practice of investigating, evaluating and reporting basic soil and site conditions which apply to the on-site wastewater treatment and disposal system type and design criteria.

"**Slope**" means the deviation of a plane surface from the horizontal. It is usually expressed as a ratio or percentage of number of units of vertical rise or fall per unit of horizontal distance.

"Sludge" means the accumulated semi-liquid suspension, settled solids, or dried residue of these solids that is deposited from (a) liquid waste in a municipal or industrial wastewater treatment plant, (b) surface or groundwaters treated in a water treatment plant, whether or not these solids have undergone treatment. Septage is included herein as sludge.

"**Small system**" means any on-site wastewater treatment and disposal system with a projected wastewater design flow rate < 2,500 gallons per day.

"**Soil feasibility study**" means a site/soil investigative report identifying the suitability of a parcel of land for a large, community or individual on-site wastewater treatment and disposal systems. The report includes information pertinent to the Department and other local government agencies in the determination of certain land use decisions.

"**Soil horizon**" means a layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistence and pH.

"**Soil investigation report (SIR)"** means a report that characterizes the soils present on a given site through direct observations and analysis.

"**Soil profile**" means a vertical cross-section of a soil that shows the various soil horizons. Soil drainage or moisture status are both soil characteristics that can be inferred from the soil profile.

"**Soil structure**" means the combination or arrangement of primary soil particles into secondary compound particles or clusters, the principle forms of which are: platy (laminated); prismatic (prisms with rounded tops); blocky (angular or subangular); granular and columnar.

"**Soil texture**" means the grain sizes that comprise a soil consisting of three textural classes; sand, silt and clay. Field methods for judging the texture of a soil consist of forming a cast of soil, both dry and moist, in the hand and pressing a ball of moist soil between thumb and finger.

- The major textural classifications are observed and can be determined in the field as follows:
  - **Sand**: Individual grains can be seen and felt readily. Squeezed in the hand when dry, this soil will fall apart when the pressure is released. Squeezed when moist, it will form a cast that will hold its shape when the pressure is released, but will crumble when touched.
  - **Sandy Loam**: Consists largely of sand, but has enough silt and clay present to give it a small amount of stability. Individual sand grains can be readily seen and felt. Squeezed in the hand when dry, this soil will readily fall apart when the pressure is released. Squeezed when moist, it forms a cast that will not only hold its shape when the pressure is released, but will withstand careful handling without breaking. The stability of the moist cast differentiates this soil from sand.
  - **Loam**: Consists of an even mixture of sand and of silt and a small amount of clay. It is easily crumbled when dry and has a slightly gritty yet fairly smooth feel. It is slightly plastic. Squeezed when moist, it forms a cast that will not only hold its shape when the pressure is released, but will withstand careful handling without breaking. The stability of the moist cast differentiates this soil from sand.
  - **Silt Loam**: Consists of a moderate amount of fine grades of sand, a small amount of clay, and a large quantity of silt particles. Lumps in a dry, undisturbed state appear quite cloddy, but they can be pulverized readily; the soil then feels soft and floury. When wet, silt loam runs together in puddles. Either dry or moist, casts can be handled freely without breaking. When a ball of moist soil is pressed between thumb and finger, it will not press out into a smooth, unbroken ribbon, but will have a ribbon appearance.
  - **Clay Loam**: Consists of an even mixture of sand, silt, and clay, which breaks into clods or lumps when dry. When a ball of moist soil is pressed between the thumb and finger, it will form a thin ribbon that will readily break, barely sustaining its own weight. The moist soil is plastic and will form a cast that will withstand considerable handling.
  - **Silty Clay Loam**: Consists of a moderate amount of clay, a large amount of silt, and a small amount of sand. It breaks into moderately hard clods or lumps when dry. When moist, a thin ribbon or one eighth ($^1/_8$) inch wire can be formed between thumb and finger that will sustain its weight and will withstand gentle movement.

- **Silty Clay**: Consists of even amounts of silt and clay and very small amounts of sand. It breaks into hard clods or lumps when dry. When moist, a thin ribbon or one eighth ($^1/_8$) inch or less sized wire formed between thumb and finger withstand considerable movement and deformation.
- **Clay**: Consists of large amounts of clay and moderate to small amounts of sand. It breaks into very hard clods or lumps when dry. When moist, a thin, long ribbon or one sixteenth ($^1/_{16}$) inch wire can be molded with ease. Fingerprints will show on the soil, and a dull to bright polish is made on the soil by a shovel.
- **Silt**: Consists largely of silt with very small amounts of clay. The soil feels very silky or floury. When pressed between thumb and finger it will readily pulverize without forming a ribbon.
- **Loamy Sand**: Is predominately composed of sand, but has enough clay so that it can be formed into a weakly developed ball with careful handling.
- **Sandy Clay Loam**: The predominant particle size found within this soil textural class is sand, although it contains relatively high levels of clay with lesser amounts of silt. When moist, it will form a thin ribbon that does not readily break.
- **Sandy Clay**: Consists of relatively even amounts of sand and clay with very small amounts of silt. When moist, a thin ribbon can readily be formed between thumb and finger without considerable deformation or movement.

- These and other soil textural characteristics are defined as shown in the United States Department of Agricultural Textural Classification Chart which is hereby adopted as part of these Regulations (see Exhibit B). This textural classification chart is based on the Standard Pipette Analysis as defined in the United States Department of Agriculture, Soil Conservation Service Soil Survey Investigations Report No. 1.
- Throughout these Regulations where soil textural classes and other terminology describing soils are utilized, definition and interpretation shall be in accordance with the Soil Survey Manual (Handbook 18), Field Book for Describing and Sampling Soils, and Field Indicators of Hydric Soils in the Mid-Atlantic States as published by either the U.S. Department of Agriculture or the U.S. Environmental Protection Agency.

"**Solid waste**" means any garbage, refuse, rubbish, and other discarded materials resulting from industrial, commercial, mining, agricultural operations and from community activities which does not contain free liquids. Containers holding free liquids shall be considered solid waste when the container is designed to hold free liquids for use other than storage (e.g. radiators, batteries, transformers) or the waste is household waste which is not sewage or septage.

"**Solum**" means the upper part of the soil profile (A, E and B horizons) above the parent material in which the processes of soil formation are active.

"**Spare area**" means an area set aside for construction of a second absorption facility with the equivalent design capacity of the operational absorption facility to be used in the event the operational absorption facility becomes inoperable.

"**Spray irrigation**" means the controlled application of treated wastewater to a vegetated soil surface.

"**Storage**" means the interim containment of liquid waste or treated liquid waste

before disposal or utilization.

"**Subdivision**" means any tract or parcel of land which has been divided into two or more lots for which development is intended.

"Surface impoundment" means a natural topographic depression, and/or man-made excavation, and/or diked area formed primarily of earthen materials (although it may be lined with man-made materials) or remains unlined, and which is designed to hold an accumulation of liquid wastes or wastes containing free liquids. Examples of surface impoundments are holding, storage, settling, and elevation pits, ponds, and lagoons.

"**Surface water assessment report (SWAR)**" means a report that characterizes the potential nutrient impacts of a wastewater treatment system to a site from future development through background data and computer modeling.

"**System**" means an on-site wastewater treatment and disposal system.

"**System inspector**" means a person licensed by the Department to inspect, investigate, collect data and make determinations regarding the present operational condition of an on-site wastewater treatment and disposal system.

"**System operator**" means an individual, who at a given time, through observation, interpretation or decision operates a wastewater facility or a segment of a system or facility.

"**Tertiary treatment**" means the removal of pollutants, including nitrogen and phosphorus, to meet discharge or reuse criteria with respect to specific parameters and followed by disinfection.

"**Test pit**" means an excavation used to examine a soil profile in order to assess soil permeability and depth to a seasonal high water table using soil texture, structure, and redoximorphic features as a basis for assessing site suitability.

"**Topography**" means ground surface variations or contours of the earth's surface, both natural and anthropogenic.

"**Total nitrogen**" means the sum of all the forms of nitrogen; ammonia, ammonium, nitrate, nitrite and organic nitrogen present in wastewater.

"**Total phosphorus**" means the sum of the water soluble and citrate-insoluble phosphorus present in wastewater.

"**Total suspended solids (TSS)**" means a measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for "total suspended non-filtered solids."

"Treatment" means a process which alters, modifies or changes the biological, physical or chemical characteristics of sludge or liquid waste.

"Treatment works" means any device and system used in the storage, treatment, recycling and reclamation of municipal sewage, or industrial wastes of a liquid nature, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extensions, improvements, remodeling, additions and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities and improvements to exclude or minimize inflow and infiltration.

"**Unconfined aquifer**" means an aquifer in which a relatively impermeable layer does not exist between the water table and the ground surface and in which the water surface is at atmospheric pressure.

"**Undisturbed soil**" means soil or soil profile unaltered by filling, removal, or other man-made changes with the exception of agricultural activities.
"**Unlimited public access**" means public access to the site may occur at any time.
"**Upgradient**" means an area that has a higher potentiometric surface (hydraulic head) than a comparative reference point.
"**Wastewater**" means water-carried waste from septic tanks, water closets, residences, buildings, industrial establishments, or other places, together with such groundwater infiltration, subsurface water and mixtures of industrial wastes or other wastes as may be present.
"Wastewater treatment plant" means a facility designed and constructed to receive, treat, or store waterborne or liquid wastes.
"**Wastewater utility**" means any person, partnership, association, corporation, joint stock company, agency or department of the State or any association of individuals engaged in the business of providing wastewater disposal and related services to the public for a fee, charge, or other remuneration in the State of Delaware.
"**Watercourse**" means any ocean, bay, lake, pond, stream, river or defined ditch that will permit drainage into any surface water body, excluding ephemeral watercourses as defined below.

- Ephemeral – A watercourse which flows briefly, only in direct response to precipitation in the immediate vicinity, and whose invert is above the seasonal high water table.

"**Water softener backwash**" means the wastewater by-product generated by the water softening process (see regeneration water).
"**Watershed**" means a region or area delineated by a topographical divide and draining ultimately to a particular watercourse.
"**Water table**" means the surface of an unconfined aquifer where the pore water pressure is equal to atmospheric pressure.
"**Waters of the state**" means public waters, including lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the ocean within the territorial limits of the State, and all other bodies of surface or groundwater, natural or artificial, inland or coastal, fresh or salt, within the jurisdiction of the State of Delaware.
"**Well**" means any excavation which intersects the water table, and is installed for the purpose of obtaining geologic or hydrologic information and for locating, testing, measuring, extracting, and/or recharging water and other fluids, and where the depth is greater than the width. Such excavations may have been drilled, augered, cored, bored, driven, dug, jetted, or otherwise constructed. This definition does not include excavations for utility poles, construction pilings, building foundations, fence posts, test pits, or horizontal heat pump systems that are constructed above the water table.
"**Wisconsin at-grade**" means a pressurized on-site wastewater treatment and disposal system which maintains a minimum 24 inches of separation distance above the limiting zone placed on the natural soil below a soil cap of a specified depth and texture.
"**Zone of aeration**" means a subsurface zone containing water under pressure less than that of the atmosphere, including water held by capillary and containing air or gases generally under atmospheric pressure. This zone is limited above by the land surface and below by the surface of the zone of saturation, e.g., the water table.

3.0 GENERAL STANDARDS, PROHIBITIONS AND PROVISIONS

3.1 Each and every owner of real property is jointly and severally responsible for:

3.1.1 Disposing of wastewater in conformance with all applicable regulations; and

3.1.2 Connecting all plumbing fixtures on that property, from which wastewater is or may be discharged, to a central wastewater system or on-site wastewater treatment and disposal system approved by the Department; and

3.1.3 Maintaining, repairing, and/or replacing the system as necessary to assure proper operation of the system.

3.2 No permit may be issued by the Department under these Regulations unless the county or municipality having land use jurisdiction has first approved the activity through zoning procedures provided by law.

3.3 Any governmental unit may assume responsibility and authority for administering its own regulatory program for on-site wastewater treatment and disposal systems pursuant to 7 **Del.C.** §6003(d) if the delegated program establishes standards no less stringent than the standards established in these Regulations.

3.4 Administrative and judicial review and the enforcement under these Regulations shall be in accordance with the provisions of 7 **Del.C.** Ch. 60.

3.5 If any part of these Regulations, or the application of any part thereof, is held invalid or unconstitutional, the application of such part to other persons or circumstances, and the remainder of these Regulations, shall not be affected thereby and shall be deemed valid and effective.

3.6 These Regulations, being necessary for the health and welfare of the State and its inhabitants, shall be liberally construed in order to preserve the land, surface water and groundwater resources of the State.

3.7 At the sole discretion of the Department, if the proposed operation of a system may cause pollution of public waters or create a public health hazard, system installation or use shall not be authorized.

3.7.1 In no case shall an active OWTDS be installed over or dispose of wastewater on top of an existing OWTDS without sand-lining or properly abandoning the old system.

3.8 All wastewater shall be treated and disposed of in a manner approved by the Department.

3.9 No person shall dispose of wastewater at any location other than those authorized by the Department under applicable laws and regulations for such disposal.

3.10 Discharge of untreated or partially treated wastewater or septic tank effluent directly or indirectly onto the ground surface or into groundwater and/or surface waters of the State, unless authorized by a permit issued by the Department, constitutes a public health hazard and is prohibited.

3.11 Except where specifically allowed within these Regulations, no person shall connect a dwelling or commercial facility to a system if the total projected wastewater flow would be greater than that allowed under the original system construction permit. In no case shall more than one reduction (low flow, advanced treatment, or gravel-less chambers) be used in determining minimal absorption facility sizing requirements.

3.12 Except as provided in these Regulations, the spare area shall be kept vacant, free of site improvements, livestock, vehicular traffic (including construction trafficking) and soil modifications.

3.13 All systems shall be operated and maintained so as not to create a public health hazard or cause water pollution.

3.14 No person shall cause or allow construction or repair of a system, or any part thereof, without a permit issued by the Department. An exception may be allowed for certain emergency repairs as set forth in these Regulations.

3.15 The Department shall impose, in any permit, standards for evaluating treatment system performance and compliance with these Regulations. The standards may be in the form of limitations on flow and pollutant concentrations and/or mass loadings. The standards shall reflect the utilization of best management and operational practices.

3.16 When performance standards have not been achieved on an annual average basis after the appropriate system start-up period, as defined in the regulations and/or applicable on-site system permit, those persons may qualify to participate in a nutrient offset program subject to review and approval by the Department on a site specific basis.

3.17 In no cases will underdrains or artificial drainage be considered for the siting of any on-site wastewater treatment and disposal system.

3.18 In the event that these regulations are revised by the Department, permits may be reopened and modified accordingly after notice and opportunity for a public hearing.

3.19 The permittee shall at all times properly maintain and operate all structures, systems, and equipment for treatment, control and monitoring, which are installed or used by the permittee to achieve compliance with the permit and these Regulations.

3.20 The permittee shall take all necessary actions to eliminate and correct any adverse impact on public health or the environment resulting from permit noncompliance.

3.21 All electrical connections and components utilized in an OWTDS, must, at a minimum, comply with National and Delaware Electric Code (**Admin Code**, Title 24, §1400).

3.22 FEMA guidelines must be adhered to when siting OWTDS' in flood prone areas designated as "V" zones prior to permitting.

3.22.1 Certification by a registered professional engineer (Class C) that all new and replacement on-site wastewater treatment and disposal systems, including holding tanks, are located and designed to minimize or eliminate flood damage, infiltration of floodwaters into the tank and discharges from the system into floodwaters. New and replacement on-site wastewater treatment and disposal systems shall be located so as to minimize alterations to sand dunes which would increase potential flood damage.

3.23 Moratorium Areas

3.23.1 When the Department determines that construction of on-site wastewater treatment and disposal systems should be limited or prohibited in an area, it shall issue an order limiting or prohibiting such construction.

3.23.2 The order shall be issued only after a public hearing which shall insure that 20 days notice is given.

3.23.3 The order shall contain a specific description of the moratorium area and shall be limited to the area immediately threatened with groundwater or surface water contamination if construction in that area continues.

3.23.4 In issuing an order under this Section the Department shall consider the factors contained in 7 **Del.C.** §6001.

3.23.5 The moratorium shall be limited to a period of five (5) years after which re-establishment of the moratorium may be considered.

3.24 Whenever the preparation of reports or other documents required by these regulations involves the practice of engineering, geology or other recognized profession under Delaware law, sufficient evidence of appropriate certification or registration in accordance with 24 **Del.C.** must be submitted by the preparer.

3.24.1 In accordance with 29 **Del.C.** §§501 et seq., retention of reports or other documents may be paper and/or electronic records.

3.25 All Occupational Safety and Health Act (OSHA) regulations must be complied with during all phases of system installation and inspection. OSHA regulations can be found at www.osha.gov or by contacting the U.S. Department of Labor.

3.26 Enforcement

3.26.1 The provisions of these regulations shall be enforced by the Department as provided in 7 **Del.C.** Ch. 60. Such enforcement may include suspension or revocation of any license for cause.

3.26.2 The failure of the Department to enforce any of the provisions of these regulations shall not constitute a waiver by the Department of such provisions.

3.26.3 The Department will initially attempt to gain voluntary compliance in accordance with 7 **Del.C.** §6019.

3.27 Exhibits A through NN are incorporated into these Regulations by reference.

3.28 The Department continues to encourage development of new systems, processes, and techniques for eliminating, reusing, or recovering resources from wastewater. These techniques include, but are not limited to greywater collection and use, nutrient recovery, and source reduction of wastewater. These innovative technologies are subject to review and approval by the Department.

3.29 Number of Plan Reviews

3.29.1 The Department will review no application more than three (3) times. If after the third review the plan is not approved, the application will be denied, and the reasons for plan denial will be sent to the applicants.

3.29.2 In order for a plan to be reconsidered, the Department may, at its discretion:

3.29.2.1 Require a new application package and review fee in order to continue to review the application. The second application will be reviewed no more than three (3) additional times.

3.30 All new and replacement systems permitted within 1,000 feet of the Chesapeake Bay tidal waters, as displayed by the map in Exhibit NN, shall meet the Performance Standards for Nitrogen and Phosphorus as defined in these Regulations. Small systems use PSN3 and large systems see Exhibit MM. This requirement shall become effective one (1) year from the date of promulgation of these Regulations.

3.31 General Standards, Prohibitions and Provisions for small systems (< 2,500 gpd) only

3.31.1 No person shall construct, install, modify, rehabilitate, or replace an on-site wastewater treatment and disposal system or construct or place any dwelling, building, mobile home, manufactured home or other structure capable of discharging wastewater on-site unless such person has a valid permit issued by the Department pursuant to these Regulations.

3.31.2 Each system shall have adequate capacity to properly treat and dispose of the maximum projected daily wastewater flow. The projected quantity of wastewater must be determined from Exhibit D. Other projected wastewater quantities may be approved by the Department.

3.31.3 A recorded utility easement is required whenever a system crosses a property line separating property under different ownership. The easement must accommodate that part of the system, including setbacks, which lies beyond the property line, and must allow entry to install, maintain and repair the system.

3.31.4 No cooling water, air conditioning water, groundwater, oil, water softener backwash (regeneration water) or roof drainage shall be discharged into any system without specific authorization of the Department.

3.31.5 If a site has received an approved site evaluation and is free of encumbrances which could prevent the installation or operation of the system from being in conformance with these Regulations then a permit may be issued.

3.31.6 Whenever real property is recorded as two separate lots under common ownership and an on-site wastewater treatment and disposal system crosses the common boundary of the recorded lots, the owner shall execute and record, in the appropriate county office of Recorder of Deeds, an affidavit which notifies prospective purchasers of this fact on a form approved by the Department.

3.31.7 No person shall transfer any portion of real property if the transfer would create a lot boundary which would cross an existing system or any part thereof including required setbacks and isolation distances unless a utility easement approved by the Department is granted to the owner of the existing system and recorded in the appropriate county office of Recorder of Deeds.

3.31.8 No person shall transfer any portion of real property after the issuance of a permit pursuant to these Regulations if the transfer would result in the use of the permitted on-site system on a lot which does not comply with these Regulations and the terms of the permit, including but not limited to density, set back and isolation distance requirements.

3.31.9 A central wastewater system shall be deemed <u>physically</u> available if its nearest connection point from the property line or boundary to be served is:

3.31.9.1 For all single family dwellings or establishments within 200 feet;

3.31.9.2 For a proposed subdivision or group of two (2) to five (5) single family dwellings not further than 200 feet multiplied by the number of dwellings or dwelling equivalents.

3.31.9.3 For proposed subdivision or other developments with more than five (5) single family dwellings, or equivalents, the determination of central wastewater availability shall be at the sole discretion of the Department.

However, a central wastewater system shall not be considered available by the Department if topographic or manmade features make connection impossible or a waiver is obtained from the municipality or governmental authority.

3.31.10 A central wastewater system shall be deemed legally available if the system is not under a Department connection permit moratorium and the wastewater system owner is willing or obligated to provide sewer service.

3.31.11 When a central wastewater system is deemed both physically and legally available, as outlined in Sections 3.31.9 and 3.31.10, the connection must occur within a timeframe as set forth by the wastewater system owner. The existing system must be abandoned in accordance with Section 5.4.8.

3.31.12 All cesspools and seepage pits are prohibited and when found must be replaced within one (1) year in accordance with these regulations.

3.31.13 For all properties utilizing an OWTDS that are sold or otherwise transferred to other ownership, the persons must have the system pumped out and inspected by a Class F and Class H licensee, respectively, prior to completion of the sale. An extension will be given to sheriff sales, auctions, short sales and cash sales for a period not to exceed 90 calendar days from date of sale. All inspections of on-site

wastewater treatment and disposal systems shall be submitted to the Department on forms approved by the Department (see Exhibit A). These forms shall be submitted within 72 hours of inspection completion.

3.31.13.1 For transfers of new property, the certificate of completion will suffice if issued within the previous 24 months, or;

3.31.13.2 If an inspection has occurred within the previous 36 months and the property owner can provide proof of the pump out and inspection and the system is not a cesspool or seepage pit, then the inspections referred to in Section 3.31.13 will suffice, or;

3.31.13.3 If the owner of an individual OWTDS provides proof of a licensed operator or has a service contract with a certified service provider then the requirements referred to in Section 3.31.13 have been met.

3.31.14 Timers or other electrical on/off delay devices shall be installed on all pressurized systems to ensure dosing frequencies and volumes. Appliance timers are not acceptable.

3.31.15 Siting Density

3.31.15.1 The following maximum siting densities shall be maintained:

3.31.15.1.1 For residential dwellings, the maximum siting density shall be one (1) dwelling unit per one half ($^1/_2$) acre.

3.31.15.1.1.1 For single family residences, only the area within the property lines of the lot shall be considered.

3.31.15.1.1.2 For multiple family dwellings or where more than one (1) dwelling is to be served by an on-site wastewater treatment and disposal system, the maximum siting density shall be based on the net pervious area (e.g., unpaved, without structures) available for groundwater recharge after total project completion. The following criteria shall be utilized in determining the maximum siting densities:

3.31.15.1.1.2.1 For projects utilizing only a septic tank for treatment prior to discharge to the absorption facility, the maximum siting density shall be one (1) dwelling unit per one half ($^1/_2$) acre of pervious area.

3.31.15.1.2 For commercial facilities the maximum siting density shall be established by dividing the projected design flow by 500 gallons per day per one half ($^1/_2$) acre and shall be based on the net pervious area (e.g., unpaved, without structures) available for groundwater recharge after total project completion. Campgrounds intended for overnight or transient use are evaluated as commercial facilities as opposed to manufactured home communities, which are evaluated as single family residential facilities.

3.31.15.1.3 In establishing maximum siting densities the Department may consider impervious areas where it can be demonstrated that through the establishment of an acceptable stormwater management plan, all runoff will be recharged to the groundwater of the State within the boundaries of the project site. Stormwater management plans shall be based upon the sediment and stormwater regulations.

3.31.15.2 If the deed or instrument, under which an owner acquired title to a lot or parcel, was of record prior to April 8, 1984 and if such lot or parcel does not conform to the requirements of Section 3.31.15.1.1, then the Department may approve a feasibility study and/or issue a construction permit for an on-site wastewater

treatment and disposal system. This system is to serve a single family dwelling or for multiple systems to serve dwellings to be situated within an area which has been given final site plan approval prior to April 8, 1984 for single or multi-family dwellings provided that:

3.31.15.2.1 The number of dwelling units per net pervious area (e.g., unpaved, without structures) does not increase from those approved prior to April 8, 1984 by the local governmental unit having jurisdiction; and

3.31.15.2.2 At the time the permit is issued or feasibility study is approved, the lot or parcel complies with the requirements of Section 3.0 through Section 6.0 of these Regulations.

When it may be necessary to increase the net pervious area or reduce the number of dwelling units within a lot or parcel and thus create a new date of recordation or final site plan approval, the Department shall utilize the previous date of recordation or approval in determining conformance with these Regulations. The owner shall provide, prior to any action by the Department, all documentation determined by the Department to be necessary in establishing conformance with this Section.

3.31.16 All new and replacement small systems requiring advanced treatment units must adhere to the performance standard nitrogen level 3 (PSN3). These performance standards shall become effective one (1) year from date of regulation promulgation.

3.32 General Standards, Prohibitions and Provisions for large systems (≥ 2,500 gpd) only

3.32.1 Whenever the preparation of reports or other documents required by these regulations involves the practice of engineering, geology or other recognized licensed profession under Delaware law, sufficient evidence of appropriate certification or registration in accordance with 24 **Del.C.** shall be dated and bear the signature and seal of the licensee(s) who prepared or approved them.

3.32.2 For large systems which serve communities that experience a significant variation in flow on an annual basis, the permittee shall provide the Department with specific criteria in the permit for taking certain treatment units out of service during periods of low flow. The criteria will establish procedures for winterization, restart and the minimum levels of treatment which must be provided at all times. In no event shall it be less than the level of treatment provided by a conventional on-site wastewater treatment and disposal system.

3.32.3 Unless otherwise required by a permit the permittee and operator, if applicable, must coordinate with the Department for all annual large system inspections and applicable fees.

3.32.4 The basic performance criteria for a large system is the system does not present a public health problem.

3.32.5 The permittee shall furnish to the Department within a specified period of time, any information including copies of records, which may be requested by the Department to determine whether cause exists for modifying, revoking, reissuing, or terminating the permit, or to determine compliance with the permit and these Regulations.

3.32.6 The permittee shall allow the Department entry and access, consistent with 7 **Del.C.** Ch. 60, to:

3.32.6.1 Enter the permitted facility.

3.32.6.2 Inspect any records that must be kept under the conditions of the permit.

3.32.6.3 Inspect any facility, equipment, practice, or operation permitted or required by the permit.

3.32.6.4 Sample or monitor for the purpose of assuring permit compliance of any substance or any parameter at the facility.

3.32.6.5 The permittee shall report to the Department under the circumstances and in the manner specified in this Section:

3.32.6.5.1 In writing 30 days before any planned physical alteration or addition to the permitted facility or activity if that alteration or addition would result in any significant change in information that was submitted during the permit application process.

3.32.6.5.2 In writing 30 days before any anticipated change which would result in noncompliance with any permit condition or these regulations.

3.32.6.5.3 Orally within 24 hours from the time the permittee became aware of any noncompliance which may endanger the public health or the environment at telephone numbers provided in the permit by the Department.

3.32.6.5.4 In writing as soon as possible but within five (5) days of the date the permittee knows or should know of any noncompliance unless extended by the Department. This report shall contain:

3.32.6.5.4.1 A description of the noncompliance and its cause;

3.32.6.5.4.2 The period of noncompliance including to the extent possible, times and dates and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

3.32.6.5.4.3 Steps taken or planned to reduce or eliminate reoccurrence of the noncompliance.

3.32.6.5.5 In writing as soon as possible after the permittee becomes aware of relevant facts not submitted or incorrect information submitted, in a permit application or any report to the Department. Those facts or the correct information shall be included as a part of this report.

3.33 Property owner's responsibilities shall:

3.33.1 Ensure septic tank risers, distribution box risers and dosing chamber/lift station risers, if applicable, remain above grade after final grading of property;

3.33.2 Maintain the on-site wastewater treatment and disposal system or any component thereof in accordance with these regulations and in compliance with all applicable OWTDS permit conditions; and

3.33.3 Hire an appropriately licensed Class E system contractor to repair/replace any components of the OWTDS.

4.0 LICENSES

4.1 The Department shall administer a program for the licensing of percolation testers, system designers, soil scientists/site evaluators, system contractors, liquid waste haulers, system inspectors and construction inspectors. The licensing program shall provide the issuance of licenses as follows;

4.1.1 Class A - Percolation Tester: The Class A license authorizes the performance of percolation tests and other types of infiltrometer testing.

4.1.2 Class B - Designer: The Class B license authorizes the design of conventional on-site wastewater treatment and disposal systems which utilize gravity distribution systems for seepage beds and seepage trenches and lift stations as provided for in these Regulations.

4.1.3 Class C - Designer: The Class C license authorizes the design of conventional and innovative/alternative on-site wastewater treatment and disposal systems and all pressure distribution systems.

4.1.4 Class D – Soil Scientist/Site Evaluator: The Class D license authorizes the performance of individual soil evaluations, soil investigation reports, soil feasibility studies, percolation and/or permeability tests or hydraulic conductivity tests.

4.1.5 Class E - System Contractor: The Class E license authorizes the construction, repair and installation of on-site wastewater treatment and disposal systems.

4.1.6 Class F - Liquid Waste Hauler: The Class F license authorizes the removal, transportation or disposal of the solid and liquid contents of septic tanks, cesspools, grease traps, seepage pits, holding tanks, portable toilets or other wastewater treatment or disposal facilities as specified and required under these Regulations.

4.1.7 Class H - System Inspector: The Class H license authorizes the inspection, investigation and data collection to make determinations regarding the present operational condition of on-site wastewater treatment and disposal systems.

4.1.8 Class I – Construction Inspector: The Class I license authorizes the inspection of all new, replacement and repairs of small gravity on-site wastewater treatment and disposal systems, gravity on-site system component replacements and cover inspections for above grade gravity on-site wastewater treatment and disposal systems.

4.2 It shall be necessary to have the Class A, Class B, Class C, Class D, Class E, Class F, Class H and/or Class I licenses in order to engage in the specified activities under Section 4.1 of these Regulations.

4.3 Any person seeking a license under this Section shall submit a complete application to the Department, on a standard form provided by the Department, references and pay the non-refundable application fee.

4.4 On-Site System Advisory Board (Board) approval to take an exam is valid for six (6) months from the date of the approval. If the applicant has not taken the exam within that time frame, they must re-apply with a new application, references and fee.

4.5 All applicants for a Class A, B, C, D, E, F, H or I license will be required to pass an examination prepared and administered by the Department to test the competency and knowledge of the applicant regarding pertinent subject matter and the application and use of these Regulations.

4.6 In the event an applicant fails to receive a passing grade on the examination, he/she shall be so notified by the Board within 30 days. The applicant may re-apply for a

subsequent examination only after completion of a training course approved by the Board. The examination may be taken no more than twice in a 12 month time period.

4.7 With respect to Class C licenses the following shall constitute the Department's requirements:

4.7.1 Registration as a Professional Engineer with the Delaware Association of Professional Engineers; and

4.7.2 A complete qualifications statement on approved Department forms which verifies the individual's knowledge and competency in the field of on-site wastewater treatment and disposal system engineering and design; and

4.7.3. Pass an examination prepared and administered by the Department.

4.8 With respect to Class D licenses the following shall constitute the Department's requirements for each tiered classification.

4.8.1 Class D.1 is licensed to perform individual site evaluations for both new construction and replacement systems. To qualify for a Class D.1 an individual must have:

4.8.1.1 A completed qualifications statement on approved Department forms which verifies the individual’s knowledge and competency in the fields of soil science/classification and site evaluations for on-site wastewater treatment and disposal systems; and one of the following (4.8.1.2, 4.8.1.3 or 4.8.1.4)

4.8.1.2 Six (6) years of professional experience in soil classification, mapping and interpretation under the supervision of a ARCPACS Certified Professional Soil Scientist or Class D Soil Scientist and nine (9) semester hours in soil science and six (6) semester hours in geological sciences from accredited college or university; or

4.8.1.3 Four (4) years of professional experience in soil classification, mapping and interpretation under the supervision of a ARCPACS Certified Professional Soil Scientist or Class D Soil Scientist and an undergraduate degree from an accredited college or university with nine (9) semester hours in soil science and six (6) semester hours in geological sciences; or

4.8.1.4 Two (2) years of professional experience in soil classification, mapping and interpretation under the supervision of a ARCPACS Certified Professional Soil Scientist or Class D Soil Scientist and a graduate degree from an accredited college or university with 30 semester hours in biological, physical and earth sciences and 15 semester hours in soil science; and

4.8.1.5 Pass a written examination administered by the Department to test the competency and knowledge of the applicant regarding site evaluations and pertinent information contained within the regulations as it relates to siting OWTDS; and one of the following (4.8.1.6 or 4.8.1.7)

4.8.1.6 Registration as a Professional Soil Scientist with the Federation of Certifying Boards in Agriculture, Biology, Earth and Environmental Sciences (ARCPACS) with demonstrated competence with coastal plain soils; or

4.8.1.7 Pass a field practicum prepared and administered by the Site Interpretations Advisory Council and/or the soil scientists on the Board. The field practicum shall assess whether competency exists for evaluating soils specific to Delaware.

4.8.2 Class D.2 is licensed to perform individual site evaluations for new and replacement systems, soil feasibility studies, and soils reconnaissance investigations. To qualify for a Class D.2 an individual must have:

4.8.2.1 Four (4) years of full-time experience as a Class D.1 or two (2) years of experience as a Class D.1 and certification as a Certified Professional Soil Scientist as outlined in Section 4.8.1.6.

4.8.2.2 A completed qualifications statement on approved Department forms which verifies the individual's experience as a Class D.1 and/or professional certification.

4.8.3 Class D.3 is licensed to perform all soils work licensed under Sections 4.8.1 and 4.8.2 plus detailed soil investigation reports (SIR) associated with LOWTDS. To qualify for a Class D.3 an individual must have:

4.8.3.1 Two (2) years of full-time experience as a Class D.2 and certification as a Certified Professional Soil Scientist.

4.8.3.2 A completed qualifications statement on approved Department forms which verifies the individual's experience as a Class D.2 and/or professional certification.

4.8.4 To progress from one tier to the next tier the Class D licensee must:

4.8.4.1 Have served the required amount of time within the previous tier as specified in 4.8.2.1 or 4.8.3.1.

4.8.4.2 Have obtained the required certifications as specified in 4.8.2.1 or 4.8.3.1.

4.8.4.3 Complete a qualifications statement on approved Department forms which verifies the individuals experience at the current tier and request for consideration for approval to go to the next tier.

4.9 With respect to Class E licenses the following shall constitute the Department's requirements for each tiered classification:

4.9.1 E.1 is licensed to install all conventional on-site wastewater treatment and disposal systems outlined in these Regulations. To qualify for a Class E.1 an individual must have:

4.9.1.1 A completed qualifications statement, on approved Department forms, which verifies the individual's knowledge and competency of the application and requirements of these Regulations.

4.9.1.2 A minimum of two (2) years of experience under the guidance of an experienced supervisor in the construction of on-site wastewater treatment and disposal systems or Class E system contractor. For purposes of these regulations, two (2) years of experience shall be interpreted as full-time employment for a period consisting of two (2) years with proof in writing, from a currently licensed Class E system contractor or experienced supervisor.

4.9.1.3 Proof of attendance at training class/certification in basic electricity; and

4.9.1.4 Passed a written examination administered by the Department to test the knowledge and competency of these regulations. Upon passing the written examination the applicant may be awarded a Class E.1 license.

4.9.1.5 The first six (6) installations must be supervised by the Department.

4.9.2 Class E.2 is licensed to install any conventional OWTDS plus Innovative/Alternative systems. To qualify for a Class E.2 an individual must:

4.9.2.1 Have one (1) year of full time experience installing conventional OWTDS (as a Class E.1).

4.9.2.2 Completion of a qualifications statement on approved Department forms.

4.9.2.3 All installations of Innovative/Alternative systems must be under the supervision of the respective manufacturer representative until such time that a written certification has been obtained from the manufacturer representative and submitted to the Department.

4.9.3 Class E.3 is licensed to install any system subject to permitting under these Regulations including conventional OWTDS, Innovative/Alternative OWTDS, and large systems, excluding RIBs and spray irrigation. To qualify for a Class E.3 an individual must:

4.9.3.1 Meet all licensing requirements of the E.1 and E.2.

4.9.3.2 Have three (3) years of full time experience as a Class E.2 in the on-site industry installing on-site wastewater treatment and disposal systems and meeting manufacturer's certification for proper installation of the system type.

4.9.3.3 Completion of a qualifications statement on approved Department forms.

4.9.4 Class E.4 is licensed to install RIBs and spray irrigation systems only. To qualify for the Class E.4 an individual must:

4.9.4.1 Have three (3) years of experience installing these types of systems.

4.9.4.2 Completion of a qualifications statement on approved Department forms.

4.9.4.3 Present an overview of project construction review procedures including the roles of the design engineer, owner and any third party construction review organizations. The Department will utilize this overview as the written examination.

4.9.5 To progress from one tier to the next tier, except the E.4, the Class E licensee must:

4.9.5.1 Have served the required amount of time within the previous tier as specified in 4.9.2.1 or 4.9.3.2.

4.9.5.2 Complete a qualifications statement on approved Department forms which verifies the individuals experience at the current tier and request for consideration for approval to go to the next tier.

4.10 With respect to Class H licenses the following shall constitute the Department's requirements:

4.10.1 A completed qualifications statement, on approved Department forms, which verifies the individual's knowledge and competency.

4.10.2 Furnish certification of training completed under the National Association of Waste Transporters (NAWT) certification, Pennsylvania Septage Management Association (PSMA) certification, Delaware Technical & Community College certification program, or as approved by the Board.

4.10.3 Pass a written examination administered by the Department to test the knowledge and competency of the Regulations.

4.10.4 The first three (3) inspections must be supervised by the Department.

4.11 With respect to Class I licenses the following shall constitute the Department's requirements:

4.11.1 A completed qualifications statement, on approved Department forms, which verifies the individual's knowledge and competency of the requirements of these Regulations.

4.11.2 Possess, with a minimum of three (3) years of experience, either a Class B or C license.

4.11.3 Furnish certification of required training completed under the Delaware Technical & Community College training program or as approved by the Board.

4.11.4 Not inspect any system which the licensee has installed as a Class E system contractor or any Class E system contractor working within the same company as the Class I construction inspector.

4.11.5 The I license will become effective two (2) calendar years from date of promulgation of these regulations.

4.12 Responsibilities of Licensees

4.12.1 All Class B & C licensee's must visit the site to verify site conditions as reported in the site evaluation prior to permit application completion and submittal.

4.12.2 All Class C licensed designers will perform all inspections, to include final cover inspections, on every system they design throughout the systems construction. All construction inspections of on-site wastewater treatment and disposal systems shall be submitted to the Department on forms approved by the Department. These forms shall be submitted to the Department within 72 hours of inspection completion.

4.12.3 All Class D licensed soil scientists/site evaluators:

4.12.3.1 The Department may require the Class D soil scientist/site evaluator to notify the Department orally or in writing at least 36 hours, excluding Saturdays, Sundays and state holidays, prior to conducting the site evaluation.

4.12.3.2 All soil borings must extend to a depth of 72 inches or to the limiting zone if it occurs between 60 inches and 72 inches.

4.12.4 All Class A, B, C, D, E, F, H and I licensees are responsible for correct and complete information submitted to the Department as it pertains to current Regulations.

4.12.5 All Class E licensed system contractors shall:

4.12.5.1 Initiate work only on systems for which a construction permit has been granted.

4.12.5.2 Comply with all applicable regulations and requirements.

4.12.5.3 Be responsible for the work carried out by their employees and on site during all system inspections.

4.12.5.4 Submit to the Department within 10 days of completion of a system, a Construction Report on forms provided by the Department, signed by the licensed Class E system contractor.

4.12.5.5 Notify the Department 24 hours prior to construction start up to receive an authorization number. This authorization number will expire after 14 calendar days. Upon issuance of Class E license, system contractors must notify the Department 48 hours prior to initial six (6) construction start ups to receive an authorization number.

4.12.5.6 Be the sole contact person to the Department regarding inspection call-ins, consequential changes or problems. An individual employed by the licensee may be the contact person for inspection call-ins provided that person has been designated as a contact person in writing to the Department by the licensee.

4.12.6 Class F licensed liquid waste haulers

4.12.6.1 General Requirements

4.12.6.1.1 All Class F licensees shall:

4.12.6.1.1.1 Operate under a valid State of Delaware Non-Hazardous Liquid Waste Transporters Permit (see Section 5.3.32).

4.12.6.1.1.2 Be knowledgeable of the Non-Hazardous Liquid Transporters Permitee's Plan for the Prevention, Control and Clean-up of Accidental Discharges. A copy of the Plan is to be maintained on file with the Department.

4.12.6.1.1.3 Operate under a $5,000 performance bond, or other form of security, is maintained on file with the Department for the duration of licensing.

4.12.6.1.1.4 Keep a copy of their Class F license identification card available for verification while performing any Class F license related work.

4.12.6.1.1.5 Enter into a "Sewage Holding Tank Maintenance Contract" with the property owner prior to pumping out holding tanks. A copy of the contract document must be submitted to the Department within 15 days of signing the contract.

4.12.6.1.1.6 Enter into a "Grease Trap Maintenance Contract" with the property owner prior to pumping out grease traps. A copy of the contract document must be submitted to the Department within 15 days of signing the contract. Class F licensees may not enter into a "Grease Trap Maintenance Contract" unless the Class F licensee has an approved facility to dispose of grease trap waste identified in the Non-Hazardous Liquid Waste Transporters Permit that he/she is operating under.

4.12.6.1.1.7 Not co-mingle septage and grease trap waste, unless specifically approved, in writing, by the facility(ies) that will be receiving the grease trap waste.

4.12.6.2 Safety

4.12.6.2.1 At all times, the technician's personal safety, as well as protection of the environment and the customer's property, shall receive the highest priority.

4.12.6.2.2 Generally, septic tanks should not be entered because they are a hazardous environment. If entry is required, appropriate confined space entry procedures consistent with OSHA requirements should be employed.

4.12.6.3 Accessing Tanks

4.12.6.3.1 Class F licensees are prohibited from pumping out a septic tank, cesspool, seepage pit, holding tank, or grease trap through inspection ports, clean outs, wyes, or other orifices not specifically designed for tank pump-outs.

4.12.6.3.2 Septic tanks shall only be pumped from/through the appropriate manhole/access port of each tank or tank compartment.

4.12.6.3.3 If the customer insists upon the tank being cleaned through any opening other than the access manhole, the Class F licensee must obtain a waiver and the customer must sign the waiver acknowledging the fact that he/she has been informed of the proper procedure and the reasons associated with the procedure. A copy of the waiver must be submitted to the Groundwater Discharges Section, 89 Kings Highway, Dover, DE 19901 within 30 days.

4.12.6.3.4 No liquids or solids are to be discharged into/through the outlet pipe.

4.12.6.4 Septic Tank Cleaning

4.12.6.4.1 The liquid, solid, and semi-solid material in a septic tank shall be removed by a vacuum or centrifugal pump fitted with a hose that delivers the material to a truck-mounted, sealed tank.

4.12.6.4.2 Cleaning procedures shall include agitating all solids, but only after lowering the liquid level to 12 inches below the outlet. This is necessary to ensure no solids are allowed to escape the treatment tank. Agitation methods vary, and may include alternate pumping and back flushing, forcing air into the tank, or mechanical stirring.

4.12.6.4.3 When back flushing or injecting air, care shall be taken not to fill/refill the tank to a level greater than 12 inches below the elevation of the outlet pipe.

4.12.6.4.4 When pumping out a septic tank, cesspool, dosing chamber, or seepage pit, the entire contents of all compartments of the tank(s) shall be removed, including all solids, scum, and liquids.

4.12.6.4.5 Class F licensees shall inspect the dosing chamber of any engineered on-site system being pumped out. If solids are evident in the dosing chamber, the Class F licensee shall pump the dosing chamber.

4.12.6.5 Standard Services

4.12.6.5.1 Every septic tank pump-out shall include a visual inspection of the interior of the tank. The inspection shall include a determination regarding the presence of baffles and their condition, as well as the physical condition of the treatment tank.

4.12.6.5.2 Observations of any unusual conditions such as high or low liquid level, run-back from the absorption facility, defective or broken components, lush vegetation and/or sewage overflows shall be reported to the customer.

4.12.6.5.3 During system maintenance it is advisable to observe sewage flows from the building into the tank. Corrective action for any observed obstructions should be recommended.

4.12.6.5.4 Any unsatisfactory conditions shall be noted on the sales slip or receipt.

4.12.6.5.5 Operating OWTDS' should be pumped out at least once every three (3) years. This recommended maintenance frequency should be communicated to the customer at the time of service.

4.12.6.5.6 Any existing observation ports should be capped off.

4.12.6.5.7 Class F licensees may only repair, add or replace septic tank and/or holding tank risers, baffles, lids, distribution box lids and effluent filters.

4.12.6.6 Additives

3.12.6.6.1 The use of additives in OWTDS' is prohibited.

4.12.6.7 Reports

4.12.6.7.1 The Class F licensee shall submit quarterly reports documenting the location, the 911 mailing address, and amount of septage removed in total gallons. This requirement becomes effective one (1) year after promulgation of these Regulations.

4.12.6.8 Transportation of source separated materials as defined in Section 3.0 of the Regulations Governing Solid Waste, for reuse or recycling, does not

require a Non-Hazardous Liquid Waste Haulers Permit, only if the material remains separated throughout the transport routes and are not recombined.

4.12.7 Class H licensed system inspectors

4.12.7.1 All inspections of on-site wastewater treatment and disposal systems shall be submitted to the Department on forms approved by the Department (see Exhibit A). These forms shall be submitted within 72 hours of inspection completion.

4.12.7.2 The Department may require any Class H system inspector to notify the Department orally or in writing at least 48 hours, excluding Saturdays, Sundays and state holidays, prior to conducting a system inspection.

4.12.7.3 All Class H licensed system inspectors shall:

4.12.7.3.1 Comply with all applicable regulations and requirements.

4.12.7.3.2 Be responsible for the work carried out by their employees and on-site during all inspections.

4.12.7.3.3 Ensure all wastewater and septage is removed from the appropriate tanks by a Class F liquid waste hauler in accordance with the regulations.

4.12.7.3.4 Repair, add or replace septic tank and/or holding tank risers, baffles, lids, distribution box lids and effluent filters.

4.12.7.3.5 Notify the Department, when newly licensed, at least 48 hours prior to the initial three (3) system inspections performed.

4.12.7.3.6 Submit additional information and/or paperwork as required by the Department to satisfy these Regulations.

4.12.8 Class I licensed construction inspectors

4.12.8.1 All construction inspections of on-site wastewater treatment and disposal systems shall be submitted to the Department on forms approved by the Department. These forms shall be submitted to the Department within 72 hours of inspection completion.

4.12.8.2 Notify the Department orally or in writing at least 24 hours, excluding Saturdays, Sundays and state holidays, prior to conducting a construction inspection.

4.12.8.3 All Class I licensed construction inspectors shall:

4.12.8.3.1 Comply with all applicable regulations, requirements and guidelines.

4.12.8.3.2 Be responsible for the work carried out by their employees and be on-site during all inspections.

4.12.8.4 Notify the Department at least 36 hours prior to the initial six (6) system inspections for newly licensed construction inspectors.

4.12.8.5 The Department may require any Class I system inspector to notify the Department orally or in writing at least 36 hours, excluding Saturdays, Sundays and state holidays, prior to conducting a system inspection.

4.12.9 Any person who engages in the practice of professional engineering or professional geology in the specified activities under this Section shall be duly registered in conformance with the requirements of the laws of the State of Delaware.

4.13 The Department may issue temporary Class A, B, or E licenses to property owners who wish to conduct their own percolation testing, gravity system design, or system installation on their own property and for their own use. Certification of the intended use

will be required. The applicant shall submit an application on Department forms along with any required fee and shall demonstrate their competency in those fields by successfully completing a test conducted by the Department. The term of the temporary Class A, B, or E license shall expire upon permit expiration. There will not be a temporary Class E license granted for innovative/alternative system installations.

4.14 In exercising exclusive licensing authority under this Section, the Department shall seek the views of the On-Site Systems Advisory Board (Board) regarding licensing matters. The Board shall consist of 10 members designated at the discretion of the Secretary. The Board shall, if possible, be comprised as follows: one (1) member who is a Class B designer, one (1) member who is a Class C designer (Professional Engineer), one (1) member who is a Professional Geologist, one (1) member who is a representative of the USDA, one (1) member who is a Class D soil scientist, one (1) member who is a Class E system contractor, one (1) member who is a Class F liquid waste hauler, one (1) member who is a Class H system inspector, one (1) member who is a Class I construction inspector and one (1) member representing of the Department. Effective with the promulgation of this amended Regulation, the current Board members, with their designated term expiration dates, shall be posted on the DNREC web site. No later than 60 days prior to the term expiration date of any Board member (except for the representative of the Department), notice of such term expiration shall be published in a daily newspaper of general circulation throughout the State and on the DNREC web site. Any person desiring to serve on the Board shall submit a written request to the Secretary. The Secretary shall review all submissions and select the best qualified candidate(s), publishing each selection on the DNREC web site. If no one expresses an interest in the potential vacant position the Secretary may, at his/her discretion, re-designate the incumbent to serve another three (3) year term, or make a direct appointment to the Board. The Board shall advise the Department on matters relating to issuance of Class A, Class B, Class C, Class D, Class E, Class F, Class H and Class I licenses.

4.14.1 The applicant for a license renewal shall submit with the renewal application proof that he/she has attended and/or satisfactorily completed a minimum of 10 hours of continuing education training relating to the wastewater industry. This is to include siting, design, construction, operation and/or maintenance of on-site wastewater treatment and disposal systems. Class D soil scientists not ARCPAC or professionally certified must attend at least three (3) hours of soil related curriculum. Any training must be sponsored by recognized governmental, educational or industrial groups which include equipment manufacturers, and be approved by the Board. The number of hours of continuing education for first year licensees will be decided by the Board and be based upon license issuance date.

4.14.2 The Secretary may deny, suspend or revoke the license of a Class A, B, C, D, E, F, H or I licensee after considering the recommendations of the Board and demonstration that the licensee has practiced fraud or deception; that reasonable care, judgment, or the application or their knowledge or ability was not used in performance of their duties; or that the licensee is incompetent or unable to perform their duties properly, and;

4.14.2.1 Violated any provision of these Regulations;

4.14.2.2 Violated any lawful order or rule rendered or adopted by the Department;

4.14.2.3 Obtained his/her license or any order, ruling, or authorization by means of fraud, misrepresentation, or concealment of material facts;

4.14.2.4 Failure to obtain the necessary hours of continuing education training required by these Regulations;

4.14.2.5 Been found guilty of misconduct in the pursuit of his/her profession.

4.15 Any person whose application for a license has been denied or person whose license has been suspended or revoked shall be notified in writing and provided reasons for the decision. Within 20 days of notification, the person shall notify the Secretary, in writing, if an appeal pursuant to 7 **Del.C.** §6008 is to be requested. If no appeal request is received within the designated period the decision shall become final.

4.16 Licenses issued pursuant to this Section are not transferable and shall expire on December 31st of each year. A license may be renewed for one (1) year without examination for an ensuing year provided the licensee submits a completed license renewal form (provided by the Department) by November 30th of each year, shows proof of the number of hours of continuing education training and pays any applicable renewal fees adopted by the Department. If the licensee fails to renew the license for more than one (1) year the licensee must reapply for the license and take all necessary examinations. A reminder will be sent to the licensee to renew his/her license by the Department. This reminder will be sent to the address on file for the licensee. It is the licensee's responsibility to renew the license yearly and notify the Department of any changes.

4.17 In the event that any person holding a valid license issued by the Department under §7101-4.0 of these Regulations, 7 **Del.C.** §7101, has said license suspended or revoked by the Secretary pursuant to §7101-4.12.2, or, if any license holder should die or be unable to perform the required service prior to the completion of any activity contemplated by these Regulations, the owner of the affected property will procure another licensed person to complete said activity pursuant to §7101-3.1 of these Regulations, 7 **Del.C.** §7101. The Department will not assume responsibility/liability for the completion of said activity in place of the original licensee. However, the Department will ensure regulatory compliance until said activity is completed.

5.0 SMALL SYSTEMS (< 2,500 GPD)

5.1 This section prescribes the necessary soils investigations, permitting and installation requirements, operation and maintenance procedures and waiver applications for all on-site wastewater treatment and disposal systems with daily flow rates of < 2,500 gallons, including but not limited to all conventional, innovative/alternative, holding tanks and community on-site wastewater treatment and disposal systems (OWTDS).

5.2 Soil Investigations

5.2.1 Site Evaluation Procedures

5.2.1.1 A site evaluation is the first step in the process of obtaining a construction permit for an on-site wastewater treatment and disposal system. Any person applying for a permit to install a new or replacement on-site wastewater treatment and disposal system shall first obtain a site evaluation report prepared by a Class D soil scientist. The Department shall only conduct site evaluations for Home Rehabilitation Loan Programs (HRLP), block grant households, State Revolving Fund (SRF) sites and other qualifying income programs with similar criteria.

5.2.1.2 Each report shall be applicable to one residential or commercial structure. At a minimum, each report must include; approval page(s) (excluding sites not suitable for conventional on-site wastewater treatment and disposal systems (OWTDS)), report page(s), site drawing, soil profile notes, zoning verification form and the appropriate fee. The site evaluation report shall identify specific site conditions or limitations including, but not limited to, isolation and separation distances, slopes, existing wells, cuts and fills, and unstable landforms.

5.2.1.3 The Class D soil scientist shall specify on the approval page the type(s) of on-site wastewater treatment and disposal system(s), suitable under these regulations that may be constructed in the acceptable on-site disposal area(s) as indicated on the site drawing. Any other on-site wastewater treatment and disposal options available in the evaluated area shall be specified by the Class D soil scientist. The scientist shall either assign a percolation rate (see Exhibit Y) or have the appropriate hydraulic conductivity or percolation test(s) conducted in the materials interpreted to be the most hydraulically limiting within the upper 60 inches in the proposed disposal area. The estimated percolation rate should take into consideration, but not be solely governed by, the slowly permeable material. Horizons in contact with or immediately within the required vertical separation distance may have more relevance than layers much deeper in the profile.

5.2.1.3.1 Percolation rates, actual or estimated, > 120 minutes per inch (mpi) are very slowly permeable and constitute a limiting layer. Such sites shall not be suitable for new construction, except when;

5.2.1.3.1.1 Very slowly permeable horizon(s) can be removed (see sand-lining); or

5.2.1.3.1.2 The required separation distance above the very slowly permeable horizon(s) can be met and maintained (unsaturated permeable soils over very slowly permeable soils); or

5.2.1.3.1.3 Interpretations are to be made in conjunction with DNREC Environmental Scientist(s) to ensure all limiting conditions are addressed prior to making final site suitability determination.

5.2.1.3.1.4 For design purposes;

5.2.1.3.1.4.1 For systems with a separation distance of ≤ 24 inches the assigned percolation rate must be determined based on the most limiting layer above or below (after removal or sand-lining) the very slowly permeable soils or 75 mpi, whichever is greatest. Where the separation distance is > 24 inches, the minimum percolation rate assigned will be 60 mpi. The Class D soil scientist/site evaluator has the discretion to estimate a slower percolation rate than stated based on site specific constraints and professional experience.

5.2.1.4 A site drawing drawn to scale showing the information referenced in Section 5.2.1.9. All site drawings are required to show a reference point (e.g. a numbered utility pole, telephone or electrical box, building(s), property corners or fixed survey marker). A minimum of two such reference points shall be noted on the site drawing. Site drawing(s) shall be based on a whole number scale not to exceed one (1) inch equals 100 feet. Acceptable scales are: 1 inch = 10, 20, 30, 40, 50, 60, 80 or 100 feet. Any site drawing exceeding the dimensions of 8.5 inches X 11 inches must be submitted in duplicate.

5.2.1.5 Site drawings will show the location of all on-site and adjacent wells within 150 feet of the approved soils area. The following procedure shall be used in all cases when on-site or adjacent well(s) cannot be located. For instances where the on-site or adjacent well(s) are below ground and the homeowner or adjacent property owner states that the well is located in a certain area, this information shall suffice for verification of well location. Any well(s) that cannot be verified must be researched through the Water Supply Section of the Department. The search attempts to locate any well(s) that are near the affected parcel. If, after this search is completed, the well location(s) cannot be identified the Class D soil scientist can state “records were researched under this property owner’s name and no information was found”. The Department then sends a letter to the adjacent well owners notifying them of the need to locate their well(s) due to the future installation of an on-site wastewater treatment and disposal system. If no response is rendered within 15 days of receipt then the new system is to be designed to maximize the isolation distance from the property line.

5.2.1.6 A site evaluation prescription shall follow an approach that includes consideration of topography, available area, slope gradient and uniformity, soil profile (thickness and depth of each horizon, color, percolation, absorption rate, redoximorphic features, texture (see Exhibit B), and zones of saturation), drinking water supplies, bodies of water, and shellfish growing areas. All suitable soils within the evaluated area shall be delineated regardless of isolation distances, physical encumbrances and easement requirements as well as any of the above conditions which may exist.

5.2.1.7 All soil borings, holes and/or pits shall be flagged, identified and adequately shown on the site drawing.

5.2.1.8 In describing the soils and soil profile, the Class D soil scientist shall adhere to the procedures and techniques provided in the Soil Survey Manual, USDA Agricultural Handbook No. 18 Keys to Soil Taxonomy and Field Book for Describing and Sampling Soils, as published by the U.S. Department of Agriculture.

5.2.1.9 The report shall contain, at a minimum, observations of the following site characteristics, if present:

5.2.1.9.1 Parcel size, location map of project site, 12 digit Hydrologic Unit Code (HUC) watershed name, configuration and approximate dimensions.
5.2.1.9.2 Slope – approximate percent and direction.
5.2.1.9.3 Surface streams, springs or other bodies of water and their definition (e.g. shellfish, intermittent, ephemeral, etc.).
5.2.1.9.4 Existing wells within 150 feet of approved soils area, measured from two (2) reference points or established survey control.
5.2.1.9.5 Escarpments.
5.2.1.9.6 Cuts and fills.
5.2.1.9.7 Unstable landforms.
5.2.1.9.8 A representative number of soil profile descriptions (minimum of three (3) soil borings or two (2) test pits per acre) and one soil profile description per design area in the evaluated area(s). These shall identify the soil series or taxonomic subgroup (e.g. Sassafras or Typic Hapludult). The geographic coordinates of each representative soil boring and/or test pit, a minimum of two (2), must be determined by a global positioning system.
5.2.1.9.9 Zones of saturation (as indicated by redoximorphic features).
5.2.1.9.10 Approved soils area(s) with extents delineated.
5.2.1.9.11 Encumbrances.
5.2.1.9.12 Central wastewater or water systems availability.
5.2.1.9.13 Location of any wetlands, refer to the 2007 Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable.
5.2.1.9.14 Any overhead utilities.
5.2.1.9.15 Existing buildings.
5.2.1.9.16 Existing on-site and adjacent wastewater treatment and disposal systems.
5.2.1.9.17 Flood prone areas designated as “V” zones by FEMA.
5.2.1.9.18 Tax ditches with associated easements and right of ways.
5.2.1.9.19 When prescribing a Wisconsin At-Grade system include the following information:
5.2.1.9.19.1 The percolation rate of the most limiting horizon within the upper 36 inches.
5.2.1.9.19.2 The incremental loading rate (ILR) (see Exhibit V) of each horizon within the upper 20 inches.
5.2.1.9.19.3 Provide this information in the “Design Considerations and Comments Section” of the approval page.

5.2.1.10 The application/construction permit may be submitted with the site evaluation, in an emergency situation, when there is a public health risk associated with a malfunctioning system. The permit shall not be approved until the site evaluation is reviewed and complies with these Regulations. Site evaluations needed to replace the malfunctioning system shall be given a priority review.

5.2.1.11 Once received, the report shall be reviewed for compliance with current Regulations by a DNREC Environmental Scientist with a soil science background. If the report is in non-compliance, the Class D soil scientist shall be notified. The Class D soil scientist shall contact the Department and follow up with written correspondence to rectify the discrepancy. The Department shall not modify any site evaluation report unless requested by the Class D soil scientist. The corrections shall

be submitted to the Department from the Class D soil scientist and a corrected copy to the owner/agent. The review process, which may include a field check, shall take place within 10 working days of receipt.

NOTE: If approval cannot be issued within 10 working days, the property owner or authorized agent shall be notified of the delay and a tentative date of approval or denial shall be given. However, if no property owner or authorized agent contact number provided the Department will contact the Class D soil scientist. Once approved, the report shall be mailed to the property owner or his/her authorized agent. A percentage of randomly chosen site evaluations submitted shall be field verified by DNREC staff. Site evaluations' requiring test pits should be scheduled with the Department 72 hours prior to conducting the site evaluation.

5.2.1.12 Approval of a site evaluation indicates only that the site evaluation was conducted in compliance with these Regulations. It is not an indication of the correctness or quality of the site evaluation or an indication that a permit can be issued.

5.2.1.13 The approved site evaluation report shall indicate the type of the initial and type of replacement system for which the site is approved.

5.2.1.14 Technical regulation changes shall not invalidate an unexpired approved site evaluation but may require the use of a different type of system.

5.2.1.15 The approved site evaluation shall be valid for five (5) years from the date of the Department's approval unless a subdivision base plan restricting well and on-site wastewater treatment and disposal system locations has been approved by the Department and recorded in the local Recorder of Deeds Office. After the five (5) year period, a current site evaluation as outlined in Section 5.2.1 shall be submitted to the Department for approval. This site evaluation will be reviewed as outlined in Sections 5.2.1.10 and 5.2.1.11 and must include at least one (1) new soil boring and profile description as well as any previous descriptions referred to in the approval page and report.

5.2.1.16 Supplemental soil information submitted after the original site evaluation has been approved and, prior to expiring, shall include a revised approval page, report page, soil profile notes, and revised site drawing locating supplemental borings/test pits. In all cases, the new report shall be approved provided all criteria for approval are met. If the purpose of supplemental work is to change the type of system previously prescribed, another review fee shall be required. Likewise, any borings/test pits conducted greater than 100 feet from the previously approved area, with or without a system change, or lot reconfiguration shall require a review fee. On larger parcels, the area evaluated shall be delineated on the site drawing.

5.2.1.17 The Department shall issue a notice of its intention to deny a site evaluation when appropriate.

5.2.1.18 A property owner or agent has the option to use observation wells and/or piezometers to demonstrate that redoximorphic features are not an indication of a present day limiting zone. Section 5.2.3 provides procedures for the use of observation wells/piezometers to determine the depth and duration of zones of saturation.

5.2.1.19 Site evaluations shall expire in accordance with Section 5.2.1.15 unless:

5.2.1.19.1 A subdivision base plan (record plat) restricting well and on-site wastewater treatment and disposal system (OWTDS) locations has been approved by the Department and then recorded with the Recorder of Deeds.

5.2.1.19.1.1 Recordation and/or re-recordation of a minor subdivision or individual lots not in a major subdivision

5.2.1.19.1.1.1 Applicant to submit to the Groundwater Discharges Section a Declaration of Covenants and Restrictions (DCR) with a surveyed site plan restricting the well and OWTDS locations along with the site evaluation. Once approved the applicant shall have the DCR and site plan recorded with the Recorder of Deeds.

5.2.1.19.1.2 Re-recordation of lots within a major subdivision

5.2.1.19.1.2.1 If partial subdivision re-recordation is approved by local zoning authority restricting well and OWTDS locations, the Department will consider a new subdivision base plan (record plat) for the purposes of this regulation.

5.2.1.19.1.3 Re-recordation of a major subdivision

5.2.1.19.1.3.1 If a subdivision re-recordation is approved by local zoning authority restricting well and OWTDS location, the Department will consider a new subdivision base plan (record plat) for the purposes of this regulation.

5.2.1.19.2 Installed Systems

5.2.1.19.2.1 Replacement/Malfunction (as defined in these Regulations)

5.2.1.19.2.1.1 In the case of replacement/malfunction system; a new site evaluation performed by a Class D soil scientist is required if the site evaluation is over five (5) years old.

5.2.1.19.2.1.1.1 If the site evaluation is less than five (5) years old; the Department strongly recommends that a supplemental soil boring be performed by a Class D soil scientist.

5.2.1.19.2.2 Expansion/Upgrade

5.2.1.19.2.2.1 In the case of an expansion/upgrade system for which an approved site evaluation is on file, it is recommended that a supplemental soil boring(s) as per section 5.2.1.16 be performed by a Class D soil scientist.

5.2.1.19.2.3 Emergency Repair/Repair

5.2.1.19.2.3.1 In the case of an application for a repair, the Department will review on a case by case basis the information supplied/extenuating circumstances to determine if supplemental borings or a new site evaluation is needed.

5.2.1.19.3 Any expired site evaluation that allowed a holding tank as an option and a new site evaluation and wet season monitoring (if applicable) confirms that it is a denied site; the Department will apply the Regulations that were in effect when the original site evaluation was denied.

5.2.2 Soil Feasibility Study

5.2.2.1 It is the policy of the Department to facilitate compliance with these Regulations through review of proposed development projects as early as possible in the development process to avoid unnecessary conflicts and expense. Any development project, which may or may not constitute a major subdivision, can

submit a feasibility study to satisfy other local government approval processes. Any project that proposes to use individual on-site and/or large wastewater treatment and disposal systems must submit a letter of intent prior to initiating any preliminary soil investigations.

5.2.2.2 The letter of intent must contain the following details:

5.2.2.2.1 The name of the developer and landowner.

5.2.2.2.2 The size, tax map number, 12 digit Hydrologic Unit Code (HUC) watershed name, zoning certificate for and the location of the parcel.

5.2.2.2.3 Number of proposed lots and/or projected flow rates.

5.2.2.2.4 Projected start date of site/soil investigative work.

5.2.2.2.5 Name of the Class D.2 or D.3 soil scientist and contact information

5.2.2.3 If the proposed number of lots is ≥ 50 **and** ≥ 50% of the on-site soils have limiting zones < 48 inches **or** the number of lots is ≥ 100 **or** a large on-site wastewater treatment and disposal system (LOWTDS) is proposed, proceed to the requirements of Section 6.2, if not, proceed to Section 5.2.2.5. Prior to the submission of a SIR, the Class D soil scientist may submit a soil feasibility study in accordance with Section 5.2.2.4.

5.2.2.4 A soil feasibility study for a LOWTDS shall contain the following information:

5.2.2.4.1 Site plan drawn to scale not to exceed one (1) inch equals 200 feet.

5.2.2.4.2 Illustrate topography on one (1) foot contour intervals unless the Department approves the use of an alternate scale due to extreme variations in the elevation on the site.

5.2.2.4.3 Conduct a soil suitability evaluation of the project site following the procedures prescribed in Section 5.2.1. The area of investigation should be concentrated within the proposed LOWTDS. The soil scientist must demonstrate the area proposed for the LOWTDS represents the best soils on the project site. The extent and nature of the soil evaluation shall be determined by the Class D soil scientist.

5.2.2.4.4 Based on preliminary design criteria established by the Class D soil scientist, as a result of the soils evaluation, a preliminary engineering study prepared by a Class C designer must be included which demonstrates the suitability of the evaluated area for the proposed number of lots. The engineering study must include, at a minimum, the proposed method of disposal, proposed treatment levels, and proposed design flow rates, along with preliminary calculations/layout to demonstrate there is sufficient area for both the initial and replacement system.

5.2.2.4.5 The Department may ask for any additional information deemed necessary to make a statement of feasibility.

5.2.2.5 A soil feasibility study for individual OWTDS shall be filed with the Department setting forth the proposed manner of compliance with these Regulations. The soil feasibility study shall contain the following information:

5.2.2.5.1 Site plan must be drawn to scale not to exceed one (1) inch equals 200 feet.

5.2.2.5.2 Illustrate topography by two (2) foot contour intervals unless the Department approves the use of an alternate scale due to extreme variations in elevation on the site.

5.2.2.5.3 Illustrate the approximate location of all wells, watercourses, roads and on-site wastewater treatment and disposal systems within 150 feet of the perimeter of the property.

5.2.2.5.4 Conduct a soil suitability evaluation of the project site following procedures prescribed in Section 5.2.1. The extent and nature of the soil evaluation shall be determined by a Class D soil scientist. The Class D soil scientist shall coordinate the planning of the soils evaluation with the Department prior to initiating work. The use of a 200 foot grid may help facilitate the evaluation.

5.2.2.5.5 Indicate the type of limiting zone, its depth, and list the results of the site and soils analysis on the appropriate forms.

5.2.2.5.6 Each soil interpretative unit identified for potential on-site wastewater treatment and disposal shall have at least one (1) set of percolation tests (minimum of 3) conducted within it to establish representative percolation rates for each interpretative unit.

5.2.2.5.7 Lot numbers and approximate lot areas shall be provided.

5.2.2.5.8 A general site location map shall be included on the preliminary plan for reference identification of the area.

5.2.2.5.9 Proposed storm water management areas.

5.2.2.5.10 Location of any wetlands, refer to the 2007 Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable.

5.2.2.5.11 Any other information required by the Department.

5.2.2.6 The Department shall conduct a general review of the preliminary plan and give the owner/developer a statement of preliminary subdivision feasibility which shall contain a statement of on-site wastewater treatment and disposal feasibility. This Section shall not be construed to relieve the applicant of the responsibility of obtaining individual site evaluations and permits from the Department for each lot prior to commencement of construction of any OWTDS.

5.2.3 Observation Wells/Piezometers

5.2.3.1 Observing water table fluctuations shall follow these procedures:

5.2.3.1.1 The property owner or authorized agent shall notify the Department, in writing, to “Request to use observation wells and/or piezometers” to determine the present day limiting zone which must include the following details:

5.2.3.1.1.1 The name of the developer and/or property owner.

5.2.3.1.1.2 The size, tax parcel number, zoning certificate for and location of the parcel.

5.2.3.1.1.3 Contact information of the property owner and/or developer (address/phone).

5.2.3.1.1.4 Names of the Class D soil scientist and person reading the wells, if different.

5.2.3.1.1.5 Projected date of observation well/piezometer installation.

5.2.3.1.1.6 Projected date of reading commencement.

5.2.3.1.1.7 Reason for request.

5.2.3.1.2 The Class D soil scientist shall provide the following information:

5.2.3.1.2.1 A minimum of three (3) logged soil profile notes for borings performed within the proposed monitoring area.

5.2.3.1.2.2 Site evaluation report page summarizing soil/site conditions.

5.2.3.1.2.3 Sketch showing observation well/piezometer locations.

5.2.3.1.2.4 Appropriate fee.

5.2.3.1.3 The Department shall review the submittals and provide comments/concerns, if any, regarding the proposed request and/or soils information.

5.2.3.1.4 Observation wells and/or piezometers shall be installed by or under the direct on-site supervision of a well driller licensed by the State of Delaware in accordance with the current Regulations Governing the Construction and Use of Wells and Exhibit Z. It shall be the responsibility of the Class D soil scientist to determine the depth of installation with guidance provided by the Department, if solicited.

5.2.3.1.5 The observation wells and/or piezometers must be installed prior to December 1st and monitoring will commence on this date as well. Monitoring will continue through May 15th of the following year as outlined below.

5.2.3.1.6 Monitoring must be performed by Class A, B, C, D, E, F, H or I licensees or DNREC licensed well driller. Monitoring shall occur, at a minimum, weekly throughout the monitoring period. If water is observed above 18 inches for siting OWTDS, more frequent observations are warranted. For the purposes of siting an OWTDS via observation wells and/or piezometers the hydrologic limiting zone will be determined based on the average of all readings taken within a 14 consecutive day period during the wet season determined to represent the seasonal peak water table levels.

5.2.3.1.6.1 The Department shall field check the monitoring periodically during the time of expected saturated soil conditions at their discretion.

5.2.3.1.6.2 The Department may, at any time during the observation period, verify the observed water depth by conducting a soil boring next to, and of equal depth with, any of the observation wells/piezometers. If the water level in the fresh boring, after 24 hours, presents a discrepancy with the water level observed in the well/piezometer, then at the discretion of the Department, the data may be declared invalid. If the data is declared invalid, then the Department will notify the owner in writing of the invalid data within 10 days of determination.

5.2.3.1.7 It shall be the responsibility of the Department to evaluate if precipitation levels occurring during the monitoring period are sufficient for accepting data. If, in the estimation of the Department, insufficient precipitation was received, observation wells and/or piezometers may have to be monitored an additional wet season. A near normal monitoring period is defined as a period that has plus or minus one standard deviation of the long term mean annual precipitation. (Long term refers to 30 or more years). Also, the mean monthly precipitation during a normal period must be plus or minus one standard deviation of the long term monthly precipitation for 8 of the 12 months. For the most part, normal years can be calculated from the mean annual precipitation.

5.2.3.1.8 Should the precipitation and long-term groundwater levels be significantly below or above normal, a mathematical analysis may be utilized under the direction of the Department to correlate present data with past years. The methodology and validity of such analysis is at the sole discretion of the Department.

5.2.3.1.9 When monitoring determines that the site is suitable, the Department will request a complete site evaluation be submitted in compliance with these Regulations prior to August 15th to be reviewed. The monitoring information must be incorporated into the new site evaluation. An approved site evaluation report shall be issued indicating the appropriate system type(s) and both, the site evaluation and monitoring data, will expire five (5) years from date of approval if not permitted.

5.2.3.1.10 Observation wells and/or piezometers are required to be abandoned in accordance with the current Regulations Governing the Construction and Use of Wells.

5.2.4 Soil Percolation Rate Determination

5.2.4.1 Percolation rates are assigned by State Environmental Scientists and Class D soil scientists based upon observed soil structure and textures during the site evaluation. The Department has established a table of percolation rates based upon USDA soil textures (see Exhibit Y).

5.2.4.2 Soil Percolation Test

5.2.4.2.1 The soil percolation test shall provide a measure of the rate at which water moves from an uncased bore hole into the surrounding soil under nearly constant head in both vertical and horizontal directions.

5.2.4.2.2 One (1) soil percolation test shall consist of three (3) test holes.

5.2.4.2.3 The percolation test shall be performed only after a site evaluation has indicated that the soil may be suitable for an on-site wastewater treatment and disposal system. The percolation test shall be used to determine the rate at which wastewater effluent can be expected to seep into the soil. This rate shall be used in conjunction with a projected daily flow rate to determine the area required for proper treatment and disposal.

5.2.4.2.4 The depth of the percolation test holes shall not be determined until a site evaluation is completed and a limiting zone, if any, is identified. The depth of the percolation test holes shall be as follows:

5.2.4.2.4.1 If the limiting zone occurs at least 20 inches from the soil surface, the percolation test holes shall be within the soil horizon controlling the water movement vertically and/or horizontally to a depth of 60 inches.

5.2.4.2.4.2 If the limiting zone occurs at less than 20 inches from the surface, the site is unsuitable for a conventional on-site wastewater treatment and disposal system. However, if replacing a failing or malfunctioning system, Section 5.2.4.2.4.1 should be used without regard for the 20 inch limiting condition. In situations where sand-lining through an impermeable or less permeable horizon within the top 48 inches, a percolation test should be performed within the soil zone which is controlling the water movement vertically and/or horizontally beneath the restrictive material to a depth of 60 inches.

5.2.4.2.5 The following procedures shall be used for percolation tests:

5.2.4.2.5.1 A minimum of three (3) test holes shall be dug within the proposed installation area of the absorption facility. Additional tests may be required in areas with varying soil characteristics or when warranted at the sole discretion of the Department due to the size of the required disposal area.

5.2.4.2.5.2 Test holes with a horizontal diameter of six (6) inches shall be dug or bored. A post hole digger, auger or mechanical digger may be used to dig the holes.

5.2.4.2.5.3 The bottom and sides of each test hole shall be scarified to remove any smeared soil surfaces that result from digging. Loose soil shall be removed from the hole. Two (2) inches of coarse sand or fine aggregate shall be placed in the bottom of the hole to prevent sealing of the hole bottom when water is added.

5.2.4.2.5.4 The hole shall be filled with water to a minimum depth of 12 inches above the aggregate or sand. This level shall be maintained for a period of at least four (4) hours.

5.2.4.2.5.5 The water level shall then be adjusted to six (6) inches over the gravel or sand. The hole shall be allowed to stand undisturbed for 30 minutes. The water level shall again be adjusted to six (6) inches over the aggregate and the hole allowed to infiltrate undisturbed for another 30 minutes.

5.2.4.2.5.6 Where the drop in the water level is two (2) inches or more in 30 minutes, the interval for readings during the percolation test shall be 10 minutes. Where the drop in the water level is less than two (2) inches in 30 minutes, the interval for readings during the percolation test shall be 30 minutes. The drop in water level shall be recorded after each reading and the water level shall be adjusted to six (6) inches above the gravel. Readings shall continue for a minimum of four (4) hours where the interval between readings is 30 minutes. Where the interval is 10 minutes due to fast percolation, the readings may be discontinued after one (1) hour. Where the drop between readings has not stabilized at the end of the minimum period, the reading shall continue until a steady rate is established. A steady rate is established when two (2) successive water level drops do not vary by more than one-sixteenth ($^1/_{16}$) of an inch. If any of the holes has a rate that is significantly different from the other holes, it shall be examined to see if this hole is in a soil that is different from the soil described in the site evaluation. If the hole is determined, by the licensed percolation tester, to be uncharacteristic of the site it shall be excluded from analysis but listed on the application.

5.2.4.2.5.7 The percolation rate for the site shall be determined by taking the arithmetic average of all percolation tests conducted. Percolation rates slower than 120 minutes per inch (mpi) are unacceptable and shall not be used to determine the arithmetic average percolation rate but shall be reported. On-site wastewater treatment and disposal systems shall not be placed on those portions of any sites that have percolation rates slower than 120 mpi.

5.2.4.3 Additional Methodologies

5.2.4.3.1 At the discretion of the Department or Class D soil scientist, additional methodologies may be preferred as a substitute for the soil percolation test. Approved test methods are given in the current edition of Methods of Soil Analysis, ASA and the ASTM Standards.

5.2.5 Site Interpretation Advisory Council

5.2.5.1 The purpose of the Site Interpretation Advisory Council (Council) is to act as an objective peer group in the review of discrepancies between the Department and Class D soil scientists regarding questions of interpretation of soil and site information for the purpose of siting on-site wastewater treatment and disposal systems.

5.2.5.2 The Council shall restrict its charge to those items normally and commonly addressed when conducting a site evaluation as discussed below. The Council specifically excludes instances regarding the engineering design and/or installation of on-site wastewater treatment and disposal systems except when it is directly applied to the soil science practice.

5.2.5.2.1 The description and interpretation of soil morphology in regard to the proper functioning of on-site wastewater treatment and disposal systems utilizing the soil as part of the treatment process.

5.2.5.2.2 The characterization of lithologic and hydrologic limiting layers and geomorphology pertinent to the proper siting and functioning of on-site wastewater treatment and disposal systems.

5.2.5.2.3 The recognition and documentation of site limitations for the placement of on-site wastewater treatment and disposal systems (e.g. existing wells and on-site wastewater treatment and disposal systems) in accordance with standard practice in Delaware.

5.2.5.3 The Council shall be appointed by the Secretary and consist of the following members:

5.2.5.3.1 Four (4) non-governmental Class D.2 or D.3 soil scientists actively practicing in the State of Delaware for two (2) or more years with one (1) acting as an alternate.

5.2.5.3.2 One (1) employee of the Department with soils and on-site wastewater industry expertise.

5.2.5.3.3 One (1) soil scientist designated by the State Conservationist through the State Soil Scientist, NRCS, USDA.

5.2.5.3 4 A manager of the Groundwater Discharges Section (GDS), DNREC, shall serve as a liaison to the Council without voting privileges.

5.2.5.3.5 All members shall serve three (3) year terms. Procedures shall be established by the Council to stagger terms so as to provide continuity.

5.2.5.4 Documentation and testimony regarding a review shall be submitted to the Council. After the initial review by the Council, a determination shall be made as to whether sufficient information has been submitted to render an informed decision. The Council may request additional information from the applicant before proceeding with the review. There shall be no cost to the Council for any information submitted.

5.2.5.5 Within 30 days from receipt of the documentation, the Council shall render a decision, based on a simple majority vote, regarding which system(s), if any, are suitable under the Delaware Regulations.

5.2.5.6 A site visit shall be conducted by at least two (2) members of the Council. The applicant is responsible for all costs that may be incurred. Council members shall not be reimbursed for any expenses.

5.2.5.7 Any decision rendered by the Council shall be considered by the Secretary and may be a deciding factor in his/her decision. The applicant still maintains his/her right to appeal the decision of the Secretary in accordance with 7 **Del.C.** §6008.

5.2.5.8 The Council shall designate one of its members representing the private sector to serve as chairperson for a period of one year. The chairperson, or his/her designee, serving as the principal contact person between the Council and a manager of the Groundwater Discharges Section (GDS), shall perform the following duties:

5.2.5.8.1 Call and preside at all Council meetings. (A GDS manager may also call a meeting, but is not entitled to preside at a Council meeting.)

5.2.5.8.2 Upon receipt of a request, poll the Council members and communicate the results to the GDS manager calling a Council meeting when appropriate. (This function may also be performed by the GDS manager, when necessary.)

4.2.5.8.3 Prepare a letter communicating the Council's decision in each case. (The letter shall be sent within 15 working days after the Council's decision to the GDS manager for signature and returned for mailing within three (3) working days.)

5.2.5.9 The following services shall be furnished by the DNREC to facilitate the operation of this Council:

5.2.5.9.1 A manager of the Groundwater Discharges Section shall represent the Section's position at all Council meetings.

5.2.5.9.2 All submittals for consideration shall be circulated to the Council under the direction of the GDS manager within 10 working days.

5.2.5.9.3 A GDS manager, at the request of the Council chairperson, shall reserve space in the DNREC facilities for Council meetings.

5.2.5.9.4 The DNREC shall provide clerical services for record keeping. Records of the Council meetings shall be furnished to all Council members within 15 working days following the meetings.

5.2.5.9.5 The clerical person shall prepare and mail the decisions of the Council upon receipt from the chairperson.

5.2.5.10 The Council shall restrict reviews to those submittals using one of the following two (2) methods:

5.2.5.10.1 A submittal from the Secretary, DNREC; or

5.2.5.10.2 A submittal from a Class D soil scientist.

5.2.5.11 All submittals shall be circulated to the Council membership. A majority vote of the Council is required for any submittal to be accepted for Council review.

5.3 Permitting

5.3.1 General Requirements

5.3.1.1 No person shall cause or allow construction, or repair of a system, or any part thereof, without a permit. An exception may be allowed for certain emergency repairs as set forth in these Regulations.

5.3.1.2 All disposal systems shall be located according to the minimum horizontal isolation distances specified in these Regulations (see Exhibit W). All isolation distances for capped systems and elevated sand mounds shall be measured from the edge of the aggregate or aggregate-free chamber.

5.3.1.3 All pressurized systems must be constructed in such a manner that the operating pressure can be checked at the end of the distal lateral (permanent tee, etc).

5.3.1.4 All pressurized systems must utilize timers or other electrical on/off delay devices to ensure dosing frequencies. Timers must be part of the control panel.

Any timer system utilizing a demand over-ride float shall incorporate a pump cycle counter and elapsed time meter.

5.3.1.5 Trench depths as prescribed in the approved site evaluation are for the upslope side of the trench only. Trench systems designed in sloping disposal areas > 5% may result in downslope trench sidewall depths that may change system type (e.g. capping fill vice full depth).

5.3.2 Disposal System Sizing

5.3.2.1 All disposal systems shall be sized based on the estimated wastewater flow and the results of percolation tests or the assigned percolation rate. Percolation rates shall be based on USDA soil textures and assigned by the Class D soil scientist. The table of percolation rates used by the Department (see Exhibit Y) does not represent assigned rates, but instead gives estimates based upon textures. Percolation rates < 20 minutes per inch (mpi) will not be allowed for designing any on-site wastewater treatment and disposal system, unless otherwise approved by the Department.

5.3.2.2 The minimum disposal area required for trench systems with percolation rates ≤ 120 mpi shall be determined from the following equation:

$$A = 0.33\ Q\ (t)^{0.5}$$

Where:

A = the minimum disposal area required in square feet

Q = wastewater application rate in gallons per day

t = the average percolation rate in minutes per inch (minimum rate is 20 mpi for design)

5.3.2.3 The minimum disposal area required for seepage bed systems with percolation rates ≤ 120 mpi shall be determined from the following equation:

$$A = 0.42\ Q\ (t)^{0.5}$$

Where:

A = the minimum disposal area required in square feet

Q = wastewater application rate in gallons per day

t = the average percolation rate in minutes per inch (minimum rate is 20 mpi for design)

5.3.2.4 Where percolation rates are < 6 mpi (minimum rate is 20 mpi for design), such as in soils with USDA textures of sands, and loamy sands, a pressurized distribution system is required; the minimum disposal area shall be determined from the following equation:

$$A = 1.2\ Q$$

Where:

A = the minimum disposal area required in square feet

Q = design flow rate in gallons per day

5.3.2.5 The minimum disposal area required for low-pressure pipe systems with percolation rates ≤ 120 mpi (minimum rate is 20 mpi for design) shall be determined from the following equation:

$$A = UQ$$

Where:

A = the minimum disposal are required in square feet

Q = design flow rate in gallons per day

U = unit absorption area (see Exhibit P)

5.3.2.6 The minimum disposal area for Wisconsin At-Grade systems with percolation rates ≤ 75 mpi (minimum rate is 20 mpi for design) shall be determined from the following criteria:

5.3.2.6.1 Calculate the long term acceptance rate (LTAR) (see Exhibit V); and

5.3.2.6.2 Calculate the horizontal acceptance rate (HAR) in gpd/ft using the following equation:

HAR = sum (incremental loading rate (in site evaluation) (see Exhibit V)) X (thickness of each horizon (inches) to a depth of 20 inches)

5.3.2.6.3 Calculate the effective absorption area (EAA) in ft^2 using the following equation:

EAA = Q/LTAR

Where:

Q = design flow rate in gallons per day

LTAR = long term acceptance rate (see Section 5.3.2.6.1)

5.3.2.6.4 Calculate the effective absorption width (EAW) in feet using the following equation:

EAW = HAR/(1.2 – LTAR)

Where:

HAR = horizontal acceptance rate (see Section 5.3.2.6.2)

LTAR = long term acceptance rate (see Section 5.3.2.6.1)

NOTE: An effective width of four (4) to nine (9) feet is appropriate. The designer should use an EAW that is ≤ the calculated value. If the calculated value is > 10 feet then limit the EAW to 10 feet.

5.3.2.6.5 Calculate the absorption length (AL) in feet using the following equation:

AL = EAA/EAW

5.3.2.7 For design criteria and requirements for the permitting of micro-irrigation (drip) or peat biofilter systems refer to the specific Department guidelines located at the end of the Regulations.

5.3.3 Wastewater Design Flow Rates

5.3.3.1 The projected peak daily wastewater flow shall be used to determine the appropriate size and design of on-site wastewater treatment and disposal systems.

5.3.3.2 Where actual calibrated metered flow data indicating peak daily flows over the most recent three (3) year period are available for a similar facility, such peak flow data may be substituted for the wastewater flows listed in this section subject to the approval of the Department. When ranked in descending order the adjusted design daily flow shall be determined by taking the numerical average of the daily readings within the upper 10% of the daily readings.

5.3.3.3 The design wastewater flow from residential dwellings, including single family, multiple family, manufactured homes, and apartments served by on-site wastewater treatment and disposal systems shall be 120 gallons per day per bedroom. The minimum design flow for any commercial property shall be 120 gallons per day and residential dwellings shall be 240 gallons per day. Credit for water conservation devices will be accounted for according to current Department guidelines.

5.3.3.4 The design wastewater flow from other residential, commercial and/or institutional facilities served by on-site systems shall be as prescribed in Exhibit D.

5.3.3.5 Disposal systems shall be designed to receive all wastewater, except for water softener backwash (regeneration water), from the building or structure served unless otherwise approved by the Department.

5.3.3.6 All restaurants or other establishments involved in food preparation activities shall install external grease traps as required by the Department.

5.3.3.7 Laundromat and car wash wastewater shall be pretreated as specified by the Department prior to discharge to any absorption facility under these Regulations.

5.3.3.8 Industrial wastewater shall not be discharged into a septic tank unless prior approval is obtained from the Department.

5.3.4 Isolation Distances

5.3.4.1 The minimum isolation distances set forth in Exhibit C shall be maintained when designing, locating, repairing, replacing, and installing on-site wastewater treatment and disposal systems.

5.3.4.2 The Department may require greater isolation distances for systems when conditions warrant for purposes of protecting environmental resources and the public health.

5.3.4.3 Isolation distances may be decreased by the Department based on a site specific geological and hydrogeological analysis performed pursuant to the requirements of these Regulations, provided that the Department is satisfied that such decrease will allow for protection of environmental resources and the public health.

5.3.4.4 Existing on-site wastewater treatment and disposal systems which are repaired or replaced shall be subject to the requirements of this Section, provided however, that if it is impossible to comply with such requirements due to lot size limitations, the repaired or replaced system shall conform to the maximum extent practicable with the requirements of this Section as determined by the Department at its sole discretion.

5.3.5 Water Conservation Devices

5.3.5.1 A 25% reduction in design flow is allowed for water conservation. The absorption facility shall be enlarged if the conservation devices are removed, become inoperative, or the system malfunctions.

5.3.5.2 Water saving plumbing devices are encouraged to lengthen the life of the absorption facility. However, only permanent water saving plumbing devices such as low flush toilets shall be considered in reducing the size of the absorption facility for replacement systems with limited approved disposal area, properties located in a five (5) year plan sewer district or temporary structure. Devices such as inserts in showers are considered temporary. Water conservation reductions of 25% in design flows will not be permissible for new construction.

5.3.6 Dosing and Diversion Systems

5.3.6.1 Effluent from on-site wastewater treatment and disposal systems shall be transmitted to the absorption facility by gravity, pressure distribution systems utilizing a dosing chamber (see Exhibit I) or lifted by a lift station (see Exhibit X) to overcome elevational differences between the septic tank and the gravity absorption facility.

5.3.6.2 Gravity distribution systems may be used when the design wastewater flow requires < 2,500 ft^2 of disposal area for seepage trenches or seepage beds and the percolation rate is ≥ six (6) minutes per inch.

5.3.7 Gravity distribution systems shall conform to the following requirements:

5.3.7.1 All unperforated gravity transmission pipe up to the distribution box shall be Sch. 40 PVC at least four (4) inches or greater in diameter unless lifted by a lift station to a distribution box in which case a minimum 1½ inch diameter pipe would be permissible with a minimum of 20 feet of four (4) inch diameter Sch. 40 PVC pipe set at a minimum grade of ⅛ inch per foot prior to entering the distribution box.

NOTE: Minimum bury depth requirements apply to all pressurized transmission piping – see Section 5.3.9.2.

5.3.7.2 All gravity transmission piping shall be placed on a firm undisturbed or well compacted soil. All joints shall be watertight. A minimum grade of $^{1}/_{8}$ inch per foot shall be provided for gravity transmission piping. Clean backfill shall be placed around and over the pipe and hand tamped to provide compaction.

5.3.7.3 All gravity distribution laterals shall be thin walled or Sch. 40 PVC and shall be four (4) inches in diameter. Perforated PVC pipe shall have $^{3}/_{8}$ to $^{3}/_{4}$ inch diameter holes a maximum of 30 inches on center. Coiled and corrugated piping shall not be used. A grade of less than two (2) inches per 100 feet shall be provided for all gravity distribution laterals.

5.3.7.4 The design and construction of the gravity distribution system shall provide uniform application of the effluent. All distribution laterals shall be of equal length unless approved by the Department. The effluent shall be equally divided between laterals of the gravity distribution system by means of a distribution box.

5.3.7.5 Stepped trenches shall be used on sloping ground.

5.3.7.6 All distribution boxes shall conform to the following requirements (see Exhibit H):

5.3.7.6.1 Location: Distribution boxes shall be used with all gravity systems. They shall be located in accordance with the minimum horizontal isolation distances set forth in Exhibit C. A minimum distance of three (3) feet shall separate the inlet face of the distribution box from the septic tank outlet.

5.3.7.6.2 Capacity: Distribution boxes shall be sized to accommodate the number of distribution laterals required for the distribution system.

5.3.7.6.3 An inlet baffle shall be installed in all distribution boxes. The baffle shall be perpendicular to the inlet pipe and situated six (6) inches from the end of the inlet. The baffle shall be constructed of the same material as the distribution box. In cases where concrete distribution boxes are utilized, there shall be a 12 inch square rising from the box floor, centered with the inlet connection, and permanently affixed. In cases where plastic distribution boxes are utilized, PVC tees or 90° elbows may be incorporated as baffles.

5.3.7.6.4 The inverts of all outlets shall be of the same elevation and at least one (1) inch below the inlet invert.

5.3.7.6.5 Each inlet pipe and outlet distribution lateral shall be connected separately to the distribution box. Unperforated distribution piping shall be Sch. 40 PVC and extend a minimum of five (5) feet from the distribution box prior to the absorption facility.

5.3.7.6.6 The requirements of Sections 5.3.14.6, 5.3.14.8 and 5.3.14.13 shall apply to all distribution boxes approved in accordance with these Regulations.

5.3.7.6.7 Distribution boxes shall be accessible either by means of a removable cover or access riser and shall extend above grade at time of installation. The

riser and lid shall be made of concrete or an equivalent durable material approved by the Department. If multiple risers are needed manufacturer recommendations must be followed. All above finished grade access covers shall be watertight and secure from vandalism.

5.3.7.6.8 All installations of distribution boxes shall be in accordance with the requirements of Section 5.4.3.

5.3.7.6.9 All installed distribution boxes shall be tested to ensure watertight conditions and leveled to ensure an even distribution of flow to each lateral under operating conditions.

5.3.7.7 All systems utilizing a lift station must incorporate a float activated pump control panel. The control panel shall meet the requirements of Sections 5.3.17.13, 5.3.17.14 and 5.3.17.15.

5.3.8 Pressure distribution systems shall be utilized with:

5.3.8.1 Trench or bed systems receiving flows requiring ≥ 2,500 ft^2 of disposal area.

5.3.8.2 All sand mounds.

5.3.8.3 Certain sand-lined systems.

5.3.8.4 All absorption facilities located on soils where percolation rates are < six (6) minutes per inch.

5.3.8.5 All low pressure pipe systems.

5.3.8.6 All Wisconsin at-grade systems.

5.3.9 Pressure distribution systems shall conform to the following requirements:

5.3.9.1 All unperforated pressure transmission pipes shall be Sch. 40 PVC pipe unless approved by the Department. The pipe shall be sized to provide a minimum flow rate of two (2) feet per second in the pipe.

5.3.9.2 All pressure transmission pipes shall be placed below the frost line. All joints shall be watertight and all pipes shall be placed on a firm undisturbed or well compacted soil. Clean backfill shall be placed around and over the pipe and hand tamped to provide compaction. Frost line minimums for each county are as follows:

Sussex – 24 inches **Kent** – 24 inches **New Castle** – 30 inches

5.3.9.3 All pressure distribution laterals shall be Sch. 40 PVC pipe with diameters as determined by a Class C designer. Minimum hole diameters for perforated pressure distribution laterals shall be $^5/_{32}$ to $^1/_2$ inch maximum and spacing intervals as determined by a Class C designer and be placed on center along the length of the pipe. Maximum hole spacing shall be determined by percolation rates as follows:

Percolation Rate	Maximum Hole Spacing
20 - 25 MPI	60 inches
30 - 60 MPI	72 inches
65 - 120 MPI	96 inches

NOTE: Trench systems designed on slopes > 5% must provide for balanced trench loading rates (gpd/ft^2).

5.3.9.4 All laterals shall be connected to manifolds with tees or sanitary tees constructed of PVC corresponding to the size of the connecting laterals.

5.3.9.5 Distribution of effluent from the pressure transmission pipe to the distribution laterals shall be by a central PVC manifold.

5.3.9.6 The dose volume shall be designed so that the estimated daily flow shall be discharged to the absorption facility in a minimum of three (3) equal doses that either meets or exceeds minimum dose volume requirements. Minimum dose volume shall be five (5) times the internal (liquid) volume of all piping not flooded.

5.3.9.7 The size of the dosing pumps shall be selected to maintain a minimum pressure of one (1) psi (2.31 feet of head) at the end of each distribution line. Pump characteristics and head calculations that include maximum static lift, pipe friction and orifice head requirements shall be submitted with permit applications.

5.3.10 Diversion Boxes and Diversion Valves

5.3.10.1 Location: Diversion boxes or diversion valves for dual systems shall be located according to the requirements set forth in Exhibit C.

5.3.10.2 Capacity: Diversion boxes and valves shall be sized to accommodate the piping connected to them.

5.3.10.3 Diversion Valves: All pressure dosed dual systems shall use diversion valves.

5.3.10.4 All installations shall be in accordance with the requirements of Section 5.4.3.

5.3.10.5 Diversion boxes shall be pre-cast concrete or other approved products. Diversion valve systems shall be commercially available and diversion or gate valves shall be constructed of durable cast iron or plastic.

5.3.11 Diversion Box and Diversion Valve Specifications (see Exhibit J):

5.3.11.1 All diversion boxes and diversion valves shall be installed level with connecting piping to minimize stress.

5.3.11.2 Cast iron valves shall be free of dirt and rust. Plastic valves shall be clean and dry before installation.

5.3.11.3 Diversion boxes may be standard distribution boxes with selective flow diversion devices.

5.3.11.4 All inlet and outlet cutout connections shall be sealed watertight with grout or approved rubber gaskets.

5.3.11.5 Appurtenances: All buried valves shall be furnished with a suitable box constructed of durable material approved by the Department and extended to finished grade with a tight fitting secure access cover.

5.3.11.6 Testing: Installed valves and gates shall be tested in the field prior to back fill.

5.3.12 Conventional On-Site Wastewater Treatment and Disposal Systems Criteria

5.3.12.1 **All Full Depth Gravity and Capping Fill Gravity Trench and Bed Treatment and Disposal Systems shall be designed in accordance with the following criteria (see Exhibits K, L, M or N).**

5.3.12.1.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and which are not prone to flooding.

5.3.12.1.2 Slope: 0 - 15%: Bed systems cannot be sited on slopes > 2%, unless otherwise approved by the Department. All systems must be constructed with level bottoms and shall incorporate construction procedures prohibiting equipment from entering the excavation. Trench systems on slopes in excess of

15% shall be permitted only if the design is prepared by a licensed Class C designer. Any such design shall incorporate construction procedures.

5.3.12.1.3 Depth to Limiting Zone: The limiting zone shall be a minimum of three (3) feet below the bottom of the trench ≥ 48 inches beneath the soil surface.

5.3.12.1.4 Percolation Rates:

5.3.12.1.4.1 6 - 120 mpi: Gravity distribution systems may be allowed unless otherwise required by these Regulations. Construction of seepage trenches and beds in soils with percolation rates > 120 mpi shall not be permitted.

5.3.12.1.4.2 < 6 mpi: A pressurized distribution system is required for seepage trenches or beds. The trench or bed may be placed between 12 and 24 inches in order to maintain 36 inch separation distance between rapidly permeable material and the limiting zone.

5.3.12.2 **All Low Pressure Pipe Treatment and Disposal Systems shall be designed in accordance with the following criteria (see Exhibits O & P).**

5.3.12.2.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and are not prone to flooding. Low pressure pipe (LPP) treatment and disposal systems shall not be prescribed in coastal beach sands.

5.3.12.2.2 The depth to the bottom excavation shall be nine (9) inches to 18 inches. Trench width shall be 12 inches unless otherwise approved by the Department.

5.3.12.2.3 Depth to Limiting Zone: The limiting zone shall be a minimum of 18 inches below the bottom of the trench (e.g. a minimum of 27 inches below existing grade for a nine (9) inch deep LPP trench system). Shallow disposal trenches (placed not less than nine (9) inches into the original soil profile) may be used with a capping fill to achieve the minimum separation distance specified above. The capping fill, if required, shall be placed in accordance with these Regulations (see Exhibit O). A capping fill cover is required for all LPP treatment and disposal systems with trench depths less than 18 inches.

5.3.12.2.4 Earthen dams shall be designed at the beginning of each trench and subsequent dams spaced at a maximum of 20 feet thereafter.

5.3.12.2.5 Lateral lines of the LPP treatment and disposal system which are placed on lower landscape positions shall have an interceptor drain installed upslope of the uppermost lateral to intercept and divert surface and subsurface waters away from the absorption facility as determined by a Class D licensee.

5.3.12.2.6 There shall be no soil disturbance to the proposed disposal area except the minimum required for installation. The soils may be rendered unsuitable should unnecessary soil disturbance occur. Particular care should be taken when clearing wooded lots so as not to remove the surface soil material (see Lot Clearing Guidelines).

5.3.12.2.7 LPP treatment and disposal systems shall be installed only with equipment approved by DNREC.

5.3.12.2.8 LPP treatment and disposal systems shall not be allowed where sand lining is required or where soils have been filled or disturbed.

5.3.12.2.9 Percolation Rate: 0 - 120 mpi: Construction on soils with percolation rates > 120 mpi is not permitted. A pressurized distribution system is required in all cases.

5.3.12.3 **All Wisconsin At-Grade Treatment and Disposal Systems shall be designed in accordance with the following criteria (see Exhibit U & V).**

5.3.12.3.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and are not prone to flooding. They shall not be prescribed in coastal beach sands due to the high probability of wind/water erosion and short effluent retention time in the coarse sands.

5.3.12.3.2 Slope: 0 – 3% for soils with percolation rates faster than 75 mpi, unless otherwise approved by the Department.

5.3.12.3.3 Depth to Limiting Zone: ≥ 24 inches to evidence of a limiting zone. Replacement systems must have a limiting zone ≥ 20 inches and in soils without an umbric epipedon or prone to ponding and/or flooding. Class D soil scientist shall verify these site characteristics are applicable prior to prescribing the Wisconsin at-grade as a disposal option. The soil scientist must also specify the percolation rate for each soil horizon to a depth of 36 inches and the incremental loading rates for the first 20 inches of soil (see Exhibit V).

5.3.12.3.4 Percolation Rate: 0 - 75 mpi: Construction on soils with percolation rates > 75 mpi is not permitted. A pressurized distribution system is required in all cases.

5.3.12.4 **All Elevated Sand Mound Treatment and Disposal Systems shall be designed in accordance with the following criteria (see Exhibit Q).**

5.3.12.4.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and are not prone to flooding.

5.3.12.4.2 Slope:

5.3.12.4.2.1 0 – 6% for soils with percolation rates slower than 60 mpi.

5.3.12.4.2.2 0 – 12% for soils with percolation rates faster than 60 mpi.

5.3.12.4.3 Depth to Limiting Zone: > 20 inches to evidence of a limiting zone.

5.3.12.4.4 Percolation Rate: 0 - 120 mpi: Construction on soils with percolation rates > 120 mpi is not permitted. A pressurized distribution system is required in all cases.

5.3.12.5 **All Pressure-Dosed Full Depth and Capping Fill Treatment and Disposal Systems shall be designed in accordance with the following criteria except LPP systems (see Exhibits R & S).**

5.3.12.5.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and are not prone to flooding.

5.3.12.5.2 Slope: 0 – 15%. Bed systems cannot be sited on slopes > 2%, unless otherwise approved by the Department. All designs must be constructed with level bottoms and shall prohibit equipment from entering the excavation. Slopes in excess of 15% shall incorporate construction procedures such as, but not limited to, equipment to be used, installation methods (e.g. trenches on contour, one trench at a time), and proper site restoration.

5.3.12.5.3 Depth to Limiting Zone: ≥ 48 inches from original grade and three (3) feet below bottom of filter aggregate (e.g. a minimum of five (5) feet below existing grade for two (2) foot deep trench and bed systems).

5.3.12.5.4 Percolation Rate: 0 - 120 mpi. Construction on soils with percolation rates > 120 mpi is not permitted. A pressurized distribution system is required in all cases.

5.3.12.6 **All Sand-lined Treatment and Disposal Systems shall be designed in accordance with the following criteria (see Exhibit T).**

5.3.12.6.1 Landscape Position: Areas with good surface drainage which allow surface water to run off easily without ponding and are not prone to flooding.

5.3.12.6.2 Slope: 0 – 15%. Slopes in excess of 15% shall only be allowed if the design is prepared by a Class C designer. Any such design shall incorporate construction procedures.

5.3.12.6.3 Depth to Limiting Zone: ≥ 48 inches from original grade and three (3) feet below bottom of filter aggregate (except for impermeable, slowly permeable, or very slowly permeable materials proposed for removal). Sand-lined systems shall not be used where there is less than one (1) foot of undisturbed native soil between the limiting zone after excavation and the impermeable or slowly permeable soil zone. Sand-lining will not be permitted into the water table, except in instances where it is necessary for replacement systems to function hydraulically.

5.3.12.6.4 Percolation Rate: 0 - 120 mpi. A pressurized distribution system may be required. The percolation test shall be taken in the permeable soil below the impermeable or less permeable soil zone. The bottom of the percolation test hole shall extend a minimum of six (6) inches below the slowly permeable soil zone but in no case shall it be < six (6) inches above the underlying limiting zone. If the percolation tests are to be conducted at a depth too deep to obtain accurate percolation rates, a percolation rate based on USDA soil textures shall be assigned (see Exhibit W). Otherwise, hydraulic conductivity tests may be substituted.

5.3.12.6.5 Sand-lined systems may be used where the site evaluation has shown that there is an impermeable, slowly, or very slowly permeable soil zone located over an acceptable soil. Use of this system requires removal of that zone within the disposal area and its replacement with a sandy fill as prescribed under Section 5.4.2.1. The system shall be constructed in accordance with specifications for sand-lined seepage trenches and beds (see Exhibit S). Installation may require a Class D soil scientist on site to monitor depth of sand lining and proper interfacing of the sandy fill with the native soils.

5.3.12.7 Artificially Drained Systems

5.3.12.7.1 Disposal systems shall not be constructed on sites where curtain drains, vertical drains, under drains, or similar drainage methods are utilized to artificially lower the level of the water table to meet the requirements of these Regulations. Observation wells may be used to demonstrate the change in the hydrology of a particular property for the purpose of siting an on-site wastewater treatment and disposal system.

5.3.13 Building Sewers

5.3.13.1 The minimum requirements contained in this Section shall apply to all conduits, pipes or sewers which transmit wastewater flows from building or house drains to a septic tank (or other treatment device) and from the septic tank (or other treatment device) to the distribution box, lift station or dosing tank. Collection systems servicing three (3) or more units shall be in conformance with National Standards.

5.3.13.2 Building sewers shall comply with the following requirements:

5.3.13.2.1 Location: A minimum horizontal separation of 10 feet shall be provided between a house or building sewer and any water line. Suction lines from wells shall not cross under house or building sewers.

5.3.13.2.2 Size: Building sewers shall be sized to serve the expected flow from the connected fixtures. All building gravity sewer plumbing shall be at least as large as the internal building plumbing but in no case less than three (3) inches in diameter. Pressure building sewers transmitting wastewater to a septic tank (or other device) shall be a minimum of two (2) inches in diameter.

5.3.13.2.3 Foundation: All building sewers shall be laid on a firm compacted bed through its entire length. Building sewers placed in wet soil shall have a four (4) inch bedding of $^{3}/_{4}$" to $1^{1}/_{2}$" aggregate.

5.3.13.2.4 Materials: Building sewers shall be constructed of Sch. 40 or Sch. 80 PVC, reinforced concrete, or Sch. 40 or Sch. 80 ABS pipe. PVC pipe encased in six (6) inches of concrete or sleeved within a larger sized Sch. 40 or Sch. 80 pipe shall be used for building sewers located < three (3) feet below driveways, parking area, or other areas subject to vehicular traffic or similar loading. The sleeving or encasement shall extend a minimum of two (2) feet beyond the edge of driveways, parking areas, or other areas subject to vehicular traffic or similar loading and shall be adequately bedded.

5.3.13.2.5 Joints: All pipe joints shall be watertight and protected against external and internal loads.

5.3.13.2.6 Grade: A building sewer shall be installed in a straight line to the maximum extent practicable with a uniform continuous grade not less than $^{1}/_{8}$ inch/foot, unless it can be demonstrated to the satisfaction of the Department that an alternative design can maintain adequate flow from the source and is approvable under the applicable local building code.

5.3.13.2.7 Cleanouts: Building sewer cleanouts shall be installed at minimum intervals of 50 feet for three (3) inch diameter pipe and 100 feet for four (4) inch and larger diameter pipe. Cleanouts shall be provided at all changes in direction greater than 45^{o}. Wherever possible, bends should be limited to 45^{o}. Every house or building sewer shall have at least one (1) cleanout fitting to provide access to the plumbing. Cleanouts may be placed at greater distances provided National Standards are used to design the total collection system.

5.3.14 Septic Tanks

5.3.14.1 The standard wastewater treatment system used for on-site wastewater treatment and disposal shall be the dual compartment septic tank. All concrete septic tanks must be certified through the On-Site Wastewater Accreditation Program (OWAP) of the National Precast Concrete Association (NPCA) which assures long-lasting, structurally sound and watertight septic tanks. This requirement will become effective one (1) calendar year from date of promulgation of these Regulations.

5.3.14.2 All septic tank treatment units shall be designed in accordance with Exhibit G and comply with standards for septic tanks as prescribed in these Regulations (see Section 5.4.3).

5.3.14.3 The location of septic tanks shall be in accordance with the minimum isolation distances set forth in these Regulations as prescribed in Exhibit C. Septic

tanks shall be located to avoid large elevational differences in order to facilitate periodic pumping.

5.3.14.4 The minimum liquid working capacity of septic tanks shall be:

5.3.14.4.1 For flows ≤ 500 gpd the minimum liquid working capacity shall be 1,000 gallons.

5.3.14.4.2 For flows > 500 gpd but < 2,500 gpd shall have a working capacity of 1.5 times the expected flow rate with a minimum liquid working capacity of 1,500 gallons.

5.3.14.5 If large flow surges are anticipated the septic tank shall be increased in size to accommodate the surges without causing sludge or scum to be discharged from the tank.

5.3.14.6 All tanks shall be watertight, non-corrosive, durable and structurally sound. Materials of construction for tanks shall be one of the following:

5.3.14.6.1 Pre-cast reinforced concrete; or

5.3.14.6.2 Other suitable material approved as equal by and at the sole discretion of the Department.

5.3.14.6.3 Metal tanks are not a suitable material.

5.3.14.7 All septic tanks shall be of multi-compartment design with a minimum of two (2) compartments. The first compartment of a two (2) compartment tank shall contain two thirds ($^2/_3$) the liquid capacity of the total volume of the tank. Tanks shall be of rectangular design.

5.3.14.8 Pre-cast reinforced concrete tanks shall have a minimum wall thickness of two and one half (2½) inches.

5.3.14.9 All inlet and outlet connections shall be sanitary tees or baffles constructed of pre-cast concrete or PVC. Inlet openings may have a minimum diameter equivalent to the diameter of the house sewer but in no instance shall the diameter be less than three (3) inches. The outlet invert shall be two (2) inches below the inlet invert. The inlet and outlet baffles or sanitary tees shall extend at least 12 inches below the liquid level, but to a level no deeper than 40% of the liquid depth. Baffles or sanitary tees are not necessary for any portion of the tank if it is to be used as a pumping chamber.

5.3.14.10 All pipe cutouts for inlet and outlet connections shall be sealed with a watertight concrete (95%) & bentonite (5%) grout mix or standard rubber gaskets.

5.3.14.11 Connections between compartments of multi-compartment tanks shall consist of a four (4) inch diameter sanitary tee or baffle constructed of concrete. All compartment connections shall extend to a level no deeper than 40% of the liquid depth as measured from the liquid level.

5.3.14.12 All inlet, outlet and inter-compartment connections shall be located to provide a minimum air space of one (1) inch between the top of the connection and the underside of the tank cover.

5.3.14.13 Each tank compartment shall be equipped with an access opening and cover. The opening shall be located to provide access to each tank compartment as well as providing access to the inlet and outlet connections for routine inspections. Access openings shall be at least 20 inches square or in diameter.

5.3.14.14 Each septic tank shall be constructed with a watertight access riser for each compartment and shall extend above grade at the time of installation. The riser and lid shall be made of concrete, masonry or an equivalent durable material

approved by the Department. If multiple concrete risers are needed then water tight gaskets or hydraulic cement must be placed between each riser.

5.3.14.15 All above finished grade access covers shall be water tight and secure from vandalism.

5.3.14.16 All septic tanks shall be equipped with any outlet effluent filter approved by the Department. The maintenance of these filters is the responsibility of the property owner and must remain in service for the life of the septic tank. This unit must be maintained in accordance with the manufacturer's service instructions.

5.3.14.17 All installations of septic tank treatment units shall be in accordance with Section 5.4.3.

5.3.15 Grease Traps

5.3.15.1 Grease traps shall be utilized for commercial and industrial wastewater sources at the sole discretion of the Department to assure the effectiveness of on-site wastewater treatment and disposal systems. Grease interceptors shall not be approved for new construction designs as replacement for the grease trap. Grease interceptors may be allowed for replacement systems when there are site limitations and low flow applications at the sole discretion of the Department.

5.3.15.2 All grease traps shall be designed in accordance with the following requirements:

5.3.15.2.1 The minimum size grease trap shall be 1,000 gallons (see Exhibits E & F) and be certified through the On-Site Wastewater Accreditation Program (OWAP) of the National Precast Concrete Association (NPCA).

5.3.15.2.2 The location of grease traps shall be in accordance with the minimum isolation distances set forth in these Regulations as prescribed in Exhibit C.

5.3.15.2.3 The sizing of grease traps shall be based on wastewater flow data and grease retention capacity. The grease retention capacity in pounds shall be equal to at least twice the peak flow capacity in gallons per minute. The flow capacity can be determined from the individual flows from fixtures discharging into the grease trap. Exhibit E contains the minimum flow rate fixture capacities which shall be used for grease trap designs when actual calibrated metered flow data indicating peak daily flows over a three (3) year period are not available.

5.3.15.2.4 All grease traps shall have multiple compartments.

5.3.15.2.5 All inlet and outlet connections shall be sanitary tees or baffles constructed of pre-cast concrete or PVC. Inlet and outlet openings shall be a minimum of four (4) inches in diameter. The outlet invert shall be two (2) inches below the inlet invert. The inlet baffle or sanitary tee shall extend at least 24 inches below the liquid level. The bottom of the outlet baffle or sanitary tee shall be eight (8) inches above the tank bottom.

5.3.15.2.6 Connections between compartments of multi-compartment tanks shall consist of a four (4) inch diameter sanitary tee or baffle constructed of concrete. The bottom of the sanitary tee shall be 12 inches above the tank bottom.

5.3.15.2.7 The requirements of Section 5.3.14.6, 5.3.14.8, 5.3.14.9, 5.3.14.11, 5.3.14.13, 5.3.14.14, 5.3.14.15 and 5.3.14.16 shall apply to all grease traps approved in accordance with these Regulations.

5.3.15.2.8 All installations of grease traps shall be in accordance with the requirements of Section 5.4.3 and testing shall be conducted in accordance with Section 5.4.3.6 of these Regulations.

5.3.15.2.9 Grease traps must have access above grade.

5.3.15.2.10 A copy of a contract with a licensed Class F liquid waste hauler consisting of the following conditions, as a minimum:

5.3.15.2.10.1 Duration of contract.

5.3.15.2.10.2 Pumping schedule.

5.3.15.2.10.3 Availability of equipment.

5.3.15.2.10.4 Emergency response capability.

5.3.15.2.10.5 Contents will be disposed of in a manner and at a facility or location approved by the Department.

4.3.15.2.10.6 Evidence that the owner or operator of the proposed disposal facility will accept the pumping for treatment and disposal.

5.3.16 Lift Stations

5.3.16.1 Lift stations, as defined in Section 2.0, shall be utilized for residential and commercial wastewater systems to overcome elevational differences for conveying effluent to another system component for gravity distribution and comply with standards for septic tanks as prescribed in these Regulations (see Section 5.4.3).

5.3.16.2 The location of the lift station shall be in accordance with the minimum isolation distances set forth in these Regulations as prescribed in Exhibit C and be certified through the On-Site Wastewater Accreditation Program (OWAP) of the National Precast Concrete Association (NPCA).

5.3.16.3 Lift stations/packages must be approved by the Department prior to use.

5.3.16.4 The requirements of Sections 5.3.14.1, 5.3.14.6, 5.3.14.8, 5.3.14.10, 5.3.14.12, 5.3.14.13, 5.3.14.14, 5.3.14.15, 5.3.17.7, 5.3.17.8, 5.3.17.10, 4.3.17.12 and 5.3.17.13 shall apply, where applicable, to all lift station tanks approved in accordance with these Regulations.

5.3.16.5 All inlet pipe connections shall be located above the high water level as pre-determined by the pump installation.

5.3.16.6 Check valves shall be required in all lift stations.

5.3.16.7 All installations of stand-alone lift station vaults shall be in accordance with these Regulations.

5.3.16.8 Demand dose (designed volume by draft/float) shall not exceed 30 gallons. If large flows are anticipated, larger demand dose float settings will be considered.

5.3.16.9 Maximum gated/metered flow shall be 20 gallons per minute.

5.3.16.10 Calculations required to be submitted with the application shall include static head (elevational differences) and frictional pipe losses. Manufacturer's cut-sheets for the prescribed pump and alarm, including pump curve, must also attend permit application.

5.3.16.11 Lift stations designed to convey solid waste (waste generated prior to pretreatment tanks/units) must incorporate pumps capable of handling minimum two (2) inch solids.

5.3.17 Dosing Chambers (see Exhibit I)

5.3.17.1 <u>Location:</u> Dosing chambers shall be located in compliance with the minimum isolation distances of these Regulations (see Exhibit C) and comply with standards for septic tanks as prescribed in these Regulations (see Section 5.4.3).

5.3.17.2 <u>Size/Capacity:</u> The dosing chamber shall have a minimum liquid capacity equal to the designed dose volume plus the design daily flow.

5.3.17.3 The requirements of Sections 5.3.14.6, 5.3.14.8, 5.3.14.9, 5.3.14.13, 5.3.14.14 and 5.3.14.16 shall apply to all dosing chambers approved in accordance with these Regulations and must be certified through the On-Site Wastewater Accreditation Program (OWAP) of the National Precast Concrete Association (NPCA).

5.3.17.4 All inlet pipe connections shall be located above the high water level as predetermined by the pump installation.

5.3.17.5 All pipe cutouts shall be sealed with a watertight concrete (95%) & bentonite (5%) grout mix or standard rubber gaskets.

5.3.17.6 Dosing chambers shall be constructed with a ventilation port and a watertight access manhole. The ventilation port shall be extended at least six (6) inches above finished grade while the access manhole shall also be extended above finished grade. The Department recommends six (6) inches above existing grade, at a minimum, at time of installation. The vent shall be three (3) inches in diameter and the access manhole shall be sized for easy removal of pumps. In no case shall the manhole be less than 20 inches square or in diameter. The vent shall be turned down and shall be fitted with insect and rodent proof, corrosion resistant screen.

NOTE: PVC pipe caps drilled with holes is not a permissible substitute for the screen.

5.3.17.7 Pumps which are suitable for handling septic tank effluent shall be used to meet dosing requirements and shall be installed in accordance with the manufacturer's recommendations.

5.3.17.8 Dosing chambers using pumps shall have an installed pump for which a replacement is readily available in the event of failure.

5.3.17.9 Pumps shall be sized to discharge a flow rate equal to the combined flows from all discharge holes in the laterals when operating at designed level or head.

5.3.17.10 Pumps and valves shall be equipped with suitable connections so that they may be removed for inspection or repair without entering the dosing chamber. A slide rail system or disconnect coupling accessible from outside the dosing chamber shall be utilized to allow removal and access to the pump and pump check valve for repairs and maintenance. A corrosion-proof lifting device shall be attached to the pumps and tied off at the access manhole.

5.3.17.11 Check valves shall be required on all pressure distribution systems.

5.3.17.12 An audible and visual high level warning device shall be installed for all pumps and shall be installed on a separate AC circuit from the pump.

5.3.17.13 All pump electrical connections and alarm controls shall be NEMA 4x rated corrosion resistant and waterproof. The bottom of the control panel shall be a minimum of 24 inches above finished grade within direct line of sight of the pump or treatment device being operated.

5.3.17.14 All control panels shall be UL listed.

5.3.17.15 All AC circuits shall have properly sized circuit breakers installed in the control panel.

5.3.17.16 Elevations for pump controls and high water level sensor elevations shall be provided in the design.

5.3.17.17 Testing: All dosing chambers shall be field tested to ensure watertight conditions. Pumps, alarm controls and related appurtenances shall also be field tested to ensure accuracy and proper operation in accordance with the manufacturer's recommendations. A minimum schedule for periodic testing and

calibration of the dosing chambers, pumps, alarm controls and related appurtenances shall be established and incorporated into the permit. All installed pumps shall be accompanied by instruction manuals that include operation and maintenance procedures and pump characteristics.

5.3.18 Holding Tanks

5.3.18.1 The use of a holding tank is an unusual circumstance wherein all wastewater is permitted to be held in a watertight structure until it is pumped and transported by vehicle to a point of disposal. The use of a holding tank on a permanent basis is prohibited except as provided in these Regulations.

5.3.18.2 Permanent holding tanks are not permitted on unimproved lots.

5.3.18.3 No person shall install a holding tank without first obtaining a permit from the Department.

5.3.18.4 All holding tank permit applications and designs must be completed by a Class C designer. All holding tanks must be certified through the On-Site Wastewater Accreditation Program (OWAP) of the National Precast Concrete Association (NPCA).

5.3.18.5 Permits may be issued, by the Department, for the permanent use of holding tanks when all of the following conditions are met:

5.3.18.5.1 The site is improved with a dwelling and has been evaluated for all means of on-site wastewater treatment and disposal, including innovative/alternative, and has been deemed not suitable for an on-site wastewater treatment and disposal system.

5.3.18.5.2 No community or area-wide central wastewater system is available or expected to be available within five (5) years.

5.3.18.5.3 The same isolation distances as required for septic tanks can be met.

5.3.18.5.4 The owner(s) contract(s) with a licensed Class F liquid waste hauler to provide hauling services to the dwelling for the period it is utilized or until connection can be made to an approved wastewater facility. Should the owners change waste haulers, a new contract shall be submitted to the Department.

5.3.18.5.5 The property deed shall be amended with an Affidavit of Ownership at the time of permit issuance, which states that the dwelling is served by a permanent holding tank. The Affidavit of Ownership must be recorded at the Recorder of Deeds.

5.3.18.5.6 When the governmental unit or wastewater utility provides the hauling services directly, it shall conform to the requirements for liquid waste haulers.

5.3.18.5.7 Have a water meter installed to measure the in-flow of water into the building or house or a metering device measuring the flow to the tank.

5.3.18.6 In an area under the control of a governmental unit, or a wastewater utility which has a recorded covenant with the owner that runs with the land, either of which is authorized to construct, operate, and maintain a large or area-wide central wastewater system, a holding tank may be installed for temporary use provided:

5.3.18.6.1 The application for permit includes a copy of a legal commitment from the governmental unit or wastewater utility that within five (5) years from the date of application the governmental unit or wastewater utility will extend to the property covered by the application, a large or area-wide central wastewater system meeting the requirements of the Department.

5.3.18.6.2 The large or area-wide central wastewater system has received the necessary approvals for full operation (established sewer district or CPCN) which includes the anticipated flow to the holding tank.

5.3.18.6.3 The proposed holding tank will comply with the requirements of these Regulations and tank sizing is at the discretion of the Department.

5.3.18.7 Temporary use of a holding tank may be approved when:

5.3.18.7.1 Installation of an approved on-site system has been delayed by weather conditions; or

5.3.18.7.2 The tank is to serve a temporary construction site (up to five (5) years).

5.3.18.8 Applications for holding tank installation shall contain plans and specifications in sufficient detail for each holding tank proposed to be installed and shall be submitted to the Department for review and approval. The application for a permit shall be on forms provided by the Department and contain the following items:

5.3.18.8.1 A copy of a contract with a licensed Class F liquid waste hauler shall contain, as a minimum, the following conditions:

5.3.18.8.1.1 Duration of contract.

5.3.18.8.1.2 Pumping schedule.

5.3.18.8.1.3 Availability of equipment.

5.3.18.8.1.4 Emergency response capability.

5.3.18.8.1.5 Contents will be disposed of in a manner and at a facility or location approved by the Department.

5.3.18.8.1.6 Evidence that the owner or operator of the proposed disposal facility will accept the pumping for treatment and disposal.

5.3.18.8.1.7 Method of measuring wastewater use (water meter, wastewater meter, etc.).

5.3.18.8.2 A record of pumping dates and the amounts pumped shall be maintained by both the property owner and the liquid waste hauler, and be made available to the Department along with in-flow meter readings as part of the annual renewal of the permit.

5.3.18.8.3 The appropriate annual inspection fee.

5.3.18.9 Each holding tank shall:

5.3.18.9.1 In no case have a capacity less than seven (7) days average flow from the wastewater generating facility or 2,800 gallons, whichever is larger unless authorized by the Department. When holding tanks are designed to serve the needs of a community or large system, the size shall be in conformance with standard engineering practice as determined by the Department and in accordance with an acceptable monitoring and pumping schedule.

5.3.18.9.2 Comply with standards for septic tanks as prescribed in these Regulations (see Section 5.4.3).

5.3.18.9.3 Be located and designed to facilitate removal of contents by pumping.

5.3.18.9.4 Be equipped with both an audible and visual alarm installed on an AC circuit and placed in a location, acceptable to the Department, to indicate when the contents of the tank are at 75% of capacity.

5.3.18.9.5 Have no vent at an elevation lower than the overflow level of the lowest fixture served.

5.3.18.9.6 Be designed for anti-buoyancy if test hole examination or other observations indicate that seasonally high groundwater may float the tank when empty.

5.3.18.9.7 Be constructed of the same materials approved for septic tanks. Holding tanks shall be watertight and structurally sound to withstand internal and external loads.

5.3.18.9.8 Be equipped with a 20 inch diameter or square access opening. The access opening shall be extended to a minimum of six (6) inches above grade level at time of installation.

5.3.18.9.9 All alarms shall be tested for proper operation.

5.3.18.10 Each holding tank installed under these Regulations shall be inspected annually. A fee shall be charged for each annual inspection and all required documentation shall be submitted also.

5.3.18.11 No liquid waste from a holding tank shall be applied directly or indirectly onto the ground surface or into surface waters.

5.3.18.12 Prior to purchase of a dwelling that is currently served by a holding tank or is proposed to be served by a holding tank, the prospective buyer must sign an Affidavit of Understanding of the terms and conditions associated with use of a holding tank. This Affidavit shall be submitted to the Department to be filed with the permit and a copy of the affidavit shall be provided to the prospective buyer.

5.3.19 Spare Area

5.3.19.1 Each site utilizing an on-site wastewater treatment and disposal system shall have sufficient area to accommodate a complete replacement system or an acceptable alternative approved by the Department which satisfies the requirements of these Regulations. This area shall be maintained so that it is free from encroachments by accessory buildings and additions to the main building. Encroachment shall include the 10 foot isolation distance to buildings as required by these Regulations. This requirement may be waived if the application for a permit includes a copy of a legal commitment from the governmental unit that states that within five (5) years from the date of the application the governmental unit will extend to the property a community or area-wide central wastewater system meeting the requirements of the Department or an acceptable alternative is approved by the Department. The community or area-wide central wastewater system has received the necessary approvals for full operation which includes the anticipated flow to the on-site wastewater treatment and disposal system.

5.3.20 System Permit Applications

5.3.20.1 Permit applications must be designed in accordance with the prescribed system type and design considerations as specified in an approved site evaluation for that parcel.

5.3.20.2 Applications for permits shall be made by the owner of the property or owner's legally authorized agent on forms approved by the Department.

5.3.20.3 An application is complete only when the form is completed in full, signed by the owner or owner's legally authorized agent, accompanied by all required exhibits (provided an approved unexpired site evaluation report is on file) and fee. Additionally an approval letter from the appropriate governmental unit having

jurisdiction that states the local governmental unit has approved the activity by zoning be submitted. Incomplete applications will not be processed and may be returned.

5.3.21 The completed application shall include, at a minimum, the following site information:

5.3.21.1 Parcel and/or lot dimensions and size with a location map of project site.

5.3.21.2 Slope - in absorption facility and replacement areas (percent and direction).

5.3.21.3 Existing wells within 150 feet of the proposed system.

5.3.21.4 Any and all watercourses or bodies of water.

5.3.21.5 Distances of the existing and/or proposed on-site well(s) and absorption facilities from the nearest two reference points or established survey control.

5.3.21.6 Soil boring and test pit locations along with limits of approved area as indicated in the approved site evaluation.

5.3.21.7 Owner/Agent signature on plot plan drawing, straight edge must be used (no free-hand lines), to scale (acceptable scales are: 1 inch = 10, 20, 30, 40, 50, 60 and 100 feet), north arrow or compass rose and certification that designer site checked the property to confirm no changes have taken place since site evaluation was approved. Designer's signature is certification that site check was performed.

5.3.21.8 Any other information required to satisfy these Regulations.

5.3.22 A permit shall be issued only to the owner or easement holder of the land on which the system is to be installed.

5.3.23 The Department shall either issue or deny the permit within 20 working days after receipt of the completed application. However, if conditions prevent the Department from acting to either issue or deny the permit within 20 working days, the applicant shall be notified. The Department shall either issue or return the permit within 30 working days after the mailing date of such notification.

5.3.24 All permits issued for on-site wastewater treatment and disposal systems pursuant to these Regulations shall be effective for two (2) years from the date of issuance except component replacement, repair and authorization to use existing system permits which are effective for one (1) year only. If the system has been started the Department may issue a limited time period extension and an additional fee will be charged. A one year extension will, if requested, be granted by the Department upon demonstration by the applicant that no changes have occurred in system design, siting, or regulations applicable to the permit since the permit was issued and written certification to such factual findings is provided and all appropriate fees are paid.

5.3.25 If any portion of the approved disposal area is disturbed during site construction activities, through grubbing, tree removal or other activities utilizing heavy equipment, a Class E system contractor must submit a certification document prepared by a Class D soil scientist on a form provided by the Department (see Exhibit FF) which states whether the area is suitable for installation or not. If not suitable, additional soil borings or test pits shall be performed within the disturbed area(s) to substantiate the initial site evaluation and a review fee will be charged.

5.3.26 The Department shall deny the permit if:

5.3.26.1 The application contains false information.

5.3.26.2 The proposed system would not comply with these Regulations.

5.3.26.3 The proposed system, if constructed, would violate a Department moratorium.

5.3.26.4 A central wastewater system which can serve the proposed wastewater flow is both legally and physically available as described in Sections 3.31.9, 3.31.10 and 3.31.11 of these Regulations.

5.3.26.5 Construction of an on-site wastewater treatment and disposal system is prohibited by codes, ordinances or county or municipal regulations having jurisdiction.

5.3.27 Permit Denial Review

5.3.27.1 The Department shall make a decision on the application which it determines will best implement the purposes of 7 **Del.C.** Ch. 60 and these Regulations. Providing of the requisite information in the application procedure by the applicant shall not be construed as a mandatory prerequisite for the issuance of the permit by the Department.

5.3.28 Authorization to Use an Existing System Permit

5.3.28.1 Application for an Authorization to Use an Existing System Permit shall be made on forms provided by the Department and shall be accepted only when the forms are complete.

5.3.28.2 No person shall place into service, change the use of or increase the projected daily wastewater flow above design standards into an existing system without first obtaining an Authorization to Use an Existing System, Repair, Component Replacement or Replacement System Permit(s) as required by these Regulations.

5.3.28.3 An Authorization to Use an Existing System Permit is not required:

5.3.28.3.1 Where there is a replacement of a manufactured home with similar units in manufactured home communities with on-site wastewater treatment and disposal systems when an annual inspection has taken place by the Department or an authorized designee certifying that the existing system(s) is/are not malfunctioning.

5.3.28.3.2 For use of a previously unused system for which a Certificate of Satisfactory Completion has been issued within one (1) year of the date that such system is placed into service, provided the projected daily wastewater flow does not exceed the design flow.

5.3.28.4 For changes in the use of an existing system where no increase in wastewater flow above design standards is projected or where the design flow is not exceeded an Authorization to Use an Existing System Permit shall be issued if:

5.3.28.4.1 The existing system does not incorporate a cesspool or seepage pit.

5.3.28.4.2 The existing system is not malfunctioning and is not in need of repair.

5.3.28.4.3 All isolation distances from the existing system can be maintained.

5.3.28.4.4 The proposed use would not create a public health hazard.

5.3.28.4.5 In cases where the Department has no record of an existing on-site wastewater treatment and disposal system permit, a Class H system inspection has been performed, documentation of such inspection has been submitted to the Department, and the results either meet or exceed the regulations governing such use or an inspection of the existing system by the GDS has been performed provided the following are uncovered and found to meet or exceed the regulations governing such use:

5.3.28.4.5.1 Septic tank.

5.3.28.4.5.2 Distribution box or supply manifold.

5.3.28.4.5.3 Beginning and end of all trenches or the four (4) corners of the bed (additional area may be required after inspection depending upon proposed use). A minimum of two (2) distribution laterals in a trench or bed absorption facility is required.

5.3.28.4.6 The system had been operated in violation of these Regulations but a Repair and/or Component Replacement Permit and subsequent Certificate of Satisfactory Completion are issued.

5.3.28.5 If the conditions of Section 5.3.28.4 cannot be met, an Authorization to Use an Existing System Permit shall be withheld until such time as the appropriate inspections, Repair and/or Component Replacement Permit(s) are obtained and subsequent Certificate of Satisfactory Completion are issued.

5.3.28.6 If changes in the proposed use of a system would increase the daily wastewater flows above design criteria an Authorization to Use an Existing System Permit would not be issued and a Replacement System Permit would then be required.

5.3.28.7 Applications for connections to existing systems that propose adding additional bedrooms will be considered on a case by case basis.

5.3.28.8 The Department may allow a manufactured home to use an existing system serving another dwelling, in order to provide temporary housing for a family member suffering hardship, by issuing an Authorization to Use an Existing System Permit, if:

5.3.28.8.1 The Department receives proof, in writing, from a doctor or hospital which indicates the family member is suffering physical or mental impairment, infirmity, or is otherwise disabled and is in need of temporary housing.

5.3.28.8.2 The system is not malfunctioning.

5.3.28.8.3 The application is for a manufactured home.

5.3.28.8.4 Evidence is provided that a hardship manufactured home placement is allowed on the subject property by the governmental agency that regulates zoning, land use planning, and construction.

5.3.28.9 An Authorization to Use an Existing System Permit issued for personal hardship shall remain in effect for a specified period, not to exceed cessation of the hardship. The Department shall impose conditions in the Authorization to Use an Existing System Permit that are necessary to ensure protection of public health. If the system fails and additional replacement area is no longer available, the manufactured home must be removed from the property.

5.3.29 Repair and Replacement of Malfunctioning Systems

5.3.29.1 Steps to repair and/or replace a component or malfunctioning system shall be initiated immediately and continued until system repair is completed. However, if, at the sole discretion of the Department, it is determined that adverse soil conditions exist due to climatic conditions that would likely preclude a successful repair, component or replacement system installation, the Department may allow a delay in commencing repairs or replacement until the soil conditions improve. If this allowance is made, a compliance date and interim system maintenance requirements shall be specified in system construction deficiencies to the system owner.

5.3.29.2 No person shall repair a malfunctioning system without first obtaining a Repair or Component Replacement Permit except as permitted in Section 5.3.29.6. In no case shall a repair and/or component replacement be made to a cesspool or seepage pit or tank(s) associated with a cesspool/seepage pit unless approved by

the Department. Repairs made to such systems will be considered on a case by case basis and if granted will require the issuance of a hardship permit with conditional use.

5.3.29.3 Upon completion of installation of that part of a system for which a Repair, Component Replacement or System Replacement Permit has been issued, the permittee shall obtain a Certificate of Satisfactory Completion from the Department.

5.3.29.4 The following criteria for a Repair, Component Repair or System Replacement Permit shall apply:

5.3.29.4.1 If the site characteristics and standards described in these Regulations can be met, then the repair and/or installation shall conform to them.

5.3.29.4.2 If the site characteristics or standards described in these Regulations cannot be met, the Department may allow a repair or replacement installation in order to eliminate a public health hazard. Repairs or replacements may require the installation of an innovative/alternative system in order to eliminate a public health hazard. In such cases the Department shall use its best professional judgment in approving repairs or replacements that will reasonably enable the system to function properly.

5.3.29.5 Malfunctioning systems that cannot be repaired shall be abandoned in accordance with these Regulations.

5.3.29.6 Emergency Repairs

5.3.29.6.1 Emergency repairs are considered emergencies only when Department offices are not open for business. Repairs and component replacements required as a result of Class H inspections do not constitute an emergency by definition and therefore are subject to normal permit application procedures.

5.3.29.6.2 Emergency component replacements and repairs as specifically defined in these Regulations (see Emergency Permit definition) may be made without first obtaining a permit provided a permit is applied for the first day of normal Department operations following a weekend/holiday. Such a delayed application submittal does not relieve any person, owner or licensee, from complying with these Regulations or subsequent requirements or conditions of approval as may be imposed by the Department. Repairs and/or component replacements made under this initiative are subject to normal inspection protocols as stated in these Regulations and must be made available for inspection after work is completed.

5.3.29.6.3 Emergency component replacements require drainfield verification prior to installation. The absorption facility, either trench or bed, must contain, at a minimum, two distribution laterals of equal length. If a legitimate drainfield is located a Repair or Component Replacement Permit shall be issued provided that:

5.3.29.6.3.1 The existing system is not malfunctioning.

5.3.29.6.3.2 All isolation distances as required by these regulations can be maintained.

5.3.29.6.3.3 The proposed use would not create a public health hazard.

5.3.30 Flow Equalization Requirements

5.3.30.1 Flow equalization systems may be used for non-residential facilities that regularly and predictably operate at less than full capacity. Facilities may be permitted for flow equalization when approved by the Department.

5.3.30.2 Flow Equalization Terms

5.3.30.2.1 Flow equalization cycle is the time period in which wastewater will be stored and dosed.

5.3.30.2.2 Flow event is an occurrence during the flow equalization cycle in which wastewater will be generated.

5.3.30.2.3 Equalized daily flow is the total volume of wastewater generated by flow events at the facility during the flow equalization cycle divided by the number of days in the cycle.

5.3.30.2.4 Flow balance is a daily account of the amount of stored effluent in the equalization tank which is serviced from the incoming flow, residual storage and outgoing flow. The flow balance shows the day of the week, the amount of wastewater generated, the amount of wastewater dosed, and the residual amount of effluent left in the dosing tank each day. At the end of the flow equalization cycle, the sum of the incoming flow shall equal the sum of the amount dosed.

5.3.30.3 System Sizing and Design Criteria

5.3.30.3.1 The septic tank shall be designed to accommodate the largest flow projected in a 24 hour period.

5.3.30.3.2 Equalization dosing tank shall be sized to hold the:

5.3.30.3.2.1 Minimum dose volume required based on the size of drainfield.

5.3.30.3.2.2 Highest cumulative volume of effluent as determined by the flow balance.

5.3.30.3.3 The high water alarm shall be set to activate once the equalization volume is exceeded.

5.3.30.3.4 Drainfield Sizing

5.3.30.3.4.1 The equalized flow shall be calculated by adding the design daily flow for each event in the flow equalization cycle and dividing by the number of days in the cycle. Under this approval the maximum number of equalization days is seven (7).

5.3.30.3.4.2 The drainfield shall be sized by dividing the equalized daily flow by the approved loading rate.

5.3.31 Innovative/Alternative Wastewater Treatment and Disposal Systems

5.3.31.1 Innovative/Alternative on-site wastewater treatment and disposal systems may be appropriate for areas where site constraints limit the suitability for conventional system types. The Department shall consider applications for innovative/alternative wastewater treatment and disposal systems on a case by case basis. It is the policy of the Department to pursue a program of experimentation for the purpose of obtaining sufficient data for the development of innovative/alternative wastewater treatment and disposal systems, which may benefit the people of Delaware. For the purposes of this Section, applications for large and/or community systems that employ advanced treatment units which are in conformance with standard engineering practice as determined by the Department shall not be considered innovative/alternative.

5.3.31.2 Sites may be considered for Innovative/Alternative System Permits where:

5.3.31.2.1 Soils, climate, groundwater, or topographical conditions are indicating the seasonal high water table or a limiting condition is encountered deeper than 10 inches below the soil surface or observation well data determines the seasonal high water table is deeper than 10 inches.

5.3.31.2.2 A specific acceptable backup alternative is available in the event of system failure.

5.3.31.2.3 Installation of a particular system is necessary to provide a sufficient sampling data base.

5.3.31.2.4 Zoning, planning, and building requirements allow system installation.

5.3.31.2.5 The system will be used on a continuous basis during the life of the project.

5.3.31.3 Product approvals

Applications for innovative/alternative wastewater treatment and disposal systems shall provide documentation of the capabilities of the proposed system. Such documentation shall be in the form of proven data of long term usage of facilities similar to those specified in these Regulations, or short term documentation from controlled projects from reliable sources such as Universities or the National Sanitation Foundation International. The Department shall approve only treatment and disposal system applications that provide thorough documentation of proven technology. Alternative treatment units with flows < 2,500 gpd shall provide, at a minimum, the treatment levels prescribed for PSN3.

5.3.31.3.1 Application information required for all innovative/alternative systems or protocols must include the following information (see Exhibit EE):

5.3.31.3.1.1 Name, address, phone number, fax number and email address for manufacturer, owner and agent.

5.3.31.3.1.2 Executive summary describing the system, stating the type of approval sought, model numbers, and treatment levels, as applicable.

5.3.31.3.1.3 System proposed is fully described with the following information:

5.3.31.3.1.3.1 Construction drawings provided detailing all system components.

5.3.31.3.1.3.2 Specifications describing all materials to be used, methods of construction, means for assuring the quality and integrity of the finished product, and installation procedures.

5.3.31.3.1.3.3 Materials specified for use in construction are equal or superior in physical properties and chemical durability.

5.3.31.3.1.3.4 Any special conditions for use, installation, operation; and monitoring and maintenance that should be conditions of any approval document.

5.3.31.3.1.4 Provide summary of pertinent literature, published research, and previous experience and performance with the system.

5.3.31.3.1.5 Provide other state approvals.

5.3.31.3.1.6 Provide results of any available testing, research or monitoring of pilot systems or full scale operational systems conducted by a third party independent research or testing organization. These independent studies must have adequate research from highly controlled, third party studies with

rigorous research protocols or well documented long term use studies of proven wastewater technologies.

5.3.31.3.1.7 Operation, maintenance and monitoring procedures for system.

5.3.31.3.1.8 Notification given of any proprietary information, system, component, or device.

5.3.31.3.1.9 Local distributor information and contact information.

5.3.31.4 No person shall construct an innovative/alternative on-site wastewater treatment and disposal system without obtaining a permit from the Department. Class E.2 or E.3 system contractors must install innovative/alternative systems.

5.3.31.5 Applications for innovative/alternative systems shall be made to the Department. The application shall be complete, signed by the owner and accompanied by the required fee. The application shall include detailed system design specifications, plans and any additional information requested by the Department.

5.3.31.6 Applications for innovative/alternative wastewater treatment and disposal systems shall include, but not be limited to, the following:

5.3.31.6.1 Volume and rate of wastewater flow.

5.3.31.6.2 Characteristics of the wastewater.

5.3.31.6.3 The degree and extent of treatment expected.

5.3.31.6.4 Design criteria, specifications, and drawings including a description of the system, its capabilities, operation and maintenance requirements, unique technical features and system advantages for treatment systems plus calculations, if applicable.

5.3.31.6.5 Construction materials.

5.3.31.6.6 Operational and maintenance details along with their requirements.

5.3.31.6.7 Class C license is required.

5.3.31.6.8 Any additional information required by the Department.

5.3.31.7 The permit shall:

5.3.31.7.1 Specify method and manner of system installation, mandatory operation and maintenance requirements.

5.3.31.7.2 Specify method, manner and duration of system testing and monitoring, at the Department's discretion.

5.3.31.7.3 Identify when and where the system is to be inspected.

5.3.31.7.4 Require system construction and use within two (2) years of permit issuance.

5.3.31.8 Inspection of all installed systems shall be performed by a Class C designer, Class E.2 or E.3 system contractor, the Department and the manufacturer's representative, if Class E.2 or E.3 system contractor is not certified by the manufacturer for the product. Upon completion of each phase requiring inspection by the permit, the Class E.2 or E.3 system contractor shall notify the Department, the Class C designer and manufacturer's representative, if necessary.

5.3.31.9 The Department may inspect construction at any time to determine whether it complies with permit conditions and requirements.

5.3.31.10 After system installation is complete and the Department has determined that it complies with permit conditions, a Certificate of Satisfactory Completion shall be issued.

5.3.31.11 If the Department finds the operation of the system is unsatisfactory; the owner, upon written notification by the Department shall promptly repair or modify the system, replace it with another acceptable system, or abandon the system.

5.3.31.12 The system will be monitored by the Department and/or the Department's designee in accordance with a schedule contained in the permit and the operation and maintenance requirements in 5.5.5.

5.3.31.13 Should any additional guidelines be developed by the Department, the permittee would be responsible for meeting these guidelines.

5.3.32 Transportation of Non-Hazardous Liquid Waste

5.3.32.1 No person shall haul, convey or transport any non-hazardous liquid waste in any container without a Class F liquid waste haulers license and a Non-Hazardous Liquid Waste Transporters Permit issued by the Department in accordance with 7 **Del.C.** §6003 (a)(2).

5.3.32.2 In order to obtain a Non-Hazardous Liquid Waste Transporters Permit, the applicant must submit a completed application, demonstrate proof of bonding (see Section 5.3.32.4) and adhere to the transportation requirements (see Section 5.3.32.5).

5.3.32.3 The completed application shall include, at a minimum, the following information:

5.3.32.3.1 Company and owner information.

5.3.32.3.2 A list of all Class F licensees working for company.

5.3.32.3.3 A description of all equipment to include collection, short-term holding, handling, and wash down equipment.

5.3.32.3.4 A detailed description of the transport vehicles to include vehicle type, make and model, vehicle year, license number, state of registration, capacity size, number, and all modifications made to prevent spills and leaks.

5.3.32.3.5 Type(s) of non-hazardous liquid waste being transported.

5.3.32.3.6 An operations plan to include transportation route, days and hours of operation, spill reporting and cleanup plans, plans to keeping transportation vehicles clean, and recordkeeping procedures.

5.3.32.3.7 Bonding certification in accordance with Section 5.3.32.4.

5.3.32.3.8 A description of the non-hazardous liquid waste to include; the source of the non-hazardous liquid waste, the quantity to be transported, and any treatment the non-hazardous liquid waste has undergone before transportation.

5.3.32.3.9 The destination of the non-hazardous liquid waste and a description of what is to be done with the non-hazardous liquid waste at the destination and a copy of permit/authorization letter from each disposal facility.

5.3.32.3.10 A permit fee and advertisement fee are required upon submittal of a permit application, in accordance the latest DNREC fee schedule.

5.3.32.3.11 All vehicles used to transport biosolids, septage or non-hazardous liquid waste shall be operated and maintained so as to be in compliance with all state and federal regulations and not present a hazard to human health or the environment through unsafe vehicle conditions. The permittee is responsible for the operation and maintenance of all vehicles operated under the permit.

5.3.32.3.12 All transporters of biosolids, septage or non-hazardous liquid waste shall submit to the Department a plan for the prevention, control, and cleanup of

accidental discharges. No transportation permit will be issued until such a plan has been submitted to and approved by the Department.

5.3.32.3.13 All transporters shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $100,000, and shall submit a Certificate of Insurance demonstrating compliance with this regulation.

5.3.32.3.14 A copy of the Non-Hazardous Liquid Waste Transporters Permit must be kept in each vehicle used to transport non-hazardous liquid waste.

5.3.32.3.15 At all times, and in all phases of operations, Class F licensees and/or Non-Hazardous Liquid Waste Transporters shall comply with all laws and regulations regarding the activities associated with on-site wastewater system maintenance and disposal of materials removed therefrom.

5.3.32.3.16 Other information requested by the Department.

5.3.32.4 Bonding requirements

5.3.32.4.1 A Non-Hazardous Waste Transporter shall execute as a requirement for obtaining and keeping a Non-Hazardous Liquid Transporters Permit under these Regulations, a person shall file with the Department a bond, Letter of Credit or other security in a form approved by the Department.

5.3.32.4.2 The bond shall be payable to the Department and the obligation of the bond shall be conditioned upon the fulfillment of all requirements related to the permit.

5.3.32.4.3 The amount of the bond shall be at least $5,000.

5.3.32.4.4 Liability under the bond shall remain in effect until the expiration date of the permit. The Department shall release the bond after the Department determines that all of the conditions of the permit covered by the bond have been fulfilled.

5.3.32.4.5 The bond shall be executed by the applicant and by a corporate surety licensed to do business in this State. Instead of having a bond executed by a corporate surety, the applicant may elect to deposit, with the Department, cash or negotiable bonds of the federal government or of this State or a Letter of Credit to the Department. The amount of the cash deposit or the market value of any securities shall be at least equal to the required sum of the bond. The Department shall receive and hold the cash or securities in trust, for the purposes for which the deposit is posted.

5.3.32.4.6 The obligation of the applicant and of any corporate surety under the bond shall become due and payable, and all or any part of any cash or securities shall be applied to payment of the costs of properly fulfilling any requirement of the permit if the Department has:

5.3.32.4.6.1 Notified the applicant and any corporate surety that the conditions of the permit have not been fulfilled, and specified in the notice the particular deficiencies in the fulfillment of the permit conditions;

5.3.32.4.6.2 Given the applicant and any corporate surety 60 days to correct the deficiencies and to fulfill all of the conditions of the permit.

5.3.32.4.6.3 Determined that, at the end of 60 days, some or all of the deficiencies specified above remain uncorrected.

5.3.32.5 Transportation requirements for non-hazardous liquid wastes:

5.3.32.5.1 Display the name, address and permit number of the permittee in standard block letters no less than three (3) inches high on both sides of each vehicle used for hauling purposes.

5.3.32.5.2 Equip every vehicle used for hauling purposes with a watertight tank or body.

5.3.32.5.3 Maintain every vehicle used for transporting in a clean and sanitary condition.

5.3.32.5.4 Liquid wastes shall not be transported in an open body vehicle unless contained within suitable receptacles.

5.3.32.5.5 All pumps and hose lines shall be free of leaks.

5.3.32.5.6 Assure all receptacles used for transporting liquid or solid wastes are watertight, equipped with tight fitting lids and are cleaned daily.

5.3.32.5.7 Obtain prior approval in writing from the Department for every site at which a hauler plans to discharge a specified amount of waste material collected.

5.3.32.5.8 No waste material shall be discharged on any site without such prior approval. Written approval will be based upon the applicant having satisfied the requirements of all applicable regulations.

5.3.32.5.9 Waste material collected by the hauler shall not be discharged into ditches, watercourses, lakes, ponds, tidewater or at any point where it can pollute any watercourse, water supply source, bathing area, or shellfish growing area. It shall not be deposited within 300 feet of any highway, except as provided in Section 5.3.32.5.10.

5.3.32.5.10 Discharge liquid wastes into approved wastewater treatment facilities unless otherwise authorized by the Department, provided such facilities have sufficient capacity, capability to handle such liquid wastes and have authorized discharge.

5.3.32.5.11 Fit all truck pumping and discharge hoses with automatic shutoff valves.

5.3.32.6 Transportation of biosolids

5.3.32.6.1 For the purpose of this section, biosolids and septage are divided into three types:

Biosolid Type	Percent Solids
Liquid	< 15%
Cake	15 – 35%
Dried	> 35%

5.3.32.6.2 Liquid biosolids or septage can be pumped and transported by pipeline. If liquid biosolids are transported by truck, rail, or barge, closed watertight vessels shall be used such as tank trucks and railroad tank cars or other vessels which can provide equivalent protection against spills and leakage.

5.3.32.6.3 Cake may be transported in watertight boxes, such as dump trucks properly sealed to prevent leaks, or cement type vehicles. Unless the applicant demonstrates equivalent protection against spills and leakage, when biosolid cake is transported in dump trucks, the following standards shall be met:

5.3.32.6.3.1 The trucks shall be equipped with splash guards firmly attached horizontally at the front and rear of the trailer.

5.3.32.6.3.2 Each splash guard shall cover at least 25% of the trailer's open area.

5.3.32.6.3.3 A minimum two (2) feet of freeboard shall be maintained between the biosolids and the top of the trailer unless the top of the trailer is completely sealed.

5.3.32.6.4 The Department may require certain cake biosolids to be transported as liquid biosolids.

5.3.32.6.5 Dried biosolids may be transported in open boxes, such as dump trucks, which are properly sealed to prevent leakage. The trucks shall be covered with tarps or the equivalent.

5.3.32.7 Transportation of source separated materials as defined in Section 3.0 of the Regulations Governing Solid Waste, for reuse or recycling, does not require a Non-Hazardous Liquid Waste Haulers Permit, only if the material remains separated throughout the transport routes and are not recombined.

5.4 Installation Requirements

5.4.1 Excavation

5.4.1.1 Clearing and Grubbing: All vegetation shall be cut and removed from the grade surface at a distance of 10 feet beyond the perimeter of the disposal area (see Lot Clearing Guidelines). Trees and shrubs shall be cut and removed at grade level while roots may be left in place. All cut materials shall be removed from the disposal area.

5.4.1.2 Special care should be taken when clearing vegetation from an approved disposal area as disturbance of the soil surface may render the site unsuitable.

5.4.1.3 All unsuitable excavation materials shall be discarded and the excavation shall be kept dry and de-watered from surface drainage until backfilling is completed.

5.4.1.4 Excavation machinery shall be of such type and operated in such a manner that they will not compact or smear the trench or bed sidewall soils. If smearing does occur, the smeared surfaces (trench/bed sidewalls and bottoms) shall be hand-raked (scarified) to expose an unsmeared soil interface. Trenchers are required for excavation of LPP trenches. Tracked vehicles are preferred in most installation situations.

5.4.1.5 Excavations below the design depth shall be brought up to proper elevation with approved fill materials installed in accordance with these Regulations and the requirements for sand-lined systems. Additional aggregate may only be used when a minimum of three (3) feet of undisturbed soil can be maintained between the bottom of the aggregate and the limiting zone. In no case shall more than one (1) foot of additional aggregate be used.

5.4.1.6 The sides of the trenches or beds shall be practically plumb and scarified.

5.4.1.7 The bottom of the trench or bed area shall be practically level as determined by using a transit, or laser level, with a maximum grade tolerance of two (2) inches per 100 feet.

5.4.1.8 All trench or bed excavations shall be kept free of water and dry. Tamping of trench sides and bottoms is not permitted.

5.4.2 Materials

5.4.2.1 Sandy fill and filter aggregate materials must come from a supplier whose in-house certification either meets or exceeds gradation requirements as listed in the first two tables below. Random inspection of supply pits and supplier’s storage

facilities may be performed by the Department. Tire chip (shreds) specifications are located in the third table below.

5.4.2.2 Sandy fill materials shall be medium sand, sandy loam, loamy sand/sandy loam mixture.

Sandy Fill Gradation Requirements

Sieve Size	Maximum Percentage Passing Sieve
3/8"	100%
#4	95-100%
#50	5-30%
#100	1-7%

Aggregate Sizing Requirements

Sieve Size	Maximum Percentage Retained	Minimum Percentage Passing Sieve
2 ½"	0%	100%
2"	0-3%	97-100%
1 ½"	5-10%	90-95%
1"	50-80%	20-50%
½"	25-35%	10-25%
#4	0-5%	0-5%
#8	0%	0%

Tire Chip Sizing Requirements

Sieve Size	Percentage Passing Sieve
4"	100% minimum
2"	25% minimum
#4	5% maximum

NOTE: The tire shreds shall have less than one (1)% (by weight) of metal fragments that are not at least partially encased in rubber. Metal fragments shall protrude no more than one (1) inch on 100% of the pieces and no more than one half (½) inch on 75% of the pieces (by weight). In no case shall the tire shreds contain the remains of tires that have been subjected to a fire.

NOTE: The Class E system contractor shall submit upon request a Certification of Materials for fill, aggregate and/or tire chips used in systems. This certificate shall be obtained from the supplier.

5.4.2.3 Grade boards or blocks may be used in pipe installation to assure a proper slope of less than two (2) inches per 100 feet for gravity distribution lines.

5.4.2.4 Filter fabric shall be placed over the gravel with a two (2) inch overlap turned up on each side of the trench or bed.

5.4.2.5 Aggregate-free chambers or any other similar devices may be used in the design, installation, and operation of on-site wastewater treatment and disposal systems in Delaware, but are subject to approval of the Department. The minimum disposal area required when using aggregate-free chambers shall be calculated by utilizing the most recent guidelines and Sections 5.3.2.2 and 5.3.2.3.

5.4.3 Septic Tank Installation

5.4.3.1 Excavation: The excavation shall be large enough to allow safe, unencumbered working conditions but in no case shall the size of the excavation be less than two (2) feet beyond the perimeter of the tank. Excavations shall be kept dewatered from surface drainage until backfilling is complete.

5.4.3.2 Foundations: The tank shall be placed on firm, dry, granular, undisturbed soil that has been graded level. Gravel bedding shall be used on damp or fine grained soils. A gravel bed foundation shall consist of stone which meets the specifications in Section 5.4.2 and shall be placed level to a minimum thickness of six (6) inches in the excavation. The gravel bed shall extend one (1) foot beyond the perimeter of the tank.

5.4.3.3 All tanks shall be placed on a level grade and at a depth that provides adequate gravity flow from the source. Where adequate flow from the source is maintained through the use of pumping equipment, the impact of pumping rates and potential surge flows shall be evaluated so as to maintain the treatment efficiency of the septic tank unit.

5.4.3.4 Previously excavated material from the tank excavation may be used for backfill provided the excavation material is dry and free of stones larger than four (4) inches in diameter, construction debris, concrete, wood and other similar materials. To equalize external pressure against the septic tank, backfill material shall be placed and compacted, extending a minimum of two (2) feet beyond the perimeter of the tank.

5.4.3.5 Backfill materials shall be placed in uniform layers not more than eight (8) inches thick and compacted to no less than 85% Modified Proctor Density. Tamping shall be done in a manner that will not produce undue stress or strain on the tank. All backfill shall be free of excessive moisture.

5.4.3.6 Testing: All tanks shall be tested to ensure watertight conditions and to check alignment and operation of inlet, inter-compartment and outlet connections prior to backfill. When tested, tanks shall be filled to overflowing with water to observe operation of all connections and fittings. All visible leaks in the tank observed by the installer shall be repaired prior to backfilling.

5.4.4 Distribution Networks

5.4.4.1 All systems requiring a total of ≥ 2,500 square feet of disposal area shall have a pressurized distribution system pursuant to these Regulations.

5.4.4.2 All systems requiring ≥ 2,500 square feet of disposal area, with the exception of low pressure pipe systems, shall be divided into a minimum of two separate alternating systems of equal size with pressurized distribution. The

minimum separation between absorption facilities shall be 10 feet, with the exception of subsurface irrigation systems.

5.4.4.3 All systems installed on lots where percolation rates are < six (6) mpi shall have pressure distribution systems.

5.4.4.4 A minimum distance of four (4) feet and a maximum distance of six (6) feet shall separate adjacent laterals in a bed. Laterals shall be placed no farther than three (3) feet from the sidewalls of the bed. The length to width ratio for seepage beds and elevated sand mounds shall be 4:1 or greater and maximum bed width shall not exceed 25 feet, unless approved by the Department. A minimum distance of six (6) feet shall separate laterals in a trench disposal system.

5.4.4.5 Gravity system distribution laterals may be connected in closed loop systems on slopes ≤ two (2)%.

5.4.4.6 The maximum allowable trench or bed length is 100 feet for gravity distribution systems and pressure distribution systems.

5.4.4.7 Each trench or bed system shall contain at least two distribution laterals. Trenches shall be utilized in all distribution systems located on slopes in excess of two (2)%, unless otherwise approved by the Department.

5.4.4.8 All distribution systems shall ensure equal distribution when designed on slopes.

5.4.5 Conventional Treatment and Disposal Systems

5.4.5.1 Gravity Trenches and Beds (see Exhibits K, L, M and N)

5.4.5.1.1 A minimum of 12 inches of filter aggregate or gravel-less chambers shall be placed in the bed or trench. When aggregate is utilized a minimum of six (6) inches of aggregate shall be placed under the distribution laterals. The remaining filter aggregate shall be placed so that a minimum depth of no less than two (2) inches exists above the crown of the distribution pipe.

5.4.5.1.2 For trenches or beds with a minimum sidewall depth of 24 inches, backfill shall be placed in accordance with permit requirements. Unless otherwise required by the Department, the construction sequence shall be as follows:

5.4.5.1.2.1 The backfill material shall be at least 12 inches in depth above the filter fabric and returned to the original grade.

5.4.5.1.2.2 Backfill material shall be carefully deposited by methods which will not damage or disturb the distribution pipe or result in undue compaction of the backfill.

5.4.5.1.2.3 Backfill over trenches or beds shall not be tamped.

5.4.5.1.2.4 Material containing an excess of moisture shall be permitted to dry until the moisture content is within workable limits. The moisture content of the material being placed shall be within plus or minus three (3)% of optimum as determined by AASHTO Designation T-99.

5.4.5.1.2.5 Backfill material which is too dry for proper placement shall be wetted. All materials shall be free of stones larger than two (2) inches in diameter, debris, trash, wood or other similar materials.

5.4.5.1.3 For trenches or beds with a minimum sidewall depth of 12 inches but less than 24 inches, a capping fill shall be placed over the disposal system. The cap shall be constructed pursuant to permit requirements (see Exhibits M and

N). Unless otherwise required by the Department, the construction sequence shall be as follows:

5.4.5.1.3.1 The texture of the soil used for the cap shall be of the same textural class or of one textural class finer, as the natural topsoil. All materials shall be free of stones, larger than two (2) inches in diameter, debris, trash, wood or other similar materials.

5.4.5.1.3.2 Construction of capping fills shall not occur when the natural soil has a moisture content which causes loss of soil structure and porosity when worked.

5.4.5.1.3.3 The disposal area shall be scarified to destroy the vegetative mat.

5.4.5.1.3.4 The system shall be installed as specified in the construction permit. There shall be a minimum of 10 feet of separation between the edge of the fill and the absorption facility.

5.4.5.1.3.5 Suitable backfill shall be applied to the fill site and worked in so that the two (2) contact layers (native soil and fill) are mixed. Fill material shall be evenly graded to a minimum final depth of 16 inches over the aggregate or gravel-less chambers and properly crowned.

5.4.5.1.3.6 The site shall be landscaped according to permit conditions and be protected from livestock, automotive traffic or other activity that could damage the system.

5.4.5.2 Elevated Sand Mounds (see Exhibit Q)

5.4.5.2.1 Sand mound absorption areas shall be plowed seven (7) to eight (8) inches deep parallel to the contour after removing the vegetative mat. Plowing shall not be done on wet soils. No plowing instruments which compact the soil shall be used. Moldboard or chisel plows are recommended.

5.4.5.2.2 Immediately after plowing, sandy fill shall be placed on the up-slope edges of the plowed mound absorption area and spread to a depth as specified in the permit. Only lightweight equipment such as small track type tractors shall be allowed.

5.4.5.2.3 A 12 inch bed of aggregate or gravel-less chambers shall be placed over the sandy fill. When utilizing aggregate, a minimum of six (6) inches shall be placed under the distribution lateral with the remaining aggregate placed to an additional depth of six (6) inches with at least two (2) inches over the crown of the distribution pipe.

5.4.5.2.4 A minimum allowable distance of four (4) feet and a maximum distance of six (6) feet shall separate adjacent laterals in an elevated sand mound bed.

5.4.5.2.5 The slope of the sandy fill not directly beneath the filter aggregate or gravel-less chambers shall be a minimum of 3:1, with 5:1 recommended by the Department.

5.4.5.2.6 Mound covering or berm soil shall be loamy sand or sandy loam.

5.4.5.2.7 The mound berm shall extend at least 12 inches above the 12 inch filter aggregate layer plus at least six (6) inches of topsoil cover.

5.4.5.2.8 The outside slopes of the mound cover or berm shall be a minimum of 3:1 with 5:1 recommended by the Department.

5.4.5.2.9 Erosion control shall be provided over the complete mound in one of the following manners:

5.4.5.2.9.1 Grass shall be planted over the entire mound and stabilized with mulch; or

5.4.5.2.9.2 Sod entire mound; or

5.4.5.2.9.3 Other pre-authorized methods of erosion control

5.4.5.3 Low Pressure Pipe Systems (see Exhibits O & P)

5.4.5.3.1 A trench width of 12 inches shall be used.

5.4.5.3.2 Trenches shall be no less than five (5) feet on center.

5.4.5.3.3 Nine (9) inches of filter aggregate or gravel-less chambers shall be placed in the trench. When aggregate is utilized, there shall be six (6) inches below the pipe and the remaining three (3) inches of aggregate placed around and above the pipe. There shall be a minimum of nine (9) inches of soil cover over aggregate or gravel-less chambers.

5.4.5.3.4 Filter fabric shall be placed on top of the aggregate in the trench with a two (2) inch overlap turned up on each side of the trench.

5.4.5.3.5 Check valves are required to eliminate the back siphoning of effluent from the laterals.

5.4.5.3.6 Turn ups shall be finished below grade and protected by a four (4) inch diameter or greater Sch. 40 PVC sleeve with a cap and ferrule finished at grade.

5.4.5.3.7 Timers or other electrical on/off delay devices shall be installed to ensure dosing frequencies and volumes.

5.4.5.4 Wisconsin At-Grade Systems (see Exhibits U & V)

5.4.5.4.1 Wisconsin At-Grade (WAG) absorption areas shall be plowed seven (7) to eight (8) inches deep parallel to the contour after removing the vegetative mat. Plowing shall not be done on wet soils. No plowing instruments which compact the soil shall be used. Moldboard or chisel plows are recommended.

5.4.5.4.2 Immediately after plowing, a 12 inch bed of filter aggregate shall be placed over the plowed area. Six (6) inches of aggregate shall be placed under the distribution lateral with the remaining aggregate placed to an additional depth of six (6) inches with at least two (2) inches over the crown of the distribution pipe. Only lightweight equipment such as small track type tractors shall be allowed when placing the aggregate.

5.4.5.4.3 Filter fabric shall be placed over the aggregate bed prior to backfilling.

5.4.5.4.4 WAG covering or berm soil shall be loamy sand or sandy loam.

5.4.5.4.5 The WAG covering or berm shall extend at least 12 inches above the 12 inch filter aggregate layer with six (6) inches of topsoil cover.

5.4.5.4.6 The outside slopes of the WAG cover or berm shall be approximately 5:1.

5.4.5.4.7 Erosion control shall be provided over the complete WAG in one of the following manners:

5.4.5.4.7.1 Grass shall be planted over the entire WAG and stabilized with mulch; or

5.4.5.4.7.2 Sod entire WAG; or

5.4.5.4.7.3 Other pre-authorized methods of erosion control

5.4.5.5 Site Restoration

5.4.5.5.1 The finished grade of the backfill over seepage bed, trench and sand-lined absorption facilities shall be crowned/sloped to provide positive drainage.

5.4.5.5.2 The land adjacent to all absorption facilities shall be graded to prevent both the accumulation of surface water on the absorption facility and the flow of surface water across the absorption facility. The finished absorption facility and fill extensions shall be seeded and mulched or sodded to prevent erosion.

5.4.5.5.3 Trees shall not be planted within 10 feet of the perimeter of absorption facility. All post-construction planted trees and shrubs shall be located to prevent root intrusion into the absorption facility and other components of the system. Shallow rooted shrubs are permitted (e.g., rhododendrons, azaleas).

5.4.5.5.4 All areas of disturbance due to the installation of the absorption facility shall be either sodded or seeded and mulched to establish a permanent grass cover.

5.4.6 Inspections

5.4.6.1 Construction

5.4.6.1.1 The Class E system contractor shall contact the Department 24 hours prior to system construction to obtain a startup number to authorize the construction.

5.4.6.1.2 Changes to a permit which result in only a relocation of the system can be done by submitting a pre-inspection “as-built”, which requires a minimal check against the site evaluation to ensure the system is still located within approved soils and that all required isolation distances are met. These “as-builts” are to be submitted to the Department by the Class E system contractor prior to installation. The Class E system contractor must obtain permission from the designer prior to submittal.

5.4.6.1.3 When construction or repair of a system is complete, except for backfill (cover), or as required by permit, the Class E system contractor shall notify the Department or Class I system inspector, when applicable. The inspector shall inspect the installation to determine if it complies with these Regulations and the terms and conditions of the permit, unless the inspection is waived by the Department in accordance with Section 5.4.6.1.6

5.4.6.1.4 It is the responsibility of the Class E system contractor to confirm the results of the pre-cover inspection prior to backfilling the system.

5.4.6.1.5 An inspector shall be either:

5.4.6.1.5.1 An employee of the Department.

5.4.6.1.5.2 A Class C designer or his/her designee. The Class C designer must submit a list of authorized personnel, on company letterhead, to the Department for review and approval.

5.4.6.1.5.3 Any person officially authorized by the Department to perform inspections of on-site wastewater treatment and disposal systems.

5.4.6.1.6 The Department may waive the pre-cover inspection, provided:

5.4.6.1.6.1 The installation is an on-site wastewater treatment and disposal system installed by a licensed person pursuant to these Regulations; and

5.4.6.1.6.2 After system completion the Class E system contractor shall provide a construction report which certifies in writing that the system complies with the Department's Regulations within 10 calendar days of system completion. If any changes were made to the system the Class E system

contractor shall also provide a detailed "as-built" plan (drawn to scale) within 10 calendar days of system completion.

5.4.6.1.7 Failure to comply with Departmental Regulations and the conditions of the permit will result in verbal notification to the Class E system contractor. Failure to correct deficiencies within 10 calendar days (weather permitting) may result in written notification of such to both the Class E system contractor and permittee. Additional inspections may be required by the Department.

5.4.6.1.8 Once a system has received a satisfactory pre-cover inspection or authorization to cover without a Departmental inspection, the system may be covered as specified in the approved permit. Backfilling must be completed within 10 calendar days of a satisfactory pre-cover inspection or authorization to cover by the Department, weather permitting.

5.4.6.1.9 Systems requiring earthen caps and all mound systems shall require a final cover inspection pursuant to Section 5.4.6.1.3 or 5.4.6.1.6. Capping of systems must be completed within 10 calendar days of a satisfactory pre-cover inspection or authorization to cover without Departmental inspection, weather permitting.

5.4.6.1.10 Inspections performed by Class C designers shall conform to guidelines established by the Department.

5.4.6.1.11 In situations where the Class C designer is not comfortable approving a system, he/she is to contact the Department immediately.

5.4.6.2 Inspection Protocols

5.4.6.2.1 The Class E system contractor shall be responsible for site inspection readiness which implies system completion and requires that:

5.4.6.2.1.1 All septic and dosing tanks and lift stations be set and left uncovered with all appropriate risers, filters and other appurtenances installed as required by permit design. In addition, appropriate levels of water (if applicable) for lift stations and dosing tanks shall also be provided to facilitate testing.

5.4.6.2.1.2 All accessory components be set and left uncovered with appropriate risers and other appurtenances installed as required by permit design.

5.4.6.2.1.3 All transmission trenches from septic, lift station, or dosing tanks shall be left uncovered to verify transmission pipe diameter, level and/or bury depth. Exceptions shall be considered where high water tables are encountered. Portions of the trenches may be backfilled to facilitate site access as required. All inlet/outlet connections to all tanks and components shall be left uncovered in order to ensure pipe connection quality/integrity.

5.4.6.2.1.4 The entire absorption facility (e.g. drainfield) must be left uncovered for inspection to verify trench/bed length, width and depth, sidewall condition and aggregate quality. Exceptions to this requirement may be considered for absorption facilities where site conditions such as limited site or drainfield area access, trench spacing that precludes stable equipment stabilizer placement, steep slopes, etc. are encountered. In such cases, some trenched drainfields may be backfilled to better facilitate system installation. In these instances, at the discretion of the Class E system contractor, all trenches except one may be backfilled with the exception

being the most upslope trench. All pre-inspection backfilled trenches must, at a minimum, have at least two areas along the length of the trench (not including the trench beginning/end) uncovered for depth verification. In all inspection scenarios regardless of degree of pre-inspection cover, the beginning and ends of all absorption trenches must be left uncovered to verify trench length.

5.4.6.2.1.5 All electrical components must be completely installed, wired and ready for testing and/or operation. This is to include, but not limited to, all timers, control panels, alarms, pumps, floats w/attending controls and other accessory appurtenances required by permit design. In cases where generators are utilized to provide electricity for testing where on-site power is not yet available all wiring should be complete with the exception of the final wiring tying into the available breaker box. All electrical connections and components utilized in an OWTDS, at a minimum, must comply with National and Delaware Electric Code (**Admin Code**, Title 24, §1400).

5.4.6.3 Class H

5.4.6.3.1 For all properties utilizing an OWTDS that are sold or otherwise transferred to other ownership, the persons must have the system pumped out and inspected by a Class F and Class H licensee, respectively, prior to the completion of sale. An extension will be given to sheriff sales, short sales, cash sales and auctions for a period not to exceed 90 days from date of sale. All inspections of on-site wastewater treatment and disposal systems shall be submitted to the Department on forms approved by the Department (see Exhibit A). These forms shall be submitted within 72 hours of inspection completion.

5.4.6.3.2 Must be performed by a Class H system inspector.

NOTE: If an inspection has occurred within the previous 36 months and the property owner can provide documentation of such pump out and inspection, then such documentation will fulfill the requirements of 5.4.6.3.

5.4.6.3.3 For transfers of new property, the certificate of completion will fulfill the requirements of this section if issued within the previous 24 months.

5.4.6.3.4 If the owner of an individual OWTDS provides proof of a licensed operator or has an annual service contract with a certified service provider then such documentation will fulfill the requirements of 5.4.6.3.

5.4.6.3.5 Research historic records with DNREC (permits and/or site evaluations) through tax map numbers and previous owners. Submission of current zoning certificate required.

5.4.6.3.6 All reports are required to be submitted on forms provided by the Department and are not to be altered without the prior approval of the Department (see Exhibit A).

5.4.6.3.7 Interview the homeowner and/or tenants when completing the inspection forms, if available.

5.4.6.3.8 Perform a **visual** inspection under the house for greywater lines or separate systems.

NOTE: Report if area under the dwelling is not accessible.

5.4.6.3.9 Flow test from each household fixture, if applicable.

NOTE: Report if access to dwelling is not available.

DISCLAIMER: The International Plumbing Code shall apply to the erection,

installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems (e.g. building drains) however this does not preclude others from **visually** inspecting the building drain for separate systems leaving the building.

5.4.6.3.10 Tank and Building Sewer Inspection

5.4.6.3.10.1 Locate tank.

5.4.6.3.10.2 Excavate both inlet and outlet lids on septic tank, if not equipped with risers.

5.4.6.3.10.3 Check flow through building sewer from house to inlet baffle, if possible.

5.4.6.3.10.4 Observe and make note of effluent levels in septic tank.

5.4.6.3.10.5 Observe and make note of effluent filter, if present.

5.4.6.3.10.6 Measure and report sludge and scum thickness to determine the volume of solids in the tank.

5.4.6.3.10.6.1 The combined total should not exceed 30% of tank volume.

5.4.6.3.10.7 Proceed with tank pump-out. This is required for all inspections and pump-out documentation may be required also.

5.4.6.3.10.7.1 Pay attention to pump-out, note abnormal items.

5.4.6.3.10.8 Inspect the structural integrity of the tank.

5.4.6.3.10.9 Inspect inlet and outlet pipes.

5.4.6.3.10.10 Inspect all baffles.

5.4.6.3.10.11 Observe flow back from drainfield, if any.

5.4.6.3.11 Distribution Box Inspection, if applicable, if not go to 5.4.6.3.12.

5.4.6.3.11.1 Dig up and inspect structural integrity of distribution box.

5.4.6.3.11.2 Inspect grouting and/or gaskets around both the inlet and outlets pipes.

5.4.6.3.11.3 Observe water level in distribution box.

5.4.6.3.11.4 Observe that all outlet inverts are set level.

NOTE: In a properly functioning system, the water level should not be above the invert of the outlet pipe. If the water level is above the invert of the outlet pipes, this can be an indicator that ponding may be occurring in the drainfield. Special attention should be given to the **NOTE:** in 5.4.6.3.13.3 as this condition in the distribution box along with probing throughout the drainfield may eliminate the need for additional excavation.

5.4.6.3.11.5 If pump truck is still on-site, evacuate distribution box observing any backflow from drainfield.

5.4.6.3.11.6 Check distribution box for cracks and inflow of sediment or carryover of FOG/Sludge.

DISCLAIMER: All Occupational Safety and Health Act (OSHA) regulations must be complied with during all phases of system installation and inspection. OSHA regulations can be found at www.osha.gov or by contacting the U.S. Department of Labor.

5.4.6.3.12 Dosing Chamber Inspection, if applicable, if not go to 5.4.6.3.13.

5.4.6.3.12.1 Inspect the structural integrity of the dosing chamber, riser and lid.

5.4.6.3.12.2 Inspect grouting and/or gaskets around pipe openings, tank seams and risers.

5.4.6.3.12.3 Make a **visual** inspection of the electrical components for safe and corrosion free appearance.

5.4.6.3.12.4 Check float switches for proper operation of the pump and alarm

5.4.6.3.12.5 Check for timer location, if applicable.

5.4.6.3.12.6 Ensure that flow is leaving the dosing chamber by taking effluent measurements before and after activating the pump.

5.4.6.3.12.7 Check for weep hole, if applicable, to ensure open and below check valve.

DISCLAIMER: All electrical work must meet all currently adopted State and National Electrical Codes where applicable (**Admin Code**, Title 24, §1400).

5.4.6.3.13 Gravity Drainfield Inspection (Full Depth and/or Capping Fill), if applicable, if not go to 5.4.6.3.14.

5.4.6.3.13.1 Perform visual inspection of the drainfield area.

NOTE: Look for wet or depressed areas with lush vegetation.

5.4.6.3.13.2 Using system records and permits, if available, locate the drain field.

5.4.6.3.13.3 In all cases, the existing drainfield should be probed to find its size and extent as well as its exact location.

NOTE: While probing the drainfield, care should be taken to observe the apparent operating condition of the drainfield. If, in the opinion of the inspector, there appears to be ponding in the drainfield, additional excavation, to determine the extent of the ponding and the systems functionality, may be necessary.

5.4.6.3.13.4 In the event that the dwelling/building connected to the system that is being inspected has been vacant for more than seven days, it is recommended that a flow/slug test, as described by NAWT or PSMA, be performed on the drainfield.

5.4.6.3.14 Pressure Dosed Inspection (Full Depth and/or Capping Fill), if applicable, if not go to 5.4.6.3.15.

5.4.6.3.14.1 Perform the initial inspection in the same manner as 5.4.6.3.13 above “Gravity Drainfield Inspection”.

5.4.6.3.15 Elevated Sand Mound Inspection, if applicable, if not go to 5.4.6.3.16.

5.4.6.3.15.1 Perform the initial inspection in the same manner as 5.4.6.3.13 above “Gravity Drainfield Inspection”.

5.4.6.3.15.2 Ensure the satisfactory condition of grass cover for stabilization

5.4.6.3.16 Low Pressure Pipe System Inspection (Full Depth and/or Capping Fill), if applicable, if not go to 5.4.6.3.17.

5.4.6.3.16.1 Perform the initial inspection in the same manner as 5.4.6.3.13 above “Gravity Drainfield Inspection”.

5.4.6.3.16.2 Perform a visual inspection of the drainfield.

NOTE: Look for wet, depressed areas with lush vegetation.

5.4.6.3.17 Wisconsin At-Grade System Inspection, if applicable, if not go to 5.4.6.3.18.

5.4.6.3.17.1 Perform the initial inspection in the same manner as 5.4.6.3.13 above “Gravity Drainfield Inspection”.

5.4.6.3.17.2 Perform a visual inspection of the drainfield.

NOTE: Look for wet, depressed areas with lush vegetation.

5.4.6.3.18 All Innovative/Alternative systems including advanced treatment unit's (ATU's) and alternative drainfield systems may only be inspected by a Class H licensee that has been certified through DNREC approved training for that ATU or alternative drainfield system. Proof of certification must be submitted to DNREC. A Class H license alone is not adequate enough for this task.

5.4.6.3.19 Scale drawing must contain, at a minimum:

5.4.6.3.19.1 A site drawing to scale, straight edge must be used (no free-hand lines), must show a reference point such as numbered utility pole, telephone or electrical box, building(s), property corners or fixed survey markers, or GPS coordinates. A minimum of two (2) such reference points should be noted on the site sketch. Site sketches shall be based on a whole number scale not to exceed one (1) inch equals 100 feet. Acceptable scales are: 1 inch = 10, 20, 30, 40, 50, 60, or 100 feet.

5.4.6.3.19.2 A north directional arrow.

5.4.6.3.19.3 Indicate location of central water line or on-site well. All on-site wells must be measured from two (2) reference points or established survey control.

5.4.6.3.19.4 Identify each wastewater treatment and disposal system component.

5.4.6.3.19.5 Mark distances from fixed reference points (e.g. property corners, existing dwelling) or established survey control points for each wastewater treatment and disposal system component.

5.4.6.3.19.6 Should an existing approved permit drawing be available the drawing maybe used, but the inspector must either note on the drawing that "no changes were found" or clearly mark all the changes on the permit drawing.

5.4.6.3.20 All cesspools and seepage pits are prohibited and when found must be replaced within one (1) year in accordance with these Regulations.

5.4.6.3.21 All metal tanks and metal distribution boxes are prohibited and when found must be replaced in accordance with these Regulations.

5.4.6.3.22 Once received, the Class H Inspection Report shall be reviewed for compliance with current Regulations. If not in compliance, the Class H inspector will be notified. The Class H inspector must submit the required corrections within 72 hours of notification to the Department and the owner.

5.4.6.3.23 If repairs are made to the system, after receiving an unsatisfactory rating during a Class H inspection, another Class H inspection must be performed or paperwork submitted to the Department outlining all work completed to return system to a satisfactory condition.

5.4.7 Certificate of Satisfactory Completion

5.4.7.1 The Department shall issue a Certificate of Satisfactory Completion, if, upon inspection of the installation, the system complies with the Department's Regulations, the conditions of the permit, and a Construction Report is submitted to the Department.

5.4.7.2 A system shall be backfilled (covered) when:

5.4.7.2.1 The Class E system contractor is notified by the Department that inspection has been waived; or

5.4.7.2.2 The inspection has been done and authorization has been granted to cover the system.

5.4.7.3 Corrections necessary to meet requirements for satisfactory completion shall be made within 10 calendar days after written notification by the Department, unless otherwise required and weather permitting.

5.4.7.4 A Certificate of Satisfactory Completion shall be valid for a period of two (2) years from the date of issuance. After the two (2) year period, the Regulations for Authorization to Use an Existing System Permit shall apply (see Section 5.3.28).

5.4.7.5 Denial of a Certificate of Satisfactory Completion may be appealed in accordance with 7 **Del.C.** §6008.

5.4.7.6 If the system has been placed into operation without the required Certificate of Satisfactory Completion, a Notice of Non-Compliance shall be issued to the owner and must be corrected within 10 calendar days or system must be abandoned in accordance with Section 5.4.8.3.

5.4.8 Abandonment of On-Site Wastewater Treatment and Disposal Systems

5.4.8.1 General Requirements

5.4.8.1.1 All systems shall be abandoned by a Class E system contractor or other governmental appointee.

5.3.8.1.2 Within 10 calendar days of abandonment, the Class E system contractor or governmental appointee shall submit a System Abandonment Report on a form provided by the Department (see Exhibit AA). The report shall be filled out completely and signed by the system contractor or governmental appointee.

5.4.8.2 The system shall be properly abandoned when:

5.4.8.2.1 A central wastewater system becomes available and the building sewer has been connected thereto; or

5.4.8.2.2 The source of wastewater has been permanently eliminated.

5.4.8.3 Procedures for Abandonment:

5.4.8.3.1 The septic tank, cesspool or other treatment unit shall be pumped by a Class F liquid waste hauler to remove all of the contents.

5.4.8.3.2 The septic tank, cesspool or other treatment unit shall be removed or filled with sand, bank run gravel, or other material approved by the Department.

NOTE: If metal tank is encountered, it must be removed and properly disposed of.

5.4.8.3.3 The system's building sewer shall be permanently capped.

5.4.8.3.4 The System Abandonment Report shall be submitted to the Department within 10 calendar days.

5.4.8.3.5 In addition, the requirements of Section 5.4.5.5 must be adhered to to properly restore the site after system abandonment.

5.5 Operation and Maintenance

5.5.1 The owner shall be responsible for operating and maintaining their on-site wastewater treatment and disposal systems.

5.5.2 Each on-site wastewater treatment and disposal system shall be pumped by a licensed Class F liquid waste hauler once every three (3) years and innovative/alternative treatment systems shall be pumped according to manufacturer recommendations unless determined that the tank is less than one-third ($^1/_3$) full of solids. The schedule shall be prescribed in accordance with current Department guidelines based on the size of the treatment unit and anticipated number of residents. The owner of the on-site wastewater treatment and disposal system shall maintain a

record indicating the system has been pumped and provide such documentation to the Department upon request.

5.5.2.1 Effluent filters shall be cleaned as per manufacturer's recommendations, at a minimum, or as necessary to prevent backing up into the dwelling. Cleaning is accomplished by hosing off the filter over the open inlet cover riser.

5.5.3 Grease traps shall be cleaned when 75% of the grease retention capacity has been reached.

5.5.4 The sites of the initial and replacement absorption facilities shall not be covered by asphalt or concrete or subject to vehicular traffic or other activity which would adversely affect the soils. These sites shall be maintained so that they are free from encroachments by accessory buildings and additions to the main building.

5.5.4.1 There shall be no lawn irrigating systems installed over the absorption facility when the absorption facility is active.

5.5.5 The Department may impose specific operation and maintenance requirements for on-site wastewater treatment and disposal systems to assure continuity of performance. All innovative/alternative systems have operation and maintenance requirements. These requirements follow;

5.5.5.1 For new construction, prior to the Department granting a Certificate of Completion, the permittee, unless certified by the homeowner training program, must enter into a service contract with a certified service provider initially, for a minimum of two (2) years starting at the onset of initial system operation. For replacement systems, this service contract must be submitted with the permit application. Specifically, the service contract shall prescribe an Inspection Program and Homeowner Training Program as outlined below:

5.5.5.1.1 Inspection Program

The inspection program shall include the following: a schedule indicating inspection frequency, inspection objective(s), inspection details, necessary operation and maintenance activities, additional sampling if required, and record keeping requirements.

5.5.5.1.1.1 <u>Inspection Frequency/Objective:</u> The service contract must outline that the certified service provider is to inspect the system once every six (6) months or otherwise as approved by the Department.

5.5.5.1.1.2 <u>Inspection Reports:</u> The contract must outline that the certified service provider must document all inspections. Operation inspection reports shall indicate the following: date and time of the inspection, sampling and laboratory analysis results, operation and maintenance performed, repairs, an assessment indicating the current performance status of the entire treatment and disposal system, and any corrective actions that must be taken prior to the next inspection. All inspection reports shall be on forms approved by the Department.

5.5.5.1.2 Homeowner Training Program

The service contract must state that the certified service provider is required to meet with the homeowner during the first sixth month inspection. The certified service provider is to educate the homeowner on the components of the system and on the proper operation and maintenance requirements. At this time, the certified service provider shall provide the homeowner with an operation and maintenance manual.

5.5.5.2 Following the initial two (2) year period, the permittee is required to maintain a service contract for the system by: renewing the existing contract annually, at a minimum, contracting with another certified service provider or being certified by the homeowner training program. The service contract must contain the inspection program requirements from Section 5.5.5.1.1.

5.5.5.3 All reports and contract renewals from the previous year shall be submitted by February 1st of each year to the Department. The certified service provider must submit all inspection reports to the Department and permittee. The permittee shall submit any contract renewals as necessary to the Department.

5.5.5.4 The Department reserves the right to collect and analyze samples to ensure proper treatment levels and system performance.

5.5.5.5 The Department may increase inspection frequencies as warranted. A notice outlining new frequencies and cause will be provided to the permittee prior to initiation.

5.5.5.6 Transferability

Within 90 days after the transfer of the real property which utilizes an innovative/alternative system, the owner shall notify the Department. Transfer of the maintenance agreement must also be completed within this 90 day period.

5.5.6 Innovative/Alternative systems without permit conditions requiring a certified service provider shall be inspected by the Department or its designee once every three (3) years and a fee may be required.

5.6 Waivers

Waivers from any provisions contained in these Regulations may be granted after a public notice and hearing, if warranted.

5.6.1 Applications for Waivers

5.6.1.1 A separate application shall be made to the Department for each site considered for a waiver.

5.6.2 Formal

5.6.2.1 A letter signed and submitted by the property owner or their authorized agent requesting a Formal Waiver (FW). This submittal must include all appropriate fees.

5.6.2.2 A site evaluation report conducted by a Class D soil scientist.

5.6.2.3 At the sole discretion of the Department, a design prepared by a licensed Class C designer may be required to show exact location of a proposed system with initial submission of the FW application.

5.6.2.4 A list of all property owners' names and addresses located contiguous to the waiver site.

4.6.2.5 The location of all current wells within 150 feet of the property.

4.6.2.6 The Department shall advertise a FW in accordance with 7 **Del.C.** §6004 to include direct notification of adjacent property owners. The Department will not hold a public hearing unless a meritorious request is made.

5.6.2.7 Upon approval of the FW the following will be required:

5.6.2.7.1 A completed permit application prepared by a licensed Class C designer, if not previously submitted.

5.6.2.7.2 Only those items stated in writing in the initial request will be granted in the FW.

5.6.3 Rural Area

5.6.3.1 Waivers for any provision of these Regulations may be granted by the Secretary provided that:

5.6.3.1.1 The owner executes and records in the appropriate County Office of the Recorder of Deeds an affidavit, on a form approved by the Department, which notifies prospective purchasers that the property is subject to a Rural Area Waiver (RAW).

5.6.3.1.2 The parcel size is not less than 10 acres.

5.6.3.1.3 The permit is for an on-site wastewater treatment and disposal system designed to serve a single family dwelling.

5.6.3.1.4 The on-site wastewater treatment and disposal system will function in a satisfactory manner so as not to create a public health hazard.

5.6.3.1.5 Each RAW application shall include:

5.6.3.1.5.1 A letter signed and submitted by the property owner or their authorized agent requesting a RAW. This submittal must include all appropriate fees.

5.6.3.1.5.2 A site evaluation report conducted by a Class D.2 or D.3 soil scientist to include the requirements of Section 5.6.3.1.

5.6.3.1.5.3 At the sole discretion of the Department, a design prepared by a licensed Class C designer may be required to show exact location of a proposed system with initial submission of the RAW application.

5.6.3.1.5.4 Proof the parcel is a minimum of 10 acres (survey or statement from zoning office).

5.6.3.1.5.5 Location of any wetlands, refer to Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable.

5.6.3.1.5.6 A proposed disposal location which is a minimum of 100 feet from all property boundaries (when soil conditions allow).

5.6.3.1.5.7 The location of all wells within 150 feet of the property boundaries.

5.6.3.1.5.8 A list of all property owners' names and addresses located contiguous to the site.

5.6.3.1.5.9 The Department shall advertise the RAW application in accordance with 7 **Del.C.** §6004 to include direct notification of adjacent property owners. The Department will not hold a public hearing unless a meritorious request is made.

5.6.3.1.5.10 Prior to submitting the site evaluation, the Class D soil scientist in conjunction with the Department will determine the system type, design specifications and return this information to the owner, or designated agent.

5.6.3.1.6 Upon approval of the RAW, the following criteria will be required:

5.6.3.1.6.1 A completed permit application prepared by a licensed Class C designer, if not previously submitted.

5.6.3.1.6.2 An affidavit of a RAW (as part of the permit application).

5.6.3.1.6.3 Only those items stated in writing in the initial request will be granted in the RAW.

5.6.4 Hardship

5.6.4.1 The Secretary may grant waivers from any provision of these Regulations in cases of extreme and unusual hardship.

5.6.4.2 The Department may consider the following factors in reviewing an application for a waiver based on hardship including, but not limited to:

5.6.4.2.1 Advanced age or bad health of the applicant.

5.6.4.2.2 Need of applicant to care for aged, incapacitated, or disabled relatives.

5.6.4.2.3 Relative insignificance of the environmental impact of granting a waiver.

5.6.4.3 Hardship waivers granted by the Secretary may contain conditions such as:

5.6.4.3.1 Permits for the life of the applicant.

5.6.4.3.2 Limiting the number of permanent residents using the system.

5.6.4.3.3 Use of conventional on-site wastewater treatment and disposal systems for specified periods of time.

5.6.4.3.4 Any other conditions which the Secretary finds in his/her sole discretion to be appropriate.

5.6.4.4 At the time of the application, the applicant must designate on the application that it is for a hardship waiver.

5.6.4.5 Documentation of hardship must be provided before the application is referred to the Department for action.

5.6.4.6 Department personnel shall strive to aid and accommodate the needs of applicants for waivers due to hardship.

5.6.5 Waiver Hearings

5.6.5.1 The hearing officer shall hold a public hearing in conformance with 7 **Del.C.** §6006.

5.6.5.2 The hearing shall be held in the county where the property is located.

5.6.5.3 No waiver may be granted unless the hearing officer, or in the case of an appeal to the Environmental Appeals Board, finds:

5.6.5.3.1 Strict compliance with the provision of these Regulations is inappropriate for cause; or

5.6.5.3.2 Special physical conditions render strict compliance unreasonable, burdensome, or impractical.

6.0 **LARGE SYSTEMS (≥ 2,500 GPD)**

6.1 A permit must be obtained from the Department prior to the construction, operation, maintenance or repair of any on-site wastewater treatment and disposal systems with daily design flow rates of ≥ 2,500 gallons. This Section details the necessary site suitability evaluations to determine siting of all types of large on-site wastewater treatment and disposal systems, including soil characterizations, hydrogeologic investigations, surface water assessment, required design parameters, legal documentation, permit application submittals, installation requirements, operation and maintenance procedures, monitoring requirements and annual reporting. This section is applicable to all types of on-site wastewater treatment and disposal systems.

This section applies to the permitting of large wastewater treatment and disposal system only. The permittee must obtain all necessary collection system permits separately in accordance with the State of Delaware's Department of Natural Resources and Environmental Control's Regulations Governing the Control of Water Pollution and any local or county requirements.

6.2 Site Characterization

The Department will facilitate compliance with these Regulations through a review of the proposed development project. The project should be coordinated with the Department early in the development process to avoid unnecessary conflicts and expense.

6.2.1 Letter of Intent

6.2.1.1 Any persons that propose to construct a large wastewater treatment and disposal system must submit a letter of intent prior to initiating any preliminary reconnaissance soil investigations.

6.2.1.2 The letter of intent must contain, at a minimum, the following details:

6.2.1.2.1 The name of the developer, utility and/or landowner.

6.2.1.2.2 The size, tax map number(s), 12 digit Hydrologic Unit Code (HUC) watershed name, zoning certificate for and location of the parcel(s).

6.2.1.2.3 Number of proposed lots (if applicable), proposed design flow rates and overall scope of project to include level of wastewater treatment and disposal method(s).

6.2.1.2.4 Projected start date of site/soil investigative work.

6.2.1.2.5 Name of the Class D soil scientist, Professional Geologist and Class C designer.

6.2.1.3 A soils and hydrogeological reconnaissance must be undertaken prior to actual fieldwork commencement. The reconnaissance must incorporate a combination of published data and actual field data to establish a general understanding of the site to allow selection of the most favorable areas available to site a large system.

6.2.1.4 Prior to the Soil Investigation Report (SIR) and/or Hydrogeologic Suitability Report (HSR) fieldwork commencement but, after a soils and hydrogeological reconnaissance have been completed, a preliminary meeting with the Class D.3 soil scientist, Class C designer, Delaware-licensed Professional Geologist, and DNREC personnel shall be held to discuss the scope of work for both investigations.

6.2.2 Soil Investigation Report (SIR)

A Soil Investigation Report must be submitted to the Department for review and approval for large on-site wastewater treatment and disposal systems (LOWTDS).

6.2.2.1 General Requirements

Work performed in connection with the SIR requires soil interpretation. These investigations must be completed by, or under the supervision of, a licensed Class D.3 soil scientist. Unless otherwise authorized by the Department, all soils and siting criteria for large systems shall comply with the following requirements:

6.2.2.2 The SIR shall contain, at a minimum, the following:

6.2.2.2.1 Site plan drawn to scale not to exceed one (1) inch equals 200 feet.

6.2.2.2.2 A topographic map with one (1) foot contour intervals unless the Department approves the use of an alternate scale. Topographic maps for spray irrigation sites may utilize two (2) foot contour intervals.

6.2.2.2.3 Location of all wells, well head protection areas, right of ways, watercourses, roads, storm water management features and on-site wastewater treatment and disposal systems within 150 feet of the perimeter of the property.

6.2.2.2.4 The proposed disposal area shall be mapped on a grid pattern of not more than 75 feet between observations. Spray irrigation projects must be mapped on a grid pattern at a minimum of one observation every four (4) acres.

6.2.2.2.5 Observations must be made using a number of auger borings and test pits to a minimum depth of six (6) feet. Some of these observations shall be extended to the ambient water table, when possible or practical, to augment the data collected during the HSR.

6.2.2.2.6 A minimum of one (1) double ring infiltration test per acre, or four (4) total, whichever is larger shall be conducted within the proposed disposal area (PDA). A representative number of double-ring infiltration tests must be approved by the Department for spray irrigation sites. The number of double-ring infiltration tests for a spray irrigation site shall be based upon soil variability. These tests must be performed within the most hydraulically restrictive horizon in the upper six (6) feet. A minimum of three (3) tests must be conducted for each interpretative mapping unit within the PDA.

6.2.2.2.7 Determination of an appropriate design percolation rate based upon infiltration tests, soil characteristics (textures, structure, etc.) and number of mapping units within the PDA. Certain site specific conditions may not warrant the testing and may be omitted from testing at the Departments discretion.

6.2.2.2.8 Depth of the limiting zone based on either a hydraulically restrictive layer or seasonally saturated materials based on redoximorphic features and/or piezometric study. The results of the site and soil analysis must be provided on the appropriate forms approved by the Department (e.g. Approval page).

6.2.2.2.9 Number of proposed lots, dwellings, expected gal/day/unit flow, design flow rate, anticipated disposal method and loading rate.

6.2.2.2.10 A general site location map to identify the area.

6.2.2.2.11 The location of any wetlands, refer to the 2007 Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable.

6.2.2.2.12 Identification of any limitation that could affect system performance and design considerations for the anticipated method of disposal.

6.2.2.3 Soil chemical testing of each mapping unit must be conducted. Samples must be collected from soil depths of 0–12 inches and 12–24 inches. These chemical tests determine the retention capacity of wastewater constituents in the soil. A minimum of three (3) composite samples for each mapping unit must be collected and tested. See Section 6.8.3 for testing parameters.

6.2.2.3.1 Soil chemical testing must be in accordance with Methods of Soil Analysis published by the American Society of Agronomy, Madison, Wisconsin. Other methods, properly documented, may be accepted upon approval by the Department.

6.2.2.4 Concerns regarding the suitability of the soils to assimilate the design flow must be addressed before the SIR may be approved by the Department.

6.2.2.5 The approved SIR is valid for 10 years from the date of the Department's approval unless the site is permitted for construction prior to this date. The approved SIR will then remain valid as long as the site is permitted. If the permit expires and is not renewed, the SIR also expires if SIR is more than 10 years old. If the site is not permitted within a 10 year period, a supplemental soil investigation report, as outlined in Section 6.2.2.5.1, must be submitted to the Department for approval provided no adverse effects have occurred to the site such as, but not limited to, cutting/filling activities, de-forestation or compaction of the proposed disposal area. The new SIR will be reviewed as outlined in Section 6.2.2.1.

6.2.2.5.1 The supplemental soil investigation report shall include;

6.2.2.5.1.1 Site plan drawn to scale not to exceed one (1) inch equals 200 feet.

6.2.2.5.1.2 Location of all wells, well head protection areas, right of ways, watercourses, roads, storm water management features and on-site wastewater treatment and disposal systems within 150 feet of the perimeter of the property.

6.2.2.5.1.3 The proposed disposal area (PDA) shall be mapped on a grid pattern of not more than 300 feet between observations. Spray irrigation projects must be mapped on a grid pattern at a minimum of one observation every 10 acres.

6.2.2.5.1.4 Observations must be made using a number of auger borings and test pits to a minimum depth of six (6) feet. Some of these observations shall be extended to the ambient water table, when possible or practical.

6.2.2.5.1.5 A minimum of one (1) double ring infiltration test shall be conducted within the PDA. A representative number of double-ring infiltration tests must be approved by the Department for spray irrigation sites. The number of double-ring infiltration tests for a spray irrigation site shall be based upon soil variability. These tests must be performed within the most hydraulically restrictive horizon in the upper six (6) feet.

6.2.2.5.1.6 Determination of an appropriate design percolation rate based upon infiltration tests, soil characteristics (textures, structure, etc.) and number of mapping units within the PDA.

6.2.2.5.1.7 Depth of the limiting zone based on either a hydraulically restrictive layer or seasonally saturated materials based on redoximorphic features and/or piezometric study. The results of the site and soil analysis must be provided on the appropriate forms approved by the Department (e.g. Approval page).

6.2.2.5.1.8 Number of proposed lots, dwellings, expected gal/day/unit flow, design flow rate, anticipated disposal method and loading rate.

6.2.2.5.1.9 The location of any wetlands, refer to the 2007 Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable.

6.2.2.5.1.10 Identification of any limitation that could affect system performance and design considerations for the anticipated method of disposal.

6.2.3 Hydrogeologic Suitability Report (HSR)

A Hydrogeologic Suitability Report must be submitted to the Department for review and approval for large on-site wastewater treatment and disposal systems (LOWTDS).

6.2.3.1 General requirements

Work performed in connection with the HSR shall be completed by, or under the supervision of, a Delaware-licensed professional geologist (PG). Reports and related documents must bear the seal and signature of the PG overseeing the project.

6.2.3.2 Site specific HSR requirements

General site and project details shall include, but not be limited to the following:

6.2.3.2.1 Proposed wastewater system details:

6.2.3.2.1.1 System type.

6.2.3.2.1.2 System dimensions.

6.2.3.2.1.3 Design flow.

6.2.3.2.1.4 Dosing schedule or loading rates.

6.2.3.2.1.5 Type of wastewater.

6.2.3.2.1.6 Level and type of treatment.

6.2.3.2.2 Regional (1:24,000 scale) topographic map showing the project site location.

6.2.3.2.3 Detailed (1:2,400 scale or larger) map(s) showing:

6.2.3.2.3.1 Property boundaries.

6.2.3.2.3.2 Roadways and easements.

6.2.3.2.3.3 Tax map parcel number(s).

6.2.3.2.3.4 Hypsography at one (1) foot contour intervals (must include existing and proposed elevations in proposed disposal area) unless the Department approves the use of an alternate scale. Hypsography for spray irrigation sites may utilize two (2) foot contour intervals.

6.2.3.2.3.5 Surface-water features.

6.2.3.2.3.6 Current land use.

6.2.3.2.3.7 Existing buildings.

6.2.3.2.3.8 On-site wells, both existing and proposed (including monitor/observation wells).

6.2.3.2.3.9 Test boring locations.

6.2.3.2.3.10 Area(s) evaluated for wastewater disposal.

6.2.3.2.3.11 Proposed disposal area layout, including spare area.

6.2.3.2.3.12 Scale and north arrow.

6.2.3.3 On and Off-Site Wells and Surface Water Bodies

6.2.3.3.1 All wells and surface-water bodies located within a 1,000 foot radius of the boundaries of the proposed wastewater disposal area must be identified and shown on an appropriately scaled map. The following well data must be tabulated: permit number, coordinates (in Delaware State Plane, meters, North American Datum of 1983 (NAD83)), water use (e.g. domestic, public, irrigation), total depth, screened interval, diameter, owner's name, owner's address, tax map parcel number. Procedures used to obtain this information shall be documented. All well completion reports and formation logs must be included.

6.2.3.3.2 The potential for impact to wells and surface water bodies shall be considered and addressed. If the Department determines it is necessary,

proposed methods to minimize the potential for impact to a well or surface water body must be submitted. In some instances, the Department may also require modeling to demonstrate that a well or surface water body will not be adversely impacted by a proposed discharge.

6.2.3.3.3 The well survey will remain valid from date of HSR submittal through a five (5) year period unless a construction permit has been issued by the Department. If construction has not been initiated prior to the expiration of the construction permit, a new well survey must be submitted for a permit extension or renewal.

6.2.3.4 Hydrogeologic Framework

6.2.3.4.1 Hydrostratigraphy

6.2.3.4.1.1 Geologic units containing the water-table aquifer and the first regional confining unit shall be identified and described in terms of formation name, lithology, approximate thickness, depositional environment, and stratigraphic relationships with other units. The saturated thickness of the water table aquifer shall be approximated based on available information. In some instances, the Department may require saturated thickness to be documented based on field data.

6.2.3.4.2 Test Borings

6.2.3.4.2.1 Test borings shall be drilled and logged to characterize the near-surface geology in the immediate vicinity of the proposed wastewater disposal area. Test boring requirements vary based on system type and capacity as follow:

6.2.3.4.2.1.1 All systems, including drip irrigation but excluding rapid infiltration basins (RIBs) and spray irrigation systems with proposed discharges ≥ 2,500 gpd and ≤ 20,000 gpd must have a minimum of three (3) 20-foot deep continuously sampled test borings.

6.2.3.4.2.1.2 All systems, excluding RIBs and spray irrigation systems with proposed discharges > 20,000 gpd must have a minimum of three (3) 40-foot deep continuously sampled test borings.

6.2.3.4.2.1.3 All RIB systems with proposed discharges ≥ 2,500 gpd must have a minimum of three (3) 40-foot deep continuously sampled test borings per proposed acre of disposal area.

6.2.3.4.2.1.4 All RIB systems with proposed discharges > 100,000 gpd must have at least one (1) 100-foot deep boring continuously sampled to 40 feet below land surface then every 5 feet thereafter. Boring may be terminated at a shallower depth if a confining bed is encountered < 100 feet below land surface.

6.2.3.4.2.1.5 All spray irrigation systems must have at least three (3) 20-foot deep continuously sampled test borings with an additional one (1) 20-foot boring per 10 acres of proposed disposal area.

6.2.3.4.2.2 Depending on site or project characteristics, greater test-boring depth or additional test borings may be required. If a restrictive lithology is identified it shall be assumed continuous unless demonstrated otherwise.

6.2.3.4.2.3 Subsurface data obtained from borings shall be collected using drilling techniques that preserve sample integrity (e.g. hollow-stem auger with split-spoon, direct-push, coring devices). Samples shall be described using a

generally accepted classification system (e.g. Unified Soil Classification System, USDA soil classification system). Test boring coordinates must be determined using a global positioning system (GPS) or standard survey methods and shall be reported in Delaware State Plane, meters, North American Datum of 1983 (NAD83). Test-boring logs shall include: sample descriptions, project name, test-boring identification, coordinates of test boring, general weather conditions, drilling method, name of drilling contractor, name of licensed driller in charge, and name of person logging samples and their association. If a well is completed in the borehole, a well completion report must be submitted to the Department containing "as-built" construction, borehole dimensions, well development methodology, and water levels (after completion and static).

6.2.3.4.3 Groundwater Flow

6.2.3.4.3.1 At a minimum, three (3) observation wells (OWs) shall be constructed to document flow direction and hydraulic gradient across the proposed disposal area. The Department may require additional wells depending on site or project characteristics. Wells may be completed during the test-boring investigation (see Section 6.2.3.4.2). The wells may also be used as groundwater monitoring wells provided they are constructed and classified according to Delaware Regulations Governing the Construction and Use of Wells and are located in positions suitable to provide representative samples. Well coordinates must be determined using a GPS or standard survey methods and shall be reported in Delaware State Plane, meters, North American Datum of 1983 (NAD83).

6.2.3.4.3.2 A top-of-casing (TOC) reference mark shall be established for each well and surveyed into the North American Vertical Datum of 1988 (NAVD 88). The land surface elevation adjacent to each well shall also be surveyed. All water-level measurements shall be taken to the nearest 0.01 foot from the surveyed reference mark on the well's TOC and reported in (i) feet below TOC, (ii) feet below ground surface, and (iii) feet above mean sea level (msl). Water-table contour maps shall be submitted to the Department based on water-level measurements representative of high, low, and average water-table conditions.

6.2.3.4.4 Wet-Season Water-Level Monitoring

6.2.3.4.4.1 Wet-season water-level monitoring shall be conducted at least weekly from January 1st through April 30th (see Section 6.2.3.4.3.2 for the collection and reporting of water level data). Wells installed for the purpose of establishing groundwater-flow direction may be used for wet season monitoring. Pressure transducers may be deployed to collect continuous water-level data.

6.2.3.4.4.2 On-site wet-season water-level data shall be correlated to the nearest unconfined well(s) with a long-term record (≥ 20 years).

6.2.3.4.4.3 The hydrograph shall include; the minimum, 10th, 25th, 50th (e.g., median), 75th and 90th percentiles and maximum water level for the long-term well(s) in conjunction with the on-site water-level data.

6.2.3.4.4.4 The peak on-site wet-season water level shall be corrected to the 10th percentile of the long-term record. Water levels ≤ 10th percentile shall not

be corrected.

6.2.3.4.5 Aquifer Properties

6.2.3.4.5.1 Aquifer properties (e.g. saturated hydraulic conductivity, transmissivity) shall be derived from on-site in-situ testing (e.g. slug test, pumping test). Wells installed to establish groundwater-flow direction may be used for aquifer testing, provided they are suitably constructed and necessary documentation is available. Standard methods shall be used to implement the testing and analyze the data. Testing methods shall be clearly documented, and all data shall be submitted digitally to the Department.

6.2.3.5 Ambient Groundwater Quality

6.2.3.5.1 Ambient groundwater quality shall be established by conducting a minimum of three (3) independent sampling events. Each sampling event shall be at least 30 days apart and include a minimum of three (3) wells. Wells installed for the HSR may be used for long-term groundwater compliance monitoring provided they are constructed and classified according to the Delaware Regulations Governing the Construction and Use of Wells and are located in positions suitable to provide representative samples.

6.2.3.5.2 Specific conductance, pH, temperature, dissolved oxygen, and oxidation reduction potential shall be measured using a calibrated field meter during well purging, which should be performed using either a submersible or peristaltic pump. Once the field parameters have stabilized, a groundwater sample shall be obtained and analyzed by a certified laboratory. Sampling requirements are as follows. Additional parameters may be required depending on the proposed wastewater characteristics.

Parameter	Unit Measurement	Sample Type
pH	S.U.	Field Test
Temperature	°F	Field Test
Specific Conductance	µS/cm	Field Test
Dissolved Oxygen Or Oxidation Reduction Potential	mg/L or mv	Field Test
Depth to Water Table	Hundredth of a foot	Field Test
Ammonia Nitrogen	mg/L	Grab
Arsenic	mg/L	Grab
Cadmium	mg/L	Grab
Chloride	mg/L	Grab
Chromium	mg/L	Grab
Copper	mg/L	Grab
Fecal Coliform	Col/100 ml	Grab
Hardness	mg/L	Grab
Iron	mg/L	Grab
Lead	mg/L	Grab
Manganese	mg/L	Grab
Mercury	mg/L	Grab
Nickel	mg/L	Grab
Nitrate as Nitrogen	mg/L	Grab
Nitrite as Nitrogen	mg/L	Grab
Organic Nitrogen	mg/L	Grab
Selenium	mg/L	Grab
Sodium	mg/L	Grab
Sulfate	mg/L	Grab
Total Dissolved Solids	mg/L	Grab
Total Nitrogen	mg/L	Grab
Total Coliforms	Col/100 ml	Grab
Total Phosphorus	mg/L	Grab
Total Suspended Solids	mg/L	Grab
Zinc	mg/L	Grab

6.2.3.5.3 Exceptions to these requirements may be considered by the Department. All data, including sampling logs, must be submitted in the HSR and Surface Water Assessment Report (SWAR) (see Section 6.2.4).

6.2.3.6 Groundwater Mounding Analysis

6.2.3.6.1 A groundwater mounding analysis must be performed to demonstrate that the required vertical isolation distance between the mounded water table and the disposal surface can be maintained (see Exhibit W).

6.2.3.6.2 The groundwater modeling requirements vary based on system type and capacity as follow:

6.2.3.6.2.1 All systems, excluding rapid infiltration basins (RIBs), with proposed discharges ≥ 2,500 gpd and ≤ 100,000 gpd must, at a minimum, use an analytical model.

6.2.3.6.2.2 All systems with proposed discharges > 100,000 gpd must use a numerical model.

6.2.3.6.2.3 All RIB systems must use a numerical model.

6.2.3.6.3 Selection of an analytical (e.g. Hantush equation) or numerical model (e.g. ModFlow) is at the discretion of the PG. Modeling protocol for the simulation of groundwater mounding must, at a minimum, include the following components (Anderson and Woessner, 1992):

6.2.3.6.3.1 Conceptual Model: A conceptual model must be developed based on the hydrogeologic framework and a preliminary design of the disposal system. Hydrologic boundaries of the groundwater-flow system must be defined in the conceptual model.

6.2.3.6.3.2 Model Documentation: The model selected for groundwater mounding analyses must be clearly referenced. Assumptions inherent in the selected model must be stated.

6.2.3.6.3.3 Model Design: Implementation of hydrologic properties and boundaries in the mathematical model must be documented to a degree that permits duplication of the modeling effort.

6.2.3.6.3.4 Calibration: Where applicable, methods used to calibrate the model must be stated, and calibration statistics must be furnished to the Department. Specifically, the root-mean-squared error (RMSE) and the normalized RMSE between modeled and observed hydraulic head must be presented.

6.2.3.6.3.5 Prediction: The model predicted groundwater mound(s) must be presented. Figures and/or tabulated data should be used in conjunction with written text to summarize the results.

6.2.3.6.4 The groundwater-mound elevation derived from the calibrated groundwater model shall be corrected with respect to the long-term wet-season water-table elevation determined in Section 6.2.3.4.4.4.

6.2.3.6.5 All RIB systems with a design flow ≥ 100,000 gpd must have a basin test performed to evaluate infiltration rates, the potential for perching and/or groundwater mounding.

6.2.3.6.5.1 The test basin(s) infiltration area must be a minimum of 10 foot diameter circle or a 10 foot by 10 foot square with the basin bottom completed at the same elevation as the proposed full-scale system.

6.2.3.6.5.2 The location of the basin(s) within the proposed disposal area shall be determined by the most hydraulically restrictive zone observed in the on-site borings (e.g., clay, silty clay, clayey silt).

6.2.3.6.5.3 A work plan must be submitted to the Department for approval prior to commencing the basin test. The work plan shall outline the proposed number of basins, size, location, construction methods, monitoring plan, dosing schedule and test duration.

6.2.3.7 Supplemental HSR Considerations

6.2.3.7.1 Due to unforeseen site complexity, wells and surface water bodies or system design the Department may require additional work beyond the HSR

requirements previously outlined.

6.2.4 Surface Water Assessment Report (SWAR)

A Surface Water Assessment Report (SWAR) must be submitted to demonstrate that nutrient performance standards for wastewater are being met at the post treatment location of a large on-site system or through natural attenuation processes prior to reaching the closest receiving surface water body in order to comply with surface water quality standards. Work performed in connection with the SWAR requires geologic interpretation. These assessments must be completed by, or under the supervision of, a Delaware-licensed professional geologist (PG). The SWAR and related documents must bear the seal and signature of the PG overseeing the project. The SWAR must be submitted to the Department for review and approval. The SWAR must contain the following:

6.2.4.1 Identification of the watershed(s) in which the system is to be located.

6.2.4.2 Ambient groundwater quality determination to include:

6.2.4.2.1 Total phosphorus concentrations.

6.2.4.2.2 Total nitrogen concentrations.

6.2.4.2.3 Oxidation-reduction potential or dissolved oxygen measurement.

6.2.4.3 Background soil testing for total phosphorus to include either:

6.2.4.3.1 Fertility Index Value (FIV); or

6.2.4.3.2 Mehlich 3 value.

6.2.4.4 Phosphorus fate and transport evaluation is required when both conditions below are met:

6.2.4.4.1 A FIV > 100 or soil test value > 100 ppm by Mehlich 3 test.

6.2.4.4.2 Groundwater total phosphorus concentrations are > 0.034 mg/L and indicate reducing conditions due to a low dissolved oxygen concentration, < 1 mg/L, or an oxidation-reduction potential < 200 mV.

6.2.4.5 One (1) of the following approaches:

6.2.4.5.1 Demonstration that the wastewater treatment facility will achieve applicable performance standards (as defined in the definitions and identified in Exhibit MM) at the post treatment location for nitrogen and, if required, phosphorus as determined in 6.2.4.4 or

6.2.4.5.2 Perform a comprehensive analysis to determine surface water impact. A meeting with Department personnel and the PG will be held to discuss work plan development. The comprehensive analysis will include determination of the fate and transport of nitrogen and phosphorus at design and peak flows by means of a groundwater contaminant flow and transport model. Calculation of the groundwater nutrient loading to the nearest surface water body including the resulting modeled groundwater and stream nutrient concentrations. It must be demonstrated that the proposed system will not further impair water quality with respect to dissolved oxygen, enterococcus bacteria, total nitrogen and total phosphorus.

6.3 Design Parameters

6.3.1 Standard requirements

6.3.1.1 A large on-site wastewater treatment and disposal system is required when:

6.3.1.1.1 The proposed number of lots is ≥ 100 or

6.3.1.1.2 The overall density of the subdivision or planned unit development is more than one (1) dwelling unit per one half (½) acre.

6.3.1.2 Upon receiving a permit application, the Department may require a meeting with the Class D.3 soil scientist, Professional Geologist, and Class C designer to discuss the project.

6.3.1.3 Permit applications must demonstrate the system is designed in accordance with the prescribed system type and design considerations as specified in the approved SIR, HSR and SWAR for that parcel.

6.3.1.4 Disposal Area Determination

6.3.1.4.1 For dwellings consisting of up to four (4) bedrooms, the design peak daily flow rate to be utilized for the sizing of the disposal area(s) is **300** gallons per day (gpd) for each equivalent dwelling unit (EDU). Dwellings with higher numbers of bedrooms must seek Departmental approval.

6.3.1.5 Treatment Facility Sizing

6.3.1.5.1 The design average daily flow rate for sizing of the wastewater treatment plant is **220** gpd/EDU regardless of dwelling construction, treatment method or similar type projects.

6.3.1.5.2 A system may be designed in phases (see Section 6.5.11).

6.3.1.6 Large systems shall be designed with influent and effluent wastewater flow metering to evaluate treatment facility performance. Flow data must be recorded, totalized and reported to the Department by the licensed operator.

6.3.1.6.1 Where actual calibrated metered flow data indicating peak and average daily flows over the most three year period are available for a similar facility, such flow data may be substituted for the wastewater flows listed in this Section subject to the approval of the Department. When ranked in descending order, the adjusted design peak daily flow shall be determined by taking the numerical average of the daily readings within the upper 10% of the daily readings.

6.3.1.7 All new large wastewater treatment facilities shall adhere to Exhibit MM for performance standard criteria.

6.3.1.8 Any large system permitted prior to the promulgation of this regulation that does not meet the groundwater monitoring requirements in accordance with Section 6.8.1, the owner/operator will have up to 12 months from date of promulgation to bring system into compliance with the groundwater monitoring requirements.

6.3.1.9 All wastewater containing domestic wastes must undergo disinfection prior to being discharged to the disposal system with the exception of subsurface disposal methods. All disinfection must reduce fecal coliforms to ≤ 200 col/100 mL. Wastewater containing domestic wastes intended for spray irrigation onto unlimited public access sites must be disinfected prior to being discharged to the irrigation system to reduce fecal coliforms to ≤ 20 col/100mL (see Exhibit LL).

6.3.1.10 Solids, sludges, filter backwash or other pollutants removed in the course of treatment or control of wastewater shall be disposed of in a manner such as to prevent any pollutant from entering the surface water or groundwater and to comply with applicable federal or state laws and regulations.

6.3.1.11 Large system subsurface absorption facilities shall be designed with pressure distribution.

6.3.1.12 All mechanical tanks, chambers, vaults and pits proposed for a large system must be evaluated to determine if remote sensors/alarms are necessary to identify high water levels in order to avoid overflows. Sensors shall be connected to a notification mechanism that will notify the licensed wastewater operator if a high

water level is reached. All lift stations and pumping chambers shall be equipped with remote sensors and notification mechanisms.

6.2.1.13 An alternative power source, which is sufficient to operate the wastewater treatment and disposal facilities, shall be available. If such alternative power source is not available, the permittee shall halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater facilities.

6.3.1.14 Construction Permit

5.3.1.14.1 A construction permit application, plans and specifications and design engineer report with applicable fees must be submitted to the Department if the construction permit has expired or changes have occurred.

6.3.1.15 Operation Permit

6.3.1.15.1 Once an operation permit has been issued and the wastewater flow reaches 80% of the permitted treatment capacity for the constructed phase based on a period of seven (7) consecutive days, the permittee must submit written notification to the Department. The written notification must include a work plan for construction of the next permitted phase. The permittee must submit a construction permit application, plans and specifications and Design Engineer Report with applicable fees if the next phase has not yet been permitted or if there are changes to the previously permitted design.

6.3.1.15.2 Any flow above the permitted flow for a phase shall not be allowed to be discharged to the system until construction is completed on the following phase and an operating permit has been issued or amended by the Department for the next phase.

6.3.1.15.3 Effluent nitrogen and phosphorus concentration limits established by an applicable performance standard or approved SWAR will be based on the actual, metered influent flow to the large on-site wastewater treatment and disposal system. Once a system reaches a monthly average flow during any calendar month that exceeds the 20,000 gpd flow threshold the effluent nitrogen and phosphorus concentration limits will be reduced to comply with the established levels of the performance standards or approved SWAR, as applicable.

6.3.1.16 A 100% spare area must be maintained or set aside for full system replacement for all systems except spray irrigation in the event the initial system is taken off-line or a catastrophic failure occurs. The spare area should not be in the immediate vicinity of the initial system when the groundwater mounding analysis indicates groundwater mounding comes to within three (3) feet of the point of compliance of any system except spray irrigation. Upgrading the initial system(s) will not suffice as replacement area.

6.3.1.17 Vertical separation distances are measured between the point of compliance for each system type and the projected mounded groundwater elevation (see Exhibit W).

6.3.1.18 Sand-lining > 12 inches, except LPP's, will be allowed on a case by case basis if slowly permeable substratum is present in the proposed disposal area, however one (1) foot of unsaturated native soil must be maintained above the projected mounded groundwater elevation.

6.3.1.19 Engineered sandy fill must be used for replacing excavated native materials.

6.3.1.20 Minimum search distances for locating wells and watercourses for all large systems is 1,000 feet.

6.3.1.21 Minimum separation/buffer distances must be adhered to when siting all large system components (see Exhibit C).

6.3.1.22 A licensed Class E.4 system contractor must oversee the installation of all large systems.

6.3.2 System specific design parameters

6.3.2.1 Subsurface disposal

6.3.2.1.1 The absorption facilities shall be divided into relatively equal areas.

6.3.2.1.2 The length to width ratio for seepage beds and elevated sand mounds shall be 4:1 or greater.

6.3.2.1.3 Each unit shall receive no more than 1,300 gallons per day if seepage beds are utilized and no more than 2,600 gallons per day if seepage trenches are utilized.

6.3.2.1.4 Effluent distribution shall alternate between all disposal area units.

6.3.2.1.5 Each absorption facility shall be at least 10 feet apart.

6.3.2.1.6 The replacement (spare) disposal area must be divided in relatively equal units.

6.3.2.1.7 Refer to Section 5.0 for additional design considerations and construction requirements.

6.3.2.2 Rapid Infiltration Basins (RIB)

6.3.2.2.1 Design considerations

6.3.2.2.1.1 There must be a minimum of four (4) basins constructed. See Section 6.3.1.16 for spare area requirements.

6.3.2.2.1.2 RIBs shall have a 72-hour resting period between doses unless otherwise approved by the Department. Hydraulic loading and resting cycles shall be developed so as to restore operating infiltration rates of the RIB system to design levels by the end of the resting period.

6.3.2.2.1.3 RIBs are recommended to be configured in such a way as to reduce the effects of groundwater mounding. Basins should be configured in a strip configuration perpendicular to the direction of groundwater flow.

6.3.2.2.1.4 All berms must be at least two (2) feet tall, eight (8) feet wide (if providing access to that basin), and have a 3:1 slope ratio enabling light vehicular traffic for maintenance (e.g. mowing). Berms shall be compacted to prevent seepage and should be graded so drainage runoff flows away from the RIB area.

6.3.2.2.1.5 No filling or adding to original grade is allowed; therefore, the basin bottom must be leveled to the lowest elevation identified in the basin. Leveling of the basin bottom may need to be performed but not to exceed six (6) inches of additional engineered sandy fill.

6.3.2.2.1.6 The RIBs must be enclosed by fencing with a minimum height of 42-inches to prevent access to the area by foot or vehicular traffic. Fencing design must be approved by the Department. The entrance to the RIBs must be locked and signs must be posted every 200 feet warning the public that the enclosed area is utilized for the disposal of treated wastewater.

6.3.2.2.1.7 A silt fence must be installed around the perimeter of the basin between the berm and the basin bottom to prevent eroded sediments from

moving into the basin during construction. The silt fence line must be shown in the construction permit application.

6.3.2.2.1.8 The permit application must identify the advantages of bare soil, vegetation or other media, as approved by the Department, on the basin bottom and which method is to be utilized. Additionally, a justification of why the particular method selected was chosen must be included.

6.3.2.2.1.9 If vegetation is grown in the basin, it must be limited to perennial grasses or as approved by the Department. Plants which develop woody root systems are prohibited.

6.3.2.2.1.10 A maintenance schedule for the removal of cuttings from the basin must be submitted to and approved by the Department, if applicable.

6.3.2.2.1.11 All berms must be seeded with perennial grasses or other suitable vegetation as determined appropriate by the Department to stabilize slopes and prevent erosion.

6.3.2.2.1.12 Berms must be maintained to prevent the establishment of plants with woody root systems.

6.3.2.2.1.13 Provisions shall be made in the design to ensure uniform distribution of wastewater across the entire bottom area of the basin by incorporating multiple discharge locations.

6.3.2.2.1.14 RIBs must be equipped to divert incoming wastewater to other basins or be completely shut off.

6.3.2.2.1.15 All wastewater containing domestic wastes must undergo disinfection prior to being discharged to a RIB.

6.3.2.2.2 Operation and Maintenance

6.3.2.2.2.1 The basin surface must be maintained as necessary to remove any impedance to infiltration. Any maintenance activity, scheduled or emergency must be performed when the basin is dry.

6.3.2.2.2.2 All basin maintenance activities must be documented in the log book and be available upon request for review.

6.3.2.2.2.3 If basins are vegetated, the grass must be cut regularly; cuttings collected and removed in accordance with approved schedule (see Section 6.3.2.2.1.10).

6.3.2.2.2.4 Berms must be properly maintained and periodically inspected for areas of settling, erosion, burrowing animal disturbance, etc.

6.3.2.2.2.5 Periodic infiltration testing may be required by the Department.

6.3.2.3 Spray irrigation

Wastewater spray irrigation systems may be utilized on agricultural land, forest lands and other designated areas.

6.3.2.3.1 Treatment standards

The applicant must develop and submit for the Department's review and approval, an operating protocol designed to ensure the high-level disinfection criteria is met before the wastewater is released to the storage system or to the wastewater reuse system.

6.3.2.3.1.1 Domestic Wastewater

6.3.2.3.1.1.1 All wastewaters containing domestic wastes shall receive, at a minimum, but not limited to biological treatment and disinfection prior to irrigation. This level of treatment is required to protect the health of

persons who may come in contact with the irrigated wastewater and to reduce the potential for odors in storage ponds and during irrigation.

6.3.2.3.1.2 Industrial Wastewater

6.3.2.3.1.2.1 The Department will evaluate all industrial wastewaters to determine the required level of treatment. All industrial system permit applications must contain copies of work place chemical lists. Treatment requirements will be based on factors including, but not limited to, wastewater constituency, odors, nuisance conditions and adverse impacts to groundwater or soil, such as clogging and runoff.

6.3.2.3.2 Wastewater Effluent Standards

6.3.2.3.2.1 Wastewater effluent standards for domestic and municipal wastewater for BOD_5, TSS, and disinfection are based on site access control. In cases where public access cannot be restricted, such as landscaped areas, golf courses, parks, and roadway medians, levels of wastewater pretreatment need to be increased in order to assure comparable public health safeguards exist (see Exhibit LL).

6.3.2.3.2.2 The point of compliance for monitoring effluent standards is after treatment and prior to storage unless otherwise specified in the permit or for effluent distribution in accordance with Section 6.11.

6.3.2.3.2.3 Wastewater reclamation standards for domestic and municipal wastewater for BOD_5, TSS and disinfection are based on site access control.

6.3.2.3.2.4 Automatic diversion of wastewater that fails to meet the operating criteria must be included in the system design.

6.3.2.3.3 Public Access

6.3.2.3.3.1 Limited public access sites are sites where access by the public is controlled and only available to authorized personnel, including operations staff, laboratory staff and farm personnel.

6.3.2.3.3.1.1 Suitable barriers, access road gates, or “No Trespassing” signs must be provided at all limited access site entry points.

6.3.2.3.3.1.2 The treated wastewater utilized for limited public access sites must meet the following daily permissible average concentrations:

6.3.2.3.3.1.2.1 The 5-day Biochemical Oxygen Demand (BOD_5) of the treated wastewater must not exceed 50 mg/L.

6.3.2.3.3.1.2.2 Disinfection of wastewaters containing domestic waste is required to yield a discharge not to exceed 200 col/100 mL Fecal Coliform.

6.3.2.3.3.1.2.3 The treated wastewater must not contain more than 50 mg/L of Total Suspended Solids for mechanical systems and 90 mg/L of Total Suspended Solids for ponds.

Parameter	**Daily Permissible Average Concentration**
BOD_5	50 mg/L
Fecal Coliform	200 colonies/100 mL
Total Suspended Solids	90 mg/L for ponds, 50 mg/L for mechanical

6.3.2.3.3.2 Unlimited public access

Unlimited public access sites are those landscaped areas such as golf courses, residential lawns, cemeteries, parks, and highway medians which may not have adequate buffer zones and are accessible to the public at all times.

6.3.2.3.3.2.1 Direct irrigation onto people and pets is to be avoided.

6.3.2.3.3.2.2 All wastewater used for irrigation on unlimited access sites must be biologically treated, filtered and disinfected. Any advanced treatment technology achieving the same treatment levels will be considered by the Department.

6.3.2.3.3.2.3 Disinfection

6.3.2.3.3.2.3.1 If chlorine is utilized for disinfection, a total chlorine residual ranging between 0.5 and 4 mg/L must be maintained at the compliance monitoring point prior to irrigation. If ultraviolet disinfection is utilized, ultraviolet disinfection must be performed following storage with an ultraviolet dose of 100 mJ/cm^2 or greater.

6.3.2.3.3.2.3.2 If chemical disinfection is utilized, continuous on-line monitoring of residual disinfection concentrations must be provided at the compliance monitoring point.

6.3.2.3.3.2.3.3 If ultraviolet disinfection is utilized, routine sampling for the effectiveness of disinfection must be performed at the compliance monitoring point.

6.3.2.3.3.2.4 The treated wastewater utilized for unlimited public access sites must meet the following daily permissible average concentrations:

6.3.2.3.3.2.4.1 The 5-day Biochemical Oxygen Demand (BOD_5) of the treated wastewater must not exceed 10 mg/L.

6.3.2.3.3.2.4.2 Disinfection of wastewaters containing domestic waste is required to yield a discharge not to exceed 20 col/100 mL Fecal Coliform.

6.3.2.3.3.2.4.3 The treated wastewater must not contain more than 10 mg/L Total Suspended Solids.

6.3.2.3.3.2.4.4 The turbidity of the treated wastewater must not exceed five (5) NTU.

Parameter	**Daily Permissible Average Concentration**
BOD_5	10 mg/L
Fecal Coliform	20 colonies/100 mL
Total Suspended Solids	10 mg/L
Turbidity	5 NTU

6.3.2.3.3.2.5 Treatment facilities for wastewater to be used on unlimited access sites shall include continuous on-line monitoring for turbidity at the compliance monitoring point.

6.3.2.3.4 Nitrogen

6.3.2.3.4.1 The Design Engineer Report must indicate the expected range of

nitrogen in the treated wastewater.

6.3.2.3.4.2 Spray irrigation systems must be designed to ensure the performance standards are adhered to as outlined in Exhibit MM.

6.3.2.3.4.3 Nitrogen Balance

6.3.2.3.4.3.1 Percolate total nitrogen concentration must be estimated in a monthly nitrogen balance spreadsheet. The nitrogen balance must take into consideration the following: the average design wastewater loading, nitrogen concentration in effluent, average annual precipitation and fixation, application of all fertilizers, proposed cover crop and cover crop management scheme (see Exhibit GG).

6.3.2.3.4.3.2 In the nitrogen balance calculations, all nitrogen not lost to denitrification, ammonia volatilization, evapotranspiration or plant uptake must be assumed to leach into the groundwater as nitrate nitrogen.

6.3.2.3.4.3.3 For row and forage crop systems, assumed losses to denitrification should not exceed 15% of the total nitrogen applied.

6.3.2.3.4.3.4 In forest systems, assumed denitrification losses should not exceed 25%.

6.3.2.3.4.3.5 Assumed losses to ammonia volatilization should not exceed 5% of the total ammonia nitrogen applied.

6.3.2.3.4.3.6 Soil storage of nitrogen should be assumed to be zero.

6.3.2.3.4.3.7 The source of the monthly plant nitrogen uptake rate(s) used for design must be referenced in the Design Engineer Report.

6.3.2.3.5 Ponds

6.3.2.3.5.1 Treatment ponds may be aerated, facultative or a combined aerated-facultative system.

6.3.2.3.5.2 Sizing of completely and partially mixed aerated ponds must be based on first-order removal rate kinetic equations and the expected annual temperature variation.

6.3.2.3.5.3 Facultative pond cells must have an appropriate length to width ratio consistent with current engineering standards to minimize short circuiting.

6.3.2.3.5.4 Facultative pond cells must have a depth between three (3) and five (5) feet.

6.3.2.3.5.5 All systems must have provisions for storage or an alternative permitted disposal method(s).

6.3.2.3.5.6 Ponds used for treatment and/or storage must have impermeable synthetic liners having a hydraulic conductivity equal to or less than 1×10^{7} cm/sec.

6.3.2.3.5.7 At least three (3) feet of freeboard, measured from the lowest point of the berm, is required for all ponds. The lowest point of the berm must be determined and marked.

6.3.2.3.5.8 The base of any pond, at its lowest point, must be at least two (2) feet above the seasonal high water table.

6.3.2.3.6 Cover Crop Selection and Management

6.3.2.3.6.1 Crops irrigated with treated domestic wastewater must not be intended, utilized, sold or distributed for direct human consumption.

6.3.2.3.6.2 Spray field cover crops require management and periodic

harvesting to maintain optimum growth conditions.

6.3.2.3.6.3 Forage crops must be harvested and removed from the irrigation field(s) at least twice a year. Crops harvested must be removed from the irrigation site within six (6) months of harvest.

6.3.2.3.6.4 Sufficient spray field area or storage capacity must be provided in the design to allow for harvesting and the regeneration cycle.

6.3.2.3.6.5 Spray irrigation fields must be assessed every five (5) years to determine if soils renovation or maintenance is necessary. Assessments must address crop consistency, soil monitoring results, infiltration, and compaction.

6.3.2.3.6.6 Disturbed areas in forest systems must be initially replanted or covered with thick mulch for succession to forest vegetation.

6.3.2.3.6.7 Pine forest systems should be harvested at 20 to 25 year intervals.

6.3.2.3.6.8 Hardwood forest systems should be harvested at 40 to 60 years.

6.3.2.3.6.8.1 Due to soil exposure and compaction as a result of any forest harvesting activities, wastewater loadings must be reduced following harvesting until the hydraulic capacity of the site is restored.

6.3.2.3.6.9 Forage crops irrigated with treated domestic wastewater must be harvested before feeding to livestock.

6.3.2.3.6.10 The grazing of animals on a site actively irrigated with treated domestic wastewater is prohibited.

6.3.2.3.6.11 If domestic treated wastewater applications are terminated, the facility must adhere to the following precautions:

6.3.2.3.6.11.1 Grazing by animals (other than lactating dairy cows) whose products are consumed by humans is prohibited for one (1) month.

6.3.2.3.6.11.2 Grazing by lactating dairy cows is prohibited for one (1) year.

6.3.2.3.6.11.3 Growing vegetables and root crops, which are eaten raw, is prohibited for 18 months.

6.3.2.3.6.11.4 Hay must not be cut for four (4) days after applications.

6.3.2.3.6.11.5 If the wastewater contains more than 25% industrial waste (excluding food processing industries) the forage must be monitored for potential toxicity problems to animals or possible food-chain effects.

6.3.2.3.6.12 Unmanaged, volunteer vegetation is not an acceptable spray field cover.

6.3.2.3.7 Soils

6.3.2.3.7.1 Soils with a permeability < .02 inches/hour are prohibited from irrigation of treated wastewater.

6.3.2.3.7.2 Soils with a depth to water < 24 inches are prohibited from irrigation of treated wastewater.

6.3.2.3.7.3 Equipment limitations and erosion potential dictate maximum slopes for wastewater spray fields to be limited to 7% for row crops, 15% for forage crops and 30% for forests.

6.3.2.3.7.4 Design considerations must be taken for depressions to preclude ponding.

6.3.2.3.8 Land limiting constituents

6.3.2.3.8.1 Annual loading rates and site life limitations must be determined for phosphorus and heavy metals present in the wastewater (see Exhibit HH).

6.3.2.3.8.2 Phosphorus

6.3.2.3.8.2.1 Phosphorus may become the land limiting constituent (LLC) of the irrigation site over time. Conditions which indicate that phosphorus has become the LLC include:

6.3.2.3.8.2.1.1 A rise in phosphorus concentrations as indicated by groundwater monitoring well test results over three consecutive sampling periods; or

6.3.2.3.8.2.1.2 Phosphorus adsorption test results indicate that the phosphorus adsorption capacity of the upper 24 inches of the soil column has decreased to a level at which the adsorption capacity is no longer sufficient to assimilate excess phosphorus not taken up by the vegetation.

6.3.2.3.8.2.1.3 Once phosphorus has become the LLC the phosphorus application rate must be reduced to crop phosphorus uptake levels. Under such conditions, high phosphorus utilization vegetation may be grown to increase the phosphorus assimilative capacity.

6.3.2.3.8.3 Heavy Metals

6.3.2.3.8.3.1 The site assimilative capacity for heavy metals (Cadmium, Copper, Lead, Nickel and Zinc) must be calculated on a constituent by constituent basis to approximate the site life for each spray irrigation field.

6.3.2.3.8.3.2 The cumulative metal loadings must not exceed the levels set forth in Exhibit HH.

6.3.2.3.8.3.3 Spray irrigation activities must be terminated when any one of the cumulative metal limits is reached unless otherwise mitigated.

6.3.2.3.9 Lysimeters

6.3.2.3.9.1 To allow for percolate monitoring, a minimum of one (1) pore-liquid sampler (lysimeter) as defined in ASTM Standard (D 4696) (Standard Guide for Pore-Liquid Sampling from the Vadose Zone) must be installed within the disposal area prior to system operation.

6.3.2.3.10 Buffer requirements

Buffer zones are required to control aerosols. Buffer zones must be vegetated.

6.3.2.3.10.1 The following buffer zones must be provided for limited public access spray irrigation sites:

6.3.2.3.10.1.1 A 150 foot buffer must be maintained between the edge of the wetted field area and all property boundaries.

6.3.2.3.10.1.2 A 150 foot buffer must be maintained between the edge of the wetted field area and the shoulder of internal and external public roads. Buffers from highways must be measured from the outer edge of the shoulder or edge of the highway, if no shoulder.

6.3.2.3.10.1.3 A 150 foot buffer must be maintained between the edge of the wetted field area and any public supply well and a 100 foot buffer from any individual domestic well unless other jurisdictions dictate greater distances.

6.3.2.3.10.1.4 Internal roads that are closed to public use do not require buffer zones.

6.3.2.3.10.1.5 A 100 foot buffer is required between the wetted edge of spray fields and the edge of any perennial lake or stream or ephemeral drain.

6.3.2.3.10.1.6 A 50 foot buffer is required between spray fields and the edge of any channelized, intermittent watercourse.

6.3.2.3.10.1.7 If an intermittent watercourse were to become perennial, the 100 foot buffer requirement will apply.

6.3.2.3.10.1.8 A 50 foot buffer is required between the wetted field area and the edge of any wetlands.

6.3.2.3.10.2 Lesser distances may be permitted if the design and operations demonstrate that aerosols will be contained within the site and/or no threat to public health or the environment exists.

6.3.2.3.10.3 Buffer zones for unlimited public access sites are not normally required except for Sections 6.3.2.3.10.1.5, 6.3.2.3.10.1.6, 6.3.2.3.10.1.7 and 6.3.2.3.10.1.8 however other buffers may be necessary depending on site constraints.

6.3.2.3.10.4 Buffer zones around pretreatment facilities shall be designed for aerosol containment, noise abatement and nuisance control.

6.3.2.3.11 Water Balance Calculations

6.3.2.3.11.1 The Design Engineer Report must contain monthly water balance calculations to determine the design hydraulic loading.

6.3.2.3.11.2 Average monthly values for potential evapotranspiration generated from vegetative, soil and climatological data are to be used in the water balance calculations. A list of evapotranspiration references is presented in Exhibits II & JJ.

6.3.2.3.11.3 The Department requires the use of five (5) year return monthly precipitation values in water balance calculations. Five (5) year return values are defined as the 80^{th} percentile value in a 30 year ranked listing of historical monthly precipitation data (see Exhibit KK).

6.3.2.3.12 Storage

6.3.2.3.12.1 Municipal systems require a minimum of 45 days storage, unless other disposal options are permitted.

6.3.2.3.12.2 All facilities must demonstrate through monthly wastewater irrigation rate calculations that adequate storage is provided for design flows.

6.3.2.3.12.3 A separate off-line system for storage of reject wastewater must be provided at all unlimited access sites unless another permitted reuse system or effluent disposal system is capable of receiving the reject wastewater. At a minimum, this capacity must be the volume equal to two days flow at the average daily design flow rate of the treatment facility. Provisions for re-circulating the reject wastewater back to the treatment facility for further treatment may be incorporated into the design of the facility.

6.3.2.3.12.4 The Design Engineer Report must demonstrate through monthly calculations that there is sufficient spray acreage to eliminate the average daily design flow and the total storage volume within a 90 day period via irrigation.

6.3.2.3.13 Other System Design Considerations

6.3.2.3.13.1 The source of all data used and assumptions made for design

must be referenced in the Design Engineer Report.

6.3.2.3.13.2 Signs

6.3.2.3.13.2.1 Limited Public Access: Signs must be posted on all limited public access spray fields utilized to irrigate treated wastewater to prohibit public contact. The signs must indicate that the water being irrigated is treated wastewater. The signs must be legible. Limited public access sites must have signs posted on the perimeter every 1,000 feet, at a minimum, and at all entry points. Unlimited public access sites must have signs posted at all entry points.

6.3.2.3.13.2.2 Unlimited Public Access: Unlimited public access sites must have advisory signs posted at all entry points that indicate the site is spray irrigated with treated wastewater. Verbiage should include the following wording: “RECYCLED WASTEWATER – DO NOT DRINK”. Alternate verbiage may be used if approved in writing by the Department.

6.3.2.3.13.3 Fencing is required at treatment facilities, pump stations and storage/treatment ponds. Fencing of spray fields is not required.

6.3.2.3.13.4 All domestic, irrigation, commercial, industrial, and public wells must be identified within 1,000 linear feet from the perimeter of the irrigation fields.

6.3.2.3.13.5 Shallow and poorly constructed wells within the land treatment system will require proper abandonment.

6.3.2.3.13.6 The design percolation rate at land treatment sites with seasonal high groundwater at depths greater than five (5) feet (after consideration of mounding due to wastewater irrigation) be no more than 10% of the mean saturated hydraulic conductivity of the most limiting layer within the first five feet from the surface.

6.3.2.3.13.7 The Design Engineer Report must include an emergency contingency plan to demonstrate preparedness in the event that the wastewater treatment facility may experience a significant natural occurrence.

6.3.2.3.13.7.1 The contingency plan must address, but must not be limited to, extended periods of excessive precipitation, and extended periods of subfreezing temperatures causing prolonged periods of frozen soil conditions.

6.3.2.3.13.7.2 The contingency plan must delineate the wastewater treatment facilities available options to reduce, eliminate and/or prevent non-compliant conditions.

6.3.2.3.13.8 Wastewater application rates

6.3.2.3.13.8.1 Wastewater application rates may not exceed a maximum of 2.5 inches/acre/7 day period absent Department written authorization.

6.3.2.3.13.8.2 There must be a sufficient rest period between applications to prevent field saturation from occurring in any part of the field.

6.3.2.3.13.8.3 Sites that experience direct runoff as a result of wastewater irrigation must reduce application rates.

6.3.2.3.13.8.4 The design wastewater application rates must account for site specific:

6.3.2.3.13.8.4.1 Precipitation – normal and 5 year return (P5).

6.3.2.3.13.8.4.2 Evapotranspiration.

6.3.2.3.13.8.4.3 Design percolation rate.
6.3.2.3.13.8.4.4 Nitrogen loading and other constituent loading limitations.
6.3.2.3.13.8.4.5 Groundwater and drainage conditions.
6.3.2.3.13.8.4.6 Influent wastewater flows.

6.3.2.3.13.9 The collection and channelization of irrigated wastewater for purposes other than retreatment is prohibited.

6.3.2.3.13.10 Direct application of treated wastewater to drainage ditches, any water bodies, and wetlands is prohibited.

6.3.2.3.13.11 Irrigation on frozen or saturated soils is prohibited.

6.3.2.3.13.12 Surface water bodies adjacent to wastewater spray irrigation sites must be monitored by the wastewater treatment facility. The Department may deem necessary the monitoring of other surface water bodies in close proximity to the spray irrigation site. Monitoring must be performed upgradient and downgradient of the irrigation site.

6.3.2.3.13.13 Spray nozzle pressure variation due to friction loss and static head for solid set, uniformly spaced systems should not exceed plus or minus 10% of the design spray nozzle pressure. If this criterion cannot be met, sprinkler head spacing and spray nozzle diameters must be adjusted or flow control valves be used to ensure a uniform application covering the entire application area.

6.3.2.3.13.14 The use of secondary mist nozzles on impact sprinklers is prohibited.

6.3.2.3.13.15 The layout of spray fields and spray field roads shall provide easy access for inspection and maintenance of the distribution system. Spray field access roads must be designed for all weather use.

6.3.2.3.13.16 A recording device is required to measure the total volume of treated wastewater applied to each spray irrigation pivot/zone.

6.3.2.3.13.17 A recording device is required to measure the total volume of treated wastewater entering into storage.

6.3.2.3.13.18 A low pressure detection system to automatically shut down irrigation pumps in the event of force main, sub-main or lateral blowout is required.

6.3.2.3.13.19 A high pressure shut-off at the irrigation pump station must also be provided.

6.3.2.3.13.20 Above ground piping systems must drain when depressurized. Pipe drains shall discharge either to the spray fields or other identified vegetated areas and must not produce a runoff.

6.3.2.3.13.21 Sites with seasonal high groundwater less than five (5) feet deep (after consideration of mounding due to wastewater irrigation) must perform depth to water monitoring prior to spray irrigation to ensure the depth to water is greater than two (2) feet during irrigation.

6.3.2.3.13.22 Prior to pumping to the spray field distribution system, materials that can clog distribution pipes or spray nozzles must be removed, if applicable. Screening to remove solids greater than one-third ($^1/_3$) the diameter of the smallest sprinkler nozzle is recommended. Screenings must be captured and removed for disposal (method of disposal must be described

in detail).

6.3.2.3.13.23 The application of commercial fertilizers on spray irrigation fields is prohibited unless prior written approval from the Department is granted.

6.3.2.3.14 Leased Agricultural Sites

6.3.2.3.14.1 All sites to be leased for utilization for spray irrigation of treated wastewater are subject to the application process and provisions set forth in this regulation.

6.3.2.3.14.2 The applicant shall provide a map depicting each field and crop type proposed for treated wastewater disposal.

6.3.2.3.14.3 The applicant shall provide a copy of a lease/contract between the applicant and the owner of the site. The lease/contract must include the following:

6.3.2.3.14.3.1 The acreage of each field to be utilized.

6.3.2.3.14.3.2 The crop types to be grown on each field.

6.3.2.3.14.3.3 The farmer that will be growing and maintaining the crops.

6.3.2.3.14.3.4 The minimum volume of treated wastewater per each calendar month the farmer will accept on each crop.

6.3.2.3.14.3.5 The minimum amount of treated wastewater the farmer must accept to receive full payment of any amount negotiated for land use if applicable.

6.3.2.3.14.3.6 A delineation of ownership, operation and maintenance of spray irrigation equipment and piping.

6.4 Legal Documentation

6.4.1 Owner/Operators of large and/or community on-site wastewater treatment and disposal systems must provide legal documentation addressing long term management of the system. Public wastewater utilities subject to the jurisdiction of the Delaware Public Service Commission (PSC) may be exempt from this section and, if exempt, shall comply with Section 6.4.2. Municipalities and political subdivisions are exempt from Section 6.4.

6.4.1.1 Applications for permits to construct and operate large and/or community on-site wastewater treatment and disposal systems shall include documentation addressing construction, ownership, operational responsibility, transfer of ownership, maintenance, repairs, operation, performance and funding of the on-site wastewater treatment and disposal system through the design life of the system. This documentation shall be in the form of a Binding Agreement between the applicant for the construction and/or operation permits, and owner/operator.

6.4.1.1.1 The Binding Agreement must:

6.4.1.1.1.1 Identify a responsible party (Public Wastewater Utility, Home Owners Association, property owner, etc.) that will assume full responsibility for the operation, management, maintenance and repairs of the large and/or community on-site wastewater and disposal system, the wastewater system, upon satisfactory completion of the construction, by providing:

6.4.1.1.1.1.1 Full name and business address of the responsible party.

6.4.1.1.1.1.2 A description of the responsible party's experience, training and education in the wastewater treatment and disposal industry, together with any supporting data regarding the responsible party's qualifications in the industry.

6.4.1.1.1.1.3 Proof of the responsible party's financial solvency by providing a business financial statement (including balance sheet) that is not more than six (6) months old, and a statement of financial encumbrances.

6.4.1.1.1.1.4 A list of licensed wastewater treatment facility operators employed by the responsible party. The required class of operator will be determined by the Board of Certification for Licensed Wastewater Operators (refer to the Regulations for Licensing Operators of Wastewater Facilities).

6.4.1.1.1.2 Identify the terms and conditions under which the responsible party shall assume operational responsibility of the wastewater system.

6.4.1.1.1.3 Provide a detailed description of the wastewater system.

6.4.1.1.1.4 Disclose any existing encumbrances, liens or other indebtedness to the title of the wastewater system.

6.4.1.1.1.5 Provide an operating budget with a funding plan for the proper operation and maintenance of the wastewater system, including the accumulation of funds necessary to provide for repair or replacement of mechanical components of the wastewater system based on manufacturer recommendation. See Section 6.4.1.3 for funding requirements.

6.4.1.1.1.6 The operating budget shall include the establishment of an escrow account to be maintained by the responsible party and used exclusively for repair and replacement of failed or failing components of the wastewater system.

6.4.1.1.1.7 The escrow account may not be used for phasing construction or the expansion of the wastewater system to accommodate additional residential units.

6.4.1.1.1.8 The responsible party must maintain the escrow account throughout the life of the wastewater treatment, conveyance and disposal system, or any component thereof that the responsible party is responsible for managing.

6.4.1.2 An application to operate a large and/or community on-site wastewater treatment and disposal system shall include documentation demonstrating that an escrow account has been established. The value of the escrow account shall be equivalent to 25% of the cost of all mechanical equipment (e.g., pumps, flow meters, aerators, blowers, gear boxes) plus 50% of the cost of construction of the wastewater treatment's disposal system (e.g., infiltration beds, trenches).

6.4.1.3 Funds shall be deposited into the escrow account as dwelling units are connected to the wastewater system. The amount of funds deposited shall be equivalent to the percentage of units connected to the wastewater system (e.g., at 25% of build-out, the funds accumulated in the escrow account shall equal 25% of the amount established in 6.4.1.2).

6.4.1.4 The responsible party of the wastewater system shall notify the Department, in writing, of intent to access funds from the escrow account. The escrow funds may not be used without prior written approval of the Department. When escrow funds are used for the repair and/or replacement of mechanical equipment, the responsible party must submit a plan for the reestablishment of the escrow fund balance through the use of user fees or other sources.

6.4.1.5 The escrow account established for a community or a development can only be used for the community or development for which it was established. Accounts for non-contiguous communities or developments may not be co-mingled.

6.4.1.6 If the wastewater system for which the escrow account was established is abandoned, and the development connects to a regional or municipal wastewater treatment facility, the escrow account may be reduced to cover 25% of the replacement cost of all mechanical equipment associated with the transmission and conveyance sewer lines. If the transmission and conveyance sewer lines are all gravity lines, with no lift stations, pumps, or other mechanical equipment, the escrow account may be terminated and the funds returned to the wastewater system owner.

6.4.1.7 The escrow account must be approved by the Department and fully executed before an operation permit will be issued by the Department.

6.4.1.8 The Department shall have the right to inspect and review the financial records of the owner of the wastewater system, to include the operating budget, escrow account, and financial statements. The responsible party shall provide to the Department an annual financial report. The annual financial report shall include the following:

6.4.1.8.1 The number of homes or equivalent dwelling units connected to the facility during the calendar year.

6.4.1.8.2 The total amount of funds in the escrow account on the last day of the calendar year.

6.4.1.8.3 The amount of money withdrawn from the escrow account during the calendar year.

6.4.1.8.4 The amount of money returned to the escrow account during the calendar year.

6.4.1.8.5 The surplus or deficit of funds in the escrow account on the last day of the calendar year.

6.4.1.9 An application for a permit to construct a large and/or community on-site wastewater treatment and disposal system shall include an executed performance bond, irrevocable letter of credit, or other security, as approved by the Department. The performance bond shall be made payable to the Department and the obligation of the performance bond shall be conditioned upon the fulfillment of all requirements related to the construction permit. Terms of the performance bond shall be:

6.4.1.9.1 The amount shall be equivalent to 100% of the construction cost of the wastewater system (excluding the conveyance system and its appurtenances).

6.4.1.9.2 A performance bond is not required for any local, municipal, county, state, federal government agency, political subdivisions of the state or public wastewater utilities having more than $1,000,000.00 in annual revenue, provided the utility is duly incorporated within the State of Delaware, and is in compliance with Section 6.4.2.

6.4.1.9.3 The Department shall be made the beneficiary of the security and obligations thereof shall be conditioned upon the fulfillment of all requirements of the construction permit. The Department shall release the security only after the wastewater system has been constructed in accordance with approved plans, the operation permit has been issued by the Department and the system is performing in accordance with the conditions established in the operation permit, provided all other requirements are met.

6.4.1.9.4 The performance bond shall be executed by the responsible party through a corporate surety licensed to do business in the State of Delaware. In lieu of a performance bond, the responsible party may elect to provide an original irrevocable letter of credit equal to the required sum of the performance bond.

6.4.1.9.5 The obligation of the responsible party under the performance bond shall become due and payable for the purposes of properly fulfilling the requirements of the construction permit when the Department has:

6.4.1.9.5.1 Notified the responsible party that the conditions of the permit have not been fulfilled and specified the specific deficiencies in the fulfillment of the permit conditions;

6.4.1.9.5.2 Given the responsible party an opportunity to correct the deficiencies and to fulfill all the conditions of the permit; and

6.4.1.9.5.3 Determined that, at the end of a specified length of time, some or all of the deficiencies specified under Section 6.4.1.9.5.1 remain uncorrected.

6.4.1.9.6 Upon formal transfer of ownership of a large wastewater system to an entity identified in Section 6.4.1.1.1.1, the performance bond requirement shall cease provided all other requirements are met.

6.4.1.10 The construction permit application shall also include the following documents for legal review by the Department;

6.4.1.10.1 A Purchase and Sale Agreement -- which specifies that the purchaser or a dwelling unit has an encumbrance on the title for wastewater treatment and disposal system operation fees, easements, and other assessments related to the community system.

6.4.1.10.2 An Acknowledgment of Buyer -- which is appended to the Purchase and Sale Agreement and signed by the buyer after being furnished copies of appropriate agreements, covenants, restrictions, Articles of Incorporation and Bylaws of the Owner's Association, and indicates understanding that the buyer is obligated to pay assessments for maintaining the community system.

6.4.1.10.3 The Articles of Incorporation -- which establishes the owner's association as a state chartered, nonprofit corporation and gives the owners' association specific authority to operate, maintain, and repair the large system; to collect fees and special assessments; and to enforce any covenants, restrictions, or agreements.

6.4.1.10.4 The Bylaws of the Owners' Association -- which govern the operation of the owners' association and specifically authorizes the Board of Directors to supervise the operation and maintenance of the large system, collect fees and special assessments, and to take appropriate action when the public health is imperiled by the malfunctioning of the community system.

6.4.1.10.5 A Declaration of Covenants, Restrictions, and Easements -- which establishes, among many other limitations, the easements for the on-site sewage collection, treatment, and disposal system, and specifies responsibilities of the developers, their successors or assigns, and any owners' association regarding the community system. It further sets the fees and assessments for operation and maintenance of the large system.

6.4.1.11 For developments that do not contain homeowner’s associations, the above list of documents may be modified, at the Department’s discretion, to include only those documents that are applicable.

6.4.1.12 All large or community systems that are owned solely by one owner, partnership or corporation, who own the property that the system will be installed upon and the area to be serviced by the system must execute a Declaration of Covenants and Restrictions (DCR). The DCR must be notarized and recorded at the County's Office of the Recorder of Deeds after it has been approved by the Department. The recorded copy shall then be returned to the Department. Large or community systems meeting this requirement shall be exempt from Sections 6.4.1.1 through 6.4.1.10.

6.4.1.13 Once the Department has verified that the wastewater system has been constructed in accordance with approved plans, the owner may apply for a permit to operate the system.

6.4.1.14 Responsibility for operation and maintenance of a large or community system shall be vested in a governmental unit or a Council on behalf of the unit property owners pursuant to 25 **Del.C**. Ch. 22 or for subdivisions with an owners' association duly incorporated within the State with specific authority to operate, maintain, and repair the community system, to collect fees and special assessments and to enforce any covenants, restrictions or agreements (see Section 6.4.1.10).

6.4.2 A public wastewater utility may be exempted from the requirements of Section 6.4.1 under the following provisions:

6.4.2.1 The public wastewater utility is certified by the PSC and is in full compliance with **Del.Admin.C.**, Title 26, §6001, Regulations Concerning the Jurisdiction of the Public Service Commission to Grant and Revoke Certificates of Public Convenience and Necessity (CPCN) to Provide Wastewater Service and §6002 Regulations Governing the Minimum Standards for Service Provided by Public Wastewater Utilities Subject to the Jurisdiction of the Delaware Public Service Commission.

6.4.2.2 Public wastewater utilities having < $1,000,000.00 in annual revenue, for the utility or its parent company, must establish an escrow account and secure a construction bond.

6.4.2.3 The Utility must be duly incorporated within the State and remain in good standing.

6.4.2.4 The Utility must remain financially solvent on a continuous basis through a method of financing construction, maintenance, operation, and emergency work related to the large system to the exclusion of whatever other obligations the corporation may assume in other fields.

6.4.2.5 To the extent not already on file with the PSC, the following documents must be submitted to the Department before a Utility may be permitted to operate a large and/or community on-site wastewater treatment and disposal system:

6.4.2.5.1 Copy of the Utility's Article of Incorporation.

6.4.2.5.2 Copy of the general ledger for the two previous years and current year to date.

6.4.2.5.3 Statement of revenue and expenditures with details of revenue for service provided, capital fees, interest earnings, debt costs, income taxes and other applicable expenses.

6.4.2.5.4 Explanation of how the construction and operation of the wastewater system will be funded.

6.5 Large System Permitting

In order to obtain a permit to construct and operate an on-site wastewater treatment and disposal systems with daily flow rates of ≥ 2,500 gallons, a permit application must be

submitted to the Department for review and approval. A permit application will not be reviewed by the Department until the SIR, HSR and SWAR have been reviewed and approved by the Department.

6.5.1 Large system construction permit application requirements

All large system construction permit applications must contain the following:

6.5.1.1 DNREC application form.

6.5.1.2 Applicable DNREC fees.

6.5.1.3 Written approval from all appropriate governmental entities for the construction for the collection system.

6.5.1.4 Design Engineer Report

The Design Engineer Report is to be submitted for Department review by the owner or a designated agent. The report must include all applicable calculations and justifications for the overall design of the on-site wastewater treatment and disposal facility including pump stations and treatment processes. Once approved by the Department, the Design Engineer Report becomes the basis of design for the project. Once the facility is permitted, the facility must be constructed, operated and maintained in accordance with the Design Engineer Report. The Design Engineer Report must, at a minimum, address all of the following applicable items:

6.5.1.4.1 General information

6.5.1.4.1.1 Executive summary

6.5.1.4.1.1.1 Purpose

6.5.1.4.1.1.2 Scope

6.5.1.4.1.1.3 Design flows (peaks and average)

6.5.1.4.1.1.4 Number of equivalent dwelling units

6.5.1.4.1.1.5 Influent wastewater characteristics

6.5.1.4.1.1.6 Design effluent wastewater characteristics

6.5.1.4.1.2 Summary table of design parameters

6.5.1.4.1.3 Facility name

6.5.1.4.1.3.1 Brief description of proposed activity

6.5.1.4.1.3.2 Facility location

6.5.1.4.1.3.2.1 Area by cross roads

6.5.1.4.1.3.2.2 All applicable tax map parcels

6.5.1.4.1.3.2.3 The 12 digit Hydrologic Unit Code (HUC) Watershed(s) name(s)

6.5.1.4.1.3.2.4 County

6.5.1.4.1.3.2.5 Location map

6.5.1.4.1.3.3 Developer/owner

6.5.1.4.1.3.3.1 Name

6.5.1.4.1.3.3.2 Mailing and email addresses

6.5.1.4.1.3.4 Utility/operator

6.5.1.4.1.3.4.1 Plan of long term ownership and operation

6.5.1.4.1.3.5 Certificate of Public Conveyance and Necessity (CPCN). When applicable, a CPCN must be fully executed with the Public Service Commission before the Department will issue a permit to operate a large on-site wastewater treatment and disposal system.

6.5.1.4.1.3.6 Conditional use approval

6.5.1.4.1.3.7 Lease agreement(s)

6.5.1.4.1.3.8 Easement agreement(s)
6.5.1.4.1.3.9 Legal documents (see Section 6.4 for additional legal requirements)
6.5.1.4.1.4 Site Map
6.5.1.4.1.4.1 Provide scaled drawings with one (1) foot contour elevations, excluding spray irrigation fields, showing:
6.5.1.4.1.4.1.1 Layout of service area (development, strip mall, etc.)
6.5.1.4.1.4.1.2 Wastewater treatment facility, including:
6.5.1.4.1.4.1.2.1 Lift stations
6.5.1.4.1.4.1.2.2 Storage structures
6.5.1.4.1.4.1.3 Disposal site(s) and spare disposal site area(s)
6.5.1.4.1.4.1.4 Irrigation fields including acreage of each pivot or zone with two (2) foot contour elevations
6.5.1.4.1.4.1.5 Access roads and utilities
6.5.1.4.1.4.1.6 Location of all monitoring and observation wells (existing and proposed)
6.5.1.4.1.4.1.7 Buffers to property lines, watercourses and wetlands
6.5.1.4.1.4.1.8 Location of any storm water control structures
6.5.1.4.1.4.1.9 Drainage structures
6.5.1.4.1.4.1.10 FEMA 100 year floodplain line
6.5.1.4.1.4.1.11 Location of any wetlands, refer to the 2007 Statewide Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable
6.5.1.4.1.4.1.12 Watercourses within or contiguous to the site
6.5.1.4.1.4.1.13 Residences and habitable structures within or contiguous to the site
6.5.1.4.1.5 Design wastewater characteristics

Design wastewater characteristics for new facilities must be in accordance with current industry averages. Expansions and phase upgrades must utilize actual parameter concentrations from monitoring results.

6.5.1.4.1.5.1 Influent to treatment facility
6.5.1.4.1.5.1.1 Average and peak daily flow
6.5.1.4.1.5.1.2 BOD_5
6.5.1.4.1.5.1.3 Total suspended solids (TSS)
6.5.1.4.1.5.1.4 Ammonia nitrogen
6.5.1.4.1.5.1.5 Nitrate + Nitrite nitrogen
6.5.1.4.1.5.1.6 Total nitrogen
6.5.1.4.1.5.1.7 Total phosphorus
6.5.1.4.1.5.1.8 Sodium
6.5.1.4.1.5.1.9 Chlorides
6.5.1.4.1.5.1.10 pH
6.5.1.4.1.5.1.11 Additional parameters may be warranted for industrial facilities based on materials processed and Material Safety Data Sheets
6.5.1.4.1.5.2 Effluent to disposal system
6.5.1.4.1.5.2.1 Average and peak daily flow
6.5.1.4.1.5.2.2 BOD_5

6.5.1.4.1.5.2.3 TSS
6.5.1.4.1.5.2.4 Nitrate + Nitrite nitrogen
6.5.1.4.1.5.2.5 Ammonia nitrogen
6.5.1.4.1.5.2.6 Total nitrogen
6.5.1.4.1.5.2.7 Total phosphorus
6.5.1.4.1.5.2.8 Chlorides
6.5.1.4.1.5.2.9 Sodium
6.5.1.4.1.5.2.10 Sodium adsorption ratio, if applicable
6.5.1.4.1.5.2.11 Metals (Copper, Cadmium, Nickel, Lead, Zinc)
6.5.1.4.1.5.2.12 pH
6.5.1.4.1.5.2.13 Fecal coliform
6.5.1.4.1.6 Wastewater treatment facility process design
6.5.1.4.1.6.1 Overview
6.5.1.4.1.6.2 Process description
6.5.1.4.1.6.3 Process flow diagram
6.5.1.4.1.6.4 Hydraulic profile
6.5.1.4.1.6.5 Level of treatment
6.5.1.4.1.6.6 Schematic of pump stations and unit processes
6.5.1.4.1.6.7 Basin/tank volumes
6.5.1.4.1.6.8 Storage capacities
6.5.1.4.1.6.9 Capacity of pumps, blowers and other mechanical equipment
6.5.1.4.1.6.10 Determination of required storage volume
6.5.1.4.1.6.11 Chemical addition
6.5.1.4.1.6.12 Grit removal and/or screening process
6.5.1.4.1.6.13 Sludge production and disposal process
6.5.1.4.1.6.14 Influent and effluent flow metering and recordation
6.5.1.4.1.6.15 Overview of mechanical control and alarm system(s)
6.5.1.4.1.6.16 Calculations
6.5.1.4.1.6.16.1 Process design calculations and equations
6.5.1.4.1.6.16.2 Wastewater disposal system sizing
6.5.1.4.1.6.16.3 Dosing
6.5.1.4.1.6.16.4 Sludge production
6.5.1.4.1.6.16.5 Lift station(s)
6.5.1.4.1.6.16.6 Provide all assumptions used and supporting data
6.5.1.4.1.7 Effluent disposal system
6.5.1.4.1.7.1 Disposal system type
6.5.1.4.1.7.2 Effluent conveyance and distribution
6.5.1.4.1.7.3 Flow metering and recordation
6.5.1.4.1.7.4 Disinfection
6.5.1.4.1.7.5 Loading rates
6.5.1.4.1.7.6 Spray specific
6.5.1.4.1.7.6.1 Water balance/determination of design wastewater loading(s)
6.5.1.4.1.7.6.2 Phosphorus and other constituent metals loading rates
6.5.1.4.1.7.6.3 Determination of land limiting constituent (LLC) and site life based on LLC

6.5.1.4.1.7.6.4 Determination of required wetted field area(s)
6.5.1.4.1.7.6.5 Actual design wetted field area(s)
6.5.1.4.1.7.6.6 Determination of required storage volume
6.5.1.4.1.7.6.7 Actual design storage volume
6.5.1.4.1.7.6.8 Five (5) year vegetative management plan to include:
6.5.1.4.1.7.6.8.1 Crop type(s)
6.5.1.4.1.7.6.8.2 Crop planting sequence
6.5.1.4.1.7.6.8.3 Anticipated crop yield based on field data
6.5.1.4.1.7.6.8.4 Timing and application rates of commercial fertilizers (See Section 6.3.2.3.13.24), if applicable
6.5.1.4.1.7.6.8.5 Planting and harvesting timelines
6.5.1.4.1.7.6.8.6 Nitrogen balance calculation sheet
6.5.1.4.1.7.6.8.7 Selection of cover crop and management scheme(s)
6.5.1.4.1.7.6.8.8 Phosphorus balance calculations for phosphorus limited sites
6.5.1.4.1.7.6.9 Construction application requirements
6.5.1.4.1.7.6.9.1 After performing individual calculations to determine the design parameters, create and submit an active spreadsheet that incorporates all required calculated design parameters, and demonstrates their mathematical influence on each other per field and per month. The spreadsheet should iterate the design parameters, including, but not limited to, the Design Treatment Capacity, Design Disposal Capacity, Daily Average Flow, Total Spray Acreage, Maximum Allowed Infiltration Rate, Irrigation Rate, Total Storage Volume, etc. Include nitrogen balance calculations taking into consideration the Average Design Wastewater Loading, Nitrogen Concentration in Effluent, Average Annual Precipitation and Fixation, Application of all Fertilizers, Proposed Cover Crop and Cover Crop Management Scheme, Crop Nitrogen Uptake Rates.
6.5.1.4.1.7.6.9.2 Ensure the spreadsheet includes monthly storage pond volume calculations and required storage calculations. Ensure that the calculations demonstrate the ability to evacuate the maximum accumulated storage within a 90 day period and include the following considerations on a monthly basis: Average Precipitation, Volume Added to Pond from Precipitation, Evaporation, Volume lost due to Evaporation, Net Change in Pond Volume, Treated Effluent Volume to Pond, Potential Application from Pond to Spray Fields, Change in Volume, Required Accumulated Storage.
6.5.1.4.1.8 Monitoring of effluent, groundwater and surface waters
6.5.1.4.1.8.1 Site map depicting proposed locations of monitoring points, wells and lysimeters
6.5.1.4.1.9 Project phasing (see Section 6.5.11)

6.5.1.5 Plans

The plans must include, at a minimum, the following applicable items:

6.5.1.5.1 Site Plan:

6.5.1.5.1.1 Layout of collection system(s), including lift station and force mains.

6.5.1.5.2 General layout of the wastewater treatment facility including:

6.5.1.5.2.1 Topography of the wastewater treatment facility site with one (1) foot contours unless the Department approved the use of an alternate scale. Topography for spray irrigation fields may utilize two (2) foot contour intervals.

6.5.1.5.2.2 Size and location of all proposed wastewater treatment plant structure(s).

6.5.1.5.2.3 Process flow diagram showing the flow through all treatment units.

6.5.1.5.2.4 Piping and appurtenances (including arrangements for bypassing individual units).

6.5.1.5.2.5 Materials handled and direction of flow through pipes must be shown.

6.5.1.5.2.6 Hydraulic profiles showing the flow of wastewater, supernatant liquor, and biosolids.

6.5.1.5.2.7 Influent and effluent flow meters locations.

6.5.1.5.2.8 Monitoring location point(s).

6.5.1.5.2.9 Location, dimensions and elevations of all existing and proposed facility components.

6.5.1.5.2.10 Type, size, pertinent features and manufacture's rated capacity of all pumps, blowers, motors, and other mechanical devices, unless included in the specifications.

6.5.1.5.3 General layout of wastewater disposal area, including:

6.5.1.5.3.1 Topography of the wastewater disposal site with one (1) foot contours unless the Department approves the use of an alternate scale. Topography for spray irrigation fields may utilize two (2) foot contour intervals.

6.5.1.5.3.2 Proposed disposal system elevations.

6.5.1.5.3.3 Disposal system location, size and layout.

6.5.1.5.3.4 Spare disposal system location, size, layout and dimensions.

6.5.1.5.3.5 Piping inverts to disposal system.

6.5.1.5.3.6 Monitoring and observation well locations as approved by the Department.

6.5.1.5.3.7 Overlay of disposal area with approved soil delineation area.

6.5.1.5.3.8 Buffer areas.

6.5.1.5.3.9 Provide disposal system layout (identify laterals, transmission line, manifolds, valving, vaults, splash blocks, runs, laterals, air release valves, remote zoning, etc.).

6.5.1.5.3.10 Cross section of disposal system(s).

6.5.1.5.3.11 Cut/fill sections, if applicable.

6.5.1.5.3.12 Piping details to system including inverts.

6.5.1.5.3.13 Valving details of disposal system.

6.5.1.5.3.14 Splash block details for rapid infiltration basin(s).

6.5.1.5.3.15 Berm details applicable to the disposal system.

6.5.1.5.3.16 Fence details.

6.5.1.5.3.17 Sign details.

6.5.1.5.3.18 Silt fence details.

6.5.1.5.4 Sequence of Construction

6.5.1.6 Technical Specifications

6.5.1.6.1 The specifications accompanying the plans shall include, but not be limited to, the following:

6.5.1.6.1.1 Detail of the design requirements pertaining to:

6.5.1.6.1.1.1 The quality of materials and workmanship.

6.5.1.6.1.1.2 Fabrication of the project.

6.5.1.6.1.1.3 The type, size strength, operating characteristics, and ratings of equipment.

6.5.1.6.1.2 Equipment list – provide all equipment specifications to include cut sheets, model numbers, pump curves, system curves, capacities, etc.

6.5.1.6.1.3 Complete specifications for all mechanical equipment, including machinery, valves, piping and pipe joints.

6.5.1.6.1.4 Meters, laboratory fixtures and equipment.

6.5.1.6.1.5 Operating tools.

6.5.1.6.1.6 Construction materials.

6.5.1.6.1.7 Miscellaneous appurtenances.

6.5.1.6.1.8 Chemicals used.

6.5.1.6.1.9 Instruction for testing materials and equipment, as necessary, to meet design standards.

6.5.1.6.1.10 Operating tests for the completed facilities.

6.5.2 Large System Construction Permit

6.5.2.1 Public Advertisement

6.5.2.1.1 Upon approval of the completed application for a construction permit or construction permit renewal, the Department will advertise receipt of the application and conduct any hearings in accordance with 7 **Del.C.**, Ch. 60. The cost of the advertisement is to be borne by the applicant. If a public hearing is not conducted, and all requirements of these regulations have been fulfilled, a construction permit shall be issued by the Department.

6.5.2.2 Construction Permit Expiration

6.5.2.2.1 All construction permits for large on-site wastewater treatment and disposal systems pursuant to these Regulations may be issued for no more than five (5) years.

6.5.2.2.2 If construction has not been initiated prior to the expiration of the construction permit, and there are proposed changes to the approved design, the applicant must submit a new or updated Design Engineer Report and construction plans as outlined in Sections 6.2.3, 6.5.1.4 and 6.5.1.5 for project re-evaluation. This will require public notification.

6.5.2.2.3 If construction has been initiated prior to the expiration of the construction permit, and construction has not been completed prior to the expiration of the permit, the permittee may apply for a one (1) year extension of the construction permit.

6.5.2.2.4 If construction has not been initiated or construction has not been completed prior to the expiration of the one (1) year extension, provided, the SIR is valid, and there are no changes to the approved design prior to the expiration of the construction permit, the applicant must submit a construction permit application

along with applicable fees, and a construction schedule.

6.5.2.3 Construction Permit Extension

6.5.2.3.1 The application for extension must include the following:

6.5.2.3.1.1 A DNREC extension form.

6.5.2.3.1.2 Applicable Department fees.

6.5.2.3.1.3 Construction schedule.

6.5.3 Large System Operation Permit

Upon completion of construction, an operation permit must be obtained from the Department prior to system operation. A classification shall be performed on the facility in accordance with Regulations Licensing Operators of Wastewater Facilities. The class of operator required for the facility will be determined by the Board of Certification for Licensed Wastewater Operators in accordance with the Regulations Licensing Operators of Wastewater Facilities. All large systems must be under the direction of a licensed operator. The licensed operator must be available at all times. The licensed operator shall be on-site at the time the system is put into operation and is to receive all training as necessary to properly operate the system.

6.5.3.1 Application requirements for an operation permit

Prior to the issuance of an operation permit, the following applicable items must be submitted. Failure to submit all required information constitutes grounds for denial of the operation permit.

6.5.3.1.1 A DNREC application form.

6.5.3.1.2 Applicable Department fees.

6.5.3.1.3 Design Engineer Inspection Report(s) certifying the facility has been constructed in accordance with approved plans and specifications.

6.5.3.1.4 Copies of any other applicable State/County inspection reports.

6.5.3.1.5 Contractor's Certificate of Completion.

6.5.3.1.6 A certificate or letter of completion/approval from the wastewater treatment plant manufacturer.

6.5.3.1.7 A copy of the agreement with a licensed operator and license certification.

6.5.3.1.8 A copy of the agreement with a regulated wastewater utility in the State of Delaware that the treatment facility will be operated under.

6.5.3.1.9 A set of "as-built" drawings of the facility bearing the seal and signature of a licensed Professional Engineer registered in the State of Delaware.

The "as-built" drawings must include:

6.5.3.1.9.1 Site map showing the location of all structures, piping and appurtenances, disposal areas and buffers.

6.5.3.1.9.2 A full equipment list and technical specifications for all equipment used, if different than submitted in the permit application.

6.5.3.1.9.3 The new topography elevations of the system.

6.5.3.1.9.4 Monitoring/Observation well elevations at the top of the casing (TOC) and at the ground surface, GPS coordinates (State Plane), and local topography tied to a common benchmark.

6.5.3.1.9.5 The location and screen depth, length of stick up, and well ID's must be provided for each monitor well.

6.5.3.1.9.6 Elevations at the center and corners of each RIB.

6.5.3.1.10 A copy of all Collection System Permit(s)

6.5.3.1.11 Inspection Reports demonstrating collection system has been installed and inspected by Design Engineer

6.5.3.1.12 If the collection system does not require county approval, the permittee must supply the Department with all testing procedures conducted on the collection system, force main(s) and lift station(s).

6.5.3.1.13 An Operation and Maintenance (O&M) Plan in accordance with Section 6.7

6.5.3.1.14 Spreadsheet summary of groundwater monitoring well information.

6.5.3.1.14.1 GPS information detailing the northings and eastings; the local well ID number; and the DNREC Well ID/Well Permit Number. The GPS information must be in either Delaware State Plane, North American Datum 1983 meters; or Latitude and Longitude decimal degrees.

6.5.3.1.14.2 TOC elevations survey results for all monitoring wells to be utilized for groundwater monitoring. Provide the length of the well stickup and the well survey information to the closest 0.01 feet. Provide a permanent mark, etch, or fixture to be used to specify the survey point where the TOC elevations were read.

6.5.3.1.15 A summary report detailing the analyses of the background groundwater quality sampling program that was conducted consisting of at least three (3) samples one (1) month apart and analyzed prior to the initiation of disposal activities (see Section 6.6.3.16).

6.5.3.1.16 Biosolids Management Plan

6.5.3.1.16.1 A copy of a biosolids management contract if a third party will be utilized to manage the biosolids.

6.5.3.1.17 Legal documents (see Section 6.4)

6.5.3.2 Operation Requirements

6.5.3.2.1 On-site systems and spray irrigation facilities (additional spray requirements in Section 6.5.3.2.2)

6.5.3.2.1.1 Samples and measurements taken as required in the operation permit shall be representative of the volume and nature of the monitored discharge. If there has been significant increase (> 25%) in the characterization of any one parameter of the effluent wastewater as established in the Design Engineer Report, the permittee shall resample the wastewater and submit the additional analyses to the Department. The permittee shall re-characterize the wastewater to determine if a change in treatment is required and/or if the land limiting constituent has changed. If a change in treatment is required and/or if the land limiting constituent has changed, a revised Design Engineer Report shall be submitted to the Department.

6.5.3.2.1.2 Roof downspouts, foundation drains, area drains, storm sewers, combined sewers or appurtenances thereto or any sewer or device carrying storm water shall not be connected to the system.

6.5.3.2.1.3 The wastewater must be applied in a manner such that the application is even and uniform over the disposal area.

6.5.3.2.1.4 The groundwater mound created by the added infiltration shall at no time reach within two (2) feet of the ground surface in any section of the disposal area. Should the groundwater mound exceed this limit, the permittee

shall cease all distribution of wastewater to the affected area until the groundwater mound recedes to acceptable levels.

6.5.3.2.1.5 Connections or additions to the system other than those indicated on the approved plans are prohibited without prior approval from the Department.

6.5.3.2.1.6 In the event that the permittee installs new monitoring wells or replaces any existing monitoring wells, the permittee shall submit to the Department new elevation details relative to the common benchmark previously established. Additionally, the permittee shall conduct a groundwater quality sampling program prior to initiation of wastewater disposal activities on the area incorporating the well. The sampling program shall be sufficient to establish representative ground water quality at each well prior to initiation of the wastewater disposal activities. A minimum of three (3) samples shall be collected at least one (1) month apart and analyzed. A summary report detailing all analyses shall be submitted to the Department prior to initiation of wastewater disposal activities. Analyses shall include the parameters iterated in Section 6.8.1.

6.5.3.2.2 Spray Irrigation Facilities

6.5.3.2.2.1 The discharge to the spray irrigation fields shall be free from material such as floating solids, sludge deposits, debris, scum, oil and grease.

6.5.3.2.2.2 The spray irrigation fields shall be managed to assure at a minimum that:

6.5.3.2.2.2.1 Spray irrigation of wastewater shall only occur on fields being prepared for planting or already planted with a crop and shall not occur on fields with crops not actively growing or on voluntary vegetation.

6.5.3.2.2.2.2 The spray fields shall be maintained in such a manner as to prevent wastewater pooling and/or discharge of wastewater to any surface waters. Should pooled areas become evident, spraying on those areas shall be prohibited until saturated conditions no longer exist.

6.5.3.2.2.2.3 Aerosols or nuisance odors shall not extend beyond the boundary of the spray irrigation site when treated wastewater is being applied. If odors are produced that are considered to be a public nuisance, the permittee shall take the necessary steps to eliminate such odors. All action taken shall be reported to the Department.

6.5.3.2.2.2.4 Erosion controls must be employed to prevent wastewater runoff from the spray irrigation fields. The permittee must notify the Department immediately if any wastewater runoff occurs.

6.5.3.2.2.2.5 The spray irrigation field’s crops must be maintained in optimal condition, including any necessary weed management, reseeding, or other vegetative management practices.

6.5.3.2.2.2.6 Effective vegetative management shall be provided such that crops harvested on the spray irrigation sites are removed from the sites.

6.5.3.2.2.2.7 Spray irrigation is prohibited when saturated or frozen soil conditions exist.

6.5.3.2.2.2.8 The permittee shall take appropriate measures to protect the spray irrigation system from damage due to sub-freezing conditions.

6.5.3.2.2.2.9 Any leaks shall be reported to the Department and repaired immediately.

6.5.3.2.2.2.10 Potable ground or surface water may be used for distribution system testing and irrigation to establish vegetation when sufficient treated effluent is not available.

6.5.3.2.2.2.11 Permittee must notify the Department in writing prior to utilizing the freeboard in any lagoon or immediately upon unexpected encroachment into freeboard. In the event of encroachment into freeboard, Permittee shall contact the Department to coordinate relief measures. In the event of an emergency, Permittee may contact the Department via telephone; however, written notification must subsequently be provided within 5 days of encroachment.

6.5.3.2.2.2.12 If the surface horizon soil phosphorus levels become excessive as defined by the University of Delaware soil testing methods, the permittee shall perform a Phosphorus Site Index (PSI) study of the site. Based on the results of the PSI study, the Department may require the permittee to submit a plan for Department review and approval detailing steps the permittee will take to reduce the phosphorus loading rates at the site to crop phosphorus uptake levels.

6.5.3.2.3 Operation Permit Conditions

Conditions necessary for the protection of the environment and the public health may differ from facility to facility because of varying environmental conditions and wastewater compositions. The Department may establish specific permit conditions. Specific conditions may be established in consideration of characteristics specific to a facility and inherent hazards of those characteristics. Such characteristics may include, but are not limited to:

6.5.3.2.3.1 Chemical, biological, physical, and volumetric characteristics of the wastewater.

6.5.3.2.3.2 Geological and climatic nature of the facility site.

6.5.3.2.3.3 Size of the site and its proximity to population centers, ground and surface water.

6.5.3.2.3.4 Legal considerations relative to land use and water rights.

6.5.3.2.3.5 Techniques used in wastewater distribution and the disposition of that vegetation exposed to wastewaters.

6.5.3.2.3.6 Abilities of the soils and vegetative covers to treat the wastewater without undue hazard to the environment or to the public health.

6.5.3.2.3.7 Potential for adverse environmental impacts to groundwater resources or surface water bodies.

6.5.3.2.3.8 The need for monitoring and recordkeeping to determine if the facility is being operated in conformance with its design and if its design is adequate to protect the environment and the public health.

6.5.3.2.3.9 The Department may impose, in any permit for large or community systems, standards for evaluating the treatment and disposal system performance and compliance with these regulations. These standards may be in the form of limitations on flow and pollutant concentrations and mass loadings, or testing basins at design loading rates. The standards shall reflect the utilization of best management and operational practices.

6.5.3.3 Permit Modifications/Amendments

6.5.3.3.1 In consultation with the permittee, the Department may modify or amend an existing permit provided that the modifications would not result in an increased impact or risk to the environment or to public health.

6.5.4 Operation Permit Re-Issuance

At least 180 days prior to the expiration date of the operation permit, the permittee must submit an application for renewal or notify the Department of the intent to cease discharging by the expiration date. The application package for systems with a design flow ≥ 100,000 gpd, must include a five (5) year Compliance Monitoring Report (CMR). In the event that a timely and complete application has been submitted as determined by the Department, and the Department is unable, through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable until a decision is made on the new application.

6.5.4.1 At a minimum, the following applicable items must be addressed. Individual permits may require additional specific items that must be submitted in the permit renewal application package.

6.5.4.2 Permit renewal application package;

6.5.4.2.1 DNREC application form

6.5.4.2.2 Applicable DNREC fees

6.5.4.2.3 Request for permit modifications

6.5.4.2.4 Revised O&M plan, if changes, including but not limited to operational or facility upgrades.

6.5.4.3 CMR Requirements

6.5.4.3.1 Soils Report

6.5.4.3.1.1 Soil reports must be signed and sealed by a Class D.3 soil scientist and contain the following:

6.5.4.3.1.1.1 One (1) soil boring/acre must be performed in the spare area. Soil profile descriptions must be logged on a soil profile note page(s).

6.5.4.3.1.1.2 List new wells, storm water ponds, filling/cutting or activity that will potentially impact the current and/or future operation of the drainfield(s) and spare area(s) on a site map.

6.5.4.3.1.1.3 Identify any areas prone to ponding, saturation or subsurface breakouts, reduction in design infiltration rates and proposed remedial activities necessary to return the site to permit compliance, if applicable.

6.5.4.3.1.1.4 Soils investigation is not required in the active disposal area.

6.5.4.3.1.1.5 Conclusions must be based on the monitoring/performance data. The conclusion and data must be summarized.

6.5.4.3.1.1.6 Recommendations for future monitoring, system upgrades or improvements, O&M, etc. must be provided.

6.5.4.3.1.1.7 Spray Irrigation Facilities

6.5.4.3.1.1.7.1 Review soil analysis lab results for the life of the permitted land application activities and report any trends which may be developing.

6.5.4.3.1.1.7.2 Review the design land limiting constituents and the approximate site life calculated at the time of design. Review the

current levels of potential land limiting constituents (e.g., hydraulic loading, phosphorus, cadmium, copper, lead, nickel, zinc). Based on trends of the monitored parameters, determine the current land limiting constituent and estimate remaining site life.

6.5.4.3.1.1.7.3 Review pH levels, liming activities, additional fertilizer applications, and cropping uptakes as they relate to permit conditions and report any concerns.

6.5.4.3.1.1.7.4 Determine if current cropping sequences/rotations are appropriate. Recommend any necessary changes.

6.5.4.3.1.1.7.5 Spray irrigation fields must be assessed to determine if soils renovation or maintenance is necessary. Assessments must address crop consistency, soil monitoring results, infiltration, and compaction. The assessment must identify any visual signs of the ponding of wastewater, runoff, poor or dead vegetation, compaction, and any other impacts affecting the facility grounds. The assessment must also indicate whether the disposal application areas show signs of stress or failure.

6.5.4.3.2 Hydrogeologic Suitability Report

6.5.4.3.2.1 Hydrogeological reports must be signed and sealed by a Delaware-licensed professional geologist (PG) and must, at a minimum, include the following:

6.5.4.3.2.1.1 The current number of units connected to the system must be reported. Also report the number of units connected for each year of the five (5) year reporting period and location of units.

6.5.4.3.2.1.2 A map of the current monitoring/observation well network must be provided. Any changes to the well network (e.g., replacement, abandonment) must be documented.

6.5.4.3.2.1.3 The following well data must also be tabulated: permit number, local identifier, easting, northing, diameter, screen interval, top of casing (TOC) elevation and land-surface elevation. The casing (inner or outer) from which the water-level measurement will be taken should be specified.

6.5.4.3.2.1.4 Metered flow demonstrating volumes versus time must be plotted for average monthly influent, average monthly effluent, and daily peak influent flows. Trends identified in the data should be discussed.

6.5.4.3.2.1.5 Water-table hydrographs must be provided to demonstrate that the required unsaturated zone thickness is maintained beneath the wastewater system (see Exhibit W). The hydrographs must show hydraulic head (in ft above mean sea level (msl)) versus time. Hydraulic head data must be evaluated with respect to the disposal surface.

6.5.4.3.2.1.6 Precipitation data for the reporting period must be plotted based on nearby meteorological stations or on-site observations. Compare peak flows to precipitation data to detect any inflow and infiltration into the collection system.

6.5.4.3.2.1.7 Maps showing the configuration of the water table and groundwater flow direction must be presented for (i) peak, (ii) average, and (iii) minimum water-table conditions for the reporting period.

6.5.4.3.2.1.8 The peak observed (or interpolated) mound beneath each system or basin must be reported as a percentage of the simulated (or predicted) mound. Example: the simulated pre-system operation water table was 50 feet msl and the simulated post-system or basin mound was 55 feet msl. An observed mound of 52 feet msl would constitute 40% of the simulated mound. This percentage must be compared to metered flows (reported as a percentage of peak flow). The PG may consider re-running the model to verify mounding using the observed flow.

6.5.4.3.2.1.9 Temporal trends in both effluent and groundwater quality must be evaluated and compared to background samples and/or previous sampling results. Tabulated influent, effluent, and monitoring well data must be provided. Data must also be plotted verses time to depict trend lines. Where applicable, groundwater data must be evaluated with respect to drinking water standards established by the U.S. EPA.

6.5.4.3.2.1.10 Some site specific criteria will be necessary for specialized conditions, needs, and/or circumstances (e.g., regional systems, phased approaches).

6.5.4.3.2.1.11 The PG must provide a conclusion of the operating status of the disposal system based on the monitoring/performance data. Recommendations for future monitoring, system upgrades or improvements, operation and maintenance (O&M) should be provided as necessary.

6.5.4.3.3 Engineering/Operation Report

6.5.4.3.3.1 The Engineering/Operation Report must be signed and sealed by a Delaware licensed Professional Engineer and must, at a minimum, include the following:

6.5.4.3.3.1.1 Operation & maintenance concerns and/or changes, if any, must be summarized. Items to address may include, but need not be limited to, the following: infiltration problems, equipment replacement, system and/or basin maintenance, treatment system problems and crop activities (e.g. harvesting, planting). Dates and descriptions of routine maintenance procedures, such as basin raking, must also be provided.

6.5.4.3.3.1.2 List, summarize, and date all compliance items relative to the permit (e.g. enforcement actions, Notice of Violations, warning letters, self-reported permit violations and effluent limitation exceedences). Indicate any outstanding non-compliance issues.

6.5.4.3.3.1.3 Provide an updated active spreadsheet as required in 6.5.1.4.1.7.6.9 utilizing existing data where possible and appropriate.

6.5.4.3.4 Vegetative Management Plan

6.5.4.3.4.1 The vegetative management plan must be executed and approved by a Nutrient Consultant, Certified Crop Advisor, or any appropriate professional authorized by the Delaware Department of Agriculture and must, at a minimum, include the following:

6.5.4.3.4.1.1 Crop type(s).

6.5.4.3.4.1.2 Crop planting sequence.

6.5.4.3.4.1.3 Anticipated crop yield based on field data.

6.5.4.3.4.1.4 Timing and application rates of commercial fertilizers.

6.5.4.3.4.1.5 Planting and harvesting timelines.

6.5.4.3.4.1.6 A recalculated monthly nitrogen balance using averaged actual irrigation rates and averaged actual nitrogen monitoring results.

6.5.4.3.4.1.7 Phosphorus balance calculations for phosphorus limited sites.

6.5.4.3.5 BioSolids Management

6.5.4.3.5.1 Permit/Contract:

6.5.4.3.5.1.1 If a third party manages the biosolids, provide a copy of the most recent biosolids management contract.

6.5.4.3.5.1.2 If the permittee manages the biosolids, provide a copy of the current DNREC – Biosolids Permit.

6.5.4.3.5.2 Provide a summary of the volume (gallons) of biosolids generated, removed and/or stored over the past five years.

6.5.4.3.6 Overall Conclusions/Recommendations

6.5.4.3.6.1 Conclusions based on the monitoring/performance data of the wastewater treatment facility and disposal system must be summarized and submitted by the engineer, consultant and/or permittee. Recommendations for future monitoring, system upgrades or improvements and O&M should be provided as necessary. Systems with compliance matters that are unresolved must include a work plan detailing the course of action proposed to return the facility to compliance. Systems with existing compliance matters that are unresolved with an existing work plan must provide a status update, a summary of actions completed, and any adjustments to the work plan's timeline or course of actions.

6.5.4.4 Emergency Repairs

6.5.4.4.1 Emergency repairs or the replacement of critical "like kind" components of the wastewater treatment facility necessary for the continued operation of the facility may be performed without first obtaining a construction permit from the Department.

6.5.4.4.2 A report must be submitted to the Department within five (5) days of completion of the emergency repairs. The report must summarize the nature of the emergency and the repairs performed. All violations must also be reported in accordance with Section 6.5.9.

6.5.5 Severability

The provisions of a permit are severable. If any provision of a permit, or the application of any provision of a permit, to any circumstances is held invalid; the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

6.5.6 Permit Transferability

Permits may be transferred to a new owner or operator. The permittee must notify the Department by requesting a change of ownership of the permit before the date of transfer. The transfer must be consistent with any notarized legal documents and/or CPCN required by these Regulations. The legal documentation must be provided with the application. The application must be received 30 days before the transfer.

6.5.6.1 No person shall transfer a permit from one (1) person to another unless 30 days written notice is given to the Department, indicating the transfer is agreeable to both persons, and approval of such transfer is obtained in writing from the

Department, and any conditions of the approval of such transfer is obtained in writing from the Department, and any conditions of the transfer approved by the Department are complied with by the transferor and the transferee.

6.5.6.2 The notice to the Department shall contain a written agreement between the transferor and the transferee, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with and liability for the terms and conditions of this permit. The notice shall be signed by both the transferor and the transferee.

6.5.7 Permit Revocation

6.5.7.1 The Department may revoke a permit if, among other things, the permittee violates any permit condition, these regulations, fails to pay applicable Departmental fees, obtains the permit by misrepresentation or fails to fully disclose all relevant facts.

6.5.7.2 Except in cases of emergency, the Department shall issue a written notice of intent to revoke to the permittee prior to final revocation. Revocation shall become final within 20 days of receipt of the notice by the permittee, unless within that time the permittee requests an administrative hearing in writing.

6.5.7.3 The Department shall notify the permittee in writing of any revocation hearing at least 20 days prior to the date set for such hearing.

6.5.7.4 If the Department finds the public health, safety or welfare requires emergency action, the Department shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the permittee. Thereafter, if requested by the permittee in writing, the Department shall provide the permittee a revocation hearing.

6.5.8 Sunset Requirement

6.5.8.1 Operation permits for large systems that were issued without a permit expiration date shall expire five (5) years following the promulgation date of these Regulations.

6.5.9 Noncompliance Notification

6.5.9.1 The permittee shall report to the Department's Enforcement Section at (800) 662-8802 any unpermitted release or discharge of any contaminant into the air, or a pollutant, including petroleum substances, into surface waters, groundwater, or onto land as soon as the permittee has knowledge of, or should have had knowledge of, the release or discharge.

6.5.9.2 If for any reason the permittee does not comply with, or will be unable to comply with, any effluent limitations or other conditions specified in the permit, the permittee shall provide the Department with the following information in writing within five (5) days of becoming aware of any actual or potential noncompliance:

6.5.9.2.1 A description and cause of the noncompliance with any limitation or condition.

6.5.9.2.2 The period of non-compliance including exact dates and times; or, if not yet corrected, the anticipated time the noncompliance is expected to continue.

6.5.9.2.3 The steps being taken or planned to reduce, eliminate and/or prevent recurrence of the noncompliant condition.

6.5.10 Regional Facilities

6.5.10.1 Design

6.5.10.1.1 Regional wastewater treatment and disposal facilities (regional facility) must be owned and operated by a wastewater utility or governmental agency, however government agencies are exempt from the requirements of Section 6.5.10.3.

6.5.10.1.2 The regional facility must be designed to not exceed the site's most limiting disposal capacity based on the SIR, HSR and SWAR, collectively.

6.5.10.1.3 If the regional facility is constructed in phases, the number of units that will be authorized to be connected to the regional facility will be limited to the approved capacity of the wastewater treatment and disposal system for that phase.

6.5.10.1.4 The force main, pump station, and appurtenances to the off-site disposal area and/or development(s) must be permitted by the Department for construction before the off-site disposal area and/or development(s) may be included as part of the regional facility.

6.5.10.1.5 All regional facilities must monitor for all constituents identified under the ambient groundwater quality sampling chart in Section 6.2.3.5.

6.5.10.2 Required documents for permitting:

6.5.10.2.1 The applicant must submit a Regional Facility Plan to the Department for review and approval. The plan must:

6.5.10.2.1.1 Identify the proposed service area for the regional facility.

6.5.10.2.1.2 Provide documentation of the proposed conveyance system.

6.5.10.2.1.3 Demonstrate the total treatment and disposal capacity, including 100% spare area, if applicable.

6.5.10.2.1.4 Propose the total number of equivalent dwelling units (EDU's) in accordance with Section 6.3.1.5.

6.5.10.2.1.5 Identify each subdivision proposed to be connected to the regional facility by name, tax parcel number and number of EDU's.

6.5.10.2.1.6 Include the appropriate county approval documentation.

6.5.10.3 Required documents for connecting subdivisions:

6.5.10.3.1 A subdivision shall not be connected to a regional facility until all of the applicable required documents have been submitted to and approved by the Department and there is sufficient demonstrated capacity (based on the approved SIR, HSR and SWAR) to connect the subdivision to the regional facility. A subdivision phase may only be connected after being incorporated into the operating permit. In order to connect a subdivision to the regional facility, the permittee must submit the following for approval:

6.5.10.3.1.1 A Certificate of Public Convenience and Necessity (CPCN).

6.5.10.3.1.2 A zoning certificate.

6.5.10.3.1.3 A binding agreement from the developer/owner stating that they authorize connection of their subdivision to the regional facility.

6.5.10.3.1.4 A copy of the approved subdivision recordation plan. The number of units shown on the approved county subdivision recordation plan must agree with the number of units identified in the Regional Facility Plan.

6.5.10.3.1.5 A copy of the approved collection system permit number and all collection system inspection approvals (county, if required).

6.5.11 Phasing

A system may be designed in phases to allow actual flow data to be collected to determine the necessity and timing for treatment facility upgrades/additions and to accommodate initial low influent flows to the wastewater treatment plant.

6.5.11.1 Application

6.5.11.1.1 The applicant must submit an overview of the design of all phases of the facility. The applicant may apply for the permitting of each individual phase or for the permitting of multiple planned phases for the facility.

6.5.11.1.2 The applicant must identify the capacity of each phase of the project.

6.5.11.1.3 Each phase of the system must be designed to be incorporated into the final design of the system. The Design Engineer Report must demonstrate how the components of each phase will be utilized within subsequent phases.

6.5.11.1.4 The applicant shall provide information regarding managing low flow and/or organic loadings through integration of multiple treatment units.

6.6 Construction Requirements

6.6.1 Construction must be performed in accordance with these Regulations and the approved construction permit (Design Engineer Report, Plans and Technical Specifications, etc.)

6.6.2 The permittee shall notify the Department in writing of the intent to initiate construction activities at least 15 days prior to the commencement of construction. The written notification shall include a draft construction schedule.

6.6.2.1 The permittee must provide updated construction schedules if the schedule changes as construction progresses.

6.6.3 Prior to initiating construction of a large on-site wastewater treatment and disposal system, a pre-construction meeting shall be held on-site and attended by the following individuals: DNREC Soil Scientist, DNREC Environmental Engineer, DNREC Hydrologist, Class D.3 Soil Scientist, Professional Geologist, Project Design Engineer, General Site Contractor, Class E.4 System Contractor and other necessary parties.

6.6.3.1 All systems must be installed by a DNREC licensed Class E.4 system contractor. Proper construction of the treatment plant and/or spray system must be certified in writing by the design engineer and the manufacturer's representative prior to startup of the wastewater treatment plant.

6.6.3.2 The Class E.4 system contractor must notify the Department 72 hours prior to construction startup.

6.6.3.3 The Class E.4 system contractor must obtain an authorization number from the Department prior to initiating construction.

6.6.3.4 Upon receipt of the authorization number, the Class E.4 system contractor shall provide an installation timeline to the Department. Upon receipt of the timeline, the Department may request weekly status reports (verbal) or monthly progress reports (written) be submitted.

6.6.3.5 The Class E.4 system contractor must have a copy of all valid, required and approved permits on site during construction.

6.6.3.6 The design engineer or his/her designee must periodically review the construction of the disposal system to ensure compliance with design specifications.

6.6.3.7 All system components must be surveyed to a common datum point.

6.6.3.8 Soil disturbance to the disposal areas must be limited to the minimum required for installation. A protective barrier must be placed around the disposal areas, including spare area, prior to the initiation of any construction activities. The

soils may be rendered unsuitable should unnecessary soil disturbance occur near or within the disposal area. Particular care should be taken when clearing wooded lots so as not to remove the surface soil material (see Lot Clearing Guidelines).

6.6.3.9 If well pointing is required during construction, the wells must be installed by a licensed well driller, and a permit to construct such wells must first be obtained from the Department.

6.6.3.10 All construction activities must be approved by the Department and must comply with all other applicable local utility construction specifications and standards; and must be in accordance with Ten States Standards.

6.6.3.11 Connections and/or additions to the wastewater treatment and disposal system, other than those indicated on the approved plans and specifications, will not be allowed without prior written approval from the Department.

6.6.3.12 Any anticipated facility expansions, production increases, or process modifications that will result in new, different, or increased discharges of pollutants must be reported in writing to the Department for approval. A new permit may be required.

6.6.3.13 Facility and Construction Changes

The permittee must submit a written report to the Department for review and approval of any changes to the facility or construction of the system within the following time periods:

6.6.3.13.1 30 days before any planned activity, physical alteration to the permitted facility or addition to the permitted facility if that activity, alteration or addition would result in a change in information that was previously submitted to the Department; or

6.6.4.13.2 30 days before any anticipated change which would result in noncompliance with any permit condition or the regulations; or

6.6.4.13.3 Immediately after the permittee becomes aware of relevant facts omitted from, or incorrect information submitted in, a permit application or report to the Department.

6.6.3.14 The permittee must have a licensed well driller install all required monitoring wells at the locations approved by the Department. The permittee shall contact the Department at least 24 hours prior to the installation of the monitoring wells. All monitoring wells must be installed by a licensed well driller, and a permit to construct the wells must first be obtained from the Department. After installation, the permittee must have all monitoring wells globally positioned. The GPS information must be submitted to the Department with the locations of the wells delineated on a Site Map. The GPS information must be in either Delaware State Plane, North American Datum 1983 meters; or Latitude and Longitude decimal degrees.

6.6.3.15 Prior to well purging and groundwater sampling, the elevation of a reference marking on the upper terminus of each monitoring well casing shall be surveyed to the nearest 0.01 ft relative to a common mean sea level datum. The elevation of the ground surface immediately adjacent to each monitoring well shall also be surveyed as previously prescribed. All elevation data pertaining to monitoring wells shall be indicated on “as-built” plans and summarized in a report (see Section 6.5.3.1.14).

6.6.3.16 The permittee shall conduct a background groundwater quality sampling program prior to initiation of disposal activities. The sampling program shall be

sufficient to establish representative groundwater quality at each well prior to initiation of disposal activities. A minimum of three (3) samples shall be collected at least one (1) month apart and analyzed prior to the initiation of disposal activities. A summary report which includes all analyses must be submitted to the Department. Analyses may include, but not be limited to, the parameters listed in Section 6.8.1.8.

6.6.3.17 The permittee must supply the Department with testing procedures and results conducted on the force main/collection/distribution system (including any lift stations).

6.6.3.18 A construction permit issued by the Department does not relieve the permittee from complying with any local, municipal, county, or state requirement.

6.6.3.19 The Class E.4 system contractor must contact the design Engineer, licensed operator and the Department to schedule an inspection prior to completion of construction.

6.6.3.20 The system may not be placed into operation until an operation permit has been issued by the Department.

6.6.3.21 Upon final approval of construction, the permittee may apply for an operation permit. The permittee may not initiate operation of the disposal system without first obtaining an operation permit from the Department. At that time, additional fees may be required.

6.6.3.22 Prior to the issuance of an operation permit the design Engineer shall provide the Department with an approved engineer inspection report(s) demonstrating that system has been constructed in accordance with the approved Design Engineer Report, Plans and Technical Specifications prior to the operation permit being issued.

6.6.3.23 The permittee is responsible for supplying the Department with a certificate or letter of completion/approval from the wastewater treatment plant manufacturer upon construction completion of the wastewater treatment plant, if applicable.

6.6.3.24 For systems with spray irrigation fields the following must be adhered to:

6.6.3.24.1 Construction activities within spray fields must be minimized. Excessive compaction of surface soils by construction equipment must be avoided. Re-grading of pipeline trenches must match original contours. Settlement of trench backfill must be repaired.

6.6.3.24.2 In forested systems, it is necessary to only grub the pipe centerline. Excessive clearing and grubbing must be avoided. Clearing for above-ground piping systems shall involve only vegetation that will interfere with operation of the system.

6.6.3.24.3 All areas disturbed by construction must be re-vegetated prior to initiation of irrigation activities.

6.6.3.24.4 Sloped areas require protection from erosion.

6.6.3.24.5 Pressure testing of the irrigation force mains and laterals shall be conducted during installation to avoid damage to spray fields from re-excavation and repair. Flushing is necessary to clear distribution system pipes of construction debris which will clog sprinkler nozzles. Care should be exercised to prevent erosion or flooding of the spray fields during pipeline flushing. Every effort should be made to keep trash and debris out of the distribution systems. Sprinklers and drain valves shall be checked for proper operation prior to installation.

6.6.3.24.6 Wastewater irrigation on bare soil is not allowed beyond what is necessary for germination to establish a vegetative cover. Wastewater application, at the design rate, may begin only after a uniform vegetative cover has been established.

6.6.3.24.7 Spray fields should be constructed early in the project so a vegetative cover can be re-established on disturbed areas before wastewater irrigation begins.

6.6.3.24.8 Potable, ground or surface water must be used for distribution system testing unless authorized in writing by the Department.

6.6.3.24.9 One (1) growing season may be necessary before new spray fields will accept the design wastewater loading. This start-up period must be considered in the design and operation of these systems.

6.7 General Operation and Maintenance Requirements

6.7.1 The permittee must properly maintain and operate all structures, pipelines, systems and equipment for treatment control and monitoring which are used by the permittee to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes, but is not limited to, effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures.

6.7.2 Adverse Impact

6.7.2.1 The permittee shall take all steps to minimize any adverse impact to the Waters of the State resulting from operation under the permit. Such steps may include, but not be limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or mitigation of such impacts.

6.7.2.2 Operation & Maintenance Plan (O&M Plan)

Following the construction of the facility, the permittee shall submit an O&M Plan detailing the operations of the wastewater treatment facility, the conveyance system, and the disposal system to the Department for review. The permittee shall operate and maintain the land treatment system in accordance with the approved O&M Plan. The O&M Plan must include, but not limited to, the following:

6.7.2.2.1 General

6.7.2.2.1.1 A narrative description and process design summary for the wastewater treatment facility and disposal system including the design wastewater flow and design wastewater characteristics.

6.7.2.2.1.2 A map of the wastewater treatment facility showing the treatment system, storage pond(s), disposal system (e.g. spray fields, RIB area(s)) buffer zones, roads, streams, drainage system discharges, monitoring wells, etc.

6.7.2.2.1.3 A map of interceptor sewers, force mains and major pump stations connected to the wastewater treatment facility, indicating size and capacity.

6.7.2.2.1.4 A schematic and plan of the treatment system and storage pond(s) identifying all pumps, valves and process control points.

6.7.2.2.1.5 A schematic and plan of the disposal distribution system identifying all pumps, valves, gauges, sprinklers, etc.

6.7.2.2.1.6 A copy of the current large system operation permit.
6.7.2.2.1.7 A copy of any other relevant Department permits (e.g. National Pollutant Discharge Elimination System (NPDES) Permit, Biosolids Permit).
6.7.2.2.2 Management and Staffing
6.7.2.2.2.1 Outline of management's responsibilities and duties.
6.7.2.2.2.2 Outline of staffing requirements and duties.
6.7.2.2.2.3 Describe the various job titles, number of positions, qualifications, experience, training, etc.
6.7.2.2.2.4 Define the work hours, duties and responsibilities of each staff member.
6.7.2.2.3 Facility Operation and Maintenance
6.7.2.2.3.1 Treatment system operation and maintenance
6.7.2.2.3.1.1 Operators manual
6.7.2.2.3.1.2 Process control manual
6.7.2.2.3.1.3 O&M manual for all mechanical components of the facility
6.7.2.2.3.1.4 Maintenance schedules and procedures
6.7.2.2.3.1.5 Provide troubleshooting procedures for common or expected problems
6.7.2.2.3.1.6 O&M of back-up, stand-by and support equipment
6.7.2.2.3.2 Disposal System Operation and Maintenance
6.7.2.2.3.2.1 Discuss the design life of the disposal system and identify factors that may shorten its useful life, including procedures or precautions which will compensate for these limitations.
6.7.2.2.3.2.2 Start-up and shut-down procedures
6.7.2.2.3.2.3 System maintenance
6.7.2.2.3.2.4 Equipment inspection schedules
6.7.2.2.3.2.5 Equipment maintenance schedules
6.7.2.2.3.2.6 Discuss operating procedures for adverse conditions
6.7.2.2.3.2.6.1 Wet weather
6.7.2.2.3.2.6.2 Freezing weather
6.7.2.2.3.2.6.3 Saturated soil
6.7.2.2.3.2.6.4 Excessive winds
6.7.2.2.3.2.7 Electrical and mechanical malfunctions
6.7.2.2.3.2.8 Provide troubleshooting procedures for common or expected problems
6.7.2.2.3.2.9 O&M of back-up, stand-by and support equipment
6.7.2.2.3.2.10 System specific considerations
6.7.2.2.3.2.10.1 RIB
6.7.2.2.3.2.10.1.1 System maintenance
6.7.2.2.3.2.10.1.1.1 Dosing schedule and dosing volume(s)
6.7.2.2.3.2.10.1.2 Operation and maintenance
6.7.2.2.3.2.10.1.2.1 Infiltration testing
6.7.2.2.3.2.10.1.2.2 Basin maintenance
6.7.2.2.3.2.10.1.3 Vegetation management
6.7.2.2.3.2.10.1.3.1 Berm maintenance
6.7.2.2.3.2.10.2 Spray irrigation system maintenance
6.7.2.2.3.2.10.2.1 Wastewater application

6.7.2.2.3.2.10.2.1.1 Wastewater loading rate (inches/week)
6.7.2.2.3.2.10.2.1.2 Wastewater application rate (inches/hour)
6.7.2.2.3.2.10.2.1.3 Spray field application cycles
6.7.2.2.3.2.10.2.1.4 Organics, metals, nitrogen, and phosphorus loading (lbs/acre per month, etc.)
6.7.2.2.3.2.10.2.2 Spray irrigation system operation and maintenance
6.7.2.2.3.2.10.2.2.1 Storage pond(s)
6.7.2.2.3.2.10.2.2.2 Irrigation pump station(s)
6.7.2.2.3.2.10.2.2.3 Spray field force main(s) and laterals
6.7.2.2.3.2.10.2.2.4 Irrigation equipment
6.7.2.2.3.2.10.2.3 Vegetation management
6.7.2.2.3.2.10.2.3.1 Discuss how the selected cover crop is to be established, monitored and maintained; how the irrigation schedule will be altered during harvest and regeneration
6.7.2.2.3.2.10.2.3.2 Discuss cover crop cultivation procedures, harvesting schedules and crop uses
6.7.2.2.3.2.10.2.3.3 Discuss buffer zone vegetative cover and its maintenance
6.7.2.2.3.2.10.3 Subsurface disposal systems
6.7.2.2.3.2.10.3.1 Dosing controls
6.7.2.2.3.2.10.3.2 Dosing volume and schedule
6.7.2.2.3.2.10.3.3 Inspection of disposal area(s)
6.7.2.2.3.2.10.3.4 Vegetative cover
6.7.2.2.3.2.10.3.5 Common signs of system specific expected problems and relative troubleshooting procedures.
6.7.2.2.4 Monitoring Program
6.7.2.2.4.1 Sampling procedures, frequency, location and parameters for:
6.7.2.2.4.1.1 Treatment system
6.7.2.2.4.1.1.1 Influent and effluent
6.7.2.2.4.1.2 Disposal system
6.7.2.2.4.1.2.1 Groundwater monitoring wells
6.7.2.2.4.1.2.2 Surface water
6.7.2.2.4.1.2.3 Storage pond(s)
6.7.2.2.4.1.2.4 Lysimeters
6.7.2.2.4.2 Soil sampling and testing
6.7.2.2.4.3 Monitoring ambient conditions
6.7.2.2.4.3.1 Precipitation
6.7.2.2.4.3.2 Wind speed
6.7.2.2.4.3.3 Soil moisture
6.7.2.2.4.4 Interpretation of monitoring results and effect on facility operation
6.7.2.2.4.4.1 Treatment system
6.7.2.2.4.4.2 Disposal system
6.7.2.2.4.4.3 Groundwater
6.7.2.2.4.4.4 Soils
6.7.2.2.5 Records and Reports
6.7.2.2.5.1 Maintenance records

6.7.2.2.5.1.1 Preventive
6.7.2.2.5.1.2 Corrective
6.7.2.2.5.2 Monitoring reports and/or records
6.7.2.2.5.2.1 Treatment system and storage pond(s)
6.7.2.2.5.2.1.1 Influent flow
6.7.2.2.5.2.1.2 Influent and effluent wastewater characteristics
6.7.2.2.5.2.2 Disposal system
6.7.2.2.5.2.2.1 Wastewater volume applied to disposal system
6.7.2.2.5.2.2.2 Disposal system operation scheduling
6.7.2.2.5.2.2.3 Loading rates
6.7.2.2.5.2.3 Annual record of groundwater depth
6.7.2.2.5.2.4 Surface water parameters
6.7.2.2.5.2.5 Soils data
6.7.2.2.5.2.6 Rainfall and climatic data
6.7.2.2.6 Emergency and Contingency Planning

6.7.3 An operator log must be kept on site at all times. Each section of the disposal system shall be numbered and referred to by number in the operator log. All records and reports shall also be kept in a bound log book and available upon request for review by the Department. Copies of operating log books shall be provided at the request of the Department. This log shall, at a minimum, include the following applicable items:

6.7.3.1 Time spent at the treatment facility on any date.

6.7.3.2 Details of the operation and maintenance performed on the wastewater treatment and disposal system on any date.

6.7.3.3 The volume of wastewater discharged to each section of the disposal system on any date and the acreage over which the wastewater was distributed.

6.7.3.4 Identification of those portions of the disposal system that were ponding on any date.

6.7.3.5 A record of any deviations from the operation and maintenance manual.

6.7.3.6 General daily weather conditions.

6.7.3.7 A site map showing the disposal area with each RIB, absorption facility or center pivot or solid set spray zone numbered.

6.7.3.8 A record of all actions taken to correct violations of the 7 **Del.C.**, Ch. 60, Department regulations and permit conditions.

6.7.3.9 A record of all site management activities undertaken such as RIB maintenance, planting, reseeding, harvesting of crops, commercial fertilizer applications and any other chemical additions or applications.

6.7.3.10 Identify any RIB that is ponded for more than 72 hours.

6.7.3.11 Loading and resting periods for each dosing event of any large system must be documented.

6.7.3.12 Record the date, volumes and destination of biosolids removed from the facility. This shall be completed by measuring the tank level before and after the biosolids removal and calculating the volume accordingly.

6.7.4 Organic chemical septic tank cleaning agents shall not be used in large on-site wastewater treatment and disposal systems.

6.7.5 Grease traps shall be cleaned when 75% of the grease retention capacity has been reached.

6.7.6 The sites of the initial and replacement absorption facilities shall not be covered by impervious materials subject to vehicular traffic or other activity which would adversely affect the soils. These sites must be maintained so that they are free from encroachments by accessory buildings and additions to the main building.

6.7.7 The Department may impose specific operation and maintenance requirements for large on-site wastewater treatment and disposal systems to assure continuity of performance.

6.7.8 Large systems which serve communities that experience a significant variation in flow on an annual basis, may be prescribed specific criteria in the permit for taking certain treatment units out of service during periods of low flow. The criteria will establish procedures for winterization and restart.

6.8 Monitoring Requirements

6.8.1 Groundwater Monitoring

6.8.1.1 A groundwater monitoring network shall be constructed to ensure wastewater-related contaminants are detected and quantified. The monitoring network must account for nearby wells and surface water bodies. Wells installed for the Hydrogeologic Suitability Report (HSR) may be used for long-term groundwater compliance monitoring provided they are constructed and classified according to Delaware Regulations Governing the Construction and Use of Wells and are located in positions suitable to provide representative samples.

6.8.1.2 Any monitor wells constructed after the completion of the HSR must have a minimum of three (3) groundwater samples collected and analyzed to establish ambient conditions in the new well(s) (see Section 6.2.3.5).

6.8.1.3 Spray irrigation systems require a minimum of six (6) monitor wells (MWs): one (1) upgradient, two (2) downgradient, one (1) within the wetted field, one (1) up gradient and one (1) down gradient of the treatment and storage pond(s).

6.8.1.4 All systems other than spray irrigation will require a minimum of four (4) MWs: one (1) upgradient, one (1) within, and two (2) downgradient of the proposed disposal area.

6.8.1.5 The Department may require additional wells depending on site or project characteristics.

6.8.1.6 All RIB systems with a design flow ≥ 100,000 gpd shall install a minimum of three (3) nested monitor well sets with each nest having a minimum of two (2) wells with varying depths and screen intervals. The nested wells shall be located and constructed based on a particle tracking analysis in the numerical model developed for the groundwater mounding analysis in the HSR.

6.8.1.7 Groundwater monitoring shall be performed on a quarterly basis unless otherwise required by the Department.

6.8.1.8 Groundwater sampling shall include the following parameters unless otherwise required by the Department:

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
pH	S.U.	Quarterly	Field Test
Temperature	°F	Quarterly	Field Test
Specific Conductance	µS/cm	Quarterly	Field Test
Dissolved Oxygen	mg/L	Quarterly	Field Test
Depth to Water Table	Hundredth of a foot	Quarterly	Field Test
Ammonia Nitrogen	mg/L	Quarterly	Grab
Nitrate + Nitrite Nitrogen	mg/L	Quarterly	Grab
Total Nitrogen	mg/L	Quarterly	Grab
Total Coliforms	Col/100 ml	Quarterly	Grab
Fecal Coliform	Col/100 ml	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab
Sodium	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Total Dissolved Solids	mg/L	Quarterly	Grab

6.8.1.9 Specific conductance, pH, temperature, and dissolved oxygen shall be measured using a calibrated field meter during well purging, which should be performed using either a submersible or peristaltic pump. Once the field parameters have stabilized, a groundwater sample shall be obtained for the parameters listed above and analyzed by a certified laboratory.

6.8.1.10 All large systems ≥ 100,000 gpd and all RIBs regardless of size must maintain, at a minimum, one (1) monitor well within the disposal area with a pressure transducer to record water levels. Pressure transducer readings must, at a minimum, be recorded at a one (1) hour frequency. These readings shall be maintained and made available to the Department upon request.

6.8.1.11 Ensure that the water levels are consistently taken directly below the points where the TOC elevations were read.

6.8.1.12 Exceptions to monitoring requirements may be considered by the Department.

6.8.2 Influent and Effluent Monitoring

6.8.2.1 Influent samples may be grab samples collected in accordance with the process control requirements.

6.8.2.2 The applicable effluent samples shall be collected using a composite sampler.

6.8.2.3 All influent and effluent samples shall be tested for the following parameters unless otherwise specified in the permit:

Parameter	Unit Measurement	Monitoring Frequency	Sample Type	
			Influent	Effluent
Flow	Gallons Per Day	Continuous	Recorded	Recorded
BOD_5	mg/L	2 x Month	Grab	Composite
TSS	mg/L	2 x Month	Grab	Composite
Total Dissolved Solids	mg/L	Quarterly	NA	Grab
Fecal Coliform	Col/100 ml	Quarterly	NA	Grab
Total Nitrogen	mg/L	2 x Month	Grab	Composite
Ammonia Nitrogen	mg/L	Monthly	Grab	Composite
Nitrate/Nitrite as Nitrogen	mg/L	Monthly	Grab	Composite
pH	S.U.	3 x per week	Grab	Composite
Total Phosphorus	mg/L	Monthly	Grab	Composite
Chloride	mg/L	Quarterly	Grab	Composite

6.8.2.4 Quality Assurance Practices

6.8.2.4.1 The permittee is required to show the validity of all effluent monitoring and groundwater monitoring data by requiring its laboratory to adhere to the following minimum quality assurance practice:

6.8.2.4.1.1 Duplicate[1] and spiked[2] samples must be run for each effluent monitoring and groundwater monitoring constituent in the permit on 5% of the samples, or at least on one sample per quarter, whichever is greater. If the analysis frequency is less than one sample per quarter, duplicate and/or spiked samples must be run for each analysis.

[1]Duplicate samples are not required for the following parameters: color, temperature, and turbidity.

[2]Spike samples are not required for the following parameters: Acidity, Alkalinity, Bacteriological, Benzidine, Chlorine, Color, Dissolved Oxygen, Hardness, pH, Oil & Grease, Radiological, Residues, Temperature, Turbidity, BOD_5 and Total Suspended Solids.

6.8.2.4.1.2 For spiked samples, a known amount of each constituent is to be added to the discharge sample. The amount of constituent added should be approximately the same amount present in the unspiked sample, or must be approximately that stated as maximum or average in the discharge permit.

6.8.2.4.1.3 The data resulting from 6.8.2.4.1.1 and 6.8.2.4.1.2 shall be summarized in the annual report in terms of precision; percent recovery; number of duplicate and spiked samples run; date and laboratory log number of samples run, and name of analyst.

6.8.2.4.1.4 Precision shall be calculated by the standard deviation (s) formula $s = (\Sigma d^2/k)^{.5}$ where d is the difference between duplicate results and k is the number of duplicate pairs used in the calculations.

6.8.2.4.1.5 Percent recovery (R) shall be reported on the basis of the formula $R = 100\ (F-I)/A$ where F is the analytical result of the spiked sample, I is the result before spiking of the sample, and A is the amount of constituent added

to the sample.

6.8.2.4.1.6 The percent recovery in Quality Assurance Practice shall be summarized yearly in terms of mean recovery and standard deviation from the mean. The formula, s = $[\sum((x-\bar{x})^2)/(n-1)]^{1/2}$ where s is the standard deviation around the mean $x-\bar{x}$, x is an individual recovery value, and n is the number of data points, shall be applied.

6.8.2.4.1.7 The permittee or contract laboratory is required to annually analyze an external quality control reference sample for each pollutant. These are available through the EPA regional quality assurance coordinator. Results shall be included in the annual report Quality Assurance Practice, see Section 6.8.2.4.1.3.

6.8.2.4.1.8 The permittee and/or contract laboratory is required to maintain an up-to-date and continuous record of the method used, any deviations from the method or options employed in the reference method, reagent standardization, equipment calibration and the data obtained in Quality Assurance Practices, see Sections 6.8.2.4.1.1, 6.8.2.4.1.2 and 6.8.2.4.1.6.

6.8.2.4.1.9 If a contract laboratory is utilized, the permittee shall report the name and address of the laboratory and the parameters analyzed together with the monitoring data required.

6.8.3 Soils Monitoring

6.8.3.1 Three (3) composite soil samples from each major soil series must be collected and analyzed for the parameters below. Soil pH is an indicator of changes in soil chemistry. If soil pH remains constant, analysis of cation exchange capacity and percent base saturation is not required. If the soil pH changes by one (1) unit, analysis of these parameters will be required.

Parameter	Unit Measurement	Measurement Frequency	Sample Type
pH	S.U.	Annually	Soil Composite
Organic Matter	%	Annually	Soil Composite
Phosphorus (as P_2O_5)	mg/kg	Annually	Soil Composite
Potassium	mg/kg	Annually	Soil Composite
Total Nitrogen	mg/L	Quarterly	Soil Composite
Nitrate as Nitrogen	mg/L	Quarterly	Soil Composite
Sodium Adsorption Ratio	meq/100g	Annually	Soil Composite
Cadmium	mg/kg	Once per 4 years	Soil Composite
Nickel	mg/kg	Once per 4 years	Soil Composite
Lead	mg/kg	Once per 4 years	Soil Composite
Zinc	mg/kg	Once per 4 years	Soil Composite
Copper	mg/kg	Once per 4 years	Soil Composite
Cation Exchange Capacity	meq/100g	*Only if soil pH changes significantly	Soil Composite
Phosphorus Adsorption	meq/100g	**Only if soil phosphorus levels become excessive for plant growth	Soil Composite
Percent Base Saturation	%	*Only if soil pH changes significantly	Soil Composite

* A significant change in soil pH is defined as a change of one (1) or more standard units (S.U.) from the original value established in the Design Engineer Report.

** Excessive levels of soil phosphorus are defined by the Delaware Nutrient Management Commission. Soil phosphorus levels must be tested in accordance with the University of Delaware soil testing methods (Gartley, 2002). If the soil phosphorus levels become excessive, the permittee must perform a Phosphorus Site Index (PSI) study. The results must be submitted to the GDS within 30 days of study completion. Based on these, the GDS may require the permittee to submit a plan detailing steps to reduce the phosphorus loading rates at the site.

6.8.3.2 Wastewater systems receiving industrial process wastes or water treatment facility residuals may be required to monitor metals, salts or other pollutants in soils and vegetation. The parameters and monitoring frequencies will be determined on a case by case basis.

6.8.4 Lysimeter Percolate Monitoring

6.8.4.1 To allow for percolate monitoring, a minimum of one (1) pore-liquid sampler (lysimeter) as defined in ASTM Standard (D 4696) (Standard Guide for Pore-Liquid Sampling from the Vadose Zone) must be installed within the disposal area.

6.8.4.2 For existing systems, if lysimeter data exceeds permitted performance

standards for any parameter required to be monitored, on an average annual basis, the Department will review the ground water monitoring data to determine if any down gradient monitoring wells exceed permitted performance standards for those parameters on an average annual basis. No existing facility will be found in violation of the permitted performance standards unless the down gradient monitoring well data also exceeds the required parameters on an average annual basis. The lysimeter data will be used as an early indicator of potential permit exceedence.

6.8.4.3 The constituents are listed below in highest priority. In the event that enough sample volume is not obtained to test for all parameters listed, the sample shall be tested for as many constituents possible.

Parameter	**Unit Measurement**	**Measurement Frequency**	**Sample Type**
Total Nitrogen	mg/L	Monthly	Grab
Total Phosphorus	mg/L	Monthly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Monthly	Grab
Ammonia as Nitrogen	mg/L	Monthly	Grab
Chloride	mg/L	Monthly	Grab
Sodium	mg/L	Monthly	Grab
Total Dissolved Solids	mg/L	Monthly	Grab
pH	S.U.	Monthly	Field Test
Specific Conductance	µS/cm	Monthly	Field Test
Temperature	°C	Monthly	Field Test

6.8.5 Monitoring Reporting

6.8.5.1 Monitoring results obtained during the previous one (1) month/quarter shall be summarized and reported on an approved monitoring report form(s) postmarked no later than the 28th day of the month following the completed reporting period. Unless otherwise specified in the permit, signed reports/forms and field data shall be submitted to the Department at the following address:

Delaware Department of Natural Resources and Environmental Control
Groundwater Discharges Section/Large Systems Branch
89 Kings Highway
Dover, DE 19901
Telephone: (302) 739-9948
Fax: (302) 739-7764

6.8.5.2 All field sampling logs and laboratory results for samples obtained from a well shall be identified by the DNREC ID affixed to the well.

6.8.5.3 If the permittee monitors any parameter at the location(s) designated in the permit more frequently than required, using approved analytical methods, the results shall be reported to the Department on an approved monitoring report form. Such increased frequency shall also be indicated.

6.8.6 Monitoring modifications

6.8.6.1 Requests for monitoring modifications must be submitted to the Department in writing. Such requests must clearly state the reason for and nature of the proposed modification and, where applicable, must contain supporting scientific information, analysis, and justification. Requests will be addressed by the Department on a case by case basis.

6.9 Annual Report

6.9.1 The permittee shall submit to the Department an annual report summarizing the operations, management, administration and maintenance of the facility for the calendar year. The annual report must be submitted to the Department on or before February 28th of each year. The report must be submitted to the address identified in Section 6.8.4 unless otherwise specified in the facility's permit. The report must, at a minimum, include the following applicable items. The report must also include any additional items specified in the facility's permit.

6.9.1.1 Influent flow to treatment system

6.9.1.1.1 Total annual flow

6.9.1.1.2 Annual average daily flow

6.9.1.1.3 Average monthly flow

6.9.1.1.4 Peak monthly flow

6.9.1.2 Effluent flow to disposal system

6.9.1.2.1 Total annual flow

6.9.1.2.2 Annual average daily flow

6.9.1.2.3 Average monthly flow

6.9.1.2.4 Peak monthly flow

6.9.1.3 Total number of equivalent dwelling units connected to the system.

6.9.1.4 Number of equivalent dwelling units connected to the system during the calendar year.

6.9.1.5 Effluent BOD_5 annual average concentration.

6.9.1.6 Effluent TSS annual average concentration.

6.9.1.7 Effluent total nitrogen annual average concentration and annual total nitrogen mass load.

6.9.1.8 Effluent total phosphorus annual average concentration and annual total phosphorus mass load.

6.9.1.9 Biosolids removed (total gallons).

6.9.1.10 Daily rainfall, temperature, wind speed and direction.

6.9.1.11 Operational and maintenance activities.

6.9.1.12 Vegetative management practices followed during the previous year and anticipated for the coming year.

6.9.1.13 Documentation verifying the calibration of influent and effluent flow meters.

6.9.1.14 Spray irrigation facilities:

6.9.14.1 The annual volume of wastewater spray irrigated on each field with the total nitrogen and phosphorus loading applied from all sources to each field in pounds per acre per field as well as total pounds of nitrogen and phosphorus

removed through crop uptake.

6.9.14.2 Nitrogen balance calculation spreadsheet using actual effluent, nitrogen monitoring data and any additional applied nitrogen.

6.9.14.3 A chemical analysis of soils from each field for the soil monitoring constituents identified in the permit.

6.9.14.4 Identification of those portions of the field(s) which have been prone to ponding, pooling or runoff.

6.9.14.5 The type and amount of crop removed from each field.

6.9.2 All records and information resulting from the monitoring activities required by the construction or operation permit or these Regulations including all records of performed analyses, calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation shall be retained for five (5) years. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee or as requested by the Department.

6.10 Temporary Holding Tank

A permit must be obtained from the Department prior to the construction, operation, maintenance or repair of a temporary holding tank. In order to obtain a permit, the applicant must submit a permit application (see Section 6.10.3) to the Department for review and approval. A temporary holding tank permit shall not exceed a five (5) year period and may be extended at the discretion of the Department.

6.10.1 Temporary holding tank permits may be issued for large systems when:

6.10.1.1 A permit to construct the wastewater treatment and disposal system has been issued by the Department and is still valid.

6.10.1.2 A permit to construct the wastewater conveyance system, including all lift stations and force mains has been issued by the Department.

6.10.1.3 Construction of the wastewater treatment and disposal system has been initiated.

6.10.1.4 A construction completion schedule demonstrates the construction of the wastewater treatment and disposal system will be completed prior to the expiration date of the temporary holding tank permit.

6.10.1.5 The number of dwellings to be served by the temporary holding tank permit is at the discretion of the Department and will be based on the design flows, number of equivalent dwelling units and the minimum volume of wastewater necessary to properly operate the initial train of the wastewater treatment facility.

6.10.1.6 Holding tanks shall be equipped with a visual and/or audible alarm system that indicates when the tank is 90% full. An alarm which utilizes off-site notification may be used in lieu of the visual and audible alarm system.

6.10.2 Regional Temporary Holding Tank

6.10.2.1 A temporary holding tank permit for a satellite subdivision that will connect to a utility or government owned regional facility may be issued to the utility or government agency when:

6.10.2.1.1 A permit to construct a regional wastewater treatment and disposal facility has been issued by the Department and is still valid.

6.10.2.1.2 A construction completion schedule that demonstrates the construction of the regional facility, force main, lift station(s) and appurtenances

from the satellite subdivision to the regional facility will be completed prior to the expiration date of the temporary regional holding tank permit.

6.10.2.2 The maximum amount of units to be connected to a regional temporary holding tank system shall be 49. Additional connections to the regional temporary holding tank system will not be permitted.

6.10.3 The permit application must include all of the following applicable items:

6.10.3.1 DNREC application form.

6.10.3.2 Applicable Departmental fees.

6.10.3.3 Project overview.

6.10.3.4 Zoning certificate.

6.10.3.5 Design flows.

6.10.3.6 Number of equivalent dwelling units that will be served.

6.10.3.7 Design drawings including location.

6.10.3.8 Design and sizing calculations.

6.10.3.9 System technical specifications.

6.10.3.10 Alarm system specifications.

6.10.3.11 Non-Hazardous Liquid Waste Transporters Permit.

6.10.3.12 A copy of the agreement with a licensed operator and license certification.

6.10.3.13 Legal documentation of the agreement between the owner and a utility provider.

6.10.3.14 A county conditional use ordinance approval.

6.10.3.15 A CPCN for the development.

6.10.4 General Conditions

6.10.4.1 The capacity of the temporary holding tank must be designed for a minimum of two (2) days capacity at design flows of 300 gpd/dwelling unit provided the applicant submits an executed contract with a licensed liquid waste hauler to inspect and pump the temporary holding tank levels every two (2) days.

6.10.4.2 Holding tanks shall be equipped with a visual and/or audible alarm system that indicates when the tank is 90% full. An alarm which utilizes off-site notification may be used in lieu of the visual and audible alarm system.

6.10.4.3 See Section 6.6 for construction requirements.

6.11 Distribution of Treated Wastewater

6.11.1 Distribution of treated wastewater for disposal, reuse, or any other purpose is prohibited without first obtaining a permit from the Department addressing the activity.

6.11.2 Any person receiving and reusing treated wastewater must have a permit from the Department and/or must be receiving the treated wastewater in accordance with a permit issued by the Department specifically authorizing the activity.

6.11.3 General design considerations for wastewater treatment facilities distributing treated wastewater

6.11.3.1 Distributed wastewater must be treated, filtered and meet the treatment requirements for the specific purpose of its use but at a minimum of limited public access levels as specified in Section 6.3.2.3.3.1.

6.11.3.2 Distributed treated wastewater must meet PSN1 and PSP1 limits for non-irrigation activities and for irrigation activities that are not required to have a Nutrient Management Plan.

6.11.3.3 Back flow controls must be installed if the distribution line will also be connected to a ground, surface or fresh water supply. Also refer to the Regulations Governing the Construction and Use of Wells.

6.11.3.4 A low pressure detection system to automatically shut down distribution pumps in the event of force main, sub-main or lateral blowout is required.

6.11.3.5 A high pressure shut-off at the distribution pump station is required.

6.11.3.6 Wastewater treatment facilities permitted to distribute treated wastewater will be evaluated by the Department as to whether or not they will receive an increase in the permitted disposal capacity for the volume distributed.

6.11.4 Application Requirements

6.11.4.1 Any utility, municipality or wastewater treatment facility proposing to provide treated wastewater for distribution must submit to the Department an application for a permit.

6.11.4.2 When possible, the applicant shall provide electronic copies, in addition to hard copies, of all submittals. Providing the electronic copies in a searchable format may expedite the review of the application.

6.11.4.3 The application must include, at a minimum, the following information as applicable and must bear the signature and seal of a Delaware licensed Professional Engineer:

6.11.4.3.1 Application form.

6.11.4.3.2 Applicable fees.

6.11.4.3.3 A list of all sites and users of the treated wastewater to include type of use of the wastewater.

6.11.4.3.4 Tax map numbers for proposed reuse site.

6.11.4.3.5 Zoning certificates for proposed reuse site.

6.11.4.3.6 Conditional use approval from the appropriate County.

6.11.4.3.7 Permit from the Department for distribution piping. A separate application must be submitted to obtain a permit for the force mains that will be installed to distribute the treated wastewater.

6.11.4.3.8 Which watershed the proposed use will be located including the 12 digit HUC (Hydrologic Unit Code).

6.11.4.3.9 Any relevant mapping, including delineation of wetlands, watercourses and ditches.

6.11.4.3.10 Details on the level of treatment proposed.

6.11.4.3.11 Details on any necessary facility upgrades, the force mains to each distribution point, showing connection points, irrigation equipment and redundant back flow controls if the pivots will also be connected to a fresh water supply.

6.11.4.3.12 A process flow diagram including the sample points for compliance monitoring and the location of flow meters. The process flow diagram must demonstrate provisions for ensuring water not meeting the treatment requirements is recycled through the treatment process and not distributed. Indicate on the process flow diagram the intended locations for effluent sampling monitoring.

6.11.4.3.13 A prioritization of treated wastewater allocation between all dedicated spray fields, farm lands, park lands, golf courses, and any other distribution or disposal points.

6.11.4.3.14 The proposed concentrations of total nitrogen and total phosphorus in the treated effluent.

6.11.4.3.15 Wastewater treatment facilities distributing treated wastewater for land application on areas that are not required to have a Nutrient Management Plan by the Delaware Department of Agriculture must provide detailed monthly nutrient loading calculations. Calculations must account for application of nutrients from treated wastewater and commercial fertilizers.

6.11.4.4 Site assessment must include the following, if applicable:

6.11.4.4.1 Abandoned wells within the reuse/disposal area must be identified as well as all domestic, irrigation, commercial, industrial, and public wells within 1,000 feet of the reuse/disposal area.

6.11.4.4.2 A report summarizing the results of the soils sampling and the calculated remaining site life on a constituent by constituent basis in accordance with Section 6.5.4.3.1.1.7.2.

6.11.5 Operation and Maintenance Requirements

6.11.5.1 The wastewater treatment facility must provide to the Department an amended Operation and Maintenance Plan addressing the distribution of treated wastewater.

6.11.6 Monitoring Requirements

6.11.6.1 Treated Wastewater Monitoring Requirements

Monitoring requirements for the treated wastewater provided to all recipients must be as follows unless otherwise stipulated in the operation permit.

Parameter	Unit Measurement	Monitoring Frequency	Sample Type	Sampling Location
Effluent Flow	Gal/day	Continuous	Recorded/ Totalized	After storage, prior to distribution
Turbidity	NTU	Continuous	Recorded	Prior to storage
Total Residual Chlorine	mg/l	Continuous	Recorded	After storage, prior to distribution
pH	S.U.	Daily	In-situ	After storage, prior to distribution
BOD_5	mg/L	Twice per month	Composite	Prior to storage
Total Suspended Solids	mg/L	Twice per month	Composite	Prior to storage
Ammonia Nitrogen	mg/L	Twice per month	Composite	After storage, prior to distribution
Chloride	mg/L	Twice per month	Composite	After storage, prior to distribution
Nitrate + Nitrite Nitrogen	mg/L	Twice per month	Composite	After storage, prior to distribution
Organic Nitrogen	mg/L	Twice per month	Calculation	After storage, prior to distribution
Potassium	mg/L	Twice per month	Composite	After storage, prior to distribution
Sodium	mg/L	Twice per month	Composite	After storage, prior to distribution
Total Nitrogen	mg/L	Twice per month	Composite	After storage, prior to distribution
Total Phosphorus	mg/L	Twice per month	Composite	After storage, prior to distribution
Fecal Coliform	Col/100 ml	Twice per month	Grab	After storage, prior to distribution
Cadmium	mg/L	Annually – performed in the beginning of April	Composite	After storage, prior to distribution
Copper	mg/L	Annually – performed in the beginning of April	Composite	After storage, prior to distribution
Lead	mg/L	Annually – performed in the beginning of April	Composite	After storage, prior to distribution
Nickel	mg/L	Annually – performed in the beginning of April	Composite	After storage, prior to distribution
Zinc	mg/L	Annually – performed in the beginning of April	Composite	After storage, prior to distribution

6.11.6.2 Soil Monitoring Requirements

If the treated wastewater is to be reused for irrigation activities, background and decennial soils sampling must be performed for the parameters listed below. A minimum of one (1) composite sample must be taken for each 50 acre area, unless otherwise provided in the permit.

Parameter	Unit Measurement	Sample Type
pH	S.U.	Soil Composite
Organic Matter	%	Soil Composite
Phosphorus (as P_2O_5)	mg/kg	Soil Composite
Potassium	mg/kg	Soil Composite
Sodium Adsorption Ratio		Soil Composite
Cadmium	mg/kg	Soil Composite
Nickel	mg/kg	Soil Composite
Lead	mg/kg	Soil Composite
Zinc	mg/kg	Soil Composite
Copper	mg/kg	Soil Composite
Cation Exchange Capacity	meq/100g	Soil Composite
Phosphorus Adsorption	meq/100g	Soil Composite
Percent Base Saturation	%	Soil Composite

6.11.6.2.1 The site assimilative capacity for cadmium, copper, lead, nickel, zinc and phosphorus must be determined via calculation on a constituent by constituent basis to determine the site life for each reuse area receiving the treated wastewater.

6.11.6.2.2 The cumulative metal loading to each reuse area must not exceed the values set forth in Exhibit HH. The number of years treated wastewater may be applied to a site must be based on the allowable cumulative metal loading values set forth in Exhibit HH. Providing treated wastewater to any particular reuse area must cease when any one of the cumulative metal limits is reached for that area.

6.11.6.2.3 Prior to the initiation of any reuse activity, and every 10 years thereafter, a report must be submitted to the Department containing the following information for each reuse area:

6.11.6.2.3.1 The results of the soils sampling.

6.11.6.2.3.2 The calculated remaining site life on a constituent by constituent basis for phosphorus, cadmium, copper, lead, nickel and zinc.

6.11.7 Reporting

6.11.7.1 The Wastewater Treatment Facility must report the following information to:

6.11.7.1.1 The Department:

6.11.7.1.1.1 Monthly - The quality and quantity of the treated wastewater provided to each of the recipients on a monthly basis.

6.11.7.1.1.2 Annual - An Annual Summary Report that summarizes all parameters monitored as required in Section 6.9. The report must include the annual volume of wastewater provided to each recipient and any additional items specified in the permit. If the recipient is reusing the treated wastewater for agricultural use in accordance with 3 **Del.C.** §2301, the report must also include the total nitrogen, total phosphorus, potassium and metals loading to each recipient reported in pounds. The cumulative metals loading must also be calculated and reported. The total number of acres under irrigation for each recipient for that reporting year must also be indicated.

6.11.7.1.1.3 Decennial - Results of soils sampling and the calculated remaining site life on a constituent by constituent basis for phosphorus, cadmium, copper, lead, nickel and zinc.

6.11.7.1.2 Recipients of treated wastewater:

6.11.7.1.2.1 Weekly - The quantity of treated wastewater provided to each recipient on a weekly basis.

6.11.7.1.2.2 Monthly - Copies of all effluent monitoring results.

6.11.7.1.2.3 Annual - A copy of the Annual Summary Report.

6.11.8 Agricultural Use of Distributed Treated Wastewater

Agricultural use of distributed treated wastewater is the distribution of treated wastewater to farmers for irrigation of agricultural crops in accordance with 3 **Del.C.** §2301. Sites using treated wastewater in accordance with 3 **Del.C.** §2301 which have incorporated the use of treated wastewater in a Delaware Department of Agriculture approved Nutrient Management Plan are exempt from the requirements of Sections 6.0 through Section 6.10, and Section 6.12 of these Regulations unless specifically referenced within this Section 6.11. Wastewater treatment facilities proposing to distribute treated wastewater for agricultural use must comply with all requirements set forth in Section 6.11 and must adhere to the requirements of this Section 6.11.8.

6.11.8.1 General Requirements

6.11.8.1.1 Wastewater treatment facilities permitted to distribute treated wastewater to farmers will not receive an increase in the permitted disposal capacity for the volume distributed.

6.11.8.1.2 Providing treated wastewater to farmers to utilize in accordance with 3 **Del.C.** §2301 must not cause the quality of Delaware's water and/or aquatic resources to be further impaired.

6.11.8.1.3 In addition to the limits found in Section 6.3.2.3.3.2, the treated wastewater to be distributed must not exceed a chloride concentration of 250 mg/L on an annual average basis.

6.11.8.1.4 The total volume of treated wastewater that may be distributed to each farmer must not exceed agronomic rates as determined and reported in a Delaware Department of Agriculture approved Nutrient Management Plan; and an irrigation plan developed to NRCS standards.

6.11.8.1.5 The total volume of treated and filtered wastewater distributed must be recorded/calculated over a weekly period for each user. The volume must be reported in accordance with Section 6.11.8.3.

6.11.8.2 Application Requirements

6.11.8.2.1 One application shall be coordinated, completed and submitted to both DDA and DNREC. The application submitted to DNREC shall omit the Nutrient Management Plan.

6.11.8.2.2 The application must include:

6.11.8.2.2.1 All applicable items iterated in Section 6.11.4.

6.11.8.2.2.2 The wastewater treatment facility must execute an Agricultural Spray Agreement with each farmer receiving treated wastewater. The agreement must include a point of contact and mailing address for the farmer, and Land Zoning/Ownership verification of the farmers' properties. If the farmer does not own the property, the property owner must also sign the agreement. A copy of the executed agreement must accompany the application.

6.11.8.2.2.3 Indicate which watershed the farm lands are located in including the 12 digit HUC (Hydrologic Unit Code).

6.11.8.2.2.4 Provide a map of the fields, showing the acreage at each farm to be irrigated with treated wastewater.

6.11.8.2.2.5 Indicate whether there are any watercourses on the farm lands proposed for irrigation of treated wastewater.

6.11.8.2.2.6 If a perennial stream traverses or lies at the boundary of the farm lands, the wastewater provider will be required to perform water quality monitoring of the stream. Sampling upstream and downstream of the wetted field area as well as flow measurement may be required. The parameters and frequency of monitoring will be specified as a special condition in the facility's operation permit.

6.11.8.2.2.7 Identification of any drainage structures on the farm lands proposed for irrigation of treated wastewater. Farm lands incorporating drainage improvements that result in a point discharge to surface waters are not eligible to receive and reuse treated wastewater.

6.11.8.2.2.8 Background soil samples of farm lands.

6.11.8.2.2.9 Monitoring results of treated wastewater.

6.11.8.2.2.10 Site life calculations based on cadmium, copper, lead, nickel, phosphorus and zinc.

6.11.8.2.2.11 Calculation of total volume of treated wastewater the farm land can assimilate annually based on soil types and agronomic irrigation rates for crops to be grown.

6.11.8.3 Reporting

6.11.8.3.1 The Wastewater Treatment Facility must report the following information to Delaware Department of Agriculture:

6.11.8.3.1.1 Monthly - Copies of all effluent monitoring results for the farmer to utilize in their Nutrient Management Plans/Annual Reporting.

6.11.8.3.1.2 Annual – A copy of the Annual Summary Report.

6.12 Fees

The Department has established a schedule of annual and/or one-time fees. One-time fees shall be submitted to the Department at time of application. Annual fees shall be submitted to the Department upon receipt of notice or in accordance with the fee payment schedule. Failure to pay fees constitutes grounds for denial of permits and revocation of previously issued permits.

6.12.1 Permitting

6.12.1.1 A fee is required upon submittal of a permit application, in accordance with the latest DNREC fee schedule.

6.12.2 Advertisement

6.12.2.1 An advertisement fee is required upon submittal of a permit application, in accordance with the latest DNREC fee schedule.

6.12.3 Compliance

6.12.3.1 A fee is required for annual compliance inspections in accordance with the latest DNREC fee schedule.

6.13 Severability

6.13.1 If any part of these Regulations, or the application of any part thereof, is held invalid or unconstitutional, the application of such part to other persons or

circumstances and the remainder of these Regulations shall not be affected and shall be deemed valid and effective.

6.14 Wastewater Treatment Facility Closure/Abandonment

6.14.1 Any wastewater treatment facility that is to be abandoned must submit a proposed closure and abandonment work plan with procedures on how the facility will be abandoned by the responsible party for review and approval by the Department. The site may require remediation which must also be addressed in the work plan.

6.14.2 Upon review and approval of the work plan and completion of all closure and abandonment actions the responsible party must contact the Department for a final inspection of the facility.

7.0 Sources of Information

7.1 Organizations

7.1.1 American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, Michigan 49085.

7.1.2 American Society of Agronomy, 667 S. Segoe Road, Madison, Wisconsin 53711.

7.1.3 Delaware Agricultural Extension Service, College of Agriculture, University of Delaware, Newark, Delaware 19703.

7.1.4 The Irrigation Association, 13975 Connecticut Avenue, Silver Spring, Maryland 20906.

7.2 Technical References

7.2.1 Andres, A. S. and Martin, M. J., 2005, Estimation of the Water Table for the Inland Bays Watershed, Delaware: Delaware Geological Survey Report of Investigations No. 68, 20 p.

7.2.2 Brady, N.C. 1974. The Nature and Properties of Soils, Eighth Edition. (ISBN 0-02-313350-3) MacMillan: New York, New York.

7.2.3 Cole, D., C. Henry, and W. Nutter. 1986. Forest Alternative for Land Treatment of Municipal and Industrial Wastes. University of Washington Press, Seattle, 592 pp.

7.2.4 The Irrigation Association. 1983. Irrigation, Fifth Edition. Silver Spring, Maryland.

7.2.5 Metcalf and Eddy, Inc. 1979. Wastewater Engineering: Treatment, Disposal and Reuse. (ISBN 0-07-041667-X) McGraw-Hill: New York, New York.

7.2.6 Overcash, M.R. and P. Pal. 1979. Design of Land Treatment Systems for Industrial Wastes - Theory and Practice. Ann Arbor Science: Ann Arbor, Michigan.

7.2.7 Reed, S.C. and R.W. Crites. 1984. Handbook of Land Treatment Systems for Industrial and Municipal Wastes. (ISBN 0-8155-0991-X) Noves Publications: Park Bridge, New Jersey.

7.2.8 Rich, L.G. 1980. Low Maintenance, Mechanically Simple Wastewater Treatment Systems. (ISBN 0-07-052252-9) McGraw-Hill: New York, New York.

7.2.9 Smedema, L.K. and D.W. Rycroft. 1983. Land Drainage: Planning and Design of Agricultural Drainage Systems. (ISBN 0-8014-1629-9) Cornell University Press: Ithaca, New York.

7.2.10 United States Department of Agriculture. National Engineering Handbook, Sections 15 and 16. Soil Conservation Service. Washington, D.C.

7.2.11 United States Environmental Protection Agency. 1981. Process Design Manual: Land Treatment of Municipal Wastewater. (EPA 625/1-81-013) Center for Environmental Research Information. Cincinnati, Ohio.

7.2.12 United States Environmental Protection Agency. 1983. Design Manual: Municipal Wastewater Stabilization Ponds. (EPA-625/1-83-015) Center for Environmental Research Information. Cincinnati, Ohio.

7.2.13 Water Pollution Control Federation, American Society of Civil Engineers. 1977. WPCF Manual of Practice No. 8: Wastewater Treatment Plant Design. Washington, D.C.

8.0 Exhibits

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L. Typical Aggregate Free Trench/Bed Design – Full Depth
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O. Typical Low Pressure Pipe Design
P. Low Pressure Pipe Design Percolation Rates & Maximum Hole Spacing Distances
Q. Typical Elevated Sand Mound Design
R. Typical Pressure-Dosed Trench/Bed Design – Full Depth
S. Typical Pressure-Dosed Trench/Bed Design – Capping Fill
T. Typical Sand-Lined Trench/Bed Design
U. Typical Wisconsin At-Grade Design
V. Wisconsin At-Grade Design Loading Rates
W. System Information Quick Reference Guide
X. Septic Tank Lift Station
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CC. Micro-Irrigation “Drip” Design Loading Rates
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GG. Crop Nutrient Uptake Websites
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LL. Minimum Treatment Requirements for Large Systems
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NN. Chesapeake Bay 1,000 Foot Enforcement Zone

GROUND WATER DISCHARGES SECTION
EXISTING ON-SITE WASTEWATER SYSTEM FIELD INSPECTION REPORT

Inspection Request Received From

Name: _____ Mailing Address: _____
Telephone #: _____ City, State, Zip: _____

Owner (if different)

Name: _____ Mailing Address: _____
Telephone #: _____ City, State, Zip: _____

Property
ZONING CERTIFICATE MANDATORY

Tax Map #: _____ Type of Structure: ____ Single Family Dwelling
Subdivision (if appl): _____ ____ Multi-Family
City, State, Zip: _____ ____ Community/Large
Physical Address: _____ ____ Commercial

Age of Structure: _____ # of Bedrooms: _____ # of Residents: _____

Occupied: ___ Yes ___ No Length of Vacancy: ____ Weeks ____ Months ___ N/A if occupied

Permit / System

Permit Available: ____ Yes ____ No Permit #: _____
Age of System: _____

System Type:
___ Full Depth Gravity ___ Full Depth LPP ___ Elevated Sand Mound
___ Capping Fill Gravity ___ Capping Fill LPP ___ Micro Drip Irrigation
___ Full Depth Pressure Dosed ___ Alternative System* ___ Seepage Pit
___ Capping Fill Pressure Dosed ___ Wisconsin at Grade ___ Cesspool

* All Innovative/Alternative systems including Advanced Treatment Unit's (ATU's) and alternative drainfield systems may only be inspected by a Class H licensee that has been certified through DNREC approved training for that ATU or alternative drainfield system. Proof of certification must be submitted to DNREC. **A Class H license alone is not adequate enough for this task.**

General Information

Pump Out
Date of Last Pump Out: _____
Pumping Frequency: _____

Repairs
Repairs made to system? ____ Yes ____ No
Was repair permit issued? ____ Yes ____ No
Details _____

Name of System Maintainer
_____

Water Service
____ Central Water ____ On-Site Well

Is this a second opinion inspection? ____ Yes ____ No
Is there a water treatment system discharging into the systems? ____ Yes ____ No
Does grey water discharges somewhere other than the septic system? ____ Yes ____ No
If yes, location _____

Information Verification

I attest this information I have provided is true and accurate to the best of my knowledge

_____ _____
Owner's/Requestor's Signature Date

For Kent & New Castle Counties - 89 Kings Highway, Dover, DE 19901 - (302) 739-9947 Tel / (302) 739-7764 Fax
For Sussex County - 20653 DuPont Blvd, Unit 5, Georgetown, DE 19947 - (302) 856-4561 Tel / (302) 856-5088 Fax

GROUND WATER DISCHARGES SECTION
EXISTING ON-SITE WASTEWATER SYSTEM FIELD INSPECTION REPORT

Inspection Data

Date: _____

Site Condition: ___ Dry _____ Wet Recent Heavy Precipitation? _____ Yes _____ No

Weather: _____ Sunny _____ Cloudy _____ Rain _____ Snow

Is there evidence that sewage has backed up into the structure?	_____ Yes	_____ No
Do trees or tree roots appear to interfere with the system?	_____ Yes	_____ No
Is there evidence or documentation of wastewater surfacing?	_____ Yes	_____ No
Is any portion of the system below a deck, driveway, walkway, etc.?	_____ Yes	_____ No
Was a visual inspection under the home for grey water performed?	_____ Yes	_____ No
	_____ No Access	
Was a flow test from each household fixture performed?	_____ Yes	_____ No
	_____ No Access	

Treatment Tank(s)
** PUMP OUT MANDATORY **

___ Septic Tank Capacity (gal) * _____ # of Compartments _____

Material ** _____ Dimensions ___ x _____ x _____

___ Cesspool Capacity (gal) * _____ # of Compartments _____

Material ** _____ Dimensions ___ x _____ x _____

___ Other Capacity (gal) * _____ # of Compartments _____

Material ** _____ Dimensions ___ x _____ x _____

Scum Thickness _____" Sludge Thickness _____"

** Round: D" X D" / 292.5 X H" Rectangular: L" X W" / 231 X H" ** Specify Concrete, Metal, Other*

	S	SWC	U		S	SWC	U
Tank	___	_____	_____	Liquid Level (Tank)	_____	_____	_____
Top/Lids/Risers (if appl)	___	_____	_____	Effluent Filter ___ N/A	_____	_____	_____
Baffles	___	_____	_____				

Name of pump company_____ Date of pump out_____

*** PUMPOUT DOCUMENTATION MAY BE REQUIRED ***

Does effluent from the absorption facility run back to the treatment tank? _____ Yes _____ No

Is there evidence of effluent surfacing above the treatment tank(s)? _____ Yes _____ No

S = Satisfactory, SWC = Satisfactory With Concerns, U = Unsatisfactory

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GROUND WATER DISCHARGES SECTION
EXISTING ON-SITE WASTEWATER SYSTEM FIELD INSPECTION REPORT

Distribution System

	S	SWC	U		S	SWC	U
Distribution Box (if Existing)	___	_____	____	Liquid Level (D-Box)	_____	_____	_____
Diversion Box (if Existing)	___	_____	____	Liquid Level (Div-Box)	_____	_____	_____
Distribution Piping	___	_____	____	Top/Lid	_____	_____	_____
Baffles	___	_____	____				

S = Satisfactory, SWC = Satisfactory With Concerns, U = Unsatisfactory

Distribution Box level, allowing equal distribution?	_____	Yes	_____	No	_____ N/A
Is effluent above the lateral inverts in the distribution box?	_____	Yes	_____	No	_____ N/A
Does effluent from the absorption facility run back to the D-Box?	_____	Yes	_____	No	_____ N/A
Is there evidence of effluent surfacing above the D-Box?	_____	Yes	_____	No	_____ N/A

Distribution Box Capacity (gal) * _____
Material ** _____
Dimensions _____ x _____ x _____

** Round: D" X D" / 292.5 X H" Rectangular: L" X W" / 231 X H"*
*** Specify Concrete, Metal, Other*

Holding / Dosing Tank / Lift Station

____ Holding Tank ____ Lift Station ____ Dosing Tank Gallons: _____
Material: _____
Dimensions: _____ x _____ x _____

	S	SWC	U		S	SWC	U
Tank	____	_____	_____	Electrical Connections	_____	_____	_____
Top/Lids/Risers (if appl)	____	_____	_____	Timer ____ N/A	_____	_____	_____
Pump/Siphon Operat.	____	_____	_____	Check Valve & Weep Hole	_____	_____	_____
Alarm	____	_____	_____	Pump Elev. Off Tank Floor	_____	_____	_____
Vent Pipe	____	_____	_____				

S = Satisfactory, SWC = Satisfactory With Concerns, U = Unsatisfactory

Accumulated solids found in pump tank?	_____	Yes	_____	No
Is alarm on separate circuit?	_____	Yes	_____	No
Infiltration of surface waters?	_____	Yes	_____	No

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GROUND WATER DISCHARGES SECTION
EXISTING ON-SITE WASTEWATER SYSTEM FIELD INSPECTION REPORT

Absorption Facility

Located: _____ Yes _____ No More than one absorption facility: _____ Yes ____ No

How Many: _____ Total Sq Ft: _____

_____ Bed _____ x _____ (approx. size) = _____ Sq Ft
_____ Trenches _____ x _____ (approx. size) = _____ Sq Ft # of Trenches _____
_____ Seepage Pit _____ x _____ (approx. size) = _____ Sq Ft
_____ Cesspool _____ x _____ (approx. size) = _____ Sq Ft
_____ Other (describe) _____

Are there signs of previous absorption facility failure? ____ Yes _____ No
Are there any overflow lines? ____ Yes _____ No

Summary of System Component Inspections
Review "Overall Comments" for Summary of Ratings

	Satisfactory	Satisfactory With Concerns	Unsatisfactory
Treatment Tank(s)	_____	____	____
Holding/Dosing Tank/Lift Station	_____	____	____
Absorption Facility(ies)	_____	____	____
Distribution System	_____	____	____

Overall Comments (use additional paper if needed)
Include Comments for Satisfactory with Concerns & Unsatisfactory Ratings

Inspector

Name: _____ License #: _____
Telephone #: _____
Signature: _____ Date: _____

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GROUND WATER DISCHARGES SECTION
EXISTING ON-SITE WASTEWATER SYSTEM FIELD INSPECTION REPORT

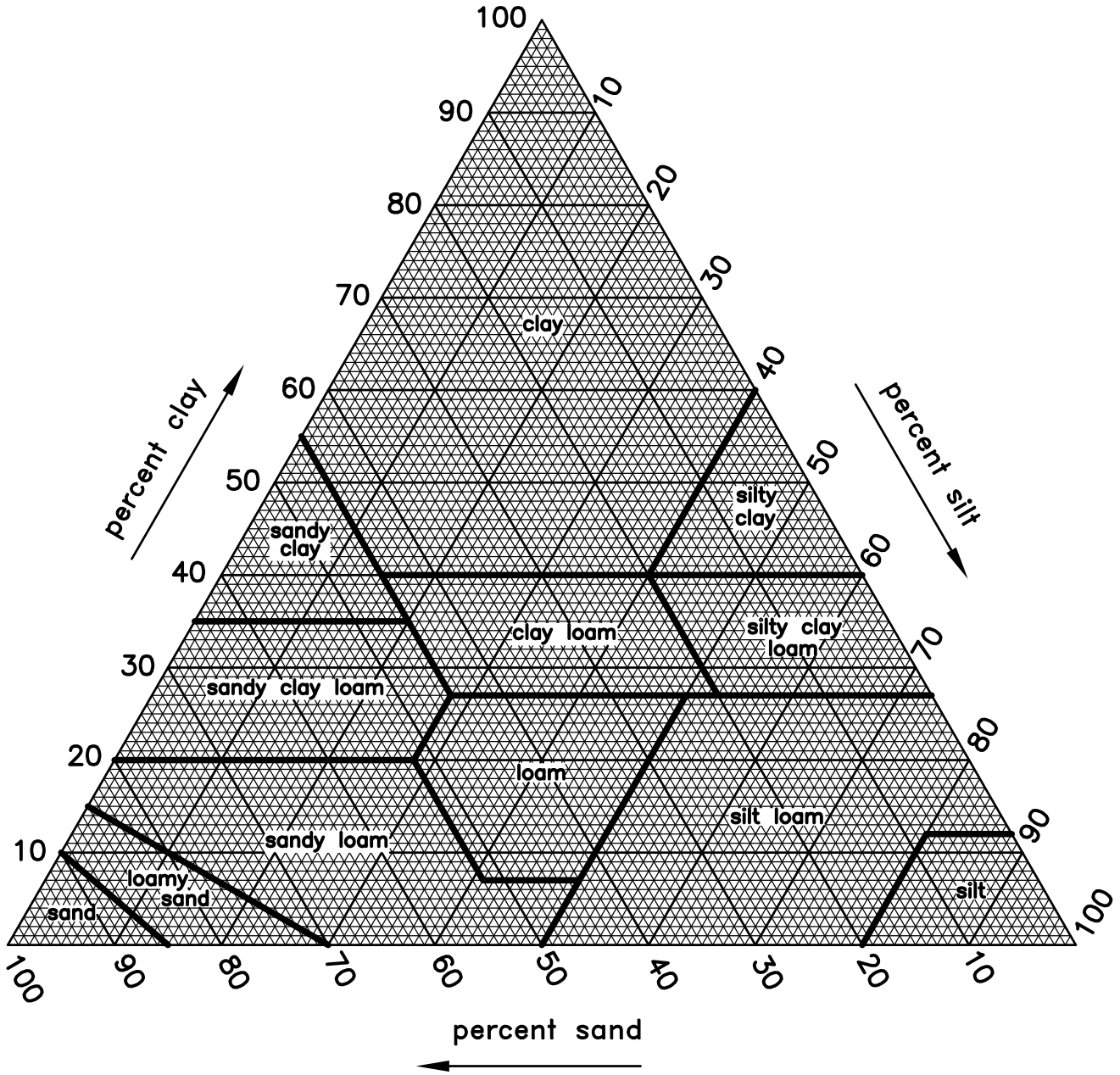
Scale Drawing of On-Site Wastewater Treatment & Disposal System Location or Attach Existing Permitted Plot Drawing

Scale 1"=_____'	North

- A site drawing to scale, straight edge must be used (no free-hand lines), must show a reference point such as numbered utility pole, telephone or electrical box, building(s), property corners or fixed survey markers, or GPS coordinates. A minimum of two (2) such reference points should be noted on the site sketch. Site sketch(es) shall be based on a whole number scale not to exceed 1 inch equals 100 feet. Acceptable scales are: 1 inch = 10, 20, 30, 40, 50, 60, or 100 feet.
- A north directional arrow.
- Indicate location of central water line or onsite well. All onsite wells must be measured from two (2) reference points or established survey control.
- Identify each wastewater treatment and disposal system component.
- Mark distances from fixed reference points (i.e. property corners, existing dwelling, etc.) or established survey control points for each wastewater treatment and disposal system component.
- Should an existing approved permit drawing be available the drawing maybe used, but the inspector must either note on the drawing that "no changes were found" or clearly mark all the changes on the permit drawing.

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For Sussex County - 20653 DuPont Blvd, Unit 5, Georgetown, DE 19947 - (302) 856-4561 Tel / (302) 856-5088 Fax

GUIDE FOR TEXTURAL CLASSIFICATION



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TEXTURAL TRIANGLE
FOR
SOIL CLASSIFICATION

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - B

MINIMUM ISOLATION DISTANCES (FEET) FOR SMALL SYSTEMS

Components	Well	Water Supply Pressure Line	Watercourse	Dwellings and Property Lines	Other active on-lot systems	Top of Bank or Escarpment >25%
Septic tank Grease trap Distribution box Dosing chamber Diversion valve or box Advanced treatment unit	50	10	25	10 f	--	--
Disposal area	100 a, c, d, e, h, i	10	100 b	10 g	10	15

MINIMUM ISOLATION DISTANCES (FEET) FOR LARGE SYSTEMS

Components	Well	Water Supply Pressure Line	Watercourse	Dwellings & Property Lines	Other active on-lot systems	Top of Bank or Escarpment >25%
Spray field	100 d	10	100 j, k	150 k	10	--
Rapid Infiltration Basin	100 a, c, d, e	10	100 b	50 g	10	15
Treatment plant	10 d	10	10	10	--	--
Disposal area	100 a, c, d, e	10	100 b	50 g	10	15

NOTE: These isolation distances satisfy the requirements of the Ground Water Discharges Section and these regulations; however, County Codes and Pollution Control Strategies associated with Total Maximum Daily Load regulations may be more stringent.

Notes:

a) Approval of a lesser distance to a minimum isolation distance of 50 feet may be approved by the Department as per the Delaware Regulations Governing the Construction and Use of Wells. The applicant shall provide documentation regarding well distances, depths, and construction to the Department upon request.

b) Approval of a lesser distance to a minimum isolation of fifty (50) feet may be approved by the Department if the watercourse has not been designated for use as a public water supply or shellfish. There is no setback from an ephemeral watercourse. It is the sole responsibility of the Class D soil scientist to determine whether a watercourse, by definition, is ephemeral.

c) For elevated sand mound and capping fill systems, distances shall be measured from the outer edge of the stone or gravel-less chamber. RIB's are measured from inside edge of berm.

d) For public or industrial wells the minimum isolation distance shall be 150 feet.

e) For replacement systems on lots created by plat or deed and recorded prior to April 8, 1984, an isolation distance of fifty (50) feet between domestic wells and absorption facility may be considered by the Department where the lot size will not allow an isolation distance of 100 feet. The well must be cased to a depth of forty two (42) feet, exclusive of the screen, and pressure-grouted with either concrete or bentonite clay to a minimum depth of forty (40) feet. The applicant shall provide documentation regarding well distances, depths, and construction to the Department upon request.

f) Except in the case of a septic tank for a central sewer system where the absorption facility is not located on the same lot as the septic tank, in which case the distance shall be five (5) feet from the interior lot or easement lines within a recorded subdivision.

g) Except in the case of a central sewer system where the absorption facility can be five (5) feet from an interior lot or easement lines within a recorded subdivision.

h) For replacement systems, the well isolation distance may be reduced from 100 feet to a minimum of 50 feet. (maximizing the distance) if and additional twelve (12) inches of suitable soil exists below or is added to (i.e. ESM). (i.e. 36 inch separation for gravity systems to 48 inch separation for well isolation reduction).

i) The Department may reduce the well isolation distance from 100 feet to a minimum of 50 feet (maximizing the distance) if advanced treatment is incorporated.

j) If effluent is treated to "Unlimited" access levels the well isolation distance may be reduced from 100 feet to 50 feet

k) This includes the shoulder of internal and external roads or edge of the roadway if no shoulder is present.

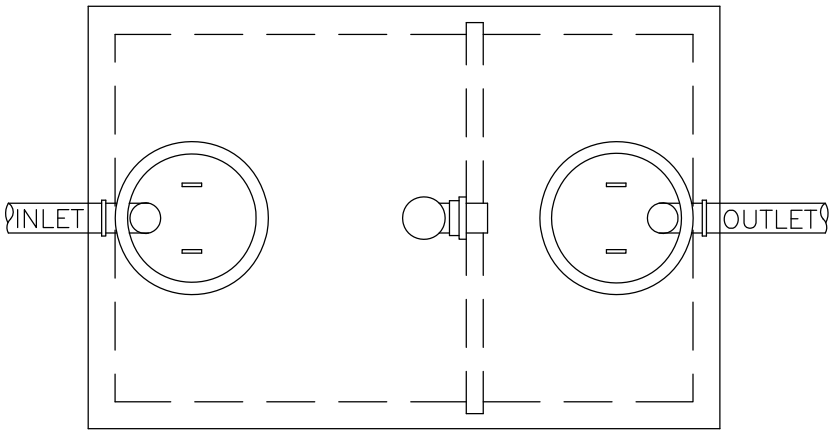
TYPE OF ESTABLISHMENT	UNIT	GALLONS/UNIT/DAY
Airport	Person	5
Assembly Hall, Auditoriums, Indoor Theaters	Seat	3
Banquet Halls/Fire Halls/Community Centers	Seat	15
With bar & food	Seat	30
Barber Shop	Chair	50
Bar with minimum food prep	Seat	20
Bath House	Person	10
Beauty Shop	Chair	125
Boarding or rooming houses	Person	50
Staff	Person	15
Bowling Alley with no bar or restaurant	Lane	100
With bar or restaurant	Lane	200
Camps		
Work	Person	40
Summer	Person	40
Trailer without sewer hook-up	Site	50
Trailer with sewer hook-up	Site	75
Churches	Seat	5
Country Clubs	Person	100
Day Care	Child	10
Day Care Staff add	Person	15
Dentist Office	Chair	100
Office Staff add	Person	20
Dog Kennel	Dog	10
Factories	Person	25
with shower	Person	35
Hospitals	Bed	250+
Hotels	Room	120

TYPE OF ESTABLISHMENT	UNIT	GALLONS/UNIT/DAY
Laundromat	Machine	500
Marinas	Boat Slip	10
Marinas with restrooms	Boat Slip	30
Motels	Room	100
with kitchen	Room	150
Medical office buildings and clinics	Persons	
Doctors, nurses and medical staff		70
Office staff		20
Patients		7
Offices	Employee	20
Outdoor sporting facilities	Persons per day	5
Parks with beaches		
Lavatory waste only	Person	5
Bath house, showers, lavatories	Person	13
Picnic Grounds, Public Swimming Pools		
Picnic with toilets only	Person	5
Picnic with lavatories and showers	Person	11
Swimming Pools and Beaches with lavatories and showers	Person	13
Residential Dwellings	Bedroom	120
Restaurants	Seat	
24 hour service		40
18 hour service		30
12 hour service		20
Add for bars & cocktail lounges		5
Rest/Nursing/Assisted Living Homes	Bed	100

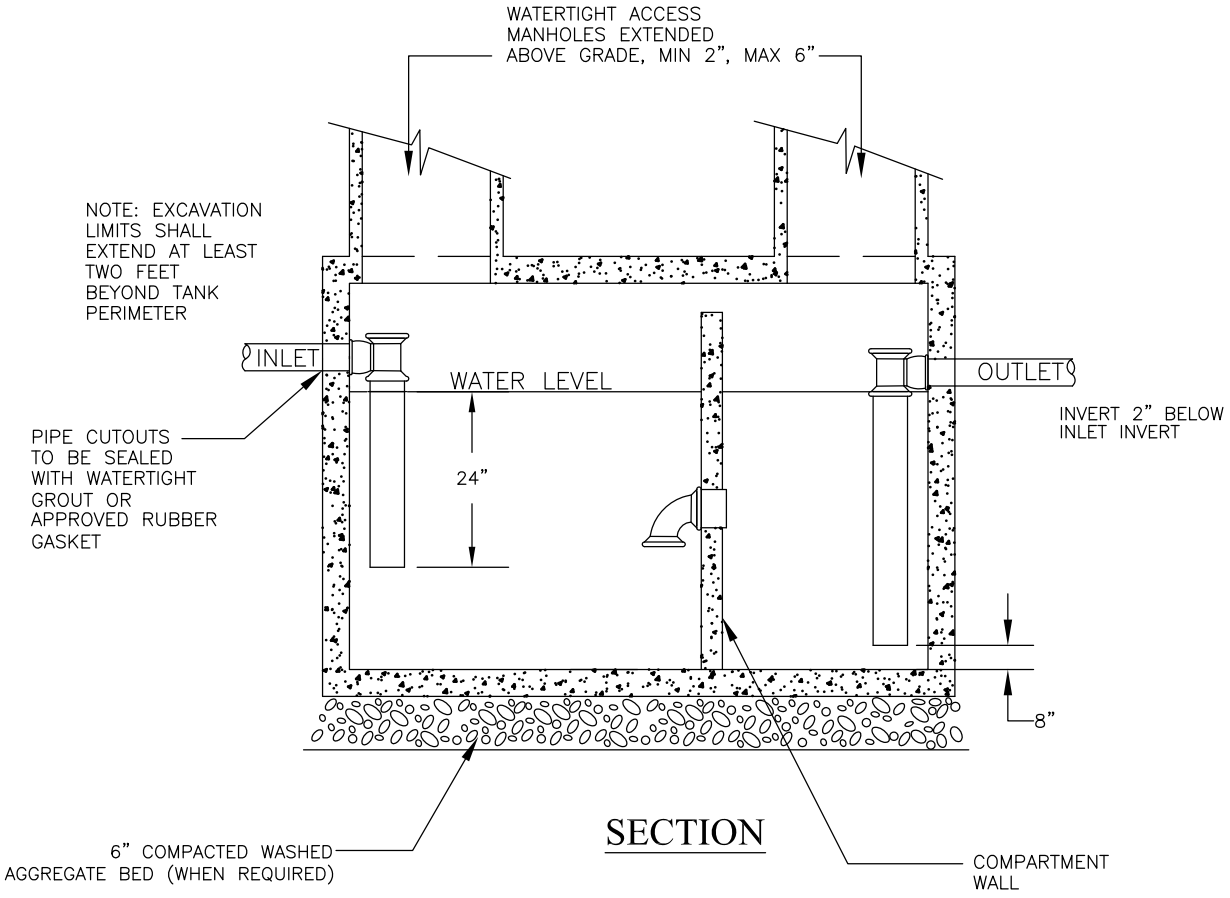
TYPE OF ESTABLISHMENT	UNIT	GALLONS/UNIT/DAY
Schools	Student	10
with gym, showers, cafeteria	Student	25
with cafeteria	Student	15
Boarding	Student	75
Non-resident staff	Staff	15
Service Station	Pump	50
with convenience store	Sq. ft.	0.1
Stores (Retail)	Sq. ft.	0.1
Theaters		
Drive-in	Space	10
Movie Theaters	Seat	4
Veterinarian	Patient	10

GREASE TRAP DESIGN CAPACITIES

TYPE OF FIXTURE	FLOW RATE (GPM)	GREASE RETENTION CAPACITY (LB)	REQUIRED CAPACITY PER FIXTURE CONNECTED TO TRAP (GAL)
Restaurant kitchen sink	15	30	50
Single-compartment sink	20	40	50
Double-compartment sink	25	50	62.5
Triple-compartment sink	30	60	75
2 single-compartment sinks	25	50	62.5
2 triple-compartment sinks	40	80	100
Dishwasher for restaurants			
Up to 30 gallons of water	15	30	50
Up to 50 gallons of water	25	50	62.5
50 to 100 gallons of water	40	80	100



PLAN



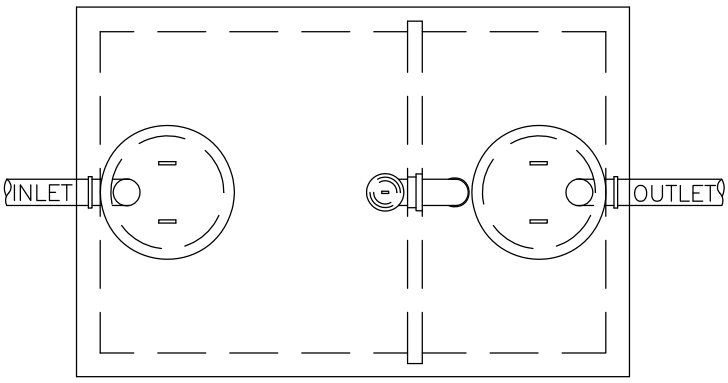
SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

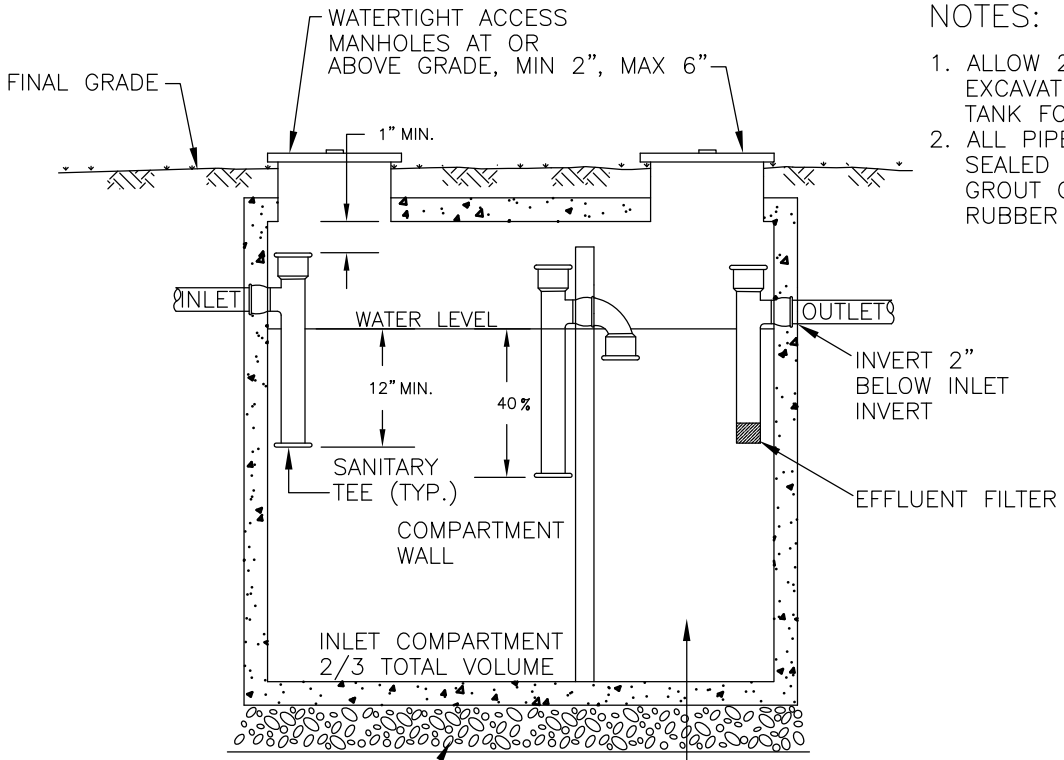
TYPICAL GREASE TRAP
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - F



PLAN



SECTION

NOTES:

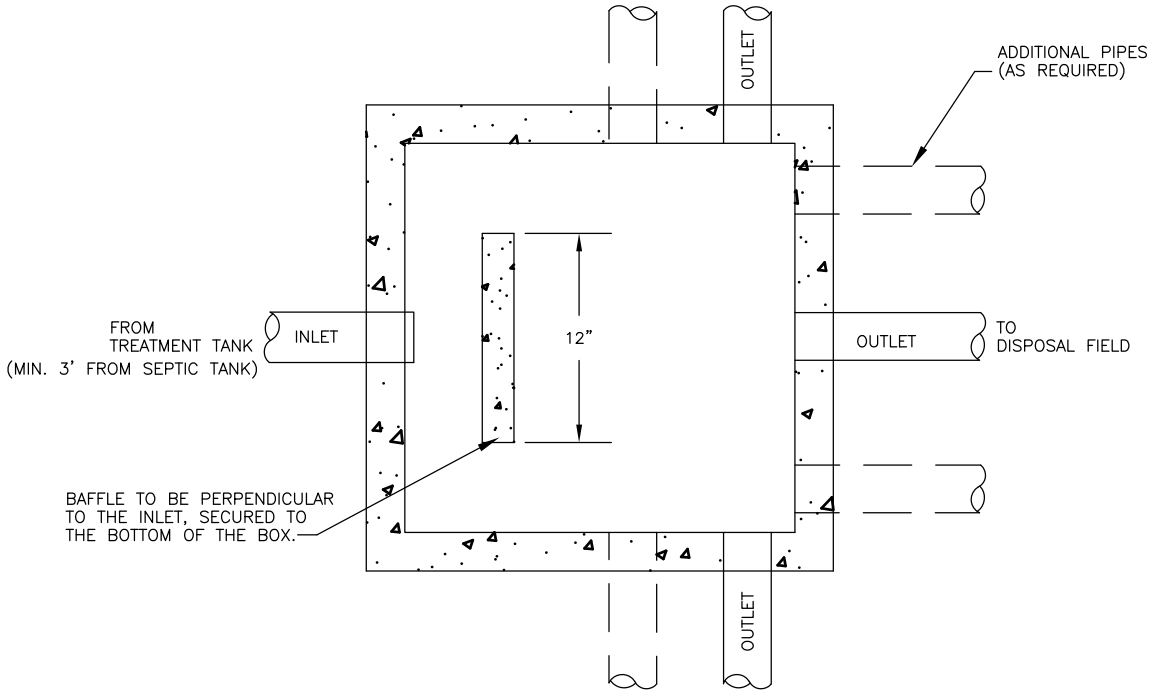
1. ALLOW 2' CLEARANCE IN EXCAVATION AROUND TANK FOR TAMPING.
2. ALL PIPE CUTOUTS TO BE SEALED WITH WATERTIGHT GROUT OR APPROVED RUBBER GASKET.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

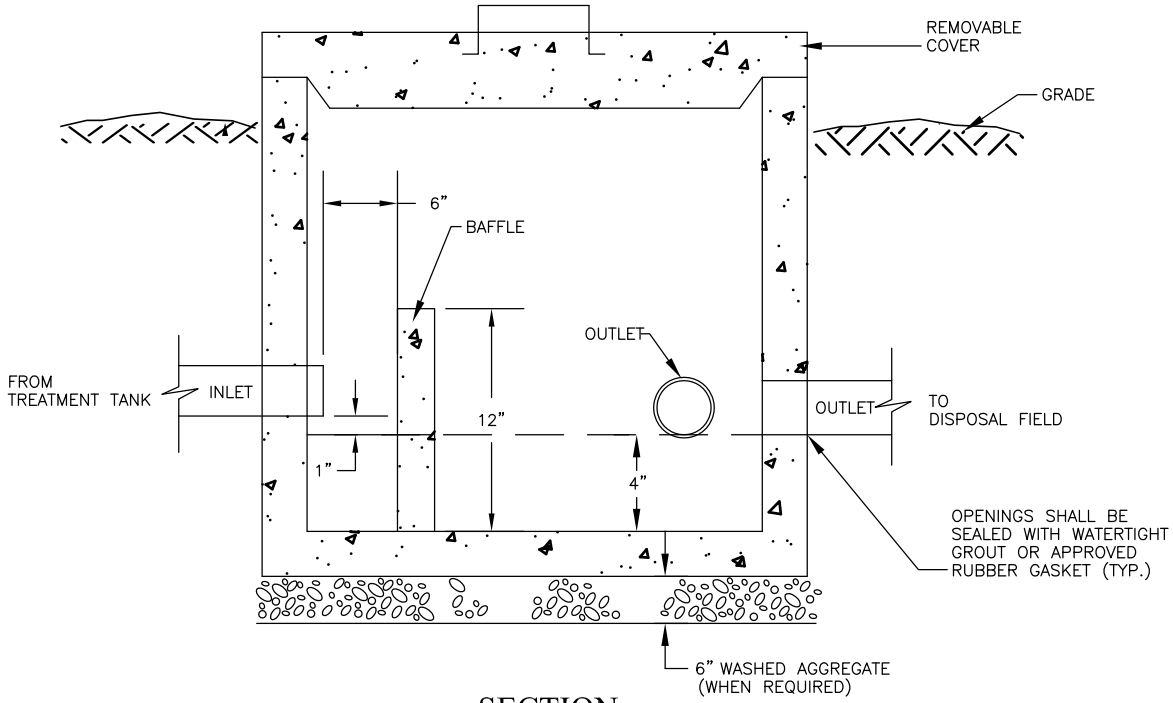
TYPICAL TWO-COMPARTMENT SEPTIC TANK

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - G



PLAN



SECTION

STATE OF DELAWARE

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

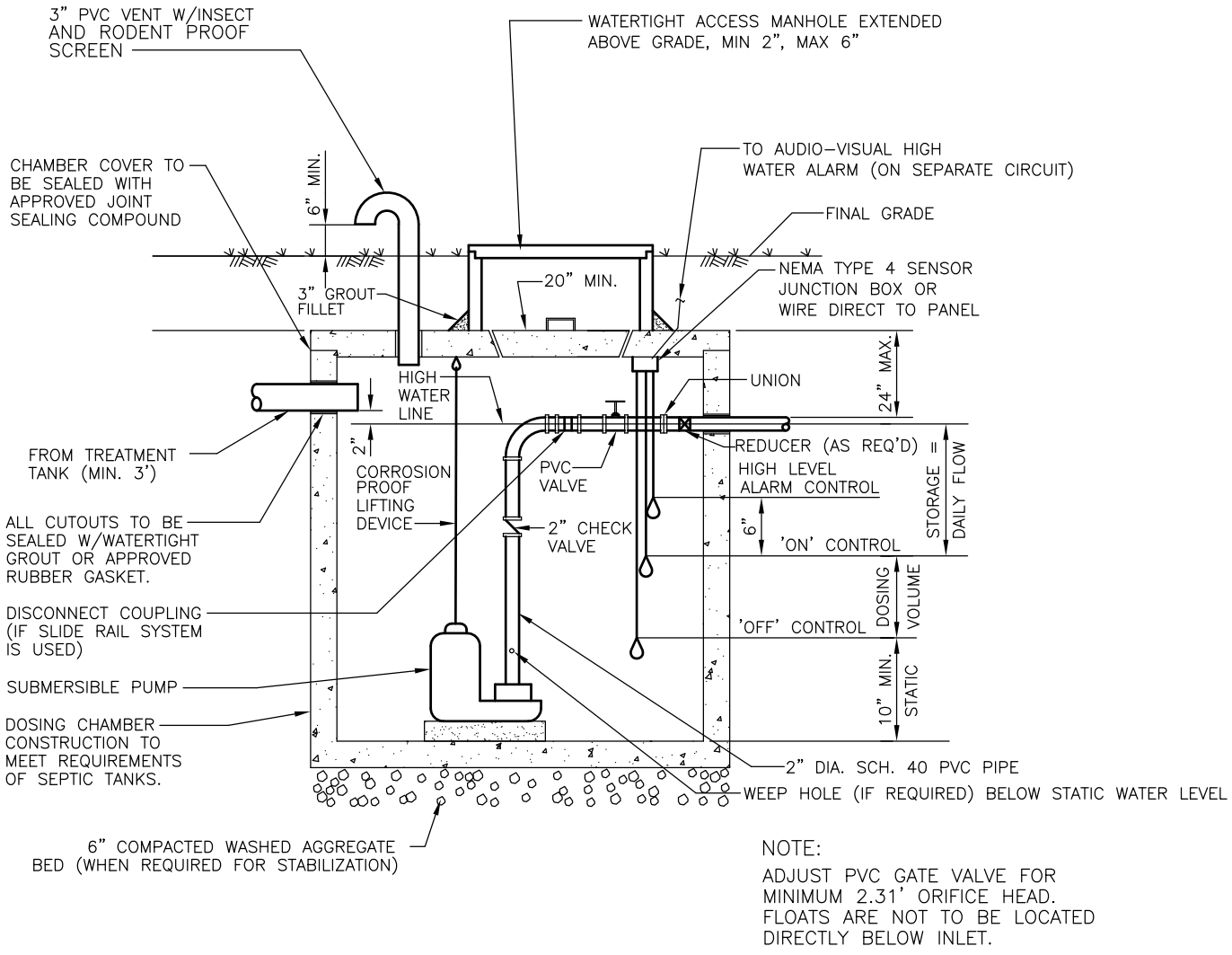
TYPICAL CONCRETE DISTRIBUTION BOX

(NOT TO SCALE)

ISSUED: JANUARY 1985

REVISED: JANUARY 2014

EXHIBIT - H



NOTE:
ADJUST PVC GATE VALVE FOR MINIMUM 2.31' ORIFICE HEAD. FLOATS ARE NOT TO BE LOCATED DIRECTLY BELOW INLET.

SECTION

NOTES:

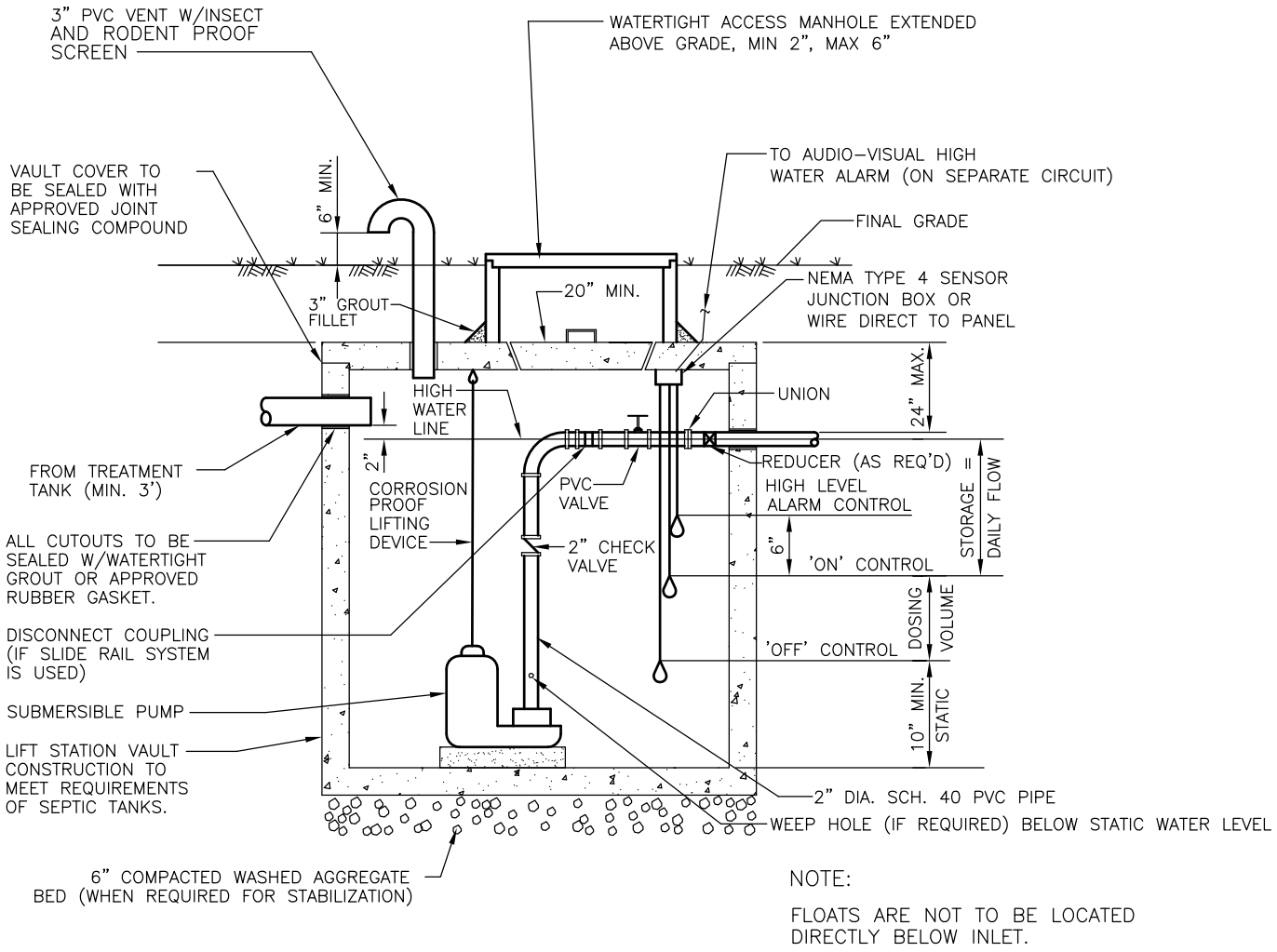
1. MAXIMUM DEPTH FROM GRADE TO INVERT OF DOSING CHAMBER TO BE 9'-0".
2. EXCAVATION LIMITS SHALL EXTEND AT LEAST 2 FEET BEYOND TANK PERIMETER.
3. ALL PIPE TO BE PVC SCHEDULE 40.
4. CHAMBER TO BE SIZED ACCORDING TO REQUIREMENTS OF DOSING VOLUME AND STORAGE.
5. ALL DOSING CHAMBER COMPONENTS SHALL BE FIELD TESTED TO ENSURE ACCURACY, WATER TIGHTNESS, AND PROPER OPERATION OF ALL PUMPS AND ALARM CONTROLS.
6. ALL ELECTRICAL CONNECTIONS SHALL BE WATERPROOF, CORROSION-RESISTANT AND EXPLOSION-PROOF. (IF INSIDE TANK)
7. WHERE POSSIBLE, PUT ALL ELECTRICAL CONNECTIONS OUTSIDE OF THE TANK.
8. RAIN TIGHT (3R) BOXES ARE REQUIRED OUTSIDE OF THE TANK: NOT EXPLOSION PROOF.
9. THE REDUCER, IF USED, CAN BE INSTALLED INSIDE OF THE TANK.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL PUMP DOSING CHAMBER
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - I
(Sheet 1 of 2)



NOTE:

FLOATS ARE NOT TO BE LOCATED DIRECTLY BELOW INLET.

SECTION

NOTES:

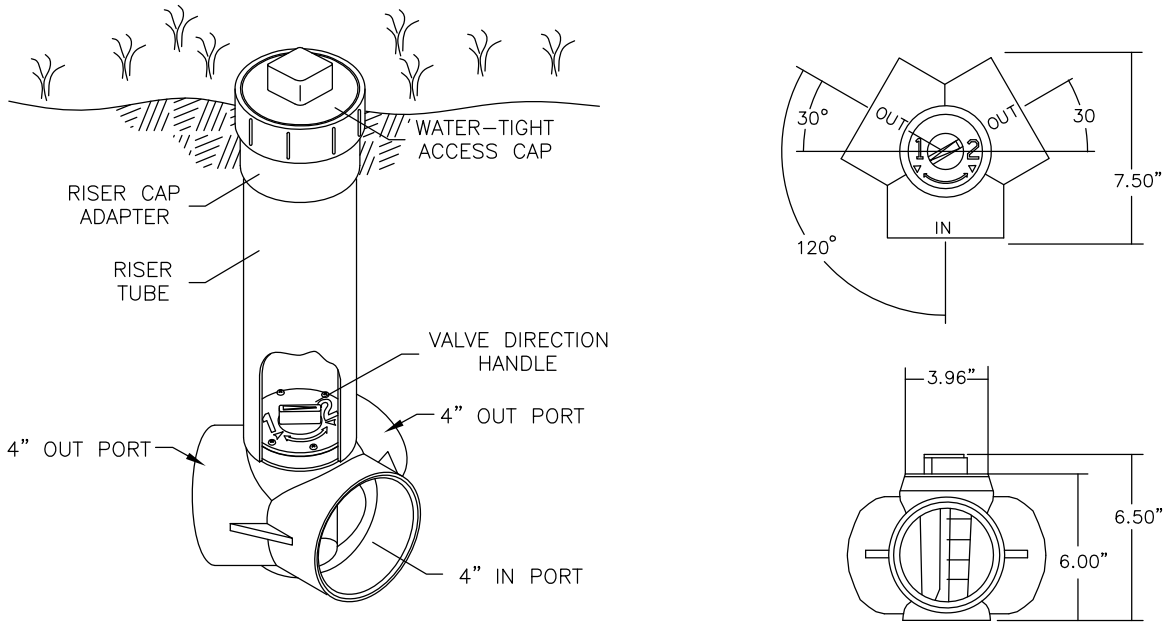
1. MAXIMUM DEPTH FROM GRADE TO INVERT OF LIFT STATION TO BE 9'-0".
2. EXCAVATION LIMITS SHALL EXTEND AT LEAST 2 FEET BEYOND VAULT PERIMETER.
3. ALL PIPE TO BE PVC SCHEDULE 40.
4. VAULT TO BE SIZED ACCORDING TO REQUIREMENTS OF DOSING VOLUME AND STORAGE.
5. ALL LIFT STATION COMPONENTS SHALL BE FIELD TESTED TO ENSURE ACCURACY, WATER TIGHTNESS, AND PROPER OPERATION OF ALL PUMPS AND ALARM CONTROLS.
6. ALL ELECTRICAL CONNECTIONS SHALL BE WATERPROOF, CORROSION-RESISTANT AND EXPLOSION-PROOF. (IF INSIDE VAULT)
7. WHERE POSSIBLE, PUT ALL ELECTRICAL CONNECTIONS OUTSIDE OF THE VAULT.
8. RAIN TIGHT (3R) BOXES ARE REQUIRED OUTSIDE OF THE VAULT: NOT EXPLOSION PROOF.
9. THE REDUCER, IF USED, CAN BE INSTALLED INSIDE OF THE VAULT.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL LIFT STATION VAULT
(NOT TO SCALE)

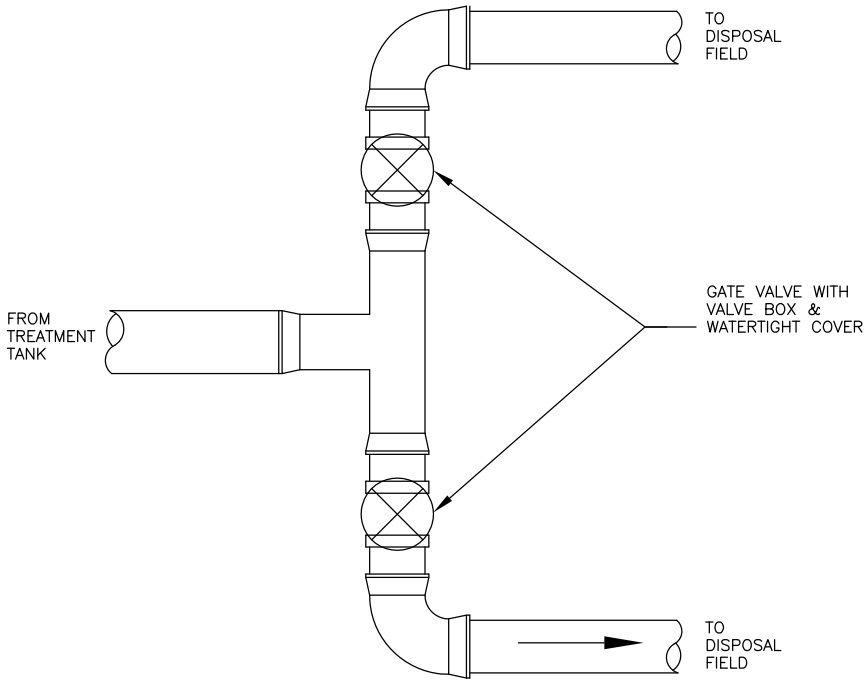
ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - I
(Sheet 2 of 2)



BULL RUN VALVE- (TYPICAL)

(FOR GRAVITY FLOW ONLY)



DIVERSION VALVES- (TYPICAL)

(FOR GRAVITY OR PRESSURE SYSTEM)

STATE OF DELAWARE

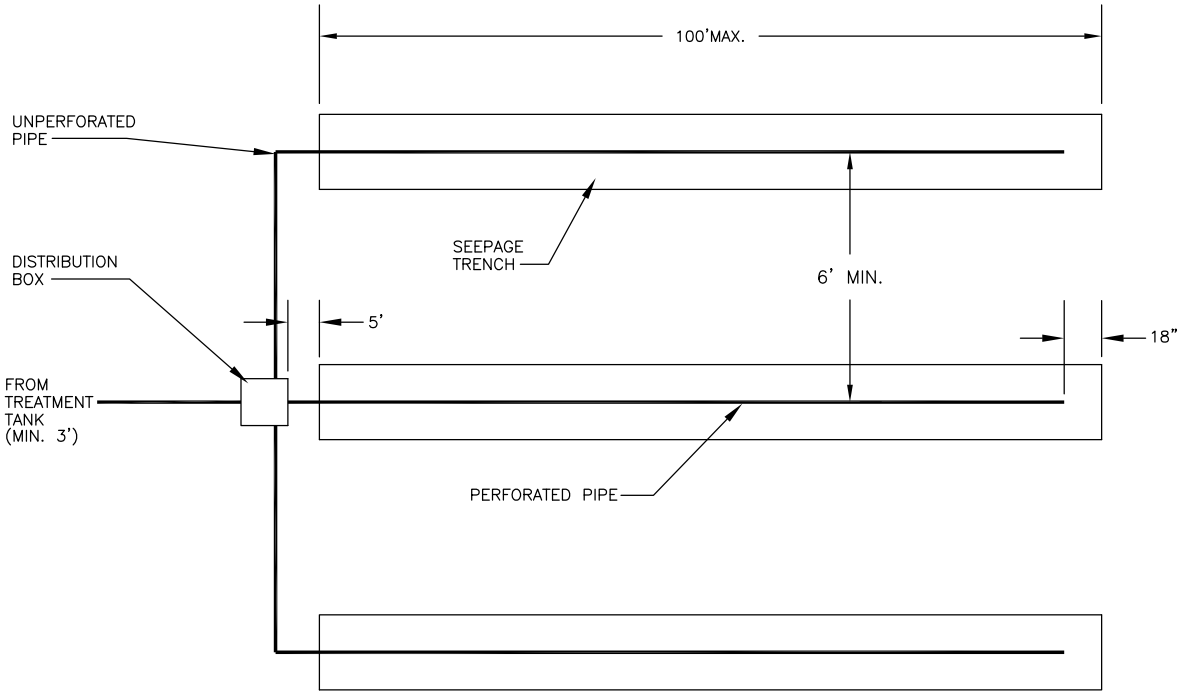
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

DIVERSION EQUIPMENT FOR
DUAL FIELDS
(NOT TO SCALE)

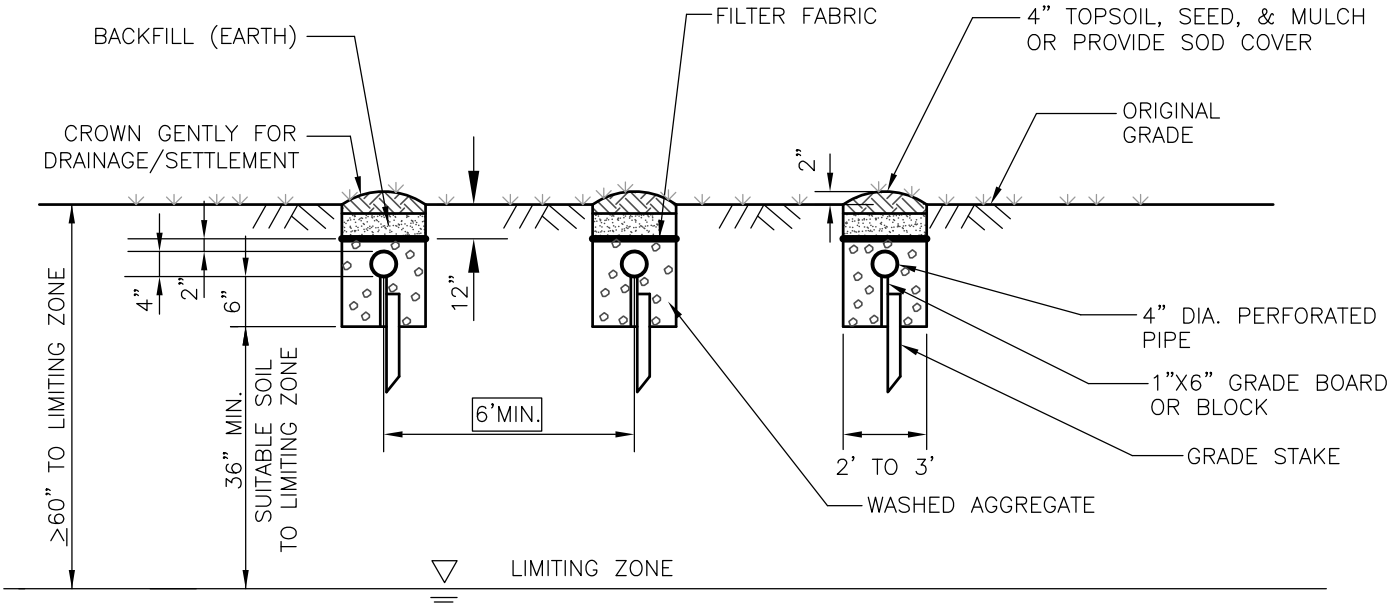
ISSUED: JANUARY 1985

REVISED: JANUARY 2014

EXHIBIT - J



PLAN



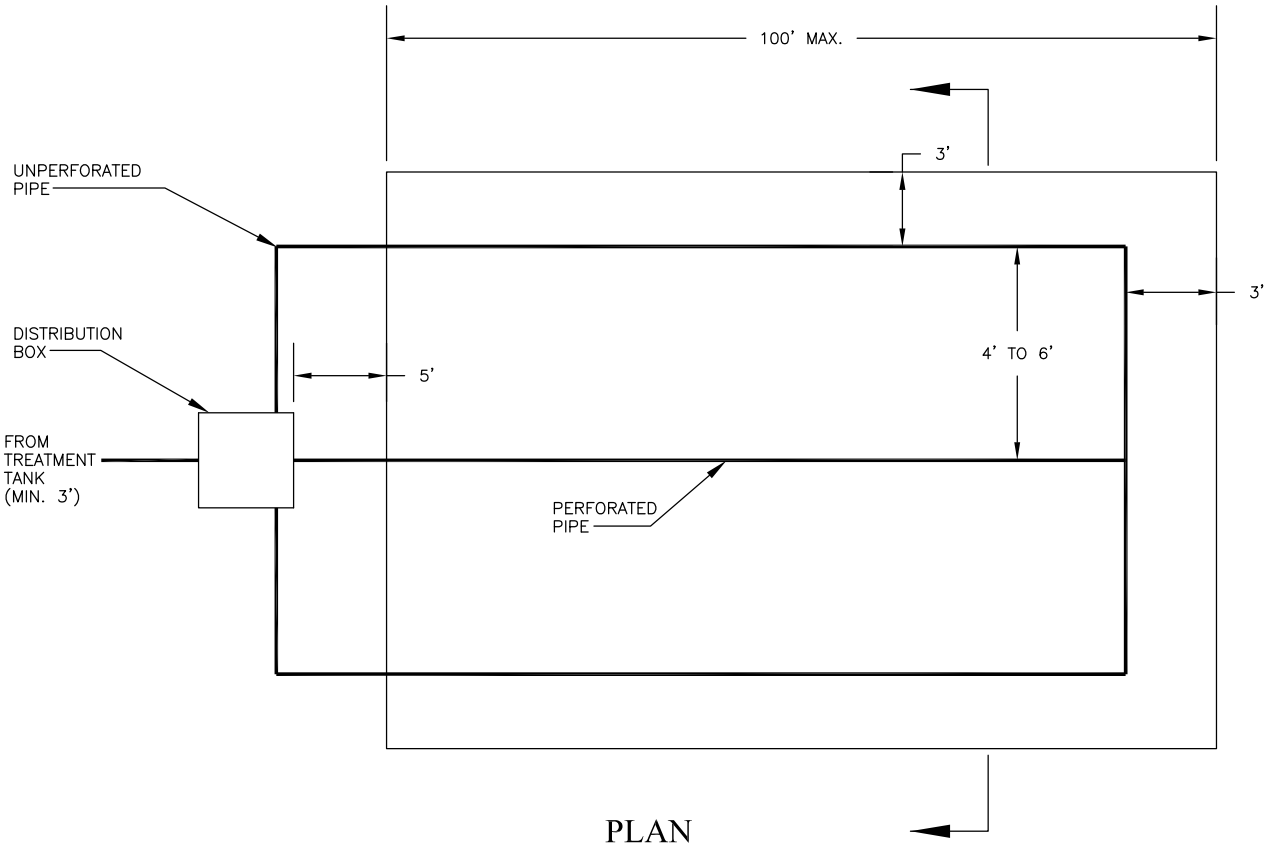
SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

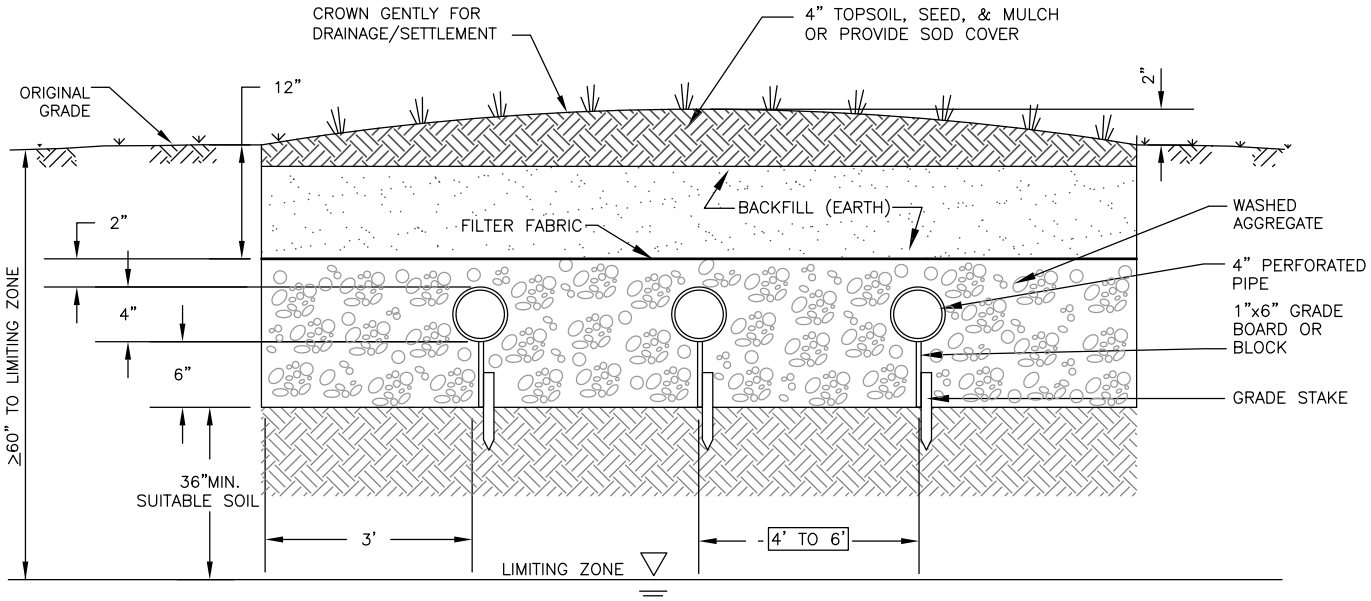
TYPICAL AGGREGATE TRENCH
DESIGN FULL DEPTH GRAVITY
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - K
(Sheet 1 of 2)



PLAN



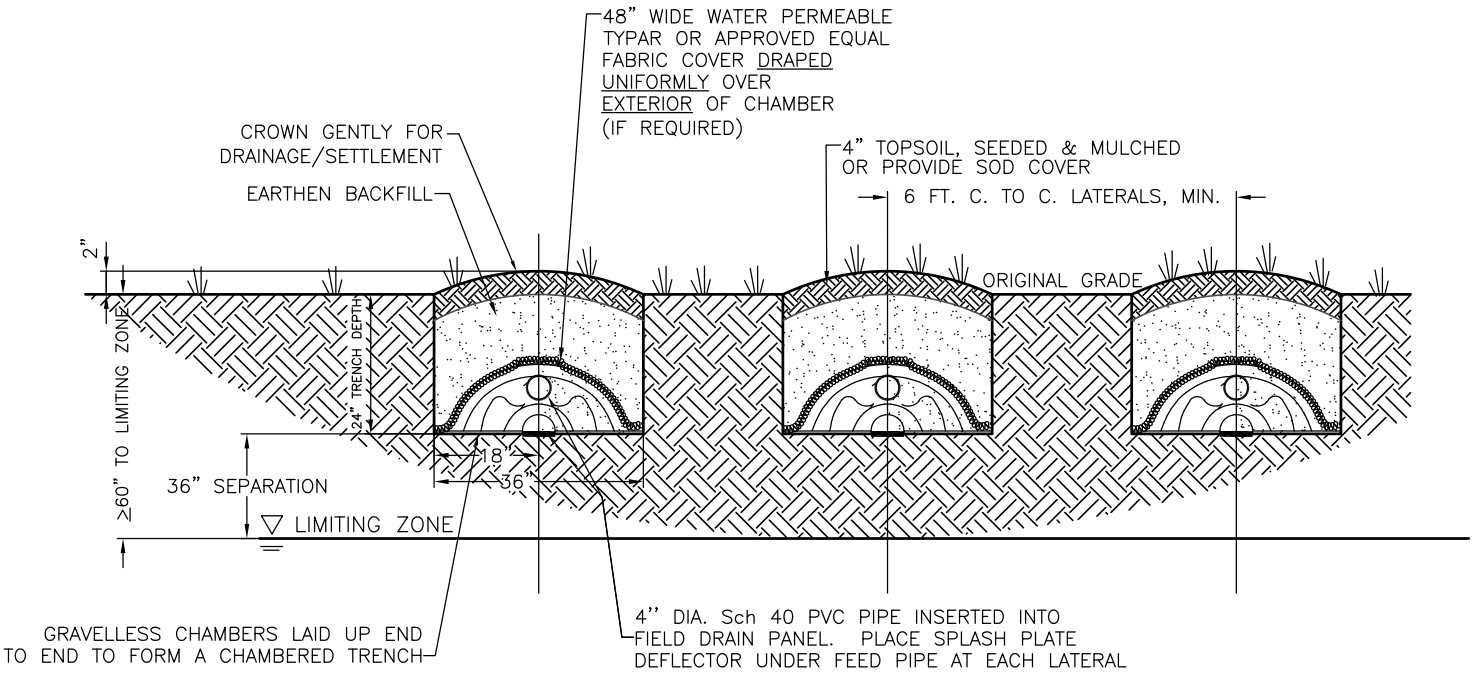
SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

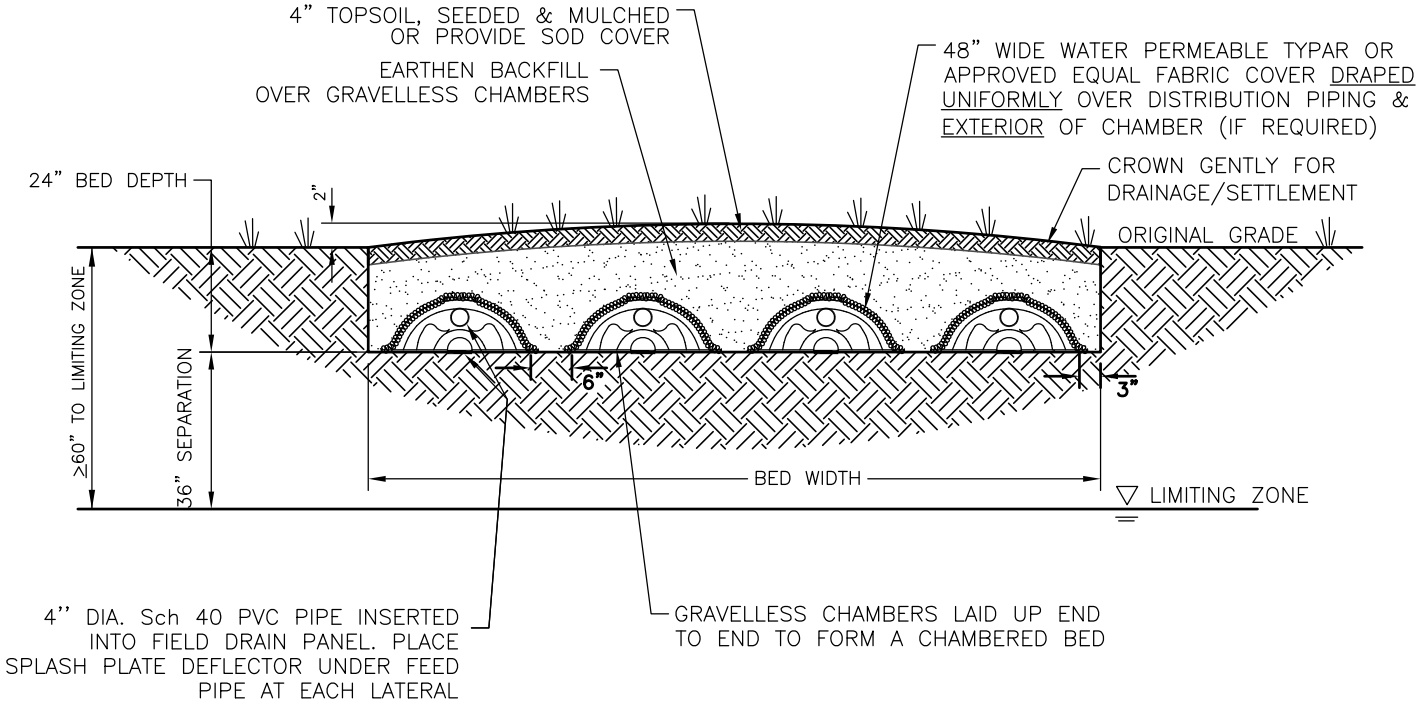
TYPICAL AGGREGATE BED
DESIGN FULL DEPTH GRAVITY
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - K
(Sheet 2 of 2)



FULL DEPTH TRENCH SECTION



FULL DEPTH BED SECTION

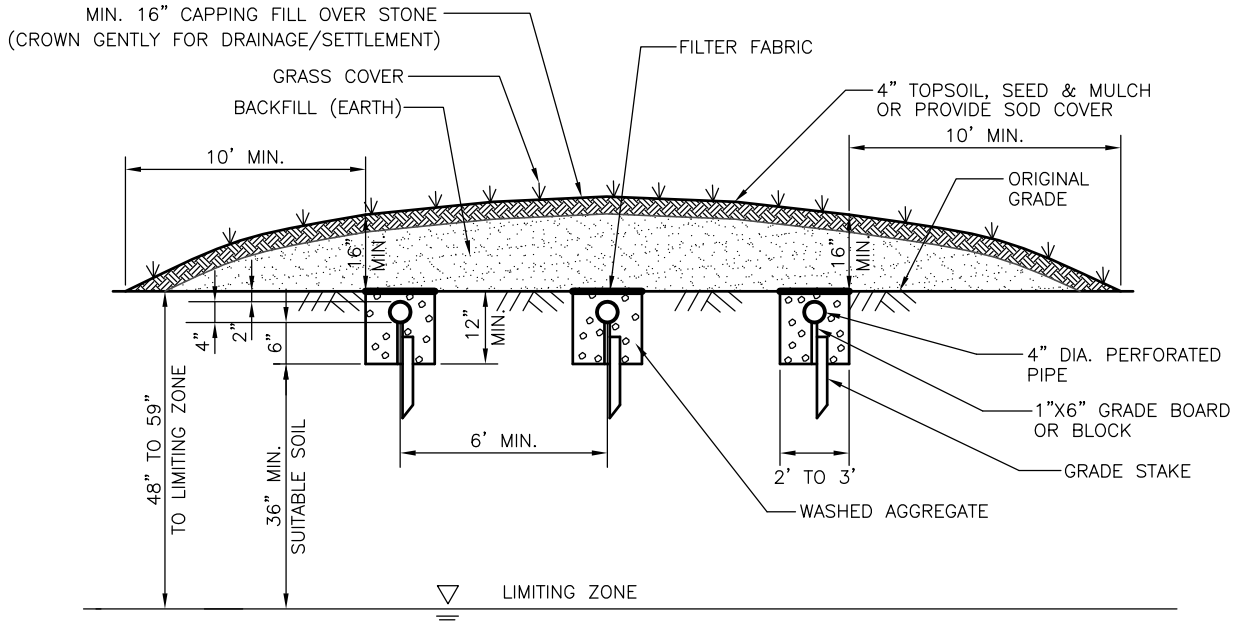
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL AGGREGATE-FREE TRENCH/BED DESIGN FULL DEPTH GRAVITY

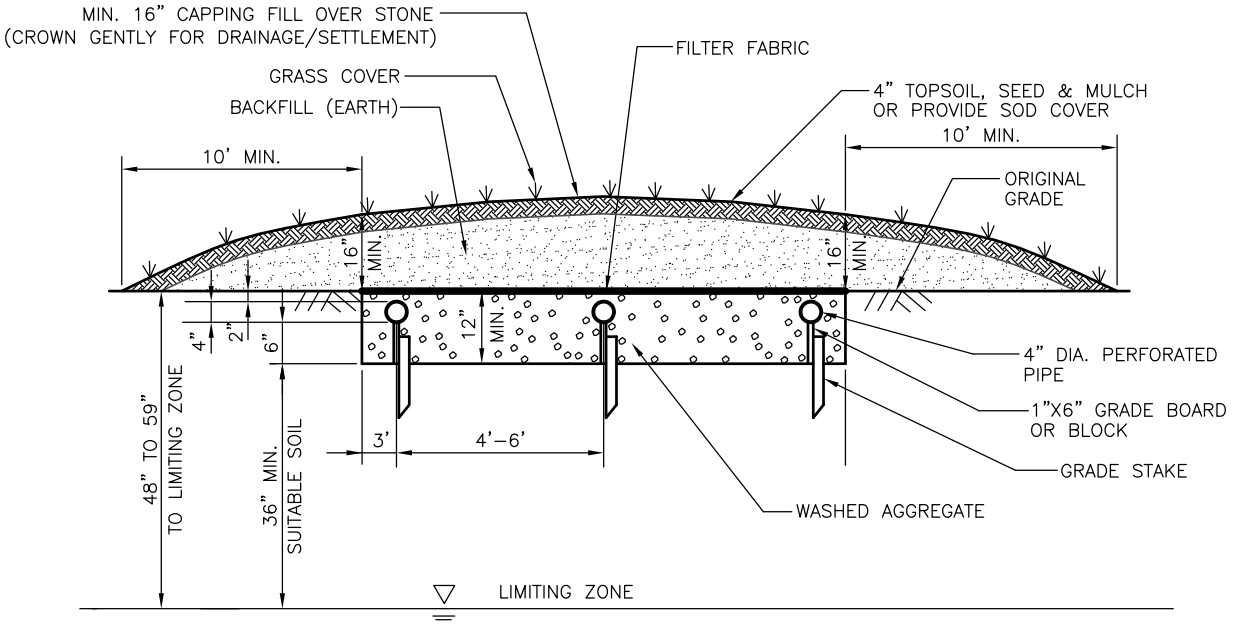
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - L



CAPPING FILL TRENCH SECTION



CAPPING FILL BED SECTION

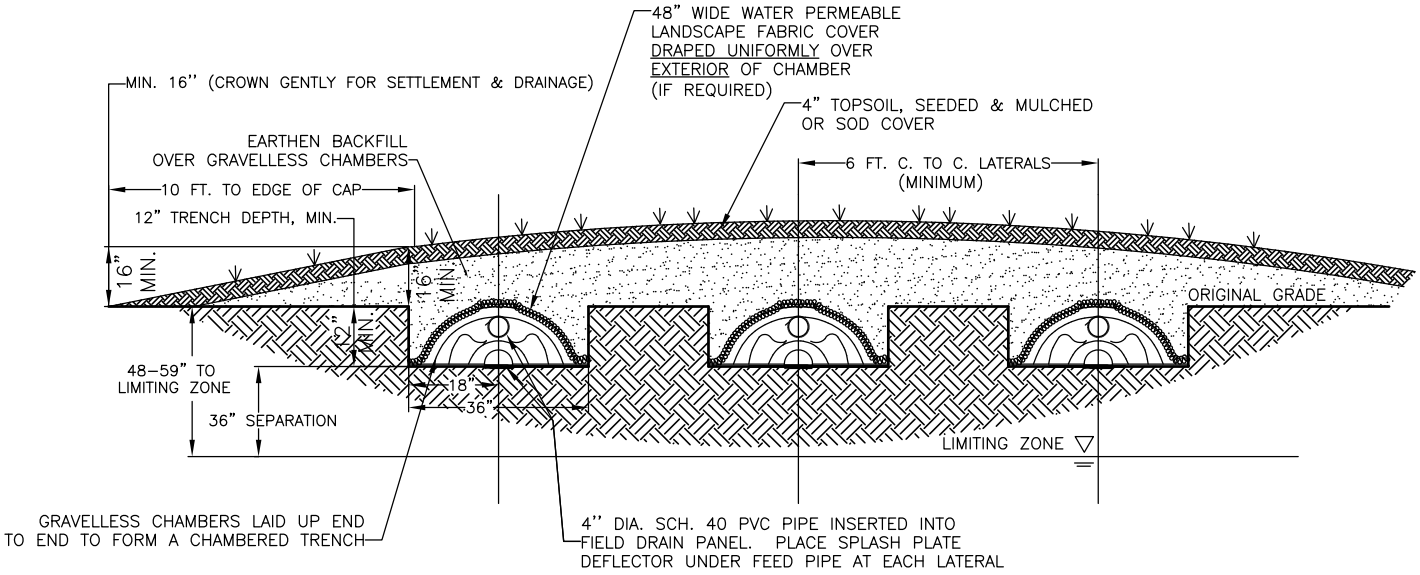
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TYPICAL AGGREGATE TRENCH/BED DESIGN- CAPPING FILL GRAVITY

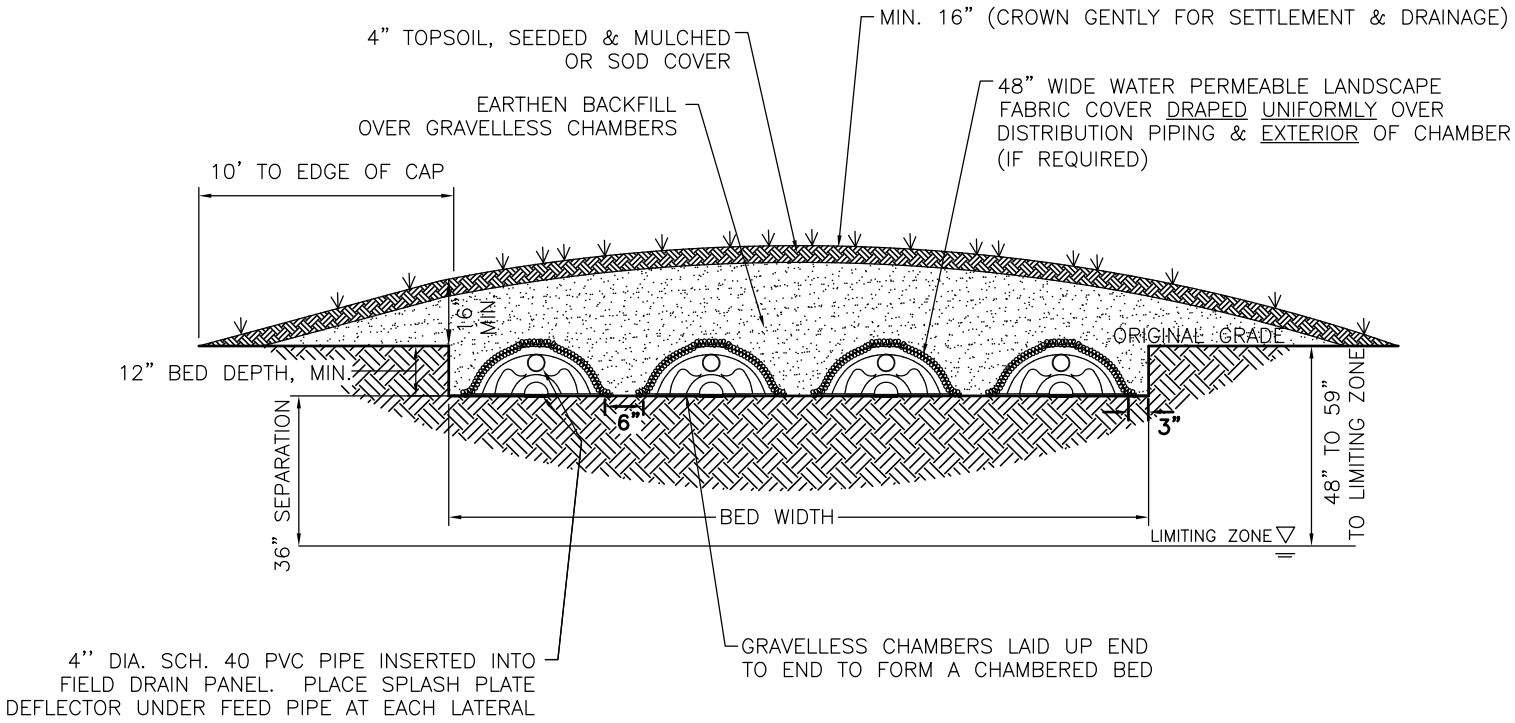
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - M



CAPPING FILL TRENCH SECTION



CAPPING FILL BED SECTION

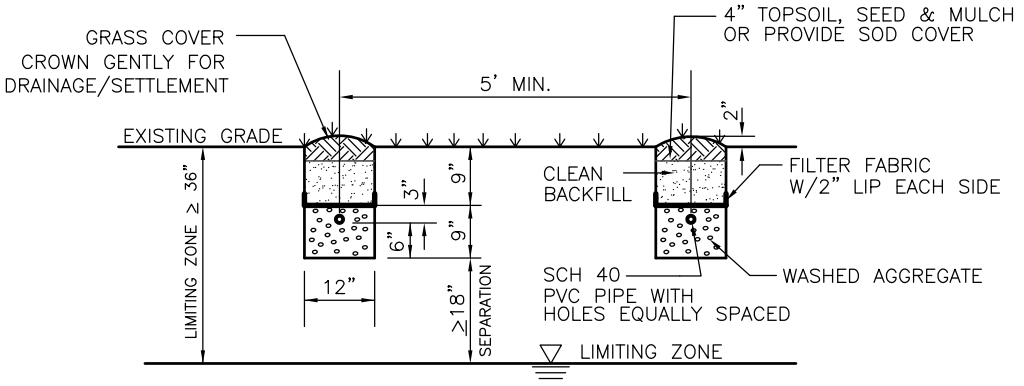
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TYPICAL AGGREGATE-FREE TRENCH/BED DESIGN CAPPING FILL GRAVITY

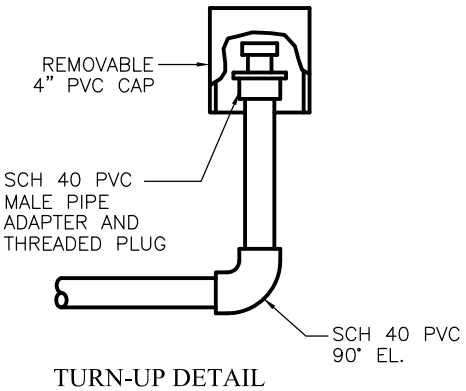
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ISSUED: JANUARY 1985
REVISED: JANUARY 2014

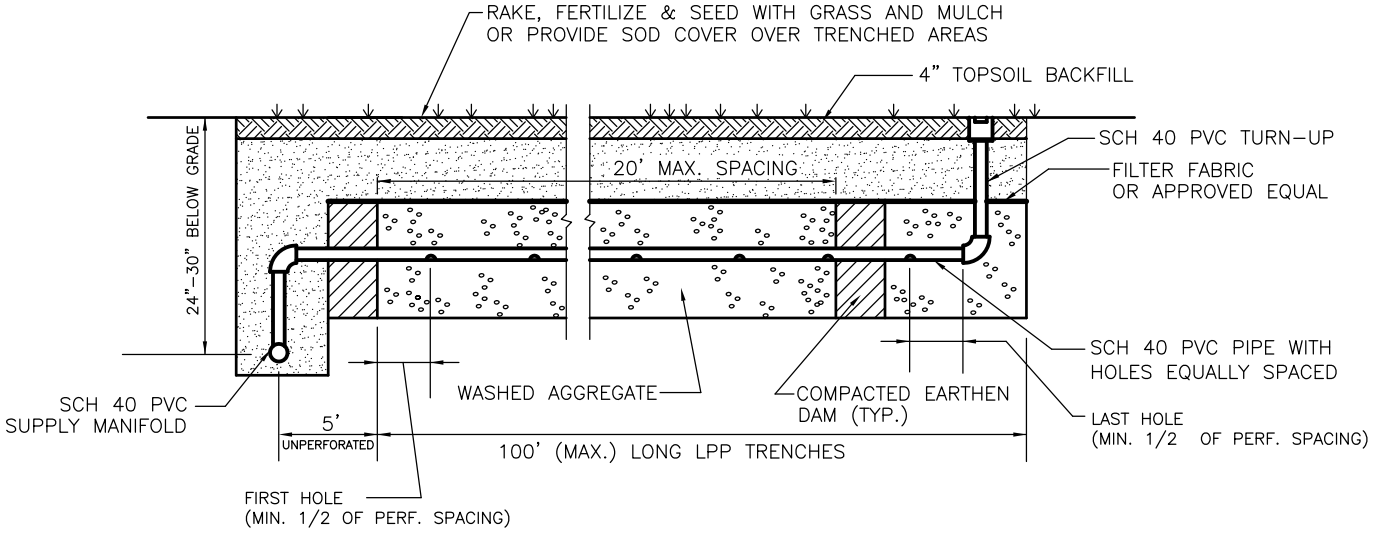
EXHIBIT - N



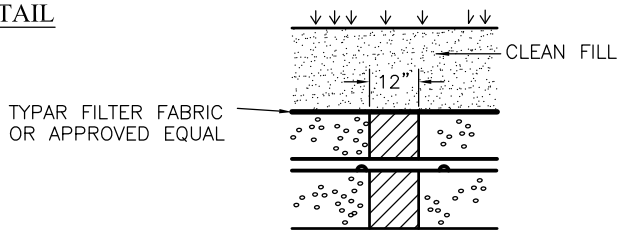
TRENCH CROSS SECTION



TURN-UP DETAIL



LPP TRENCH SECTION DETAIL



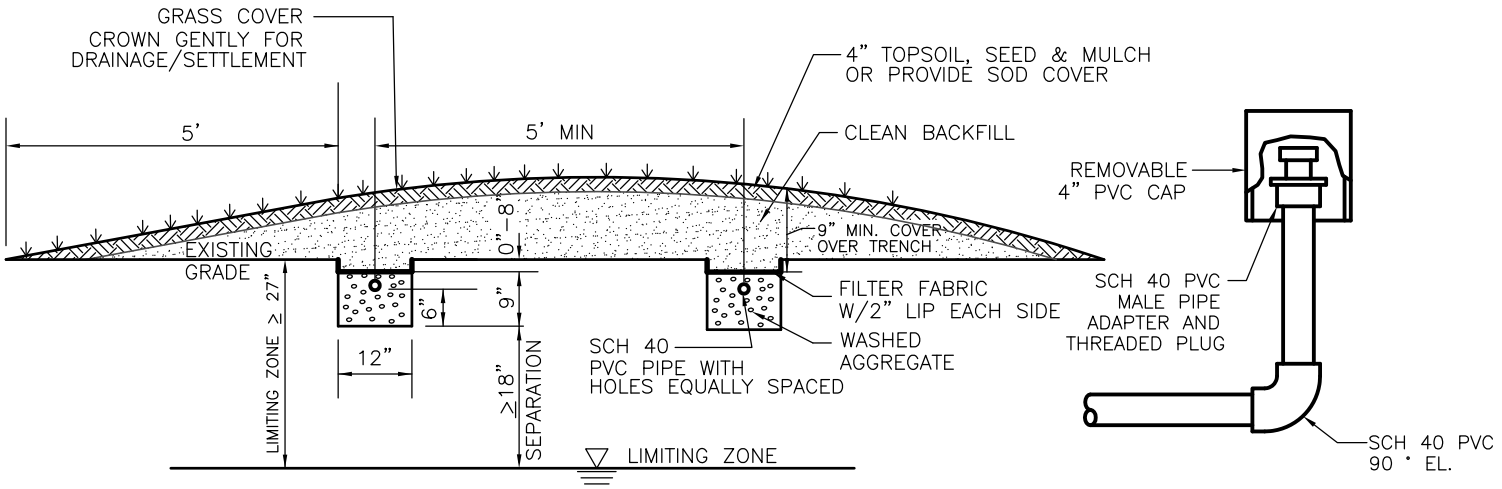
EARTHEN DAM DETAIL

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TYPICAL FULL DEPTH
LOW PRESSURE PIPE DESIGN
(NOT TO SCALE)

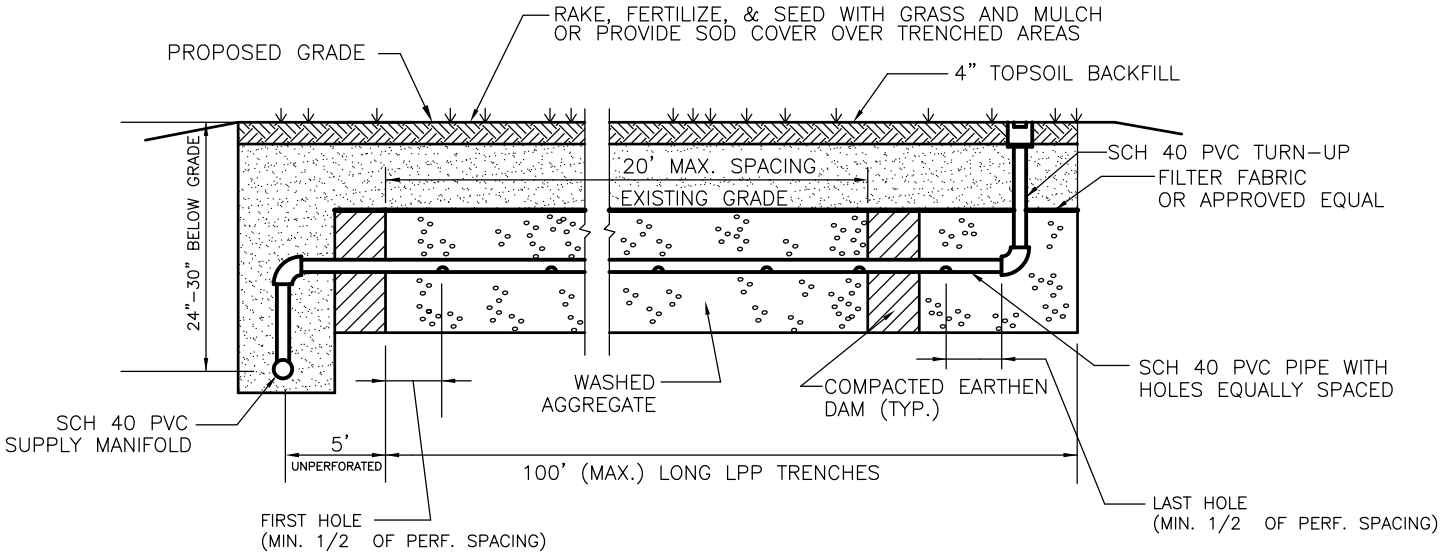
ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - O
(Sheet 1 of 3)



TRENCH CROSS SECTION

TURN-UP DETAIL



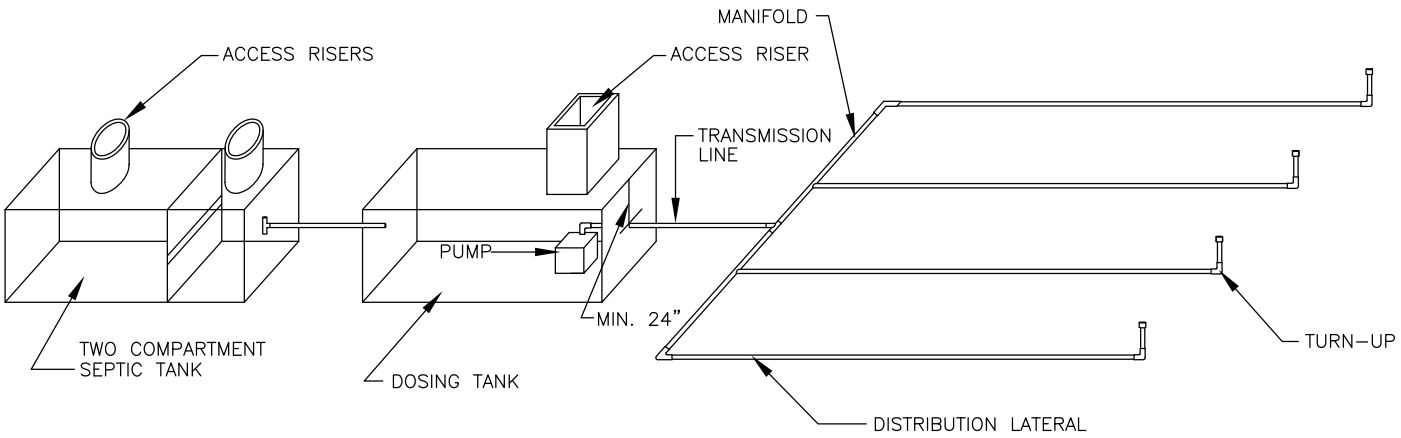
LPP W/CAP TRENCH SECTION DETAIL

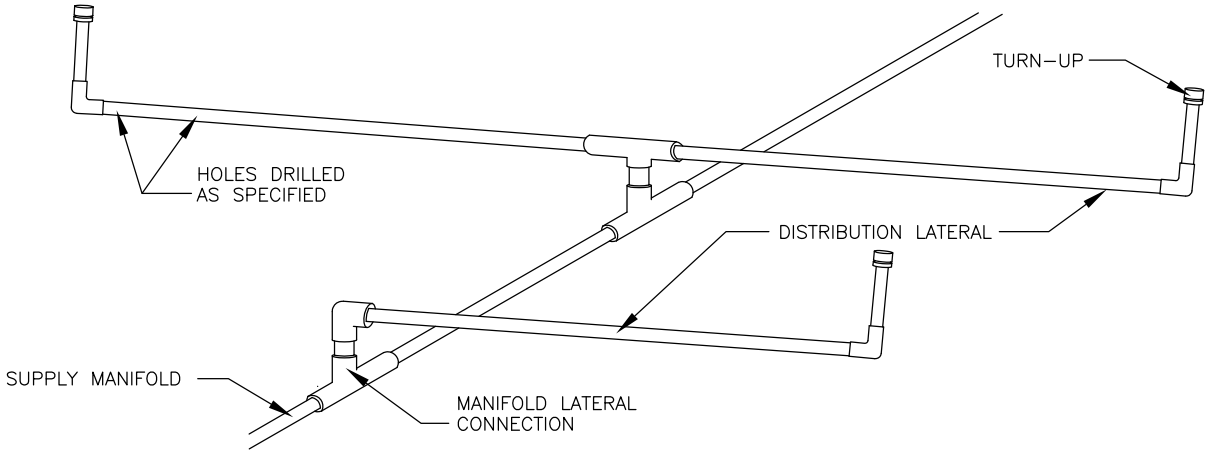
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TYPICAL CAPPING FILL
LOW PRESSURE PIPE DESIGN
(NOT TO SCALE)

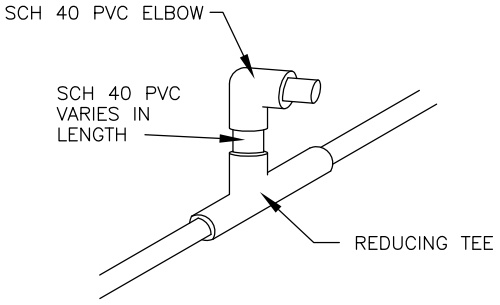
ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - O
(Sheet 2 of 3)

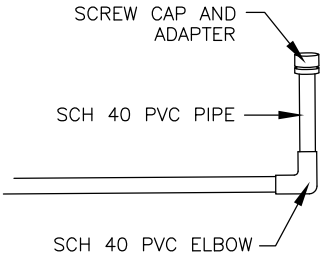




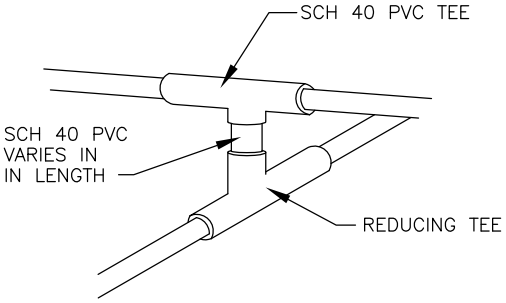
DISTRIBUTION SYSTEM



SIDE MANIFOLD LATERAL CONNECTION



TURN-UP



CENTER MANIFOLD LATERAL CONNECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

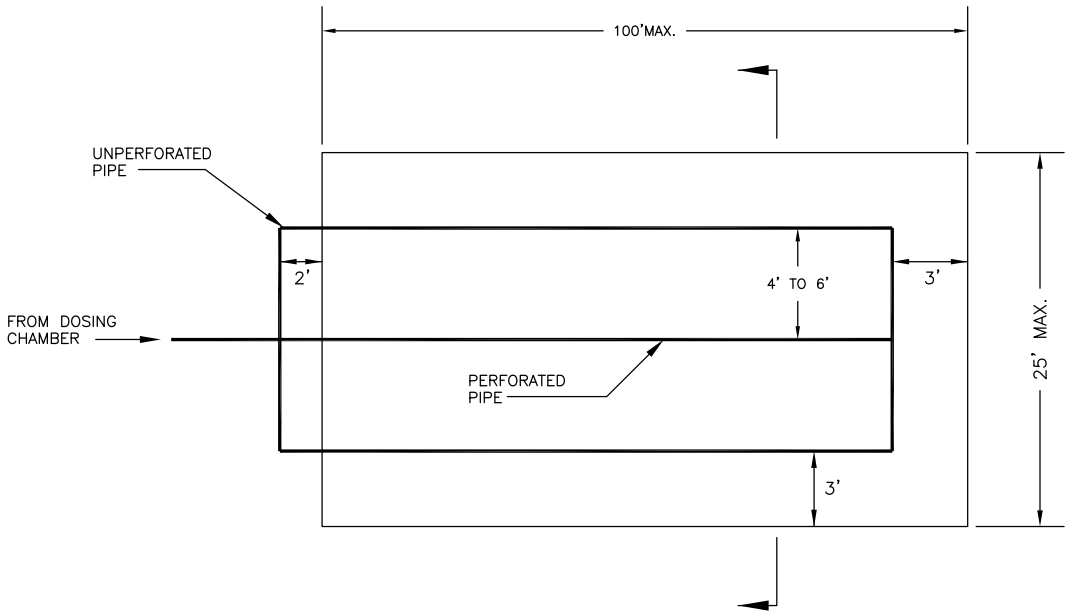
TYPICAL DISTRIBUTION NETWORK FOR A LOW PRESSURE PIPE DESIGN
(NOT TO SCALE)

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

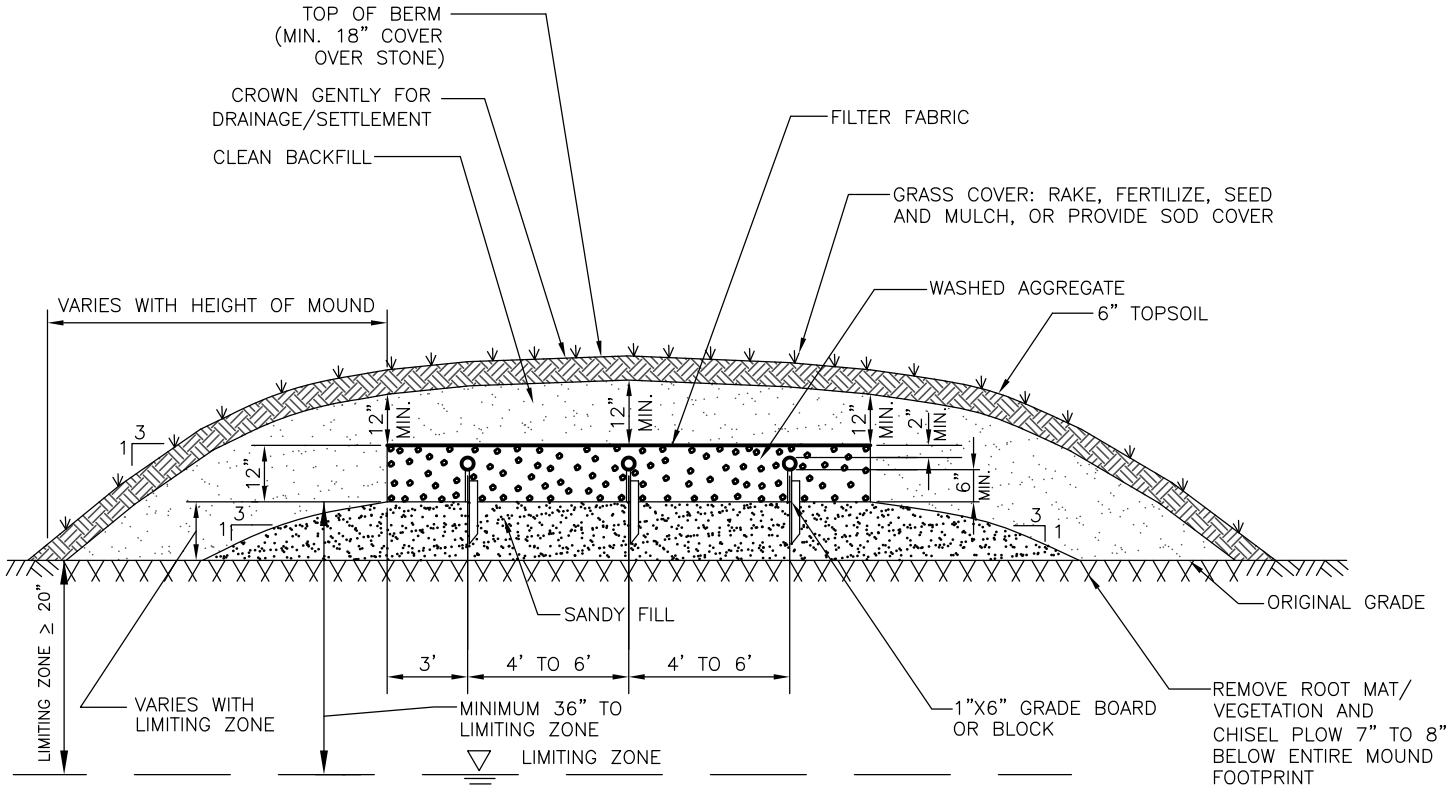
EXHIBIT - O
(Sheet 3 of 3)

LOW PRESSURE PIPE DESIGN
PERCOLATION RATES & MAXIMUM HOLE SPACING DISTANCES

MPI	FACTOR	MAX. SPC'G
20	3.70	60
25	4.20	60
30	4.80	72
35	5.50	72
40	5.58	72
45	5.87	72
50	6.16	72
55	6.45	72
60	6.65	72
65	7.35	96
70	8.05	96
75	8.75	96
80	9.45	96
85	10.15	96
90	10.99	96
95	11.76	96
100	12.74	96
105	13.86	96
110	15.26	96
115	16.52	96
120	17.50	96



PLAN



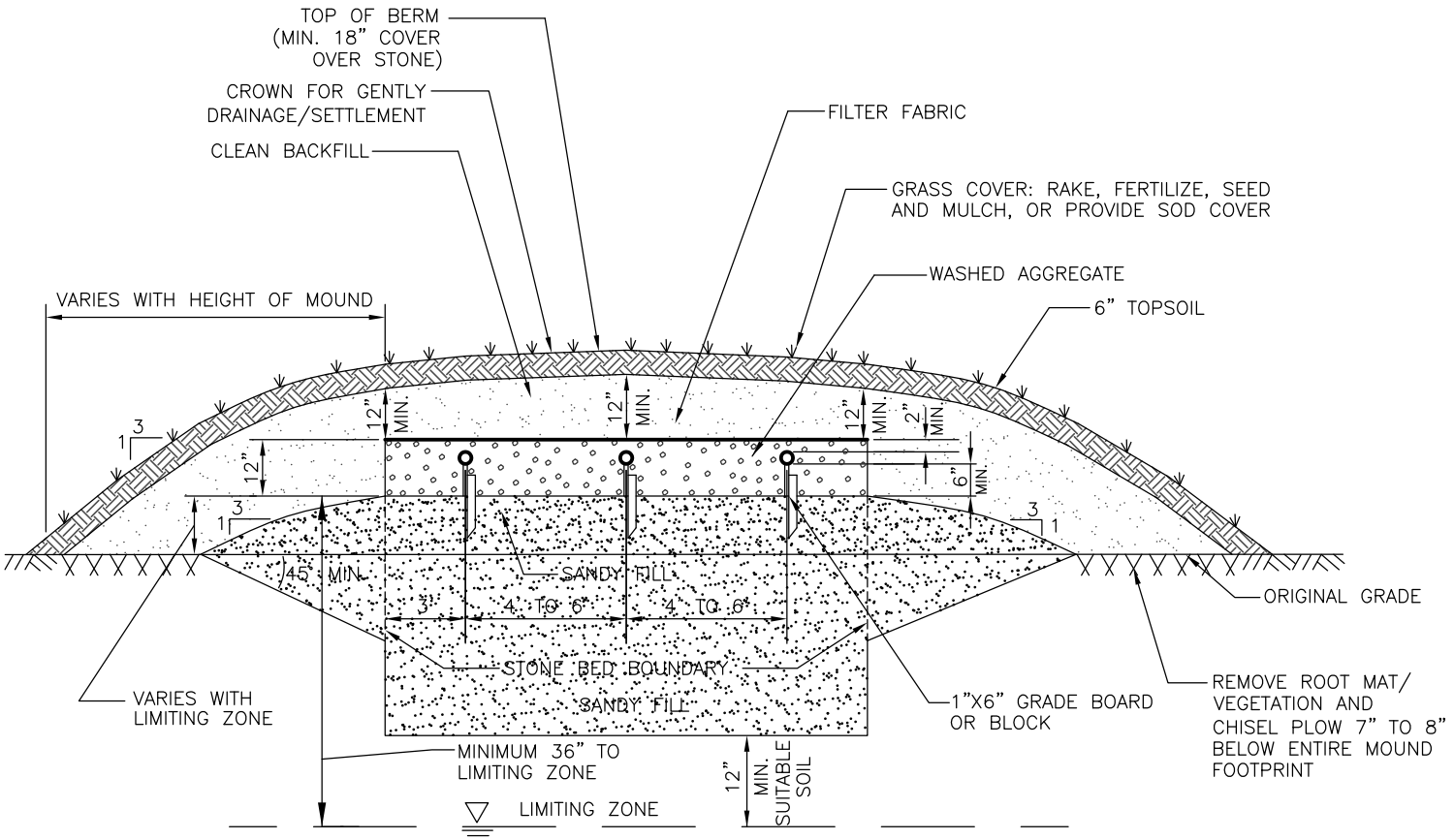
SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL ELEVATED SAND MOUND DESIGN

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - Q
(Sheet 1 of 2)



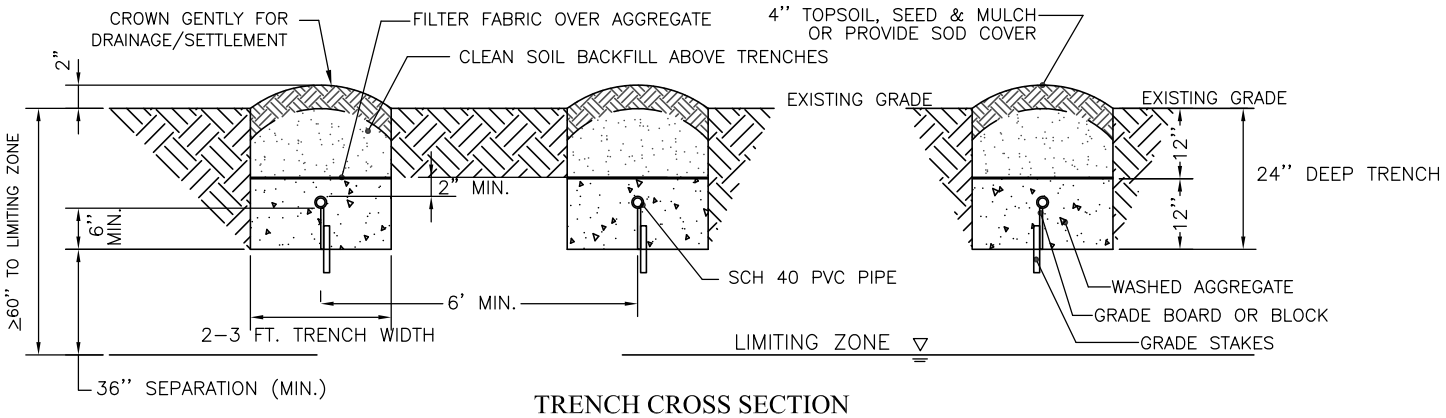
SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

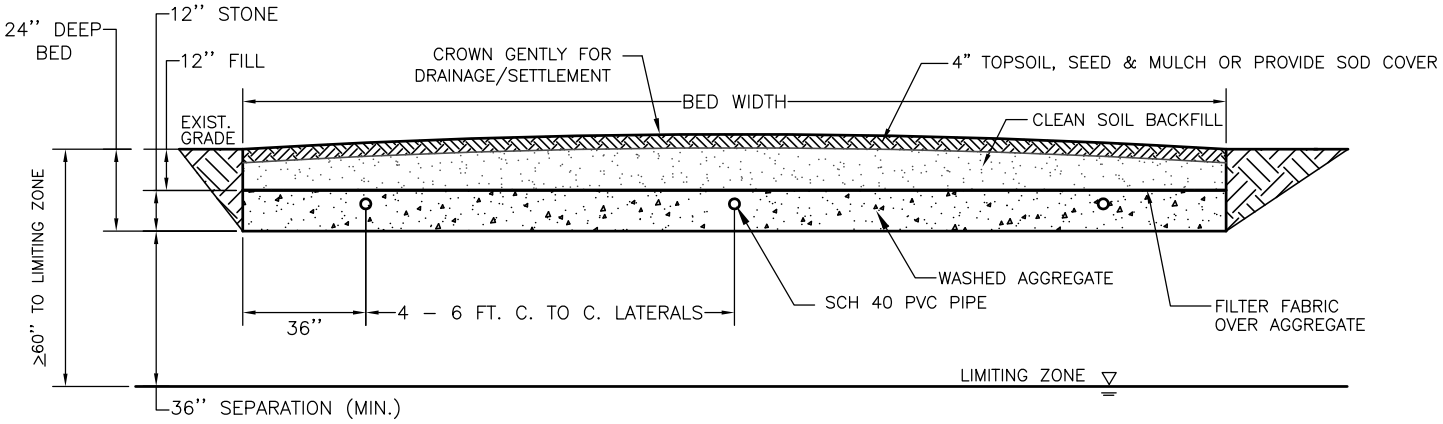
TYPICAL SAND-LINED ELEVATED SAND MOUND DESIGN

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - Q
(Sheet 2 of 2)



TRENCH CROSS SECTION



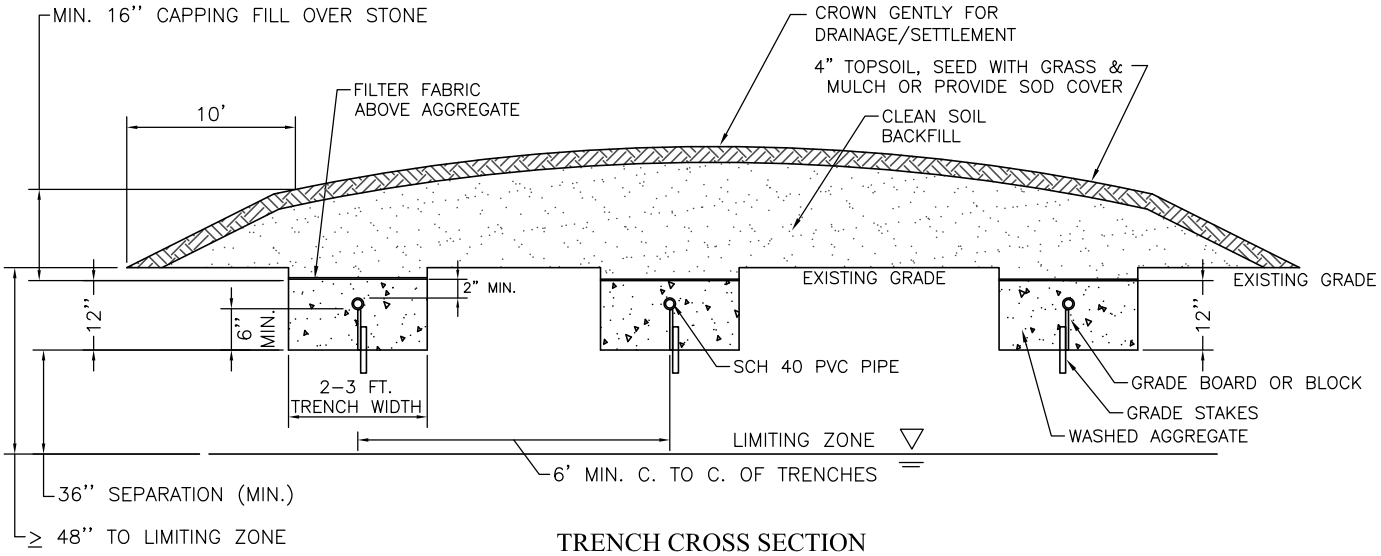
BED CROSS SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

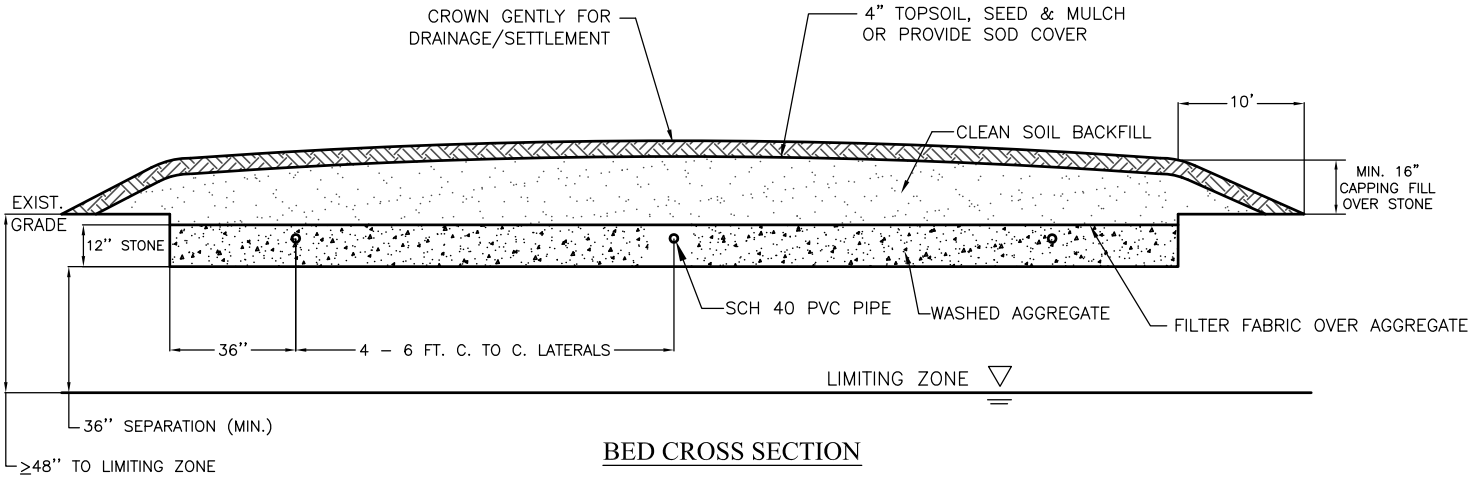
TYPICAL PRESSURE-DOSED TRENCH/BED DESIGNS FULL DEPTH

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - R



TRENCH CROSS SECTION



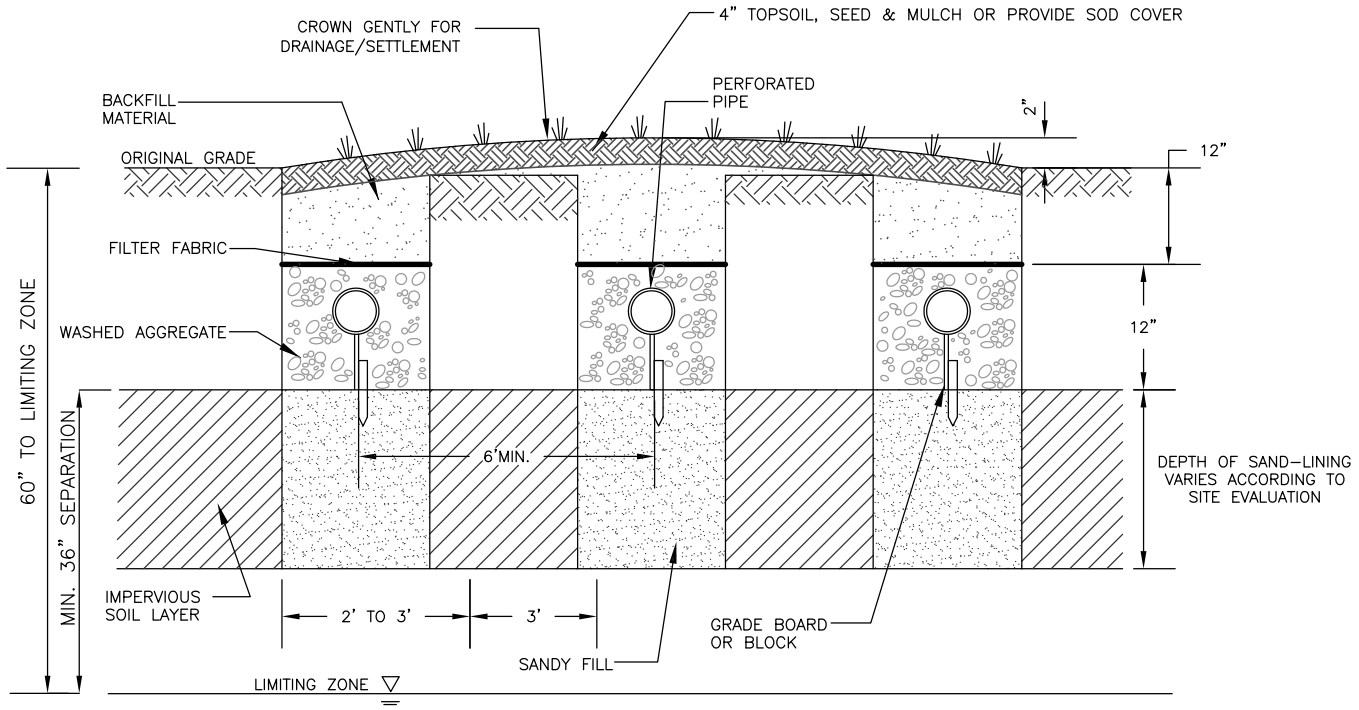
BED CROSS SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

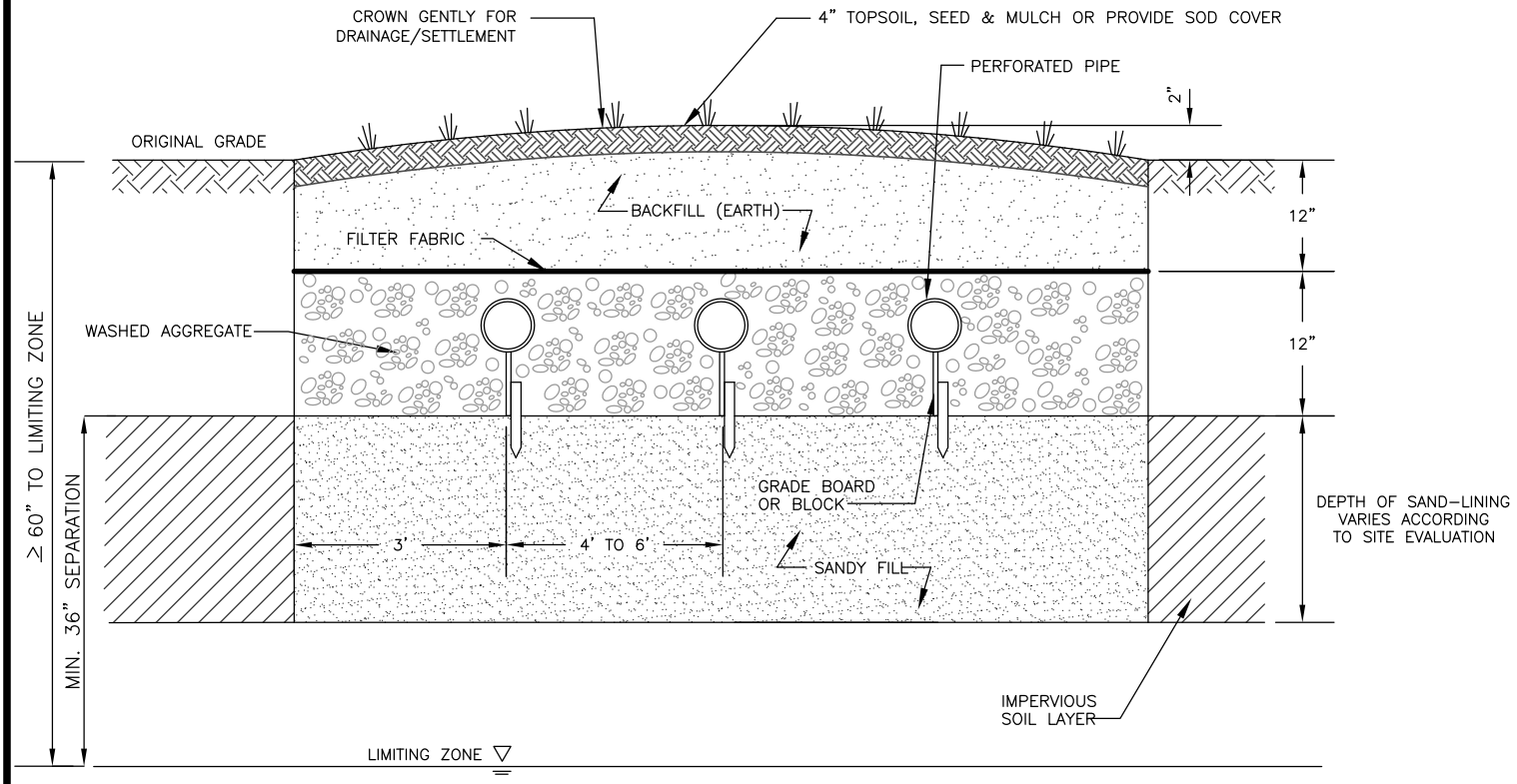
TYPICAL PRESSURE DOSED TRENCH/BED DESIGN CAPPING FILL

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - S



TRENCH SECTION



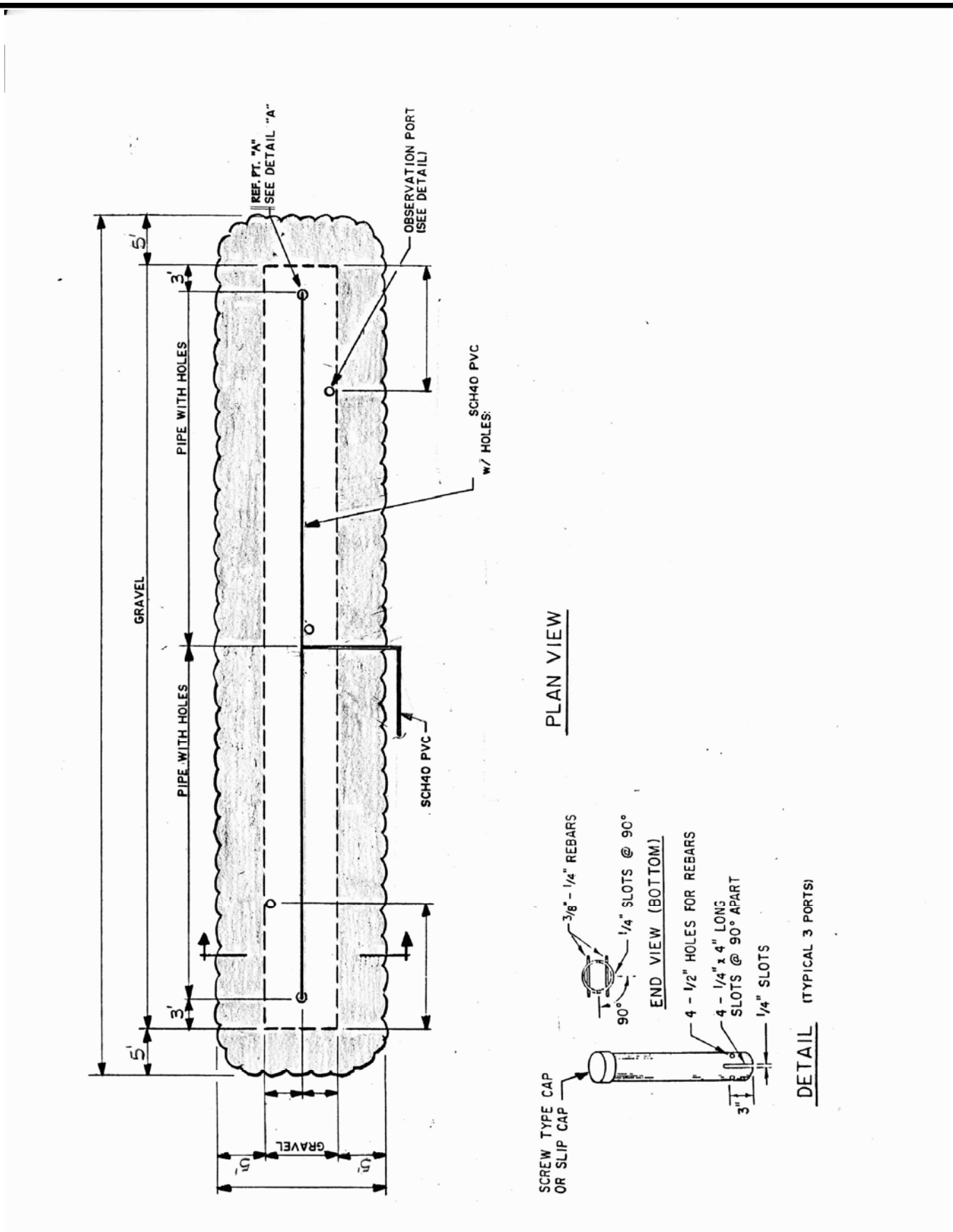
BED SECTION

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL SAND-LINED TRENCH/BED DESIGNS FULL DEPTH

ISSUED: JANUARY 1985
REVISED: JANUARY 2014

EXHIBIT - T



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

TYPICAL WISCONSIN AT-GRADE DISPOSAL SYSTEM DESIGN

(NOT TO SCALE)

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - U
(Sheet 1 of 2)

SECTION

DETAIL "A"

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

TYPICAL WISCONSIN AT-GRADE DISPOSAL SYSTEM DESIGN

(NOT TO SCALE)

ISSUED: JANUARY 2014

REVISED: _____

EXHIBIT - U
(Sheet 2 of 2)

Long Term Acceptance Rate (LTAR) Calculation

Permeability Rate (MPI)	K (ft/min)	LTAR (gpd/ft^2)
20	0.0042	0.525
25	**0.0033**	**0.501**
30	0.0028	0.483
35	**0.0024**	**0.469**
40	0.0021	0.458
45	**0.0019**	**0.448**
50	0.0017	0.440
55	**0.0015**	**0.433**
60	0.0014	0.427
65	**0.0013**	**0.421**
70	0.0012	0.416
75	**0.0011**	**0.412**

Incremental Loading Rate (ILR) Calculation

	Structure			
Texture	Moderate to Strong	Weak	Massive	Single Grain
Sand or coarser	NR	NR	NR	NR
Loamy Sand	**NR**	**0.50**	**NR**	**0.45**
L. fine sand–fine sand	NR	0.35	0.20	0.30
Sandy Loam	**0.40**	**0.30**	**0.10**	**NR**
Fine SL-L-Silt Loam	0.30	0.20	0.00	NR
Sandy Clay Loam	**0.25**	**0.15**	**0.00**	**NR**
Clay Loam-Silty CL	0.20	0.10	0.00	NR
Sandy Clay-Silty C-C	**0.05**	**0.01**	**0.00**	**NR**

NR = Not Recommended

0.00 for any cemented class or any consistency stronger than firm

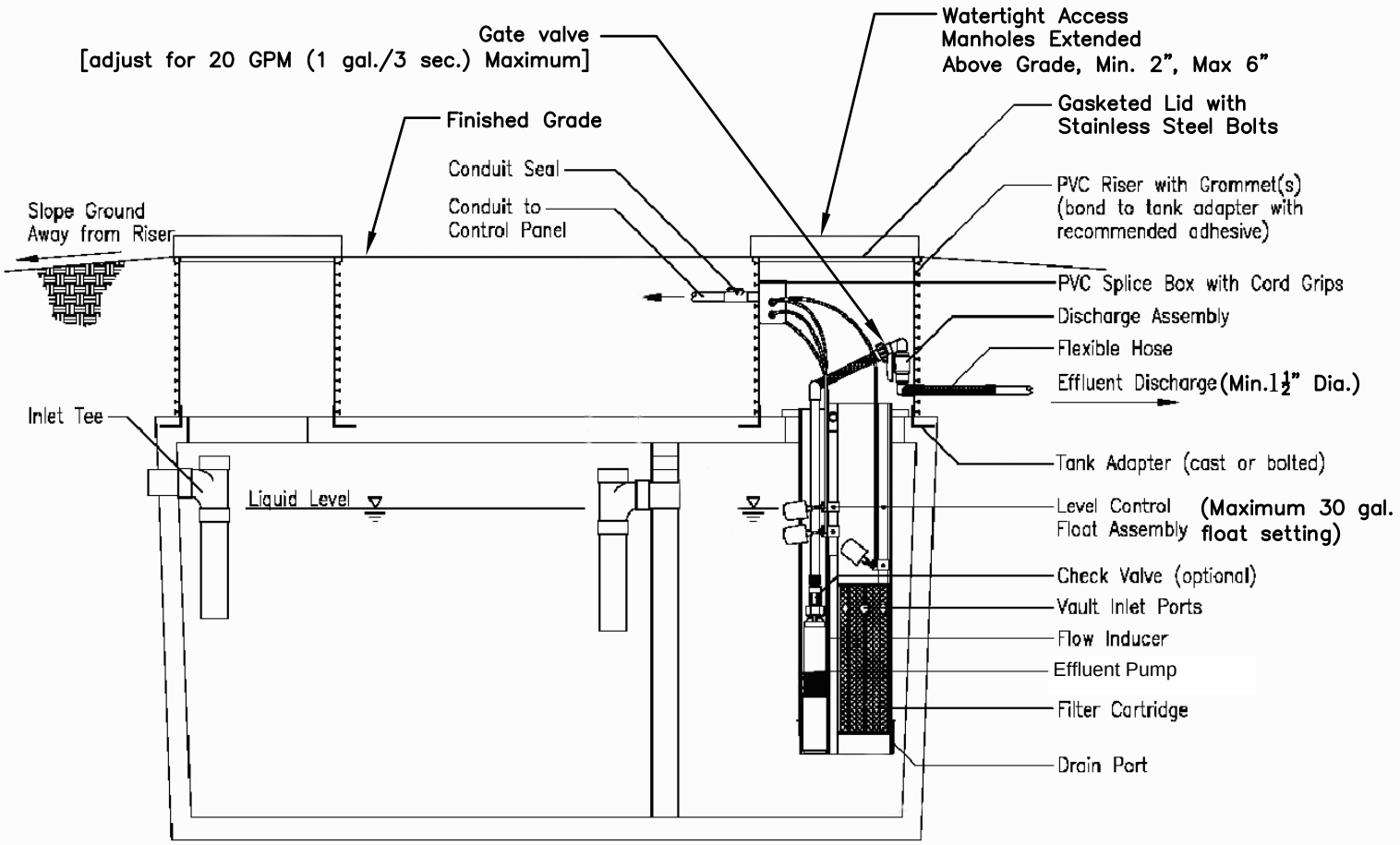
On-Site Wastewater Treatment and Disposal System Siting Information

SYSTEM TYPE	DEPTH TO THE LIMITING ZONE (LZ)	SEPARATION REQUIREMENTS			TRENCH DEPTH
		SMALL SYSTEM	LARGE SYSTEM[1]	POINT OF COMPLIANCE	
Denial	0 – <11 inches	N/A	N/A	N/A	N/A
Alternative Technologies	11 – 18 inches	*	*	*	*
Micro-Irrigation (Drip)	≥18 inches	18 inches	18 inches	Tubing	0 – 6 inches
Peat Biofilters	≥12 inches	12 inches	12 inches	Aggregate	N/A
Elevated Sand Mound	20 – 26 inches	36 inches	36 inches	Aggregate/Chamber	N/A
Wisconsin At-Grade	24 – 26 inches	24 inches	24 inches	Land Surface	N/A
Low Pressure Pipe (CF)	27 – 35 inches	18 inches	18 inches	Aggregate/Chamber	Varies, min. 9 inches
Low Pressure Pipe (FD)	36 – 47 inches	18 inches	18 inches	Aggregate/Chamber	18 inches
Gravity Capping Fill	48 – 59 inches	36 inches	N/A	Aggregate/Chamber	Varies, min. 12 inches
Pressure-Dosed (CF)	48 – 59 inches	36 inches	36 inches	Aggregate/Chamber	Varies, min. 12 inches
Full Depth Gravity	≥60 inches	36 inches	N/A	Aggregate/Chamber	24 inches
Pressure-Dosed (FD)	≥60 inches	36 inches	36 inches	Aggregate/Chamber	24 inches
Rapid Infiltration Basin (RIB)	≥48 inches	N/A	24 inches	Basin Bottom	N/A
Spray Irrigation	>24 inches	N/A	24 inches	Beneath Root Zone	N/A

[1] Large system separation requirements must be maintained from the mounded seasonal high water table to the point of compliance.

*Depends on the method of disposal.

In replacement situations with limiting zones < 20" an ESM may be assigned by a Class D soil scientist and may require advanced treatment. In this instance, converting a residential use to a commercial use the maximum allowable daily flow is 500 gpd.



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

SEPTIC TANK LIFT STATION

(NOT TO SCALE)

ISSUED: JANUARY 2014

REVISED: _____

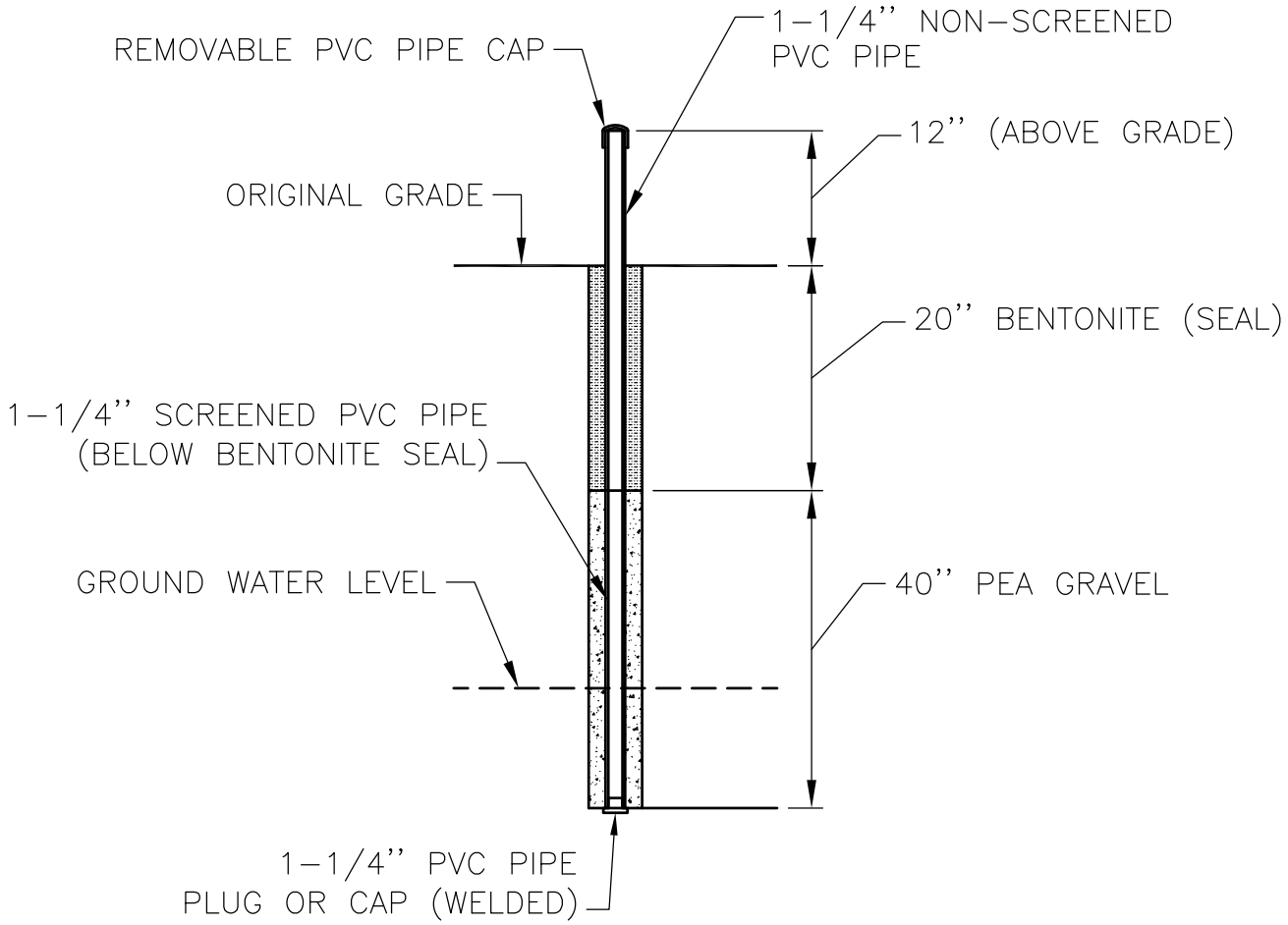
EXHIBIT - X

PERCOLATION RATES
BASED UPON USDA SOIL TEXTURES

USDA TEXTURE	DNREC ASSIGNED PERMEABILITY RATE (MPI)*
Sands	5
Loamy Sand	10
Sandy Loam	20
Sandy Clay Loam	30
Loam	30
Silt Loam	50
Silt	50
Clay Loam	75
Silty Clay Loam	75
Sandy Clay	120
Silty Clay	120
Clay	120

* Other soil properties such as high bulk density, structure, total porosity, and size and continuity of the pores may significantly affect these permeability rates. Textures of loamy coarse sand and coarse sandy loam may have permeability rates faster than assigned, while loamy very fine sand, loamy fine sand, very fine sandy loam and fine sandy loam may have permeability rates slower than assigned.

Permeability Class	Permeability Rate (mpi)
Very Slow	> 120
Slow	50 – 120
Moderate	25 – 49
Moderately Rapid	10 – 25
Rapid	6 – 10
Very Rapid	< 6



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

OBSERVATION WELL CONSTRUCTION DIAGRAM
(NOT TO SCALE)

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - Z

ON-SITE WASTEWATER SYSTEM ABANDONMENT REPORT

DELAWARE
DIVISION OF WATER RESOURCES
Working for YOU to Provide "Clean Water for Today and Tomorrow"

(Please Type or Print Legibly)

TAX MAP #: _____

DNREC LICENSEE NAME: _____ DNREC LICENSE #: _____ PHONE #: _____

OTHER GOVERNMENTAL APPOINTEE
LICENSE NAME: _____ LICENSE #: _____ PHONE #: _____

ABANDONMENT DATE: _____

THIS FORM MUST BE SUBMITTED WITHIN 10 DAYS OF COMPLETION

REASON FOR ABANDONMENT: ☐ **Connection to Central Sewer** ☐ **New System Installed**

☐ **Other** (Explain) _____

IF NEW SYSTEM INSTALLED - PERMIT #: _____

ABANDONED SYSTEM PERMIT #: _____

WAS ABANDONED SYSTEM A:
(Check all that apply)

☐ **Cesspool**	**# Cesspools** _____
☐ **Seepage Pit**	**# Seepage Pits** _____
☐ **Concrete Tank**	**# Concrete Tanks** _____
☐ **Steel Tank**	**# Steel Tanks** _____

TYPE OF ABANDONMENT:
(Check all that apply)

☐ **Crushed and Filled** ☐ **Removed and Filled**
☐ **Removed and New Tank Installed in Same Location**

_____ Date

_____ Licensee Signature

Peat System Design Loading Rates

Soil Type	Permeability Rate (mpi)	Hydraulic Loading Rate (gpd/ft²) Trench	Hydraulic Loading Rate (gpd/ft²) Bed
S	5	2.033	1.597
LS	10	1.437	1.129
	15	1.174	.922
SL	20	1.016	.799
	25	.909	.714
SCL, L	30	.803	.652
	35	.768	.604
	40	.719	.565
	45	.678	.532
Si, SiL	50	.643	.505
	55	.613	.482
	60	.587	.461
	65	.564	.443
	70	.543	.427
CL, SiCL	75	.525	.412
	80	.508	.399
	85	.493	.387
	90	.479	.376
	95	.466	.366
	100	.455	.357
	105	.444	.349
	110	.433	.341
	115	.424	.333
SC, SiC, C	120	.415	.326

Notes:

1. For commercial and/or large systems, please contact the GWDS and the manufacturers for additional siting criteria.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

PEAT SYSTEM
DESIGN LOADING RATES

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - B B

Micro-Irrigation "Drip" Design Loading Rates

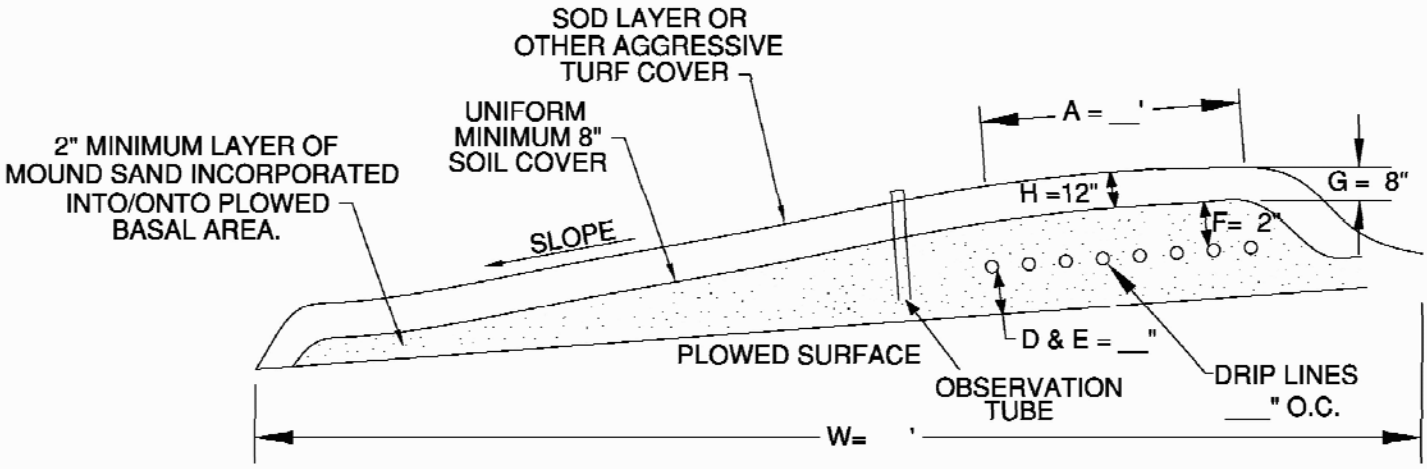
Soil Type	Permeability Rate (mpi)	Hydraulic Loading Rate (gpd/ft^2)	Drip – Line Spacing	Emitter Spacing
S	5	.303	Typically 24"	Typically 24"
LS	10	.278		
	15	.253		
SL	20	.228		
	25	.211		
SCL, L	30	.203		
	35	.196		
	40	.189		
	45	.180		
Si, SiL	50	.173		
	55	.162		
	60	.154		
	65	.146		
	70	.139		
CL, SiCL	75	.133		
	80	.127		
	85	.122		
	90	.117		
	95	.116		
	100	.105		
	105	.096		
	110	.088		
	115	.080		
SC, SiC, C	120	.073		

Notes:

1. Primary effluent systems require automation of filter and field flushing.
2. Spacing of drip-line and emitters may also be a function of soil textures and landscaping requirements. Please contact manufacturer for recommendations and limitations.
3. For commercial and/or large systems, please contact the GWDS and the manufacturers for additional siting criteria.

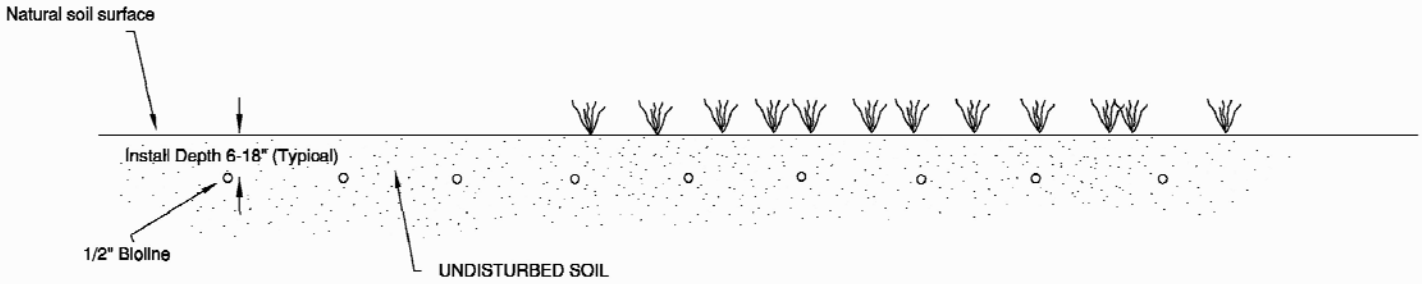
MICRO-MOUND CROSS-SECTION

NTS



STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL	MICRO-IRRIGATION "DRIP" DIPSERSAL INSTALLATION METHODS MICROMOUND/DRIP CROSS SECTION	ISSUED: JANUARY 2014 REVISED: _____ EXHIBIT - D D (Sheet 1 of 3)

SUBSURFACE DRIP TUBING INSTALLATION
(INSTALL VIA. VIBRATORY PLOW OR TRENCHER)



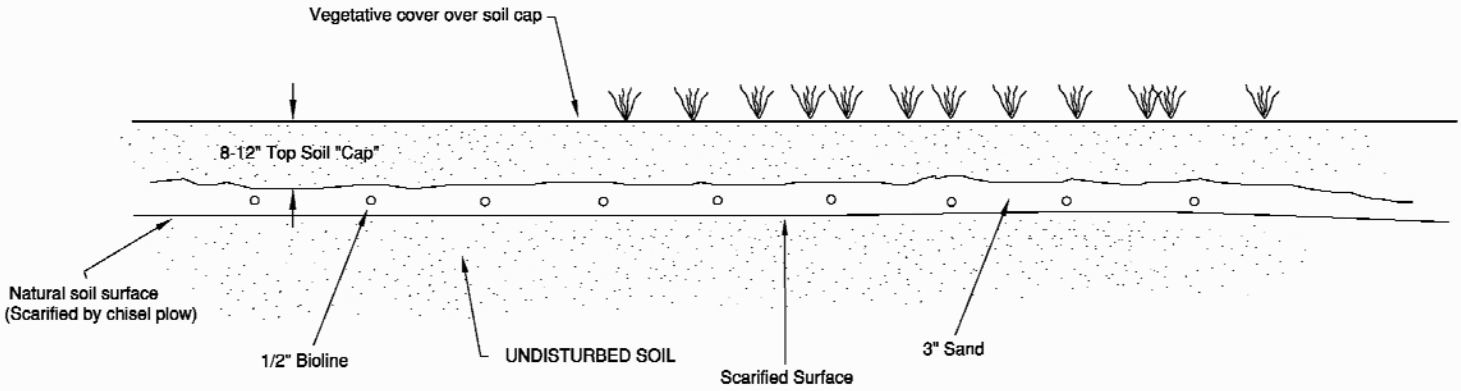
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

MICRO-IRRIGATION "DRIP"
DIPSERSAL INSTALLATION METHODS
SUBSURFACE DRIP
CROSS SECTION

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - D D
(Sheet 2 of 3)

AT-GRADE DRIP TUBING INSTALLATION
(INSTALL BY HAND IN SAND FILL OVER SCARIFIED SURFACE)



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

MICRO-IRRIGATION "DRIP"
DIPSERSAL INSTALLATION METHODS
AT-GRADE DRIP
CROSS SECTION

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - D D
(Sheet 3 of 3)

Department of Natural Resources and Environmental Control
Ground Water Discharges Section
Product Approval Checklist

Any persons seeking approval of an innovative and alternative on-site wastewater treatment unit and/or disposal system, product or component shall make an application in writing to the Ground Water Discharges Section of the Department of Natural Resources and Environmental Control in accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems, and the checklist below. Please submit one copy of all requested material as applicable to the Ground Water Discharges Section, 89 Kings Highway, Dover, DE 19901 (phone 302-739-9948).

1. Application Information Required for all Systems or Protocols
    a. Name, address, phone number, fax number and email address for manufacturer, owner and agent.
    b. Executive summary describing the system, stating the type of approval sought, model numbers, and treatment levels as applicable
    c. System proposed is fully described with the following information:
        i. Construction drawings provided detailing all system components;
        ii. Specifications describing all materials to be used, methods of construction, means for assuring the quality and integrity of the finished product, and installation procedures;
        iii. Materials specified for use in construction are equal or superior in physical properties and chemical durability
        iv. Any special conditions for use, installation, operation; and monitoring and maintenance that should be conditions of any approval document.
    d. Provide summary of pertinent literature, published research, and previous experience and performance with the system.
    e. Provide other state approvals.
    f. Provide results of any available testing, research or monitoring of pilot systems or full scale operational systems conducted by a third party independent research or testing organization. These independent studies must have adequate research from highly controlled, third party studies with rigorous research protocols or well documented long term use studies of proven wastewater technologies.
    g. Operation, Maintenance and Monitoring procedures for system.
    h. Notification given of any proprietary information, system, component, or device.
    i. Local distributor information and contact information.

The Applicant hereby certifies that, to the best of his/her knowledge and beliefs, a complete factual representation of the information requested above has been provided:

_____ _____
Applicant Date

Lot Clearing/Disturbed Site Inspection Report

Date of Report: _____ **Tax Map #:** _____

Date of Field Inspection: _____ **Septic Permit #:** _____

Location of Site: _____

- **Observation Method**: Boring(s) Test Pit(s) Probe
- **Inspected Area**: Initial Replacement
- **Selected Observable Features Indicative of Soil Compaction (upper 24 inches only)**:

Auger Resistance [1]:	Yes	No	N/A	Min & Max. Depth Observed _____
Platy Soil Structure [2]:	Yes	No	N/A	Min & Max. Depth Observed _____
Redoximorphic Concentrations [3]:	Yes	No	N/A	Min. Depth Observed _____
Visible Ruts From Equipment:	Yes	No	N/A	Max. Depth Observed _____
Presence of Fill or Stockpiling:	Yes	No	N/A	Max. Depth Observed _____
Evidence of Surface Ponding:	Yes	No	N/A	Comments _____
Moisture Content Suitable for Installation:	Yes	No		Comments _____
Stumps Visible:	Yes	No	N/A	
Drainfield Area Flagged, Roped, or Barricaded [4]:	Yes	No	N/A	
Soil Horizons Mixed (> 9 inches from surface) [5]:	Yes	No	N/A	

- **Summary of Inspection:** (Circle one or both)

? The area reserved for the initial/replacement disposal system, as of the date of inspection, does not appear to have been adversely affected by tree clearing.

? The area reserved for the initial/replacement disposal system, as of the date of inspection, does appear to have been adversely affected by tree clearing.

Inspectors Comments: _____

_____

Signed: _____ **License #:** _____

[1] Auger boring resistance is a subjective observation and may be affected by soil moisture state.
[2] Platy structure can be a result of soil compression/compaction.
[3] Redoximorphic (Iron Oxide) concentrations can form quickly in response to compaction as a result of slowed water movement thru the soil.
[4] Marking the proposed drainfield to help prevent equipment encroachment and possible compaction is a recommended practice.
[5] Extensively mixed soils may prevent the system from functioning hydraulically or from a treatment perspective.

Http://www.fieldcrops.org

Http://www.umd.edu/mce/

Http://ag.udel.edu/extension/agnr/agronomy.htm

Http://mawaterquality.org/

Http://www.agguide.agronomy.psu.edu

Http://pubs.ext.vt.edu/

Http://rutgers.edu

Http://ipni.net/ipniweb/pnt.nsf

Http://nanc.ipni.net/articles/nanc0005-en

Cumulative metal loading limit for spray irrigation systems

	Soil Cation Exchange Capacity (meq/100g)[1]		
	0-5	5-15	>15
	- - - Cumulative Limit - lb/ac (**Kg/ha**) - - -		
Metal			
Pb	500 (**560**)	1000 (**1120**)	2000 (**2240**)
Zn	250 (**280**)	500 (**560**)	1000 (**1120**)
Cu	125 (**140**)	250 (**280**)	500 (**560**)
Ni	125 (**140**)	250 (**280**)	500 (**560**)
Cd	4.4 (**5**)	8.9 (**10**)	17.8 (**20**)

[1] Annual Cd application rate not to exceed 0.44 lb/ac (0.5 Kg/ha)

NOTE: Soil must be maintained at pH 6.5 or above whenever food chain crops are grown unless plant nutrient needs and soil chemistry preclude such values without excessive lime addition, based not on cost but on unrealistic tonnage of lime/acre. In such cases, lime additions suitable to the vegetation used are to be applied in conjunction with annual metal monitoring of the vegetation.

MONTHLY AVERAGE DAYLIGHT HOURS IN UNITS OF 12 HOURS AS A FUNCTION OF LATITUDE FOR THORNTHWAITE POTENTIAL EVAPOTRANSPIRATION

Month	Duration on 15th Day of Month 39° N Latitude*
January	0.81
February	0.8
March	0.99
April	1.10
May	1.19
June	1.24
July	1.22
August	1.15
September	1.04
October	0.93
November	0.84
December	0.79

*Values for 39° N latitude may be used for all latitudes in Delaware

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

MONTHLY AVERAGE DAYLIGHT HOURS FOR THORNWAITE POTENTIAL EVAPOTRANSPIRATION

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - I I

CLIMATOLOGICAL NORMAL TEMPERATURES (Ta) AND THORNTHWAITE POTENTIAL EVAPOTRANSPIRATION FOR THE U.S. WEATHER SERVICE STATIONS IN DELAWARE

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual
	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Ta	PET	Total PET
	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	°F	in	in
Northern Region																									
Newark University Farm	31.7	0	33.7	0.1	42.1	0.6	52.8	1.8	62.7	3.3	71.2	4.8	75.7	5.4	74.5	4.9	67.9	3.5	56.3	1.9	45.8	0.8	35.6	0.1	27.2
Wilmington WSO AP	31.2	0	33.2	0	41.8	0.6	52.4	1.8	62.2	3.2	71.2	4.8	76.0	5.5	74.8	5.0	67.9	3.5	56.2	1.9	45.6	0.8	35.5	0.1	27.1
Wilmington Porter Resvr	30.8	0	32.6	0	41.0	0.6	51.8	1.7	61.6	3.2	70.4	4.7	74.9	5.3	73.7	4.8	66.9	3.4	55.7	1.9	45.2	0.8	35.1	0.1	26.5
Middletown	31.3	0	34.4	0.1	42.6	0.6	53.2	1.8	63.0	3.3	72.1	4.9	76.0	5.5	74.8	4.9	68.8	3.6	56.9	1.9	46.8	0.8	37.2	0.2	27.7
Southern Region																									
Bridgeville 4 NW	34.3	0.1	36.0	0.1	43.8	0.7	54.2	1.9	63.7	3.4	72.0	4.8	76.2	5.5	74.7	4.9	68.4	3.6	57.4	1.9	47.5	0.9	38.1	0.2	28.0
Dover	34.3	0.1	36.3	0.1	44.2	0.7	54.7	1.9	64.2	3.4	72.7	4.9	77.0	5.6	75.7	5.1	73.0	4.2	58.6	2.0	48.2	0.9	38.5	0.2	29.0
Georgetown 5 SW	34.2	0.1	35.8	0.1	43.5	0.7	53.6	1.8	63.1	3.3	71.5	4.8	76.1	5.5	74.9	4.9	68.4	3.6	57.0	1.9	47.2	0.9	37.8	0.2	27.7
Lewes	34.6	0.1	36.1	0.2	43.3	0.7	53.1	1.8	62.1	3.2	70.7	4.6	75.2	5.3	74.3	4.8	68.4	3.6	57.5	2.0	48.0	0.9	38.5	0.3	27.5
Milford 4 SE	34.3	0.1	35.8	0.1	44.3	0.7	54.4	1.9	63.9	3.4	72.0	4.8	76.5	5.5	75.2	5.0	68.8	3.6	57.7	2.0	47.6	0.9	37.9	0.2	28.2

NOTE: See Definitions Section for definition of Ta and PET

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

CLIMATOLOGICAL NORMAL TEMPERATURES (Ta) AND THORNWAITE POTENTIAL EVAPOTRANSPIRATION

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - J J

CLIMATOLOGICAL NORMAL PRECIPITATION (P) AND 5-YEAR RETURN PERIOD MONTHLY PRECIPITATION DATA (P5) FOR THE LONG-TERM U.S. WEATHER SERVICE STATIONS IN DELAWARE

Station	January		February		March		April		May		June		July		August		September		October		November		December	
	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5	P	P_5
	inches																							
Northern Region																								
Newark University Farm	2.6	4.4	2.8	4.0	3.4	4.9	3.6	5.0	3.7	5.2	3.9	5.4	4.4	6.4	4.1	6.4	3.8	5.5	3.3	4.7	3.1	4.5	3.6	5.4
Wilmington WSO AP	2.9	4.3	3.1	4.7	3.7	5.1	3.4	4.8	3.6	5.1	3.6	5.0	4.0	5.7	3.6	5.7	3.7	5.6	2.9	4.1	3.2	4.9	3.5	5.2
Wilmington Porter Resvr	3.2	4.7	3.2	4.5	4.0	5.5	4.0	5.6	3.9	5.7	4.2	5.8	4.2	6.3	4.1	6.3	4.0	6.0	3.4	4.7	3.7	5.7	3.8	5.8
Middletown	2.8	4.1	2.9	4.1	3.5	4.9	3.5	4.8	3.4	5.0	3.6	5.3	3.7	5.3	3.4	5.1	3.6	5.5	3.3	4.8	3.2	4.6	3.3	4.9
Southern Region																								
Bridgeville 4 NW	3.4	4.7	3.3	4.5	3.8	5.2	3.3	4.5	3.6	5.2	3.7	5.2	4.1	6.4	4.7	8.0	3.7	5.3	3.3	5.1	3.1	4.5	3.6	5.4
Dover	3.1	4.6	3.0	4.3	3.7	5.3	3.4	4.9	3.6	5.2	3.7	5.2	4.4	7.0	4.5	7.4	4.5	6.8	3.4	5.0	3.3	4.9	3.5	5.2
Georgetown 5 SW	3.3	4.7	3.2	4.4	4.1	5.6	3.2	4.5	3.4	5.0	3.6	5.1	3.9	6.3	5.3	8.2	3.6	5.2	3.5	5.4	3.1	4.6	3.6	5.2
Lewes	3.4	4.8	3.4	4.7	4.2	5.7	3.6	5.1	3.7	5.4	3.7	5.2	4.2	6.3	5.3	8.2	3.3	4.8	3.4	5.0	3.4	4.9	3.8	5.4
Milford 4 SE	3.3	4.7	3.3	4.6	4.0	5.5	3.4	4.8	3.7	5.2	3.7	5.1	4.1	6.6	4.4	7.1	3.9	5.5	3.4	5.1	3.6	4.8	3.7	5.4

NOTE: P = Climatological normal precipitation
P_5 = 5-year return period precipitation

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

CLIMATOLOGICAL NORMAL PRECIPITATION (P) AND 5 YEAR RETURN MONTHLY PRECIPITATION (P5)

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - K K

Minimum Treatment Requirements for Large Systems *

Parameter	Slow Rate Land Treatment		Rapid Infiltration Basins	Sub-Surface
	Limited Access	**Unlimited Access**		
Biochemical Oxygen Demand	50 mg/l	10 mg/l	30 mg/l	30 mg/l
Total Suspended Solids (TSS)	**50/90 mg/l[1]**	**10 mg/l**	**30 mg/l**	**30 mg/l**
Fecal Coliform	200 Col/100ml	20 Col/100ml	200 Col/100ml	NA
Turbidity	**NA**	**5 TU**	**NA**	**NA**

* These limits may be superseded by a Pollution Control Strategy for specific watersheds

[1] For mechanical treatment 50 mg/l and 90 mg/l for lagoon treatment

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

MINIMUM TREATMENT REQUIREMENTS FOR LARGE SYSTEMS

ISSUED: JANUARY 2014
REVISED: _____

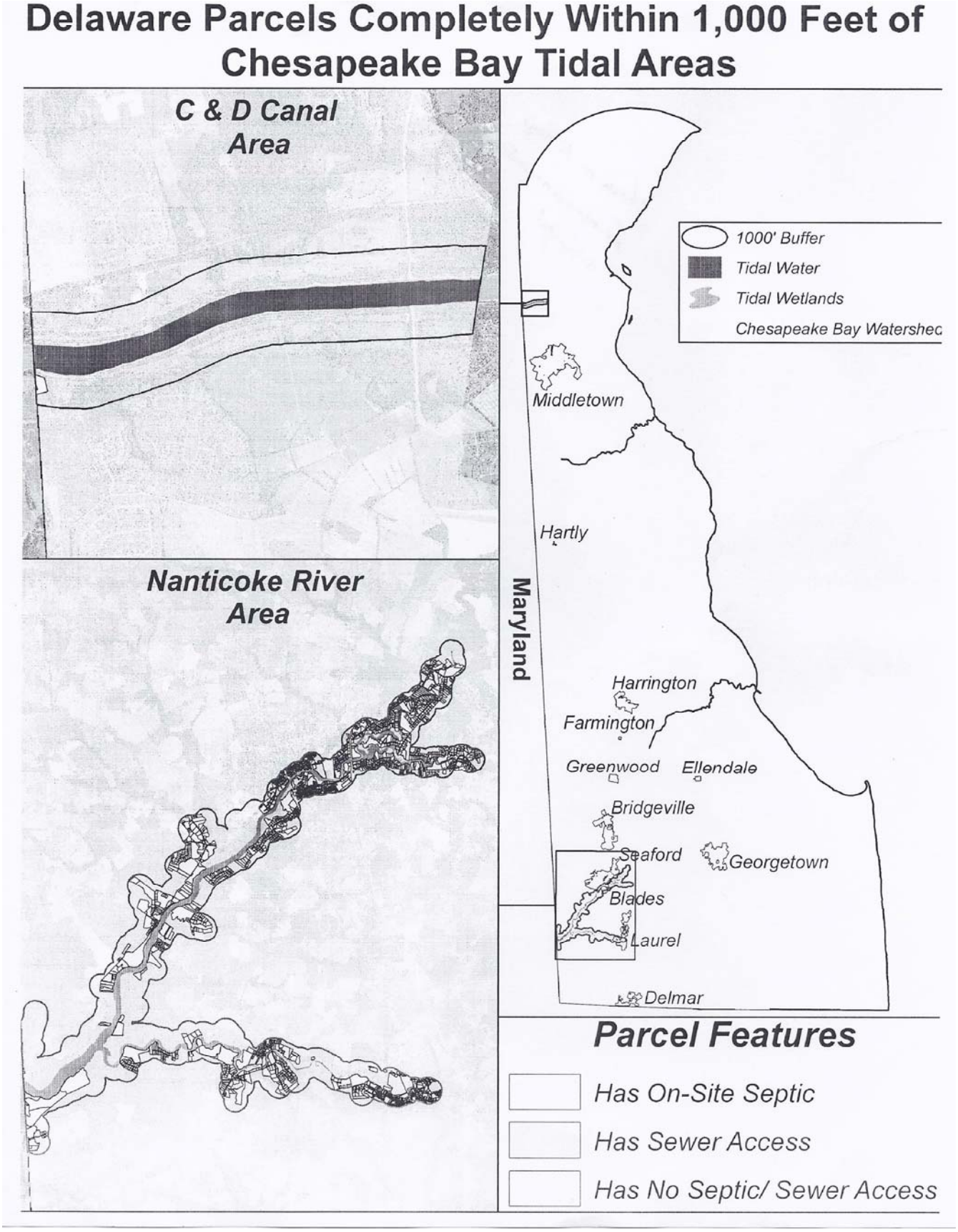
EXHIBIT - L L

Large On-Site Wastewater Treatment and Disposal System (LOWTDS)
Performance Standards

1. Requirements for LOWTDS having flows ≥ 2,500 gpd but < 20,000 gpd:
   a. All new systems shall meet a Performance Standard Nitrogen level 2 (PSN2).
   b. All replacement systems within 1000 feet of the Chesapeake Bay tidal waters (as displayed by Exhibit NN) shall meet a Performance Standard Nitrogen level 3 (PSN3).
   c. When the operation permit expires for an existing system within 1000 feet of the Chesapeake Bay tidal waters (as displayed on Exhibit NN), the system must meet a Performance Standard Nitrogen level 3 (PSN3). If the system must be redesigned, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard.

2. Requirements for LOWTDS having flows ≥ 20,000 gpd:
   a. All new systems shall meet Performance Standard Nitrogen level 1 (PSN1) and Performance Standard Phosphorus level 1(PSP1).
   b. All replacement systems within 1000 feet of the Chesapeake Bay tidal waters (as displayed on Exhibit NN) shall meet Performance Standard Nitrogen level 2 (PSN2).
   c. When the operation permit expires for an existing system, the Department will require the system to meet Performance Standard Nitrogen level 2 (PSN2). If the system must be redesigned to meet PSN2, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard. **NOTE:** Systems permitted at a higher performance standard will remain at that higher performance standard.
   d. When the operation permit expires for an existing system, and the system location is identified as having high potential for phosphorus mobility, the system must comply with the Performance Standard Phosphorous level 1 (PSP1). If the system must be redesigned to meet PSP1, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard.

Delaware Parcels Completely Within 1,000 Feet of Chesapeake Bay Tidal Areas



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DELAWARE PARCELS COMPLETELY WITHIN 1,000 FEET OF CHESPAPEAKE BAY TIDAL AREAS

ISSUED: JANUARY 2014
REVISED: _____

EXHIBIT - NN

State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Attachments to the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems

Attachments - *Guidance Documents effective January 2014*

1. Class C Inspection Guidelines
2. Lot Clearing Guidelines
3. Shellfish Waters Guidelines and Map
4. Recycling On-Site Wastewater Treatment and Disposal System Soil and Stone
5. Large System Permitting Process Flow Chart
6. Barricading the Proposed Disposal Area
7. Guidelines for Designing Micro-Irrigation "Drip" Treatment and Disposal Systems
8. Guidelines for Designing Peat Biofilter Treatment and Disposal Systems
9. General Lysimeter Construction and Sampling Guidelines



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Class C Inspection Guidelines

January 2014

Perform the following steps:

1. Verify permit has not expired and is valid.
2. Locate the absorption facility and verify the correct location with the approved permit. If the absorption facility location has moved, verify that the new location is within the area approved on the site evaluation and that the new location meets all isolation distance requirements.
3. Verify correct absorption facility measurements to an accuracy of one (1) foot. Verify proper trench/bed depth to the best of your ability. If there is doubt as to the proper depth, contact DNREC and clearly state on the inspection report your findings.
4. Determine the condition and location of major components**.** The tanks, pumps, related equipment, absorption facility and interconnecting pipes must be verified. Verify that all components are installed according to the permit and the Regulations. Compare locations of actual components with the component location on the design.
5. Check the septic tank. The Class E contractor shall insure that the entire top of the tank is clean and visible for inspection. All access lids shall be removed, rotated 45 degrees, and replaced over the openings for safety. The engineer shall visually check the inlet and outlet pipe penetrations, all internal baffles, and the visible conditions of the tank.
6. Grease Traps **-** Same as the septic tank, if applicable.
7. Inspect the dosing chamber(s).(Same as septic tanks) Any access lid weighing over 40 pounds must be removed and replaced with a temporary lightweight cover for inspection (unless contractor personnel is present at the time of the inspection). Verify screened vent pipes and pump lift out device.
8. Verify the dosing chamber components/piping - Ensure correct operation of all components inside and outside of the dosing tank (pump floats, valves, pipes, etc.).
9. Check the operating pressure on all pressurized systems at the distal lateral.
10. Check timer settings. Timers are required to be installed and wired at the time of the inspection. If not installed and wired another inspection shall be scheduled. If power has not been supplied to the site at the time of the inspection, the contractor is to supply a generator as a power source.
11. Check float switches (on/off & alarm). Manually operate floats to verify correct operation. System Contractor to verify float settings are correct. Check high level alarm (audio/visual).
12. Verify that the alarm is installed on a separate electrical circuit.

Class C Inspection Guidelines

13. Verify that all electrical connections outside of the dosing tank are water and corrosion resistant. Verify electrical connections inside the dosing tank are waterproof, corrosion resistant and, if > 500 gpd flow, explosion proof as well.
14. Verify pipe size and configuration. Check for leaks at all visible pipe joints.
15. Check for specified pump or equivalent. The contractor must notify the engineer prior to the inspection if an equivalent pump has been used instead of the pump that had been specified in the design.

16. Verify stone size. Ensure the stone is clean and free of debris.
17. Verify that the system has the proper number of clean-outs, inspection ports, etc.
18. If aggregate-free chamber units are used, verify that they are connected properly.
19. Verify isolation distances as referenced in Exhibit C.
20. Ensure proper abandonment of existing system, if applicable.
21. If well abandonment reports were required, insure proper documentation has been submitted to DNREC and well was properly abandoned.
22. Contractor to provide all equipment, labor & materials required for operationally testing the system.
23. Perform final cover inspection, if necessary (e.g. ESM's, LPP capping fills, etc.).



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Lot Clearing Guidelines

January 2014

1. All trees, shrubs and underbrush should be cut by chain saw, bush hog or mower and dragged away without allowing the heavy equipment to enter onto the proposed disposal area.
2. Stumps should be removed by excavator or backhoe from the perimeter of the proposed disposal area without treading onto the area[1]. Small stump grinders can enter the proposed disposal area and are acceptable to be used to remove stumps.
3. The stump holes should be backfilled with native soils and returned to original condition, as practical. Small tractors, bulldozers and skidsteer equipment are acceptable for this purpose.
4. If the system is not to be immediately installed then the proposed disposal area should be seeded to prevent erosion. The area should also be roped or barricaded to prevent any vehicular traffic from entering.
5. During wetter times of the year (December – May), on poorly drained soils and lower landscape positions discretion should be exercised to minimize the threat of compaction and smearing.

* The purpose of these guidelines is to minimize the threat of compaction & to avoid excessive disturbance to the soils within the proposed disposal area.

[1] Stump removal is not required as some systems may be installed with the stumps in place.



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Shellfish Waters Guidelines and Map

January 2014

1. As a matter of policy, the isolation distance between a watercourse and an on-site wastewater treatment and disposal system is to be maximized, whenever possible.
2. The isolation distance between an on-site wastewater treatment and disposal system and designated shellfish waters' is to be 100 feet.
3. Designated shellfish waters' are bounded as shown on the map below and described as follows:
   a. The Delaware Bay: East of Rt. 1, Rt. 113 and Rt. 13 from the Maryland State line north to the New Castle County line.
   b. The Inland Bays: Rt. 1, Rt. 24, Rt. 113, Rt. 26, CR 382, CR 389 & CR 396
4. Watercourses that are ephemeral (only contain water during or for a short time after a rain storm event) are not classified as shellfish waters.
5. For the Delaware Bay shellfish area, approval of a lesser isolation distance of 50 feet may be approved by the Department if the lot was created before April 8, 1984.
6. If 100 feet cannot be maintained between an absorption facility and shellfish waters, and the lot was created by plat or deed prior to April 8, 1984, then the maximum distance shall be maintained but in no case be less than shown in the following table.

Modified Isolation Distances (in feet) from Shellfish Waters

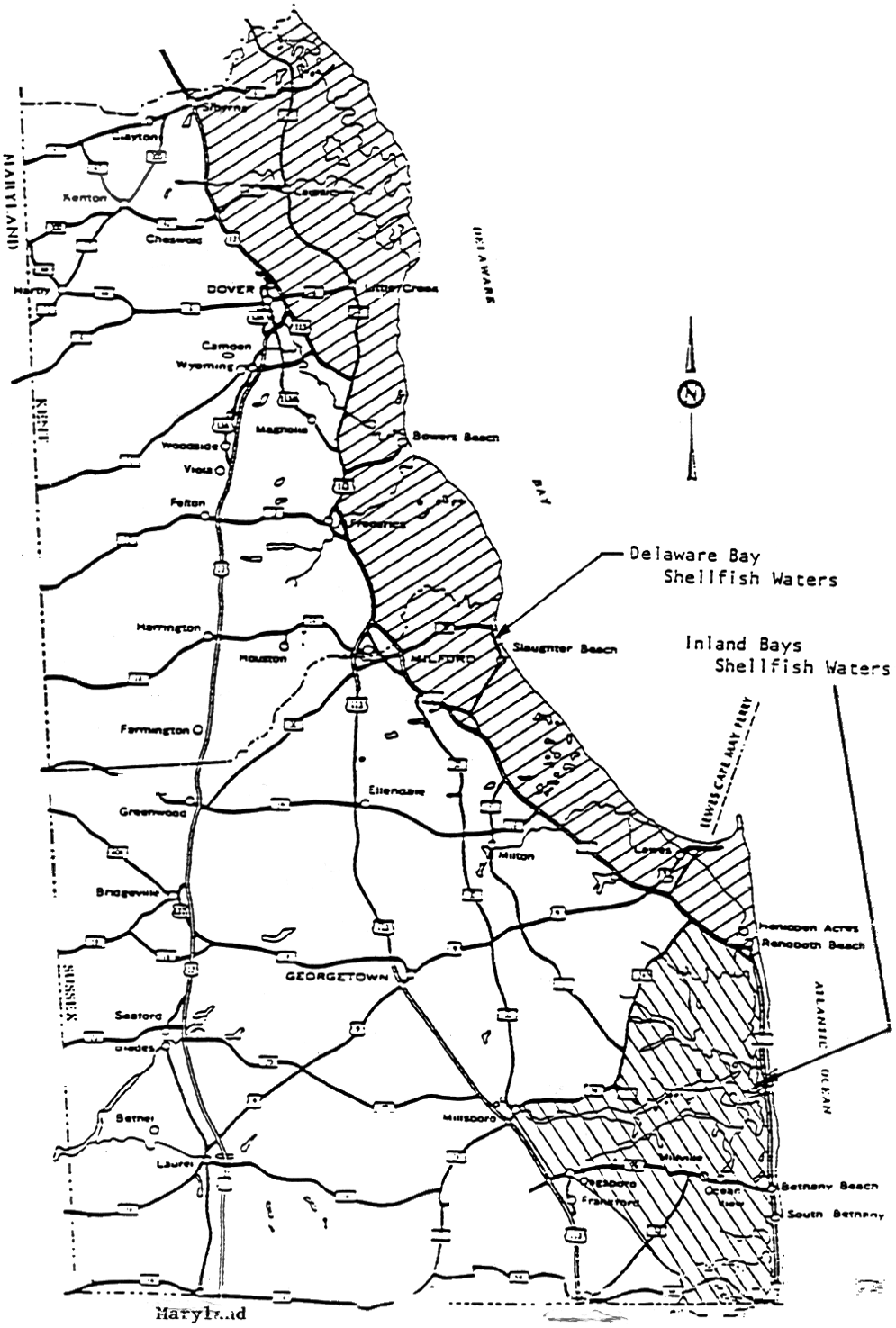
Soil Textures	Type of System Gravity(a)	LPP(a)	PD(a)	ESM
Sandy (s, ls) Sand or loamy sand that contain < 50% very fine sand	**100**(b)	**100**	**70**	**50**
Coarse and fine loamy (sl, l, scl) Loamy very fine sand, very fine sand or finer but < 35% clay	**85**	**70**	**60**	**50**
Coarse and fine silty (sil, cl, sicl) Loamy very fine sand, very fine sand or finer but < 35% clay and < 15% fine sand	**70**	**60**(c)	**60**	**50**
Clayey (sc, sic, c) Clay content > 34%	**NA**	**NA**	**50**	**50**

(a) The isolation distance reduction will be dependent upon the clay percentage of the particle size class of the soil, i.e. control section (as defined by Soil Taxonomy)

(b) Permeability rate less than 6 mpi will require pressurization

(c) Design limits above a percolation rate of 45 mpi may necessitate the use of an ESM

Shellfish Waters Guidelines and Map



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Recycling On-Site Wastewater Treatment and Disposal System Soil and Stone

January 2014

The Department has no objection to the re-use of the soil and stone and hereby approves the material to be in compliance with the requirements of Section 5.4.8.3.
The Department provides the following procedures for recycling septic system soil and/or stone;

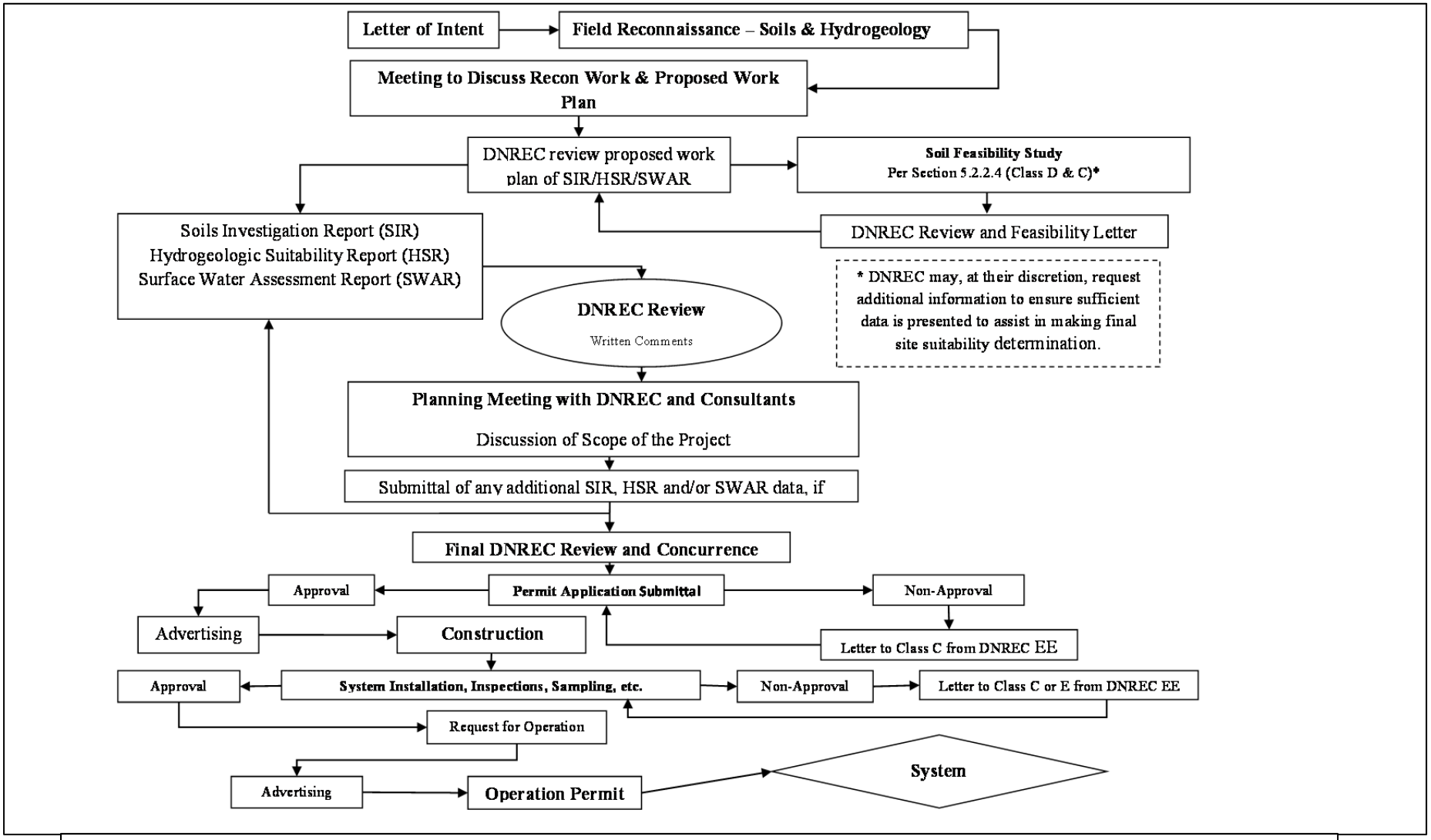
1. The system shall be dismantled, removing the soil, stone and piping.
2. The piping must be taken to a landfill for proper disposal.
3. The soil and stone can be segregated or mixed together.
4. The soil, stone or the mixture shall be spread out to dry.
5. It is required that Lime (Calcium Oxide) be spread over the soil, stone or soil/stone mixture for odor control and aid in the killing of the pathogens present. The spreading rate shall be one pound of Lime for every cubic foot of material or one pound of Lime per 100 lbs soil/stone.
6. The soil, stone or soil/stone mixture must be left exposed. Ultraviolet radiation from the sun increases the destruction of pathogens.
7. Once the soil/stone mixture is completely dry it can be used for septic tank, cesspool or other treatment unit abandonment and may be transported off site.

NOTE: This approved procedure for recycling on-site wastewater treatment and disposal system soil and/or stone is limited to the abandonment procedures as stated in Section 5.4.8.3.

State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Large System Permitting Process Flow Chart

January 2014



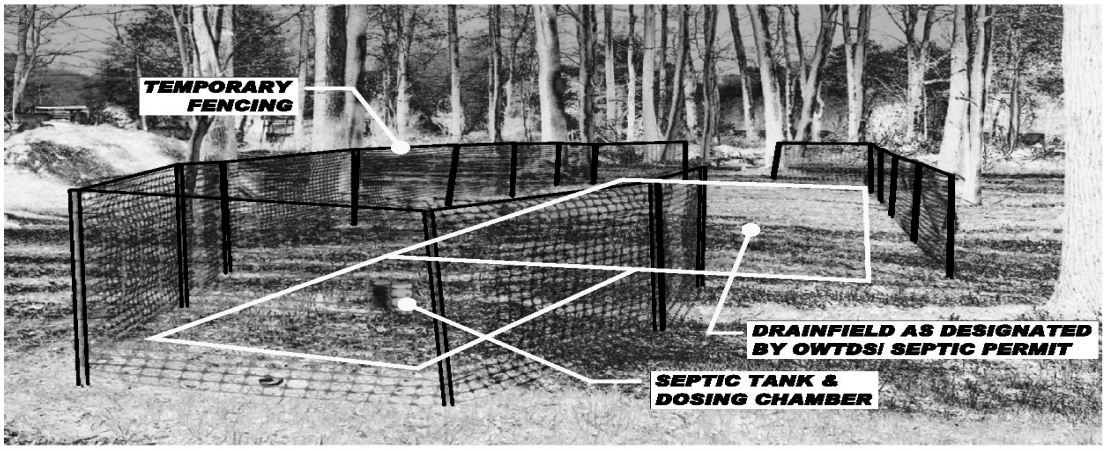
ES - Environmental Scientist **EE** – Environmental Engineer **Hydro** – Hydrologist **PG** – Professional Geologist

State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Barricading the Proposed Disposal Area

January 2014

1. The need to protect the initial and spare disposal areas prior to system installation is very important to avoid potential problems when installing the absorption facility and post installation.
2. Some problems which occur without barricading or otherwise protecting the proposed disposal area(s) include:
    a. Compaction
    b. Cutting/Filling
    c. Rutting or erosion issues
    d. Staging area/Storage area for equipment or stone
    e. Haul roads or excessive trafficking
3. Results of these problems include:
    a. Premature system failure/malfunction
    b. System type change to include advanced treatment
    c. Sand-lining
    d. Unsuitability for any system type
4. Possible barricading materials include:
    a. Split rail fencing
    b. Post & snow fence
    c. Silt fence (as per County Code, if applicable)
    d. Post & rope
    e. Chain link fence
    f. Post & caution tape (bare minimum method)
5. Example – see pictures





SAMPLES OF TEMPORARY BARRIERS/ BARRICADES FOR OWTDS



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Guidelines for Designing Micro-Irrigation "Drip" Treatment and Disposal Systems

January 2014

This guideline will serve as the new directive for micro-irrigation "drip" dispersal criteria and must be adhered to when siting, designing and constructing micro-irrigation "drip" dispersal systems in Delaware, effective January 15, 2010.

** Some design considerations and the subsequent approval will be determined on a case by case basis and in those instances when performance based criteria is utilized.

Design Criteria:

1. Pressure compensating emitters shall be spaced uniformly along the drip line on a maximum of two (2) foot centers and designed to deliver a predetermined flow rate per hour per emitter.
2. All drip systems must be designed to maintain flushing velocities of at least two (2) feet per second at the distal of each drip line during field flushing.

Siting Criteria:

1. Micro-irrigation "drip" dispersal systems are often sited addressing adsorption areas with shallow and/or multiple limitations. Scientists, designers and system contractors need to approach drip dispersal systems appropriate application with due care.
2. Loading rates are to be based on the most restrictive texture within 24" of the surface.
3. For **at-grade systems**, the tillage depths are to be 6 - 8", although slightly deeper depths may be necessary in the case of shallow thin plow pans or similar restrictive layers within 12" of the surface.
4. For **at-grade systems** on slopes > 5% no sandy fill should be utilized. Tubing should be installed directly onto the scarified surface with a 6" topsoil cap.
5. All replacement **at-grade systems** on slopes > 5% and with a limiting zone < 12" will be addressed on a case by case basis.
6. Landscape position is also a necessary consideration, do not site within a closed depression or where water tends to pond during heavy rainfall events.

New Construction:

Separation requirements;

1. 18" from limiting zone
2. Full Depth installation = 24" limiting zone, 6" trench
3. Surface installation (at-grade systems) = 18 - 22" limiting zones require that 3" sandy fill be added, then place tubing 1" into sandy fill and add 6" topsoil cap (*See Design and Construction Notes for At-Grade Systems).*
   i. ***No advanced treatment required ****
   ii. 12 – 17" from limiting zone **requires advanced treatment**. A 12" separation distance must be maintained from the limiting zone. For limiting zones 12 - 16", 3" of suitable sandy fill must be added, then place tubing 1" into fill and add 6" topsoil cap.

Replacement System:

Separation requirements:

1. 18" from limiting zone – Same installation parameters as above
2. 12 – 17" limiting zone – Suitable sandy fill added to establish 19" separation, place tubing 1" into sandy fill and add 6" topsoil cap

**** No advanced treatment required unless soil scientist determines otherwise****

3. Less than 12" limiting zone **requires advanced treatment** – Suitable sandy fill added to establish 13" separation, place tubing 1" into sandy fill and add 6" topsoil cap.

Design and Construction Notes for At-Grade Systems

1. Rope off proposed "drip" disposal area.
2. Prepare disposal area when appropriate soil moisture conditions exist (field capacity).
3. Remove vegetation, but do not pull out stumps; do not remove sod, topsoil or rock.
4. Grass, shrubs, and trees must be cut as close to the ground surface as possible and removed, preferably by hand.
5. For wooded lots, with excess litter, we recommend the litter be raked from site.
6. Chisel plow disposal area 6 - 8"deep or as prescribed by soil scientist.
7. Preferred methods
8. Chisel teeth mounted on a backhoe bucket and pulled through surface
9. Chisel plow pulled behind a tractor

******* ROTOTILLERS SHALL NOT BE UTILIZED*******

10. Add 3" of sandy fill and place tubing 1" into sandy fill.
11. Add 6" topsoil cap.
12. To maintain positive drainage additional cover on top may be necessary.

If in doubt, call the GWDS at 739-9948, prior to beginning any construction procedures.

State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Division of Water

Guidelines for Designing Peat Biofilter Treatment and Disposal Systems

January 2014

This guideline was developed to aide in the siting and design of peat biofilters. Effective September 1, 2005, persons siting, designing, and constructing peat biofilter treatment and disposal systems in Delaware must adhere to the requirements outlined below.

** *Some design considerations and the subsequent approval will be determined on a case by case basis* **

Scope of Use

1. The guideline is intended for facilities generating residential strength wastewater with flows < 2,500 gpd.

Siting Criteria:

1. Peat biofilter systems are not the cure all remedy for problem sites, *do not prescribe as such*.
2. Percolation rates are to be based on the most restrictive texture within the upper 60" of soil. See chart below for loading rate associated with a percolation rate.
3. For **at-grade systems**, the tillage depths are to be 6 - 8", although slightly deeper depths may be necessary in the case of shallow thin plow pans or similar restrictive layers within 12" of the surface.
4. Landscape position is also a necessary consideration; do not site within a closed depression or where water tends to pond during heavy rainfall events.

New Construction and Replacement Systems

Separation requirements:

1. 12" from limiting zone
2. Standard installation = 18 - 22" limiting zone
3. 6 - 8" pad *(bed)depth/10" trench depth
4. Surface installation (At-grade systems) = 12" limiting zone, * **pads only**

Design and Construction Notes for Site Preparation

1. Rope off proposed disposal area
2. Prepare disposal area when soil moisture is within a satisfactory range
3. Remove vegetation - sod, topsoil or rock
4. Grass, shrubs, and trees must be cut as close to the ground surface as possible and removed, preferably by hand from the site
5. For wooded lots, with excess litter, we recommend that it be raked from site
6. Chisel plow disposal area 6 - 8"deep, or as prescribed by soil scientist

Preferred methods

1. Chisel teeth mounted on a backhoe bucket and pulled through surface
2. Chisel plow pulled behind a tractor
3. To maintain positive drainage, additional cover on top may be necessary

Design Considerations

1. A septic tank must precede a peat biofilter system. All septic tanks must incorporate an effluent filter as specified by each individual manufacturer.
2. The loading rates within this memo shall be utilized to determine disposal pad/trench size required.
3. No additional area reductions shall be granted for the use of water saving fixtures or for the use of gravelless chambers.
4. The use of a pad* or trench for disposal shall be based on site characteristics and the individual design engineer.
5. All pads* and trenches shall be installed on contour
6. All pad* areas underneath the open bottom units shall be designed such that the bottom pad* area is level.
7. Peat biofilter systems may be fed by gravity or timed dosed, depending upon site characteristics. System shall be designed to provide equal flow throughout.
8. *All other design considerations shall utilize individual manufacturer's guidelines.*

* A pad system is synonymous with a bed system

Installation

1. The installer shall be trained by the manufacturer or their designee to install the peat biofilter.

If in doubt, call the GWDS at 739-9948, prior to beginning any construction procedures.



State of Delaware
DEPARTMENT OF
NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
Collin O'Mara, Secretary

General Lysimeter Construction and Sampling Guidelines

January 2014

1. A well permit is required to install a lysimeter, and the installation must be completed, or overseen by a licensed well driller. According to the Delaware Regulations Governing the Construction and Use of Wells (1997), any excavation advanced for the purpose of collecting a water sample in which the excavation is deeper than it is wide is considered a well regardless of whether it intersects the water table.

2. Lysimeters shall be installed in accordance to the manufacturer's instructions, or the ASTM standard D4696.

3. The bottom of the lysimeter(s) must be placed 1.5 feet below the point of compliance for each disposal method as referenced in Exhibit W of the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems.

4. The lysimeter(s) must go through a period of testing as prescribed by the manufacturer or ASTM standard to develop the lysimeter(s) and determine the duration of applied vacuum needed to obtain a sample. The sample volume should be commensurate with the manufacturer's specifications, or the ASTM standard.

5. Prior to sample collection the "stagnant" water must be evacuated from the lysimeter and discarded.

6. The vacuum for the "new" water must be applied within one (1) day, minimum, of the scheduled groundwater monitor well sampling, to ensure sampling of the lysimeter(s) and monitor well(s) will be completed on the same day.

    - If the volume of sample collected after the period of applied vacuum established during testing is not representative of the manufacturer's specifications, the lysimeter must be checked for potential vacuum leaks. Once it has been established that the lysimeter is able to maintain a vacuum, a new vacuum must be established and additional sampling performed.

7. Sampling and analysis of the solution must include, but may not be limited to, the following parameters: total nitrogen, total phosphorus, nitrate+nitrite as nitrogen, ammonium as nitrogen, chloride, sodium, and total dissolved solids. Where possible the following field parameters should also include: temperature, specific conductivity, and pH. These parameters are common in most permits; however, if any inconsistencies exist between the permit and these guidelines, the permit must always be utilized.

8. Prior to the required sampling put forth in the permit conditions, at least one (1) background sample must be collected from each lysimeter and analyzed for the parameters identified in the permit.

9. All sampling results must be submitted to the Department with the corresponding field sheets. The field sheets must include the following: DNREC permit number, applied vacuum in centibars, duration of applied vacuum, date of the last day wastewater was applied in the zone of the lysimeter(s), date and time the sample was obtained, and sample volume collected in milliliters.

10. Holding times for the sample begin when the sample is removed from the lysimeter(s).

Robert F Youngblood - Youngblood Const
P O Box 398
Atlantic Beach, NC 28512

Date: 9-14-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

Please accept this as my formal comments and objections to the following proposed rules.

The objections are listed by page and line number as shown on the proposed rules submitted by Onsite.

Page 12 Line 20 (70) "Septic Tank" means a water-tight, covered receptacle designed for primary treatment of wastewater and constructed to: Comment: needs to have "structurally sound" added back into the definition
Page 13 Line 32 (86) Comment: add the following: The Department may oversee the report for accuracy
Page 15 Line 3 Comment: (c) needs to be eliminated because applications should not expire
Page 15 Line 37 Comment: delete the words "garbage disposal"
Page 18 Line 28 Comment: (i) should read as follows: Upon written authorization of the owner a revised CA may be issued where the CA is great than five years. Also what about Plats?
Page 19 Line 3 Comment: delete "this Subchapter"
Page 20 Line 2 Comment: Delete (h) because it sets a definitive life of system
Page 20 Line 10 Comment: Delete "expires"
Page 32 Line 3 Comment: add "water treatment system back flush line
Page 63 Line 8 Comment: take out garbage disposal table
Page 64 Line 21 Comment: Delete (2)
Page 67 Line 14 – 23 Comment: Delete
Page 67 Line 34 Comment: Delete "if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet"
Page 68 Line 8 Comment: Change to 5 inches of mercury
Page 68 Line 9 Comment: Change to 2 minutes
Page 72 Line 16 Comment: Delete (13)
Page 73 Line 6 – 8 Comment: Delete (5)
Page 93 Line 36 Comment: Delete "36 inches above finished grade, within 50 feet of and in direct view of the pump tank" add "12 inches above finished grade and immediately adjacent to pump tank"
Page 94 Line 1 Comment: Delete (e)
Page 94 Line 14 Comment: change 18 inches to 12 inches
Page 119 Line 1 – 4 Comment: Delete
Page 119 Line 19 Comment: Leave as written but attention should be given to this item as "best professional judgement" should be allowed in writing the permits which Onsite has opposed
Page 121 Line 21 Comment: change four inches to 5 inches, change five minutes to 2 minutes
Page 121 Line 24- 26 Comment: Delete item (2)
Page 122 Line 9 Comment: add "structurally sound"
Page 122 Line 26 Comment: delete "inlet and"
Page 123 Line 5 – 6 Comment: add to end of sentence "manufactured, installed and maintained"
Page 123 Line 18 – 20 Comment: Delete item (H)
Page 125 Line 2 – 3 Comment: First sentence should be revised as follows: (a) Tanks designed to hold sewage shall be constructed of materials capable of being structurally sound, watertight, and not subject to excessive corrosion or decay

Page 123 Line 7 Comment: delete "of steel" from sentence
Page 126 Line 15 Comment: change four inches to five inches and five minutes to 2 minutes
Page 127 Line 12- 20 Comment: delete
Page 130 Line 18 – 29 Comment: delete
Page 147 & 148 Line 18 – 36 and 1 -7 Comment delete entire section 15ANCAC 18E .1722
Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,

Robert F. Youngblood

CC: File

Russell C. Traughton
P.O. Box 1321
Swansboro, N.C. 28584

Date: 9-18-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

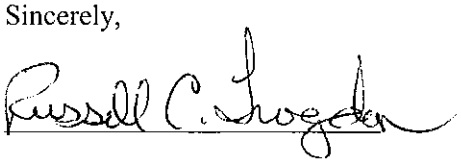
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Page 147 & 148 Line 18 – 36 and 1 -7 Comment delete entire section 15ANCAC 18E .1722
Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,



CC: File

Name: Wayne Billingsley w/Billingsley Septic Tank Co.

Street Address: 149 Penn Rd

City, State, Zip: Reidsville NC 27320

Date: 9-22-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

Please accept this as my formal comments and objections to the following proposed rules.

The objections are listed by page and line number as shown on the proposed rules submitted by Onsite.

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Sincerely,



Signature

CC: File

Name: Larry E. Beam

Street Address: 2740 Sloop Rd

City, State, Zip: Mt Ulla NC 28125

Date: 9/23/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,



Signature

CC: File

B. & C. CONCRETE
P. O. BOX 1014
NORTH WILKESBORO, NC 28659
336-838-4201

Date: 9-20-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Keith Blackburn

CC: File

In addition to the above, the use of fiber in septic tanks was omitted in the proposed changes. The language needs to be in the rules stating that "the use of fiber is an accepted reinforcement of tanks."

Name: Sterlin Church Church's Backhoe Service

Street Address: 886 N Merlon Rd

City, State, Zip: Whiteville NC. 28697

Date: 7-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

Sterlin Church

Signature

CC: File

Pipeway Plumbing, Inc.
PO Box 754
Sanford, NC 27331

Date: 9-14-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Weston S. Coggins

CC: File

Name: Ronnie Bugin

Street Address: PO Box 1507 - 1121 N. Main St

City, State, Zip: Marion NC 28752

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Ronnie Bugni

Signature

CC: File

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699
Dear Mr. Hoke

Please see attached comments on the following proposed rules

Rule revision comments

Rule 18E 0601
Table XI
SETBACKS
Setbacks from building with and without artificial drainage. I fully support the proposed change. The current rule is too subjective. Having a standard setback simplifies the siting, layout and installation of on site septic systems.

Setback for surface water diversion---A surface diversion that has less than 24" cut should have zero setback. Surface diversions are used to divert water away from homes, additional setbacks, will limit useable lot space, which could make some lots unbuildable.

Setback from storm water conveyance---Currently states 15' from pipe (closed channel) or open channel. The setback from pipe (closed channel) should be different than open channel. This could be misinterpreted as gutter drain piping. Often septic systems run from 10' on one property sideline to 10' on the other property sideline. In its current state, it may be difficult to properly drain rainwater away from a home. Closed channel (solid pipe) should be allowed to cross closed channel pipe septic lines, or at a minimum have setback reduced to 5'.

Rule 18E.0802
TABLE XV
Telemetry. What is telemetry? This is very vague. I would suggest that telemetry be defined.

1. Must call or email/text (email/text may be a stretch, telemetry was put in the rules before email/text were prevalent) continuously until the alarm condition is remedied or it is physically switched off on site.
2. Must be demonstrated on site during final inspection. Merely saying we have telemetry is not enough; it needs to be demonstrated on site during the final inspection. This must be consistent throughout all systems.

Rule 18E.0805

(A) 10% of all tanks shall be leak tested--- Who is responsible for keeping a count of the number of tanks installed in a particular county? Are those counts audited and the results made public? I see several potential problems that could arise with this policy. I read this fiscal note. I think the rule in its current form will be cost prohibitive to small

manufacturers and may drive cost higher than projected. I do not support this rule in its current form.

Item 2: The third party quality assurance program. Who administers this? Is it up to the manufacturer to find this person?

(B) Item 1: Who determines this soil wetness condition? Is it the environmental health specialist?
Item 3: I understand advanced treatment, but any PE design? Some PE's are designing gravity systems for clients. The additional time and energy will raise prices for the consumer on simple systems.

(C) Item 1 (B): The rules should be consistent across all products. Concrete, plastic, fiberglass. The leak test should be the same.
Item 2 (B): The current procedure is 5 inches of negative pressure for 2 minutes. This standard has been in place for some time now, it test both strength and water tightness. It should be left as is.

****A note on tanks, if we are really interested in making tanks better, a leak test by vacuum or water should be done on all tanks, before they leave the manufacturer's site. Job site testing is difficult, expensive and it potentially puts the local health department personnel in a tough spot of making someone pull a tank out of the ground if it fails. However, testing before it is delivered to the job site would negate some of these issues. This would have to be limited, only on tanks that are delivered in one piece. Large multi-piece 3/5/7/10 thousand gallon tanks would have to be tested on site.
*****

Rule 18E.0806
(A) Item one specifies 3 inch pipe, this should say 3 inch or greater sized pipe.

(D) All septic tanks should have risers that extend above finished grade. This promotes proper maintenance. It saves customers money during pump out. It allows access to the effluent filter without digging. Risers above finish need to be a part of the rules.

Rule 18E.0901
Item (D) 7. Serial and sequential distribution may be used by authorized agent. This should not need additional authorization. Both types of distribution have been used with success over the years. It should read "serial and sequential distribution may be used."

Rule 18E 1103

(A) Control panels should be mandatory, the old style piggyback switch was a temporary solution and is outdated. I agree with this new standard.
(H) (1) 18 inches minimum liquid depth in a pump tank will result in bigger and more costly pump tanks. It should be determined by the size of the effluent pump. Some pumps are 12 inches tall. These could easily have a 10 inch minimum liquid depth. Full submergence is only needed for continuous operation. As per pump manufacturers I have spoken with, pumping down to 70% of pump height is acceptable.

**** Additionally, on pump tanks and pumps, current practice is to set the pump on a 4-8 inch block. This is outdated. We have effluent filters on all systems. There should be no substantial solids flowing into the pump tank. This block is not needed. We are using up storage capacity in the pump tank that could be used in an emergency pump failure or electric failure. The block also makes pump replacement difficult without pumping the pump tank completely dry, which adds additional cost to the repair bill. *****

18E 1302
The excessive sampling of on site treatment systems is a major reason they are not used more often. Clients do not want a system that has additional cost of $300-$400 annually due to sampling. If a system has demonstrated the ability to meet a standard, then the requirements should be one sample every 5 years. If we want cleaner better quality effluent then we must lessen the regulatory burden on treatment systems.

Item (B) 4. States manufacturer is to notify local health department and the state. It is unlikely the manufacturer will know. This should say certified operator.

Item (B)(3)(A) Field test. Dissolved oxygen and turbidity. This is an addition to the original rule. Will this be used instead of laboratory analysis? A couple of questions come to mind:

1. What is the standard we are trying to meet? What NTU? What DO level?
2. If the standard is not being met, what adjustments are to be made.
   Lastly, most operators don't carry DO or turbidity meters with them. In counties where the number of treatment systems are limited, operators may be hesitant to purchase the equipment. This would then drive up the cost of system operation.

Item (B)(4) Although part of existing rule, this data has limited use. If the sample comes back noncompliant, the protocol is to resample. Knowing the flow will not change that fact. This control option is cost prohibitive on some sites. I have consulted with multiple industry people. All agree the collection and means there of are rarely useful.. It also creates additional control panel expense to the end user. It should be struck from the new rules.

Rule 18E.1301
Table XXXI
It's obvious in reading the table that treatment system manufacturers want to separate types of systems. All the small systems have unique operation challenges, but do not warrant different maintenance schedules. Comments follow.

Fixed media advanced pretreatment--- These systems are designed with a small amount of emergency storage. Treatment systems greater than 1500 gallon per day should be visited monthly unless equipped with telemetry and standby power.

RWTS--- This includes residential ATU's under 1500 gallon per day. The monitoring frequency should be as any pretreatment system. The higher number of service visits will drive cost up, making these uncompetitive. Operation in most cases is simpler than the fixed media systems.

The change is more stringent than the original rule, with no basis for the increased service visits. There is a new proposed rule 18E.1505 that only pertains to these systems. This is not warranted on systems less than 1500 gallons per day. To adopt this would cause undue expense to the owners of these systems, plus a less competitive atmosphere in the onsite treatment system market. I do not support the classification in table XXXI or the new proposed rule.

Rule 18E.1711
I do not support any approved system having to renew or reapply for an approval they have already received. The approval process in North Carolina can be time consuming. Manufacturers should not be subject to re-approval every 5 years.

Cory J. Brantley
489 Howard Tant Rd.
Zebulon, NC 27597
Lic# 1036

Cory J. Brantley

GUILFORD COUNTY DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Division

November 22, 2016

Dear Trish Angoli:

My name is Randy Duncan and I work for Guilford County Health Department. My main duty for them is doing the 5 year Operations and Maintenance inspections on 3B type septic systems. My reason for writing you today is my concern over the proposed change in rule.1961 that would allow private Certified Operators to do these inspections in lieu of the Health Department doing them. While I am personally in favor of less government regulations, I don't think this is an instance where allowing these inspections to be done by a private entity would work in the long run.

Guilford County has 5023 3B type systems on record. That is an average of 1000 inspections a year that need to be done. Over the past 10 months, we have completed 590 inspections. Of these 590 inspections, 44 had failing systems. We define a failing system as either the pump is not working and effluent is in the riser, or the drainfield is surfacing. While that is not a huge percentage of failing systems, that is still 44 systems that WERE failing and now are working properly. I feel this inspection in not only a great service to help protect the public's health, but also a great means of educating the public on their septic system. I have not kept up with the percentage of homeowners who are actually present when I do the inspection, but I would estimate it between 40-50 percent. Many don't know where their septic system is (especially if it is pumped offsite) or what it even does. This allows me to do some valuable education and answer any questions the homeowner may have.

Guilford County's process of doing these inspections is as follows:

1) I mail a letter to the homeowner before the inspection to inform them of my planned visit within the next 30 days. I ask them to call me if they would like to set up an appointment if there is a reason why they would like to be present during the inspection. For instance, if they have a locked or gated back yard, dogs that would need to be put up, or bushes covering the pump tank that need trimming.
2) The inspection is completed. If the homeowner is present, I inform them of the inspection results and answer any questions they might have.
3) I complete an inspection report and mail it to the homeowner.
4) I update our database which includes when the inspection was done and when it is due for the next inspection.
5) A bill is generated and sent to the homeowner.

If the inspection is privatized, I feel this is what will happen in this order:

1) I mail the homeowner a letter informing them their system is due for an inspection.
2) Upon my arrival, they will produce a report from a private Certified Operator stating the inspection has already been done.
3) Eventually, Guilford County will say it is no longer cost feasible to do these inspections and will eliminate the program.
4) Individual homeowners will not care if their systems get inspected and will not "on their own" hire a certified operator to do the inspection every 5 years.
5) No 3B inspections, either by the county or a certified operator, will eventually be done.

Therefore, my request to the state is, either leave the rule as it is now or do away with rule .1961 Table V(a) 3B completely. Thank you for your time and consideration of this matter. Feel free to contact me with any further questions or comments you may have.

Sincerely, Randy Duncan REHS 336-641-7833

400 West Market Street, Greensboro, NC 27401

Name: Kippy Blanks

Street Address: 34178 Chub Lake Rd

City, State, Zip: Rowland NC 28374

Date: 9-28-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

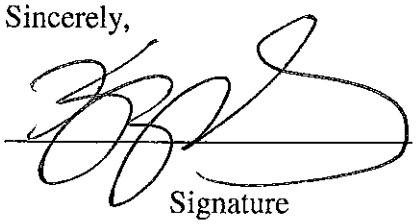
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Page 127 Line 12- 20 Comment: delete
Page 130 Line 18 – 29 Comment: delete
Page 147 & 148 Line 18 – 36 and 1 -7 Comment delete entire section 15ANCAC 18E .1722
Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,



Signature

CC: File

Richardsons Thermal Control Ind. Inc.
Brian Richardson
2246 Derby Rd
Jackson Springs NC 27281

Date: October 24, 2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

Please accept this as my formal comments and objections to the following proposed rules.

The objections are listed by page and line number as shown on the proposed rules submitted by Onsite.

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Sincerely,

CC: File

NORTH CAROLINA HOME BUILDERS ASSOCIATION

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bpace@pacedevelop.com

NAHB Executive Committee
BUDDY HUGHES
Lexington, (336) 240-3097
hucon@ptmc.net

Executive Vice President
MIKE CARPENTER

October 25, 2017

Chris Hoke
North Carolina Department of Health and Human Services
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke,

Thank you for all of your hard work in this rulemaking process. The North Carolina Home Builders Association understands the difficulties and complexity of the administrative procedures process. As an organization, we have always maintained that the rule making process should be grounded in facts with a strong consideration to the cost/benefit analyzes on regulated community.

After reviewing the latest proposed rules concerning on-site wastewater, we would like to formally express many of our concerns during the open public comment period.

Listed below are the new rules and the concerns our organization has with those proposed rules.

COMMENTS IN REGARD TO PROPOSED 15A NCAC 18E

1. Section .0202, page 15, line 3

   Rule: (c) A complete application for an IP, CA or Existing System Authorization shall expire 12 months from the date of application.
   Comment: ***Delete. A complete application should receive the attention of the local health department in the issuance of the permit. Having a 12-month window and making the owner or developer reapply for a permit is unnecessary and burdensome.***

2. Section .0202, page 15, line 37

   Rule: Eliminate in (2) identification of the proposed use of a ~~garbage disposal~~ grinder pump or sewage pump, and

   Comment: This inclusion of the garbage disposal in the household is noted for action here and on page 63 where the proposal calls for an increase in the size of the tank. This potential increase in solid (which is a matter of use of the garbage disposals) is a matter of increased maintenance more than it is an increase size capacity. This additional information is unnecessary.

*EUGENE A. GULLEDGE (1964)
C. PHIL ROBINSON, JR. (1966)
*CARL W. JOHNSON (1967)
*JOHN CROSLAND, JR. (1968)
*J.M. DAUGHTRIDGE (1969)
*HOMER BARRETT (1970)
*JAMES W. LESTER (1971)
CHARLES C. McLAURIN (1972)
*J. VAUGHN KLUTTS (1973)
*Deceased

*C.L. REAVIS (1974)
*JOHN T. BELL (1975)
*WILLIAM T. BOYD (1976)
LaRUE HAMBRICK (1977)
J. RAY SPARROW (1978)
SHERRILL FAW (1979)
MARK E. TIPTON (1980)
M. DURWOOD STEPHENSON (1981)
J. WATTS ROBERSON (1982)

*NELSON CALLAHAN (1983)
*PAUL D. TROLLINGER (1984)
RICK BATCHELOR (1985)
BURL LANCE (1986)
LARRY SUMMER (1987)
HERSCHEL REDDING (1988)
JAMES FORD (1989)
*STEVE NASH (1990)
HARRIS B. GUPTON (1991)

RUSS DAVIS (1992)
CHUCK MILLER (1993)
CHARLES MULLEN (1994)
ROBERT INGRAHAM (1995)
DAVID PRESSLY, JR. (1996)
DONALD W. BETSWORTH (1997)
GEORGE HENSON (1998)
ROBERT YATKO (1999)
DANNY ADAMS (2000)

JONATHAN ELLIOT (2001)
DON CROOM (2002)
GREG ISENHOUR (2003)
RICK JUDSON (2004)
BUDDY HUGHES (2005)
DAVE STORMONT (2006)
PAUL MULLICAN (2007)
RAY RHODES (2008)
FRANK WIESNER (2009)

LYLE GARDNER (2010)
BILL DALEURE (2011)
ERIK ANDERSON (2012)
J. GARY HILL (2013-14)
SEAN SULLIVAN (2015)
BRIAN PACE (2016)

3. Section .0204, page 18, line 28

   Rule: Upon written request of the owner, revised CA's shall be issued for the sites where the CA is greater than five years old and current technology can be expected to improve the wastewater performance.

   Comment: If the CA is greater than five years old, this site must have been applied for with a plat, which is good without expiration. If the owner does not require a re-evaluation of the site, regardless of the LHD information that there is current technology that can be expected to improve the wastewater system performance, is it within the authority of the LHD to withhold the OP if the installation follows eh construction conditions of the existing CA? If the LHD can withhold the issuance of the OP because there is newer technology that can improve the system performance without regard to additional cost to the owner, then the permit with a plat (without expiration.)

4. Section .0205, page 19, line 3

   Rule: this Subchapter and any conditions of the IP, CA.

   Comment: This is a continuing problem for property owners. The system is installed per the conditions of the IP and CA, and then another authorized agent comes to the site and threatens to deny the OP unless changes are made, while the agent claims the IP or CA should not have been issued. We believe that "this Subchapter" should be removed, and systems should be adopted based on the conditions of the IP and CA.

5. Section .0205, page 20, line 2

   Rule: For a type V or VI systems as specified in table XXXI of Rule .1301 of this subchapter, the OP shall expire five years after being issued.

   Comment: We do not believe these permits should expire due to an arbitrary date. Rather, the permits expiration should be determined on the working operation of the system.

6. Section .0801, page 63, line 8

   Rule: see table

   Comment: The table included for septic tank sizing included a column for the required increase in septic tank size when the site includes a garbage disposal. This is an unfounded expense to the homeowner. The Department cannot verify the amount of use exhausted by the garbage disposal. We suggest eliminated the column for the increased size for garbage disposals.

7. Section .1103, page 93, line 36

   Rule: The control panel shall be mounted 36 inches above finished grade, within 50 yards of and in direct view of the pump tank. The control panel shall always be accessible.

   Comment: The increased height from 12 inches to 36 inches is not necessary. This will be a year-round obstruction to the homeowner.

8. Section .1401, page 121, line 24

   Rule: After completion of the vacuum test requirement in subparagraph (f)(1) of this rule, the tank shall be subject to a water test...

   Comment: This is unnecessary and burdensome and costly. Once a structural test of application of a vacuum is completed, the design is adequately found to structurally sound, a vacuum seal cannot be completed if the unit were leaking.

9. Section .1402, page 122, line 26

   Rule: Inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible and flexible connective sleeve. The connective sleeve shall meet ASTM C 1644.

   Comment: This is costly and unnecessary. Inlet pipes should be correctly bedded and supported and not in need of the flexible sleeve the outlet needs. Hydraulic cement continues to be successful in packing around the pipe. Delete the proposed requirement of the inlet flexible sleeve.

10. Section .1301, page 113, line 24

    Rule: TABLE XXXI

Va	Fixed Media Advanced Pretreatment	Oper. Visit 2/yr.
Vc	RWTS	Oper. Visit 4/yr.

    Comment: These changes will add cost to the RWTS technologies.

11. Section .1405, page 127, line 12

    Rule: Re-Approval of risers, effluent filters, and pipe penetrations

    Comments: We would like to see this section eliminated. This seems very costly to the manufacturer, which would be passed to the contractor and then the consumer. The manufacturer should update their approval when changes are made to their products.

12. Section .1505, page 130, line 18

    Rule: RWTS Approval Renewal

Comment: Setting an expiration date on approved products and systems for 5 years. This seems very costly to the manufacturer, which would be passed to the contractor and then the consumer. Delete these sections of the calendared date of expiration.

13. Section .1711, page 147, line 18

Rule: Provisional and innovative approval renewals

Comments: Setting an expiration date on approved products and systems for 5 years. This seems very costly to the manufacturer, which would be passed to the contractor and then the consumer. Delete these sections of the calendared date of expiration.

Again, thank you for taking the time to review our concerns on this very important issue. On-site wastewater systems remain vital to home construction in many areas of North Carolina and we would like to continue working on improving these rules for the regulated community.

Sincerely,

Steven Webb
NCHBA Legislative Lobbyist

NCSTA
NORTH CAROLINA SEPTIC TANK ASSOCIATION
1426 Peter Mabe Rd Danbury, NC 27016
Phone (336) 416-3564 Fax (866) 651-8102
Email: ncseptictank@gmail.com Website: www.ncsta.net
"Working today for your future tomorrow"

To: Chris Hoke
From: NCSTA
Date: October 25, 2017
Subject: Objections to Proposed Rules

NCSTA has collected the enclosed fifty-two (52) letters of objections to proposed rules. The letters are from individuals within the on-site industry and represent fifty-two (52) individual objections.

RECEIVED
NOV 0 1 2017
DHHS
ON-SITE WASTEWATER

Jerry Pearce
President
(919) 971 4599

Doug Lassiter
Executive Director, Lobbyist
(336) 345 8357

Russell Lumber
6841 Layton Rd
Lisbon NC 27298

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

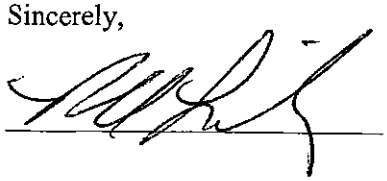
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Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,



CC: File

Solomon's Septic Tank
101 Burlington Rd
Box 3000 N.C, 27573

Date: _____

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

CC: File

Valentina Ocerdine
3460 Country Club Rd
Lumberton NC 28360

Date: 10.23.17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

_____

CC: File

Page
Page
Page
Page 12
construct

Max Lawhon
Lawhon Barbecue Inc
2525-N-Duffie Rd NC, 28377

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

_____

CC: File

Seawell Septic Tank & Concrete Co.
992 Loflin Pond Rd
Asheboro 27203

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,

Robert Seawell

CC: File

Lester Breedlove
6041 Starmount Rd.
Liberty, N.C. 27298

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

Lester Bradshaw

CC: File

I Donald Martin
5036 York-Martin Rd
Liberty N.C 27298

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Donald Martin

CC: File

D+D Organic Farming
Fremont, NC 27830
Daniel L. Newsome

Date: 10-27-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

CC: File

David Murphy
DRM
Thomasville, NC. 27360

Date: 10-24-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

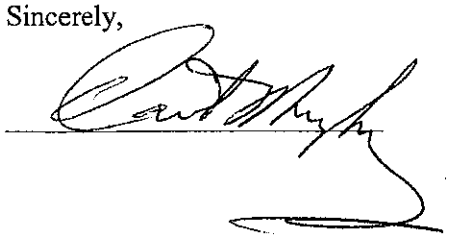
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Sincerely,



CC: File

Mark Johnson
4667 N.C. 65
Reidsville, N.C. 27320

Date: Oct. 23, 2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

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CC: File

Danny Dennis
1361 Thrifty Creek Rd
Mt. Gilead N.C. 27306

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

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CC: File

Brent Mercer
1496 Plank Rd Robbins
N.C.

Date: 12 23 2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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CC: File

Chrissee Backhouse Services
104 Weedhamgrove
Sedgrove NC 27211

Date: 10-23-2017

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1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

_____

CC: File

Jerra Cable
Jerry Cable
Cable Septic and Backhoe Service

Date: 10/23/2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,

_____

CC: File

Parish Homes Park, Inc
5310 Raine Rd
Randleman NC 27317

Date: 10/23/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

Please accept this as my formal comments and objections to the following proposed rules.

The objections are listed by page and line number as shown on the proposed rules submitted by Onsite.

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Sincerely,

John Parrish

CC: File

Brian Beebe
7285 Red Bank Rd
Germanton NC 27019

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Brian Beebe

CC: File

Hearns Pumping Service
370 Shiloh Rd.
Troy N.C. 27371

Date: 10/23/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

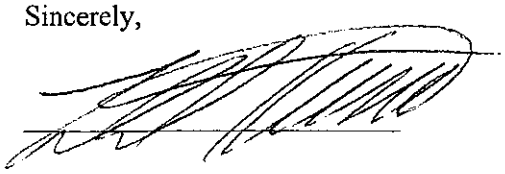
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Sincerely,



CC: File

TM Grading, INC.
1500 Mt. Carmel Rd.
Carthage, N.C. 28327

Date: 10/23/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

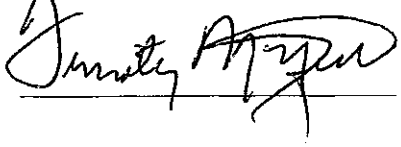
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Sincerely,



CC: File

Hank Hill Grading
3341 Giant Oaks Dr.
Sophia, N.C. 27350

Date: 10-28-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

CC: File

Terry Maples
Maples Septic & Thomas/Kelly
Rd Sanford NC 27330

Date: 10/23/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

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CC: File

Herald Leonard
4801 Joplin Dr.
High Point, N.C.

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Donald Leonard

CC: File

Terry Pearce
Po Box 58
Rolesville NC 27571

Date: 9/15/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

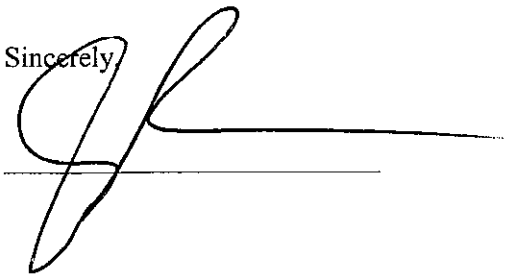
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Sincerely,



CC: File

FRANK C. PEARCE, JR. OWNER PEARCE BACKHOE & SEPTIC TANK SVC. INC.
(SAME ADDRESS)
5008 ROGERS RD.
ROLESVILLE, N.C. 27571-9673

Date: 9-15-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

Frank C. Pearce, Jr.

CC: File

Tyler Jolley
2422 W. Lenoir Dr
Lenoir, NC 28645

Date: 9/15/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

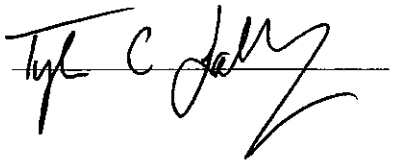
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Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,



CC: File

David L Cooper Bryant + Lassiter Septic Ser. Inc.
P.O Box 157
Potecasi NC. 27867

Date: 9-15-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

David L Cooper

CC: File

Vince Scroggins
215 White Oak Bluff Rd
Stella NC. 28582

Date: 9/14/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

9/14/17

CC: File

Barry's Grading & Septic Service
5409 Riley Hill Rd
Youngsville NC 27596

Date: 9-14-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,



CC: File

Lawrence L Clemmons
317 Airport Rd
New Bern NC 28560

Date: 09/15/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

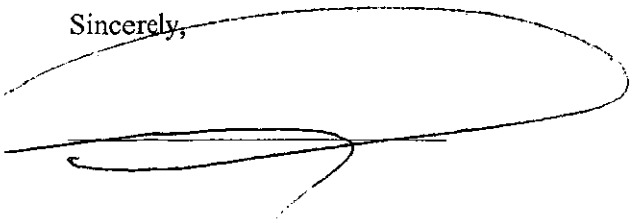
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Sincerely,



CC: File

ABCD Construction

Date: 09-14-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

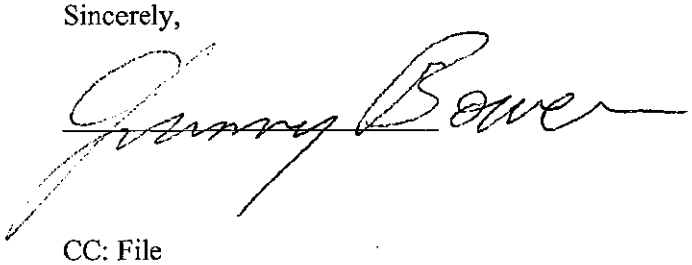
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Sincerely,



CC: File

Michael C Barker
4528 Mt Hope Ch Rd
Salisbury NC 28146

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

Michael C Barger

CC: File

1105TH ST SW
Catawba NC 28609

Date: 9/25/2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Charlie Bright

CC: File

Michael Kiel
New Horizon Landscapes Inc

Date: 9/25/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

CC: File

Chris Hedrick
1846 Hickory Springs Lane
Lincolnton NC 28092

Date: 9/25/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,

CC: File

Jeffery Wyatt
Blue Ridge Pumping
581 Rectar Rd Enka
NC 28623

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

Please accept this as my formal comments and objections to the following proposed rules.

The objections are listed by page and line number as shown on the proposed rules submitted by Onsite.

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Sincerely,

Jeffrey Wyatt

CC: File

Harry Hatcher
5485 Star Town Rd
Newton, N.C. 28658

Date: 9-25-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

CC: File

Pat Rentz
VIP Inspection Services
404 Indigo Dr
Cary NC 27513

Date: 9/25/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

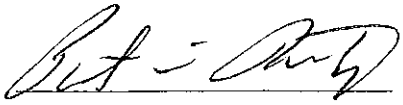
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Sincerely,



CC: File

EcoClean Septic
1936 Jamestown RD Morganton NC

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,



CC: File

Massey Septic Tank
Co - Inc -
B. H Hawes

Date: 9/25/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Bill Hauser www.douglassiter@GMail.COM

CC: File

Andrew Deepwell

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

Andrew Daywalt

CC: File

Randy Lackey
Love Valley Septic

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

_____

CC: File

Drayer's Septic Tank
Darrell Drayer

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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CC: File

Driggers Septic Tank
Chris Driggers

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

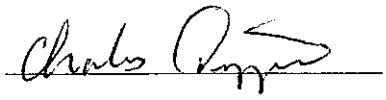
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Sincerely,



CC: File

Doug Strunk
Stanley Environmental Solutions
131 Mariposa Rd
Stanley N.C. 28164

Date: 9.25.17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

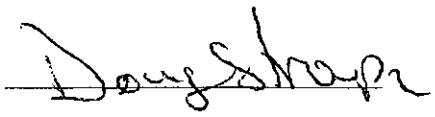
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Sincerely,



CC: File

Steve Canupp
Rowan Co. Health

Date: 9/25/19

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

CC: File

Jeff Link
Rowan County Health Dept.

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,



CC: File

C T C Septic Services, LLC

Charles R. Dodge Jr

Date: Sept. 25, 2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

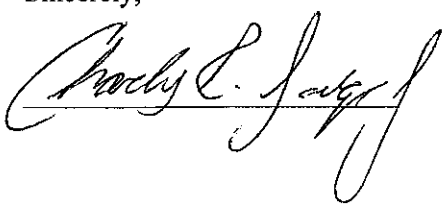
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Sincerely,



CC: File

Benfield Outdoor Services
& Solutions

Date: 7-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

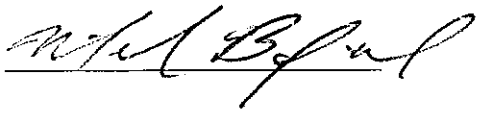
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Sincerely,



CC: File

C+C Septic Services
Charles Dodge

Date: 9/25-/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

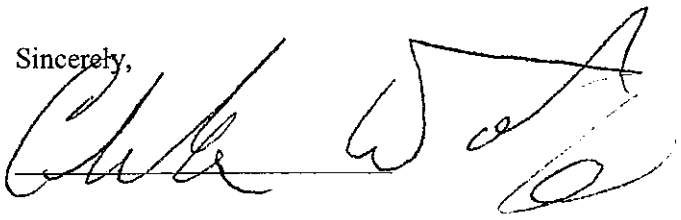
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Sincerely,



CC: File

Myers Septic Tank Co
1882 Brugh Rd
Salisbury, N.C. 28147

Date: 9/25/17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

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Sincerely,

Benny A. Wyatt

CC: File

Ben Hitchcock

Ed Hebble

Date: 9-25-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

Dear Mr. Hoke:

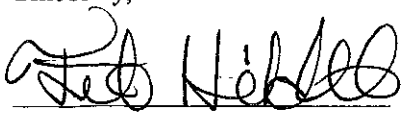
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Sincerely,



CC: File

Johnny Strickland
460 Country Club Rd.
Lumberton, NC 28360

Date: 10-23-17

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Sincerely,

_____

CC: File

Sarah Walls
59 Mistletoe Rd
Elon NC

Date: 10-23-2017

Chris Hoke
1931 Mail Service Center
Raleigh, NC 27699-2961

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Page 121 Line 24- 26 Comment: Delete item (2)
Page 122 Line 9 Comment: add "structurally sound"
Page 122 Line 26 Comment: delete "inlet and"
Page 123 Line 5 – 6 Comment: add to end of sentence "manufactured, installed and maintained"
Page 123 Line 18 – 20 Comment: Delete item (H)
Page 125 Line 2 – 3 Comment: First sentence should be revised as follows: (a) Tanks designed to hold sewage shall be constructed of materials capable of being structurally sound, watertight, and not subject to excessive corrosion or decay

Page 123 Line 7 Comment: delete "of steel" from sentence
Page 126 Line 15 Comment: change four inches to five inches and five minutes to 2 minutes
Page 127 Line 12- 20 Comment: delete
Page 130 Line 18 – 29 Comment: delete
Page 147 & 148 Line 18 – 36 and 1 -7 Comment delete entire section 15ANCAC 18E .1722
Page 148 Line 34 Comment: add "and Innovative Systems"

Sincerely,

_____

CC: File

Sept. 20, 2017

Pitt County Cooperative Extension Agricultural Auditorium

403 Government Circle

Greenville, NC

CONCERNING THE PROPOSED RULES 15A NCAC 18E, I HAVE THE FOLLOWING OBJECTIONS:

1.

PAGE/LINE SECTION

Pg 15/Ln 3 .0202 (c) A complete Application for an IP, CA or existing system authorization shall expire 12 months from the date of application.

This is not necessary. Upon a completed Application being received by the local health department, the local health department is supposed to act on the Application, as it says on Page 16 Line 20. If it's a complete Application, it should not have an expiration date since the next step of action is in the hands of the local health department. ELIMINATE .0202 (c)

2.

Pg 15/Ln 37 .0202 (2) identification of the proposed use of a garbage disposal, grinder pump, or sewage pump.

This would require that the information contained in the application for a CA require an owner to include if they were going to put in a garbage disposal. The use of a garbage disposal may not be known to the owner at the time the CA is issued and they would not know how much they would use the garbage disposal. In any event, when combined with the Tank Size Table on Page 63, the purpose of this information would mean the local health department would increase the size of the septic tank. Any added volume that may be caused by a garbage disposal would be a matter of increased pumpouts to the homeowner, not a tank size issue. ELIMINATE .0202 (f)(2).

3.

Pg 67/Ln 14 .0805 (a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

This is part of a proposed required Quality Control plan that is poorly drafted and cannot be fairly or adequately conducted. This section gives the local health department the authority to test concrete tanks to fill this 10%, but the State has told the local health departments that they haven't got the expertise or the equipment to test plastic or fiberglass tanks for strength. Instead, they get to use an annual audit report from a third-party. That's not the same as 10% of tanks sold in each county in North Carolina, and the result is that the only tanks that will get tested at the job site will be concrete tanks. ELIMINATE .0805 (a).

4.

Pg 67/Ln 34 .0805 (B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

This part of the proposed rules apply to the leak testing at the jobsite or yard. The section for watertesting the tank requires a return trip for the installer choosing concrete tanks but says nothing about plastic tanks. While concrete is technically a porous material, there is no reason to require a 24 hour revisit when the inspector is looking for a "visible flow" as described in section (E). ELIMINATE (B) AND KEEP TESTING THE SAME FOR TANKS OF ALL MATERIALS.

5.

Pg 68/ Ln 8 .0805 (B) Using calibrated equipment, draw a vacuum on the empty tank to a negative pressure of 2.5 inches of mercury.

This proposal is next to useless. A vacuum pressure of 2.5 may not even produce a reasonable verification of leaktesting. In years of industry experience, I have never seen this limit placed on any tank in North Carolina. For the State to place this limit on a tank is short-sighted, since the local health department could use this test to bring the vacuum to 5 inches of mercury and test for both leakage and structural fitness. If the State wants a quality control program, why would they miss such an obvious chance to test the tank? DELETE 2.5 INCHES OF MERCURY AND INSERT 5 INCHES OF MERCURY.

6.

Pg 73/Ln 6 .0902 (5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregates which certifies that the aggregate meets the requirements of this Rule.

The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregates installed.

This proposal is unnecessary and provides no real indication of the amount of aggregate actually used in the particular job. An installer may stockpile aggregate, and they will hardly go to the quarry and not get what is typical for the trench length. More than anything else, quarries in North Carolina may produce aggregate of different weights/square foot. ELIMINATE .0902 (5). It's unnecessary and useless. If there is actual proof of such bad installation, the local health department should address it to the NCOWCICB.

7.

Pg121/Ln 21 .1401 (e)(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings.

This section places a requirement of testing for structural integrity prior to the State approval being granted. While the idea is good, the State has historically placed a requirement for tanks to meet 5 inches of mercury, not 4 inches. Since the rules state in other sections of current rules and these proposed rules that tanks shall be constructed to withstand uniform live loads of 300 psf in addition to all other forces an underground structure may experience, this mean the tank is required to withstand in excess of 300 psf. However the State is proposing 4 inches of mercury which is only 288 psf, while 5 inches is 360 psf. DELETE 4 INCHES OF MERCURY FOR FIVE MINUTES AND INSERT 5 INCHES OF MERCURY FOR TWO MINUTES WITHOUT PERMANENT DEFORMATION OF THE TANK OR TANK OPENINGS. IN AN UNDERGROUND STRUCTURE, IF THE PRESSURES RESULT IN ANY DEFORMATION OF THE TANK, THERE WILL BE NO ABILITY TO RETURN TO THE ORIGINAL SHAPE SINCE THE DIRT WILL BE AROUND IT.

8.

Pg 121/Ln 24 .1401 (2) after completion of the vacuum test requirements in Subparagraph (f)(1) of this rule, the tank shall be subject to a water test.

Unnecessary and a waste of water. After the successful completion of the vacuum test, t is no need for a water test, since the tank could not produce a vacuum if it were capable o leaking water. ELIMINATE (2).

9.

Pg 122/Ln 26 .1402 (7) Inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible and flexible connective sleeve. The connective sleeve shall meet ASTM C1644.

The flexible seal on the inlet pipe may be better than the hydraulic cement used normally, but this rule would mean that 3 inlet boots would have to be used, since the State also requires 3 possible inlet pipe penetration points. So, two would not be used, an unnecessary cost. Additionally, the majority of tank manufacturers in Eastern NC would have to change their forms since the side-walls are on a slant. This expense would be thousands of dollars to these manufacturers. ELIMINATE THE ADDITION OF THE FLEXIBLE INLET PIPE PENETRATION.

10.

15A NCAC 18E .1505 RESIDENTIAL WASTEWATER TREATMENT SYSTEM APPROVAL 19 RENEWAL 20 (a) All RWTS approvals will expire five years after the date the approval is issued. Approvals shall be re-issued 21 when the requirements of this Rule have been met. 22 (b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the 23 State that includes verification of their continued certification and listing by a nationally recognized certification body, 24 such as NSF International, as compliant with NSF Standard 40 and authorized by NSF to distribute and service 25 products in North Carolina. 26 (c) The State shall re-issue a RWTS approval for a new five-year period when the manufacturer's re-approval request 27 provided in accordance with Paragraph (b) of this Rule shows continued product certification. 28 (d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance 29 with established effluent quality standards.

RESIDENTIAL WASTEWATER TREATMENT SYSTEM APPROVALS SHOULD NOT HAVE TO BE RENEWED EVERY 5 YEARS THERES RULES IN PLACE TO REVOKE THE APPROVALS. BY HAVING THIS IN THE RULES WOULD ADD UNESSARY COST TO THE CONSUMER AND IS UNESSARY TO PROTECTING PUBLIC HEALTH SINCE RULES ARE ALREADY IN PLACE TO REVOKE APPROVALS.

11.

15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL 19 (a) All Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals 20 shall be re-issued when the applicable provisions of this Rule have been met. 21 (b) Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request 22 to the Department that includes the following: 23 (1) summary of the current status of systems permitted and

installed under their approval; 24 (2) number of malfunctioning systems, including location, reason for malfunction, and how the system 25 was repaired; 26 (3) documentation of system compliance with effluent quality standards in accordance with Rule .1710 27 of this Section, including analysis of all effluent data collected subsequent to the most recent system 28 approval; 29 (4) documentation of compliance with all requirements in current Provisional or Innovative approval; 30 (5) documentation that 80 percent of the individual advanced pretreatment systems at a single site are 31 in compliance with Rule .1302(d) of this Subchapter; 32 (6) current status of certification and listing by a nationally recognized certification body; and 33 (7) any other information the manufacturer deems necessary to support re-issuance of their PIA 34 Approval. 35 (c) The Department shall re-issue a Provisional Approval for a specified additional period, not to exceed five years, 36 when the manufacturer has demonstrated progress in completing the approved evaluation protocol; compliance with 148 1 applicable effluent quality standards; and that there is the likelihood that re-issuance of the approval will enable the 2 evaluation protocol to be completed. A Provisional Approval may be re-issued only one time. 3 (d) The Department shall re-issue an Innovative Approval for a five-year period when the manufacturer's report 4 provided in accordance with Paragraph (b) of this Rule shows system compliance with effluent quality standards and 5 this Subchapter. 6 (e) The Department shall suspend or revoke a PIA approval upon a finding that the system fails to perform in 7 compliance with established effluent quality standards. 8 9 History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL SHOULD NOT HAVE TO BE RENEWED EVERY 5 YEARS THERES RULES ALREADY IN PLACE TO REVOKE THE APPROVALS. BY HAVING THIS IN THE RULES WOULD ADD UNESSARY COST TO THE CONSUMER AND IS REDUNDANT TO PROTECTING PUBLIC HEALTH SINCE REPORTING AND SAMPLING HAS ALREADY BEEN SUBMITTED ON BEHALF OF THE OWNER TO THE COUNTY LOCAL HEALTH DEPARTMENT. THE INFORMATION ALREADY GIVING SHOULD HAVE ALREADY BEEN REVIEWED AND THERES NO NEED TO REQUIRE THESE COMPANIES TO GIVE INFORMATION TO THE STATE THAT'S ALREADY BEEN GIVEN AND PIAD TO BE GIVEN ONCE BY THE OWNER/PUBLIC. IT WOULD BE NICE IF EACH COUNTY COULD UP LOAD DATA RECEIVED FROM OPERATORS TO ONE STATE SITE SO ALL INFORMATION COULD BE SEEN BY YOU AND THE PUBLIC. IT WOULD BE VERY EASY TO SEE COMPLIANCE AT THAT POINT AND NOT HAVE THE PUBLIC PAY FOR IT TO BE SUMITTED TWICE WITH INCREASING THE COST TO DO BUISENESS IN NORTH CAROLINA.

12. PERMITS SHOULD NOT EXSPIRE IN 5 YEARS

I WOULD LIKE TO SEE PERMITS EXSPIRE IN 10 YEARS WE SEE CONSUMERS HAVING TO PAY FOR NEW PERMITS ALL THE TIME BECAUSE IT TAKES THEM SEVERAL YEARS TO SAVE THE MONEY AFTER BUYING THE LOT TO BE ABLE TO BUILD ON IT.

THANK YOU FOR YOUR TIME

RUSS AYERS

As Of Sept 20

Proposed Rules to Replace 1900 Rules Comments, Suggestions and Objections Doug Lassiter

COMMENT I:

15A NCAC 18E .0105

Page 12 Line 20 (70) "Septic Tank" means a watertight covered receptacle designed for primary treatment of wastewater and constructed to:

COMMENT: The septic tank was once defined more accurately as a watertight and structurally sound. This has disappeared for no apparent reason and should be added back into the definition.

SUGGESTION: (70) "Septic tank" means a watertight, structurally sound, covered receptacle designed for primary treatment of wastewater and constructed to:

COMMENT II:

15ANCAC18E .0105

Page 13 Line 32 (86) "Third-party" means a person or body 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 body had knowledge of the subject area based upon relevant training and experience.

COMMENT: The question of third parties and third party reports that are prepared to fulfill requirements of laws or rules have been constantly addressed. It's a fine line between independence and relationships that cloud the ability of the person to fulfill their obligation. IF the proposed Rules are installed into Permanent Rules of North Carolina, the Department should write into the Rules the ability to review the Third-Party Report and be informed of ALL the testing sampling and evaluations, not just the ones entered into the report.

SUGGESTION: ADD TO END OF DEFINITION: The Department shall be notified of all sampling and test data within 30 days of the testing by the Third Party and shall review the Annual Report for compliance with existing rules. The Department may suspend an approval if testing or evaluation fails to meet minimum standards within these Rules until such time as subsequent reports are reviewed.

COMMENT III:

15A NCAC 18E .0202

Page 15 Line 3 — (c) A complete application for an IP, CA or existing system authorization shall expire 12 months from the date of application.

COMMENT: *Unnecessary and burdensome: In proposal 15A NCAC 18E .0203 (a) Upon receipt of a complete application for an IP, an authorized agent shall evaluate the site to determine whether the site is suitable... . This correctly indicates that the LHD, upon receipt of a complete application will act on it accordingly. The owner would not turn in a complete application unless they wanted action on it. And if the LHD were not to be able to act on a complete application in a 12 month window, this should not be cause for the application to expire.*

SUGGESTION: *Eliminate (c). Unnecessary. A complete Application should be acted upon by the local health department.*

COMMENT IV:

15A NCAC 18E . 0202

Page 15 Line 37 — Eliminate in (2) identification of the proposed use of a ~~garbage disposal~~ grinder pump or sewage pump, and

COMMENT: This inclusion of a garbage disposal in the household is noted for action here and on Page 63 where the proposal calls for an increase in the size of the septic tank. This potential increase in solids (which is a matter of use of the garbage disposal) is a matter of increased maintenance more than it is increase size capacity. This additional information is unnecessary.

AND ELSEWHERE

Page 63 Line 8 — Eliminate Table Column for additional tank volume with garbage disposal.

COMMENT: This Column requires a substantial increase in septic tank capacity. There is a possibility of additional food solids going into the septic tank when a garbage disposal is added to the kitchen routine, but there will be little way for the LHD to verify the information and affect the proposed change. And the added food solids in the septic tank will result in increased maintenance, especially since there is a requirement of an effluent filter in all septic tanks.

COMMENT V:

15A NCAC 18E .0204

Page 18 Line 28 (j) Upon written request of the owner, revised CAs shall be issued for the sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance.

COMMENT: First, if the CA is greater than five years old, this site must have been applied for with a plat, which is good without expiration. If the owner does NOT request a re-evaluation of the site, regardless of the LHD information that there is current technology that can be expected to improve the wastewater system performance, is it within the authority of the LHD to withhold the OP if the installation follows the construction conditions of the existing CA? If the LHD can withhold the issuance of the OP because there is, in their opinion, newer technology that can improve the system performance without regard to additional cost to the owner, then the permit with a plat (without expiration) isn't really without expiration.

Suggestion: *(j) Upon written request and acceptance of the owner, revised Cas shall be issued for the sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance.*

COMMENT VI:

15A NCAC 18E .0205

Page 19 Line 3 this Subchapter and any conditions of the IP, CA.

COMMENT: This is a continuing problem for the property owner. A much too recurring story across North Carolina is that the IP and CA is issued by an authorized agent, the system is installed per the conditions of the IP and CA, and then another authorized agent comes to the site and threatens to deny the OP unless changes are made, sometimes saying that the IP or CA should never have been issued. The Owner is forced to invest more money into the project or lose the project. While no person is expected to never make a mistake in the site evaluation, there should be remedies that are available to the Owner instead of (1) making the necessary corrections at their sole cost, (2) Request the arbitration by the regional specialist from the OWPB, or (3) hire a lawyer. All three options require additional costs to the owner, with no apparent responsibility on the part of the authorized agent. It may be as simple a solution as assignment of an authorized agent for all permit visits. There has been noted reasons by the OWPB that "errors may have been made" which is true.

Solution: ~~*this Subchapter and*~~ *any conditions of the IP and CA.*

COMMENT VII:

15A NCAC 18E .0205

Page 20 Line 2 (h) For a Type V or VI systems as specified in Table XXXI of Rule .1301 of this Subchapter, the OP shall expire five years after being issued.

COMMENT: *This is an unusual approach to verifying the performance of Type V and VI systems, or any treatment systems that has been capitalized and providing wastewater service. Simply, what does five years have to do with it? The systems are to have a frequent inspection and sampling program in place, and the local health departments should be receiving Operator reports and lab samples. So the verification program should not have a finite date of expiration, instead the consistent and constant operator program should give all the information needed to have ongoing performance. Is this a method of funding for the local government? The legislation for Periodic Review and Elimination of Rules was not passed to provide a method of raising fees.*

SUGGESTION: Eliminate (h) as it sets a finite expiration of the permit, whether the system is working or not. Instead, make sure the current Operator program, with the local health department and the Department receiving the required reports and lab reports is supported.

COMMENT VIII:

15A NCAC 18E .0205

Page 20 Line 10 (k) When an OP expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, OP, or existing system authorization.

COMMENT: *This appears to refer to Page 20 Line 2 where Type V and VI systems would expire in five years. As suggested above, if the system is functioning in compliance with the permit, why should the system permit expire.*

SUGGESTION: *Eliminate (h). The system should not have an expiration date, and a system that is revoked due to non-compliance, then the site would have to have a new permit anyway, as noted in other parts of this Subchapter.*

COMMENT IX:

15A NCAC 18E .0207

Page 22 Line 30(l) The LHD is responsible for the following activities related to the EOP system:

COMMENT: *The responsibilities listed for the LHD does not appear to have attendance at the Post-Construction Meeting.*

SUGGESTION: *Verify that this attendance is continued to be required by Rule.*

COMMENT X:

15A NCAC 18E .0401

Page 32 Line 3 (h) HVAC machine or ice machine condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system.

COMMENT: The specific items mentioned should include the machine that maybe impacts the wastewater system the most, the back flush from the water softener.

SUGGESTION: *ADD:* water treatment system back flush line.

COMMENT XI:

15A NCAC 18E .0601

Page 54 Line 1 (a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX.

COMMENT: *While most of these site features are to be expected at the site prior to the IP or CA being designed and sited on the property, why is the wastewater system to respect the location of things like the well location or the location of a geothermal system? Most logic would indicate that the site should be placing the location of the wastewater system as the priority and then the well and geothermal system meet a setback to the wastewater system.*

SUGGESTION: *Re-examine the site features in Table XI and make sure the proper order of locating water/wastewater features is met. Since the owner is not to infringe on the repair area, this would extend to the repair area as well.*

COMMENT XII:

15A NCAC 18E .0801

Page 63 Line 8 TABLE XIII

COMMENT: *This table for septic tank sizing includes a column for the required increase in septic tank size when the site includes a garbage disposal. This is an unfounded expense to the homeowner. As stated in the comments from page 15 Line 37, the issue is more of maintenance than septic tank sizing. The Department cannot verify the amount of use of the garbage disposal. As a maintenance issue, the owner would be liable for the amount of use, if any, in the household.*

SUGGESTION *Eliminate the column for increase size for garbage disposals.*

COMMENT XIII:

15A NCAC 18E .0802

Page 64 Line 21 (2) Equal to two-thirds of the septic tank capacity in Groups I, II, or III soils; or

COMMENT: *This is a new sizing formula and creates some confusion. How does this apply to the configuration necessary for the items in (3).*

SUGGESTION: *Eliminate (2).*

COMMENT XIV:

15A NCAC 188E .0805

RA

Page 67 Line 1415A NCAC 18E.0805 TANK STRUCTURAL INTEGRITY & LEAK-TESTING REQUIREMENTS

COMMENTS: ***On (a) the Quality Control Program proposed to be required by the Department develops the ability to select a QA verification by material of manufacture, not as a method of performance to be equally applied to ALL tanks. This has been one of the basic requirements for the North Carolina Septic Tank Association in approaching the Periodic Review and Elimination of Rules. Specifically:***

Page 67 Line 14 (a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used construction.

COMMENTS: *This deliberately establishes separate methods of Quality Assurance for the type of materials used in manufacture. And in the case of (1) creates a system most likely to be used by North Carolina manufacturers using precast concrete, where 10% of the tanks in every county shall be tested for structural integrity. Under this language, does 10% mean that the 1st tank or the 10th tank delivered to the county meets the requirement? And this is the only QA program listed that would be able to be verified by an authorized agent of the Department. A proposed third-party QA program may be the most appropriate for a manufacturer of tanks marketing in many locations across the United States and the most cost-effective. However, it would still be impossible for this to be considered equal to 10% in every county of North Carolina. The Department continues to offer instruction to their authorized agents on how to verify structural integrity for precast concrete tank, while the Department personnel has maintained that neither the local government nor the Department has the expertise or the equipment to verify the structural integrity of the thermoplastic or fiberglass tanks. The bottom line is that the Department acknowledges to its authorized agents to only test precast concrete tanks.*

SUGGESTIONS: *While increasing the quality program for tank manufacturers could actually be a good thing for the industry, the Department has not only failed to propose a program that produces equal performance; they seem to have proposed a scenario that purposely offers a verification program that will only affect tank manufacturers within North Carolina whose tanks are manufactured with concrete. THE SUGGESTION IS TO ELIMINATE ALL OF (a).*

COMMENT XV:

15A NCAC 18E .0805

Page 67 Line 34 RA

(B) Allow the tank to sit for 24 hours if the tank is made of materials that absorb water (such as concrete) and refill to the tank outlet.

COMMENT:

This language is unnecessary and burdensome to the specific material mentioned (concrete) and purposely omits the knowledge that active leaks (VISIBLE FLOWING AS DESCRIBED IN (E) OF THIS SUBSECTION) will immediately be noticed by the authorized agent. Most likely, the Department has allowed that proposed rule to be written by tank manufacturers other than concrete manufacturers. This language is new for the proposals and was not noted in past Drafts or discussions with tank manufacturers or in the comments sent by stakeholders in past comment period.

SUGGESTION:

ELIMINATE (B).

COMMENT XVI:

15A NCAC 18E .0805

RA Page 68 Line 8

2.5 inches of mercury.

COMMENT:

If a tank is to be test for structural integrity, it should be verified that the initial approval for the tank is being followed. This is NOT 2.5 inches which amounts to only an approximate 144 pounds per square foot, not the required 300 pounds per square foot. This proposal is NOT a verification for structural integrity and the Department should be questioned as to where this proposal originated from, certainly not a qualified engineer.

SUGGESTION:

~~2.5~~ five inches of mercury for two minutes.

The rules of 300 pounds per square foot in addition to all loads to which an underground tank is normally subjected, as noted in this proposal in 15A NCAC 18E .1403, has been the historical standard. Five inches of mercury for two minutes is the closest rate of vacuum pressure to achieve this. Per our figures, four inches of mercury equals 288 psf, five inches of mercury equals 360 psf. So if the historic structural verification standard is 300 psf, in addition to all other loads to which an underground tank is normally subjected, then the five inches of mercury for two minutes should be the standard. AGAIN, WHERE DID THIS PROPOSAL ORIGINATE FROM AND WHY DOES THE DEPARTMENT CONSIDER THIS A STRUCTURAL STANDARD?

COMMENT XVII:

15A NCAC 18E .1103

Page 93 Line 36 (d) The control panel shall be mounted 36 inches above finished grade, within 50 yards of and in direct view of the pump tank. The control panel shall always be accessible.

COMMENT: The increase in height from 12 inches above finished grade to 36 inches above finished grade will be easier for the Operator, which is semi-annually for most systems, just a few hours each year. This proposal means the homeowner is faced with the obstruction 24/7/365 and will not be accepted by the majority of the homeowners. The added distance of the control panel to the pump tank is unnecessary, just say adjacent.

SUGGESTION: *(d) The control panel shall be mounted ~~36~~ 12 inches above finished grade , ~~within 50 yard of and in direct view of the pump tank.~~ and adjacent to the pump tank.*

COMMENT XVIII:

15A NCAC 18E .1103

Page 94 Line 14 (1) 18 inches of effluent shall be maintained in the bottom of the pump tank.

COMMENT: Where does 18 inches come from? The subsequent requirements give the actual depth of the pump tank for the sake of the pump. His language says 18 inches, not a minimum of 18 inches or anything that would differentiate between the pump design.

SUGGESTION: (1) ~~18~~ A minimum of 12 inches of effluent shall be maintained in the bottom of the pump tank.

COMMENT XIX:

15A NCAC 18E .0901

Page 72 Line 16(13) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

COMMENT: This is not a responsibility of the installer, but the Owner's. This sub-section is under Installation Criteria.

SUGGESTION: Eliminate (13) and if necessary place it under Owner Responsibility.

COMMENT XX:

15A NCAC 18E .0902

Page 73 Line 6 RA

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregates which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregates installed.

COMMENTS: This is unnecessary and burdensome and proves nothing. This is another attempt by manufacturers of other dispersal products to add hurdles to the installer choosing to use rock and pipe. In fact, installers order natural aggregates by tonnage, and the tonnage is dependent on the specific gravity of the aggregate from the specific quarry. So, the amount of square footage needed in the drainfields cannot be accurately related to tonnage.

SUGGESTION: Eliminate (5). It is not worthy of even being in the proposed Draft, however its very inclusion in the Department's proposal is another indication that the Department is allowing certain product manufacturers to influence decisions.

COMMENT XXI: RA

15A NCAC 18E .1401

Page 121 Line 21 (1) structural testing of a tank to a vacuum of four inches of mercury for five minutes

COMMENT: Structural testing of 300 psf in addition to all other loads that an underground structure may be subject to (in plain English greater than 300 psf) would be five inches of mercury, not four. This has been the standard set by the Department for over a decade. It is apparent that a thermoplastic tank manufacturer has commented (during the stakeholder comment period) that they were "concerned with the safety of their employees if they were required to test their tanks to five inches of mercury" and more interesting, that their literature used for their approval states that the tanks are not to be subject to over four inches of mercury. This means that the Department approved a product that did not meet the standards set for other like products. To make the initial design structural testing protocol more curious is that, by normal engineering standards, an initial design test is the standard (five inches of mercury) times a Safety factor, usually 1.4 to 1.5, meaning the design test should be seven inches of mercury.

SUGGESTION: (1) structural testing of a tank to a vacuum of ~~four~~ five inches of mercury for five minutes

COMMENT XXII

15A NCAC 18E .1401

Page 121 Line 24 RA (2) After completion of the vacuum test requirement in Subparagraph (f)(1) of this rule, the tank shall be subject to a water test…

COMMENT: Unnecessary and burdensome. Once the structural test of application of a vacuum is completed successfully, the design is adequately found to be structurally sound, but also sealed, since a vacuum cannot be achieved if the tank were leaking.

SUGGESTION: Eliminate (2).

COMMENT XXIII:

5A NCAC 18E .1402

Page 122 Line 9 (a) Tanks shall be watertight and not subject to excessive corrosion or decay.

COMMENT: As per suggestion in Definitions (page 7 line 20), add "structurally sound"

SUGGESTION: (a) Tanks shall be watertight, structurally sound, and not subject to excessive corrosion or decay.

COMMENT XXIV:

15A NCAC 18E .1402

Page 122 Line 26 RA (7) Inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible and flexible connective sleeve. The connective sleeve shall meet ASTM C 1644.

COMMENT: The addition of a flexible, connective sleeve as described to inlet pipe penetration is without a doubt an added benefit to the installer or plumber, but one that is realistically burdensome on a vast majority of tank manufacturers who will be forced to modify their tank forms to accommodate the addition. The cost of this addition was noted by the Department in their Fiscal Note to the Commission to be only the material cost of the flexible sleeves, not the actual costs of retrofitting the forms. Since the rules concerning the development of the Fiscal Note include that errors in the Fiscal Note do not necessarily invalidate the Fiscal Note, the error by the Department to not consider this expense may not cause the process to stop.

The addition of the flexible sleeve to the outlet port came about because of the requirement of the effluent filter. It was realized that the added weight of the effluent filter plus the pressures caused by the removal and replacement of the filter during service would perhaps cause the cemented outlet pipe to loosen. It was also realized that the location of the outlet pipe, right at the level of the wastewater, would cause leakage if that seal were to break. In the case of the inlet, there is no effluent filter to add weight, no pressures from service, and the inlet invert is two inches above the level of the wastewater.

SUGGESTION: Eliminate (7) and return to just the requirement on the outlet end detailed in (10).

If this is not reconciled, the Department should be required to offer at least two alternatives to this proposal, especially to the tank manufacturers in the Eastern part of North Carolina who use

sloop-top tanks. The addition of the inlet sleeves to any side (not the end) is not possible without costly modifications. The proposal that the Manufacturer could have different inventories for sites needing side entry is not plausible, so this should not be under consideration.

COMMENT XXV:

15A NCAC 18E .1402

Page 123 Line 5(B) the partition shall be designed to remain in position when subjected to a liquid capacity in one compartment.

COMMENT: This requirement does not fulfill the requirement of this subsection as it speaks to design and construction. There is also an unusual standard set. The partition is later described to have a 4 inch slot or equivalent located from 25% to 50% of the liquid depth, and there is the 2/3 to 1/3 compartment design. So a partition could pass this requirement by subjecting it to liquid capacity found in 1/3 the liquid depth of a 1000 gallon tank (333 gallons) when the partition is 25% of the total interior height (.25 x 333 gallons). So the minimum would be .25 x 333 x 8.33 (weight of water per gallon) = about 693 pounds. Not exactly a structurally sound partition, not 300 psf.

SUGGESTION: (B) the partition shall be designed, manufactured, and installed to remain in position and shall be constructed to withstand a pressure of 300 psf.

This will make sure there will be a sustained two-compartment design throughout the life of the septic tank and the service of the septic tank.

COMMENT XXVI:

15A NCAC 18E .1301

Page 113 Line 24 TABLE XXXI

Va	Fixed Media Advanced Pretreatment	Oper. Visit 2/yr.
Vc	RWTS	Oper. Visit 4/yr.

COMMENT: This appears to be an attempt by the Department to add costs to the RWTS technologies as they favor the fixed media advanced pretreatment systems.

SUGGESTION: Make this requirement consistent for the Pretreatment technologies, at least of the systems of <1500 gpd to the 2 visits per year. Currently in .1961, they are a Type V system along with sand filter technologies (fixed media) and are 2 times a year. It appears that the Department is attempting a backdoor hurdle against aerobic treatment and in favor of fixed media.

COMMENT XXVII:

15A NCAC 18E .1402

Page 123 Line 18 (H) other methods for designing partitions showing performance identical to those designed in accordance with Paragraph shall be considered for approval by the State on an individual basis.

COMMENT: This clause may be appropriate for consideration, as the Department should be available to judge alternative designs for identical performance. The suspicion, unfortunately, is that the Department cannot stand behind "identical performance" in this particular design feature. There are two types of partitions; monolithic and post-construction insertions. If the Department really chooses to judge on identical performance, the suggested language in (B) above would provide the performance guidelines.

COMMENT XXVIII:

15A NCAC 18E .1403

Page 125 Line 2 (a) Tanks designed to hold sewage shall be constructed of materials capable of resisting corrosion from sewage and sewage gasses, and the active and passive loads on tank walls.Tanks and tank lids shall be able to withstand a uniform live loading of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

COMMENT: As mentioned in other parts of this proposal, the first rule should be to be consistent with the language describing the underground structure, its design, and its construction. This paragraph should be reworked to be consistent in other parts of the Draft.

SUGGESTION (a) Tanks shall be watertight, structurally sound, and not subject to excessive corrosion or decay. Tanks and tank lids shall be approved upon a demonstration of its ability to withstand a minimum uniform live load of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

COMMENT XXIX:

15A NCAC 18E .1403

Page 125 Line 7 (b), (c), and (d) Material specific specifications

COMMENT: These paragraphs further indicate the lengths that the Department separates the design and manufacture of tanks of different materials. Paragraph (a) for reinforced precast concrete tanks is prescriptive and offer the authorized agents the description of how to inspect the precast concrete tank. Paragraphs (b) and (c) is an approval by reference, with no description of how to verify the quality of these tanks. The Department has also informed the authorized agents that they lack the expertise or equipment to test these tanks. When does the Department anticipate that this unequal treatment should be remedied and there is education for the authorized agents in training?

COMMENT XXX:

15A NCAC 18E .1403

Page 125 Line 19 (5) the concrete shall achieve a minimum compressive strength of 4000 psi prior to removal of the tank from the place of manufacture.

COMMENT: One of the problems facing the quality of precast concrete tank manufacturers is the transporting of insufficiently cured tanks. While it is a fact that the authorized agents could test any tank at the site they feel does not meet the current 3500 psi @28 day standard, this responsibility is not being adequately done. In other words, the current rule is sufficient but the rules are not being enforced. The tank yards should be routinely inspected for tank quality, including sufficient inventory to indicate that proper curing is being achieved. This visit is not being done in most of the counties, and the Department has not instituted an equal program of inspection.

SUGGESTION: Place in the "Responsibility" subsection the development of an equal inspection program for all manufacturers by the Department, in conjunction with the local health departments. This Program should include the pre-inspection of tanks at the place of manufacture by local health departments or by approved QA programs.

COMMENT XXXI:

15A NCAC 18E . 1403

Page 125 Line 27 (7) Tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

COMMENT: This sentence needs to be reworked.

SUGGESTION: (7) Tank lids and riser covers shall have a durable handle made of materials resistant to decay and capable of pull capacity for the weight of the lid or cover

COMMENT XXXII:

15A NCAC 18E .1405 RA

Page 127 Line 12 15A NCAC 18E .1405 RE-APPROVALS OF RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

COMMENT: This is unnecessary. The Approvals for Risers, Effluent Filters, and Pipe Penetrations should be non-expiring. The manufacturer should update their approval when changes are made to their product. The Approvals would be suspended or revoked if the product is altered or found defective. The protocol of setting expiration limits and re-approval procedures would be tasking the staff whose efforts should be directed into more important areas. According to the Fiscal Note from the Department, this Renewal protocol adds on average less than $500 (Five hundred dollars) annually to the State.

SUGGESTION: Eliminate 15A NCAC 18E .1405

COMMENT XXXIII:

15A NCAC 18E .1505 RA

Page 130 Line 18 15A NCAC 18E .1505 RWTS APPROVAL RENEWAL

COMMENT: The proposal appears to follow the Department's determination to set expiration and renewal requirements on products and systems in North Carolina. All products and systems approved in North Carolina should not have to follow such a protocol. The current system of Approvals, with Operator and Authorized Agent reports on the wastewater systems should be sufficient. The Approvals already instruct the Manufacturer to amend their approval with any changes prior to sale, and gives the procedures for Suspension and Revocation. With the reported short-staffing and stretched manpower that the Department insists they work with, the Renewal of Approvals are just adding to their problems. See Fiscal Note information on COMMENT XXXI.

SUGGESTION: ELIMINATE 15A NCAC 18E .1505

COMMENT XXXIV:

15A NCAC 18E .1711 RA

Page 147 Line 18 15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWALS

COMMENT: As with the COMMENTS on the Riser, Effluent Filter, and Pipe Penetration products and the COMMENTS for RWTS products, this proposal to set an expiration date and renewal requirement is unnecessary. The Approvals of these products, along with the mandatory reporting of the Provisional and Innovative Systems should give the Department adequate information and ammunition to correct any inappropriate or non-compliance issue. One question is why there appears to be no Approval Renewal for Accepted Products? The benefit to the Department cited in the Fiscal Note for the Renewal of Approvals for RWTS and P & I Systems is $11,700 (Eleven thousand seven hundred dollars) annually. This proposal must be considered a new fee structure, but it is unknown if the actual benefit after the added drain to existing manpower would be worth the administrative burden to the RWTS and P & I Manufacturer.

SUGGESTION: ELIMINATE 15A NCAC 18E .1711

COMMENT XXXV: 15A NCAC 18E .1713

Page 147 Line 34 (2) Notify the Department of all IPs, CAs, and OPs issued for Provisional Systems.

COMMENT: The LHD should be compiling this information for Innovative Systems as well as Provisional. It's the only way to adequately track the all the types of systems

SUGGESTION: (2) Notify the Department of all IPs, CAs, and Ops issued for Provisional and Innovative Systems.

Doug Lassiter
douglassiter@gmail.com

COMMENTS FOR 15A NCAC 18E

ADDENDUM TO REPORT OF 9/20/17

Page 11 Line 33 15A NCAC 18E .0105 (65) "Repair area" definition:

SUGGESTION: Make terminology "Replacement ~~Repair~~ area" means an area that has been classified suitable consistent with the rules in this subchapter. The replacement ~~repair~~ area is reserved for the extension, alteration, wastewater system relocation, or repair of part or all of the initial wastewater system. The replacement ~~repair~~ area shall be available to be used in the event of malfunction or if a wastewater system is partially or totally destroyed. **MAKE CORRESPONDING CHANGES THROUGHOUT THE BODY OF THE 18E PROPOSAL.**

Page 14 Line 26-28 15A NCAC 18E .0201 After the wastewater system has been installed, the LHD shall inspect the wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP.

Based on this language, when the authorized agent determines that the installation meets the requirements of the IP and CA, the OP is issued. **This is the most proper route, however it does not give the LHD the authority to reconsider the first agent's permit conditions and installation instructions, if the second agent feels the permit doesn't comply with rules of the State. SUGGESTION: KEEP THIS SENTENCE STRUCTURE AND AMEND THE LANGUAGE FOUND IN THE NEXT SUBSECTION.**

Page 19 Line 26 15A NCAC 18E .0205 (f) When an authorized agent determines that the system installation does not meet the rules of this Subchapter and the conditions described in the IP and CA, corrections shall be made to bring the system into compliance with this Subchapter. If corrections cannot be made, an authorized agent shall not issue an OP and the system shall not be placed in use. This language allows the second agent to return a different opinion on the site conditions, etc. that may be in the Rules and deny the OP until their opinion is met. The expense is almost always on the Owner. Currently, the Owner can agree to the changes and the installer must modify the installation or they can ask for a determination by the State representative, or they can hire a lawyer. **SUGGESTION: AMEND THIS SENTENCE STRUCTURE TO MIRROR PAGE 14 LINE 26-28.**

Page 23 Line 15A NCAC 18E .0301 (a) The owner shall:

SUGGESTION: ADD (12) ESTABLISH APPROPRIATE SITE SPECIFIC VEGETATION OVER THE WASTEWATER SYSTEM AND REPLACEMENT AREA.

This language should be included in Owner Responsibility instead of on Page 72 Line 16 under General Design and Installation Criteria.

Page 31 Line 24 15A NCAC 18E .0401 (a)(2) 60 gpd per person when occupancy exceeds two persons per bedroom. This is a proper thought, but it may be unreasonable to think this will be included in the Application for the IP or CA. How is the information related at the time a permit is issued? **SUGGESTION: KEEP THE PERMIT APPLICATION TO NUMBER OF BEDROOMS, BUT TRY TO TIE THE DESIGN DAILY FLOW TO SOMETHING THAT CAN ACTUALLY BE VERIFIED AS APPLICABLE.**

Page 36 Line 3 15A NCAC 18E .0401 **Facility has potential to generate high strength wastewater. Table II appears appropriate for design daily flow, and the sites identified by the ** appears to be sites that have the "potential" of generating higher levels than found in Table III of 15A NCAC 18E .0402. Without the information of what the actual sizing and technology may be required for those sites, this simple design daily flow is misleading and comes up many times to frustrate the Owner and the LHD. **SUGGESTION: AMEND THE TABLE, WITH THE SITE (FACILITY) DESCRIPTION, THEN THE DESIGN DAILY FLOW, FOLLOWED BY REFERENCE TO THE HIGH STRENGTH CHECKOFF. THE ASTERISK SHOULD THEN REFER TO THE SUBSECTION ON ORGANIC LOADING SO THAT THE PERMIT APPLICATION IS CORRECTLY IDENTIFIED.**

Page 36 Line 19 15A NCAC 18E .0402 Alternately, a licensed consultant ,may justify not using advanced pretreatment by providing the following: What is a "licensed consultant," what are their qualifications and their accountability to their client, the State, etc.

SUGGESTION: PROVIDE CLARITY OR AMEND THE TERM "LICENSED CONSULTANT" TO ONLY INCLUDE THE PROFESSIONAL FIELDS THAT HAVE BEEN INCLUDED.

Page 61 Line 27 15A NCAC 18E .0703 (a) The gravity pipe between a septic tank, gravity distribution box and the dispersal field shall be three inch nominal size Schedule 40.

SUGGESTION: AMEND TO SAY "MINIMUM OF THREE-INCH NOMINAL SIZE SCHEDULE 40."

Page 69 Line 2 15A NCAC 18E .0806 ...and installed in accordance with the tank manufacturer's instructions and industry standards.

SUGGESTION: DELETE ABOVE-MENTIONED SECTION. AMEND AS REMAINING (f) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approved material.

Page 69 Line 5 15 NCAC 18E .0806 (g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section. **SUGGESTION: DELETE (g) THIS IS NOT THE PLACE FOR THIS SENTENCE AS IT CLEARLY IS REFERENCED IN .0805. JUST DUPLICATION OF LANGUAGE.**

Page 73 Line 3 15A NCAC 18E .0903 **SUGGESTION: ADD AGGREGATE SIZE #57.**

Page 115 Line 4 15A NCAC 18E .1302 (1) For systems installed after July 1, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this section. The contract shall be renewable and the contract term shall be for one year. This is the wrong approach for the sustained compliance of any system. The manufacturer should supply the owner with the list of approved certified operators for their system, and should supply an Operation and Maintenance Manual that incorporates the requirements of their product and the Section. **SUGGESTION: AMEND LANGUAGE IN 15A NCAC 18E .1302 (b)(1) Manufacturers of advanced pretreatment systems shall provide the owner with a current list of approved certified Operators for the system. (2) Owners of Advanced Pretreatment Systems shall maintain a contract with a certified O & M provider on the current list of approved Manufacturer's list for the life of the wastewater system. (3) The O & M provider shall notify the LHD, the State, and the Manufacturer of any expiration of the O & M contract with the owner.**

Page 120 Line 10 15A NCAC 18E .1307 If a wastewater system is found to be non-repairable or no longer required, the system shall have the contents removed and the components collapsed, backfilled, or otherwise secured as directed by the authorized agent to protect the public health and safety. When the term "components" is used in wastewater systems it can mean a variety of things. Following the current proposal, does the State intend to collapse the drainfield area? **SUGGESTION: IF A WASTEWATER SYSTEM IS FOUND TO BE NON-REPAIRABLE OR NO LONGER REQUIRED, THE TANKS SHALL HAVE THE CONTENTS REMOVED BY A PERSON CERTIFIED AS A SEPTAGE FIRM, THE TANKS COLLAPSED OR OTHERWISE SECURED PER THE LOCAL HEALTH DEPARTMENT, AND THE ABOVEGROUND COMPONENTS DE-ENERGIZED AND REMOVED.**

Page 120 Line 10-14 15A NCAC 18E .1403 (2) **AMEND:**

(2) the top, bottom, ends, and sides of the concrete tank and tank lid shall be reinforced by using a minimum reinforcing of six-inch by six-inc No. 10 gage welded steel reinforcing wire. **Other methods and materials for achieving the required uniform live loads specified in this subsection shall be considered and approved by the State. Reinforcement shall be placed to achieve required structural integrity.**

~~A. the reinforcing wire shall be lapped six inches;~~

~~B. concrete cover shall be required for all reinforcement; and~~

~~C. reinforcement shall be placed to maximize structural integrity of the tank.~~

Current proposal does not include the ability for the State to approve alternative methods of reinforcement. Deleting subparagraphs A, B, and C only eliminates unnecessary prescriptive language. The testing of the tanks prior to Approval and during any periodic site inspection is sufficient to demonstrate structural integrity and compliance with the required proof-testing.

From: kim hines <coinjocklawncare@gmail.com>
Sent: Sunday, October 29, 2017 2:20 PM
To: Angoli, Trish; douglassiter@gmai.com
Subject: [External]
Attachments: GLENNS 1900 RULES.docx

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From: Jim Beeson <jbeeson6@gmail.com>
Sent: Friday, October 06, 2017 8:15 AM
To: Robert E. Stott; chris@piedmontsoil.com; Angoli, Trish; Neal, Kevin; Aziz Amoozegar; Mike Vepraskas; Larry Baldwin; Doug Lassiter; Heath Ward; Joe Johnson; Mr. Darian Creed; Donald Wells; Michael Eaker; Jason Hall; Mr. ashley Rollans; Walter Cole; Thomas Boyce; Alan Clapp; Dwayne A. Graham
Subject: [External] 1800 rules commnets
Attachments: Public Hearing Commnets.pdf

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I have attached my comments as requested by Chris Hoke. Most of my comments pertain to the historically conservative approach to saprolite. my comments propose the same verticle and horizontal separations for saprolite as with soil. My comments also recommend that all saprolite textures be suitable just as they are with soil. My aim is to decrease any disagreement regarding saprolite with too fine of a texture to use. there is no scientific evidence that would suggest that fine textured saprolites do not move anad treat effluent.

i also comment on Apparent CEC. the break of 16.3 milliequivalents per 100 grams of clay will eliminate more areas that people are aware of. the 16.3 number places the soil in the Kandic category. There are many soils in NC with "mixed" clay mineralogy that are red, well drained, and are currently permitted that will be eliminated if we use apparent CEC. I have proposed a catagory between 16.3 and 24 mCEC that would allow us to run Ksat text in order to establish the LTAR. At a minimum this would give us some releif.

I hope you will reply to all and also send your comments to the State. NOW IS THE TIME!
--
Jim Beeson
336-215-8820

From: Hoke, Chris
Sent: Monday, October 16, 2017 4:04 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW:
15A NCAC 18A .1800 (Adoption and Repeal: Wastewater Treatment and D
ispersal Systems)
Attachments: 15A NCAC 18E - proposed 2017-08-10 - COMMENTS.docx; ATT00001.txt

FYI

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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and delete all records of this e-mail.

From: John Nykamp [mailto:jnykamp@myguilford.com]
Sent: Monday, October 16, 2017 4:01 PM
To: 'cphcomment@lists.ncmail.net' <cphcomment@lists.ncmail.net>
Subject: [cphcomment]
15A NCAC 18A .1800 (Adoption and Repeal: Wastewater Treatment and Dispersal Systems)

Members of the Commission:

After reviewing the proposed rules, I have compiled a few comments regarding various topics in these proposed rules.

Page 7 Line 3 15A NCAC 18E .0105 DEFINITIONS (11)
(11) “Collection sewer” means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

Should this definition also include “Sewer Laterals” that run from a structure to the

structure’s wastewater disposal system (on-site wastewater treatment system) or collection system (sewer outfall).

Page 54 Line 5 TABLE IX. Minimum setbacks from all wastewater systems to site features

TABLE IX. Minimum setbacks from all wastewater systems to site features

Site Features	Setback (feet)
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Delete “open or” from “Geothermal wells – open or closed loop vertical bore”. Open loop wells used in conjunction with a heating and cooling system must comply with construction standards at least as stringent as a water supply well. This would require a separation distance of 100 feet. An open loop heating and cooling system that discharges to the surface would require more water than one that returns the water to a subsurface aquifer.

Change “Geothermal wells – open or closed loop vertical bore” to “Geothermal aqueous closed loop wells”. Separation distance of 50 feet complies 15A NCAC 02C .0222 (e) (5) (B).

Add to Site Features “Geothermal Direct Expansion Closed Loop wells”. As these boreholes are often drilled diagonally outward from a central location at the surface, separation distance should be established as “50 feet from entire length of the borehole” to comply with 15A NCAC 02C .0223 (e) (6) (B).

Change “Geothermal wells – horizontal closed loop system” to "Horizontal Closed-Loop

Geothermal System" as it is not included in definition of “well”. Change separation distance to 15 feet as these systems are installed in trenches six to seven feet deep. This is a vertical cut of more than two feet.

There are many types of “injection wells”, including “Geothermal wells”. Delete “injection well” unless it is specifically defined.

What is the separation distance from “Abandoned Wells”?

Page 55 Line 2 15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS (b)
(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:
(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or
(2) the private water supply is a well for which a variance for a reduced separation has been issued.

15A NCAC 18E .0601 (b) (1) would require a separation distance of 100’ from a well even when the design flow of the septic system is 100 gpd, much less than the 50’ required separation for a 600 gpd single family dwelling. Current separation distance is 50’ for a private water supply. The proposed change would make the sewage rules concur with DWR rules. However, the higher the water usage the greater the separation should be. The 50’ separation distance should be allowed for daily flows of 480 gpd or less, regardless of usage (single family dwelling or private usage).
In 15A NCAC 18E .0601 (b) (2) who is to issue the variance and what is the reason for the variance?

Page 56 Line 11 TABLE XI. Minimum setbacks from collection sewers to site features
(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.
TABLE XI. Minimum setbacks from collection sewers to site features

Site Features	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft.*
Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft.*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with

mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 ft.*
Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters
10
Geothermal wells – open or closed loop vertical bore
25
Geothermal wells – horizontal closed loop system
5
Any basement, cellar, or in-ground swimming pool
10
Top of slope of embankment or cuts of two feet or more vertical height
5
Surface water diversion, as measured on the ground surface from the edge of the diversion
5
Any stormwater conveyance (pipe or open channel) or ephemeral stream
10
Permanent stormwater retention basin or sediment detention basin
10
Bio-retention area, injection well, or infiltration gallery
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
Utility transmission and distribution line poles and towers, including guy wires
5
Utility transformer, ground-surface mounted
5

A sewer lateral from a building to a sewer main outfall or a septic tank would meet the definition of a “collection sewer”. On May 12, 2017 the NC Division of Water Resources issued a state-wide variance allowing construction of a well for a residence or non-public water system to be constructed with a minimum separation distance of 25 feet from a sewer lateral. This variance would not apply to any other types of “collection sewers”.

Delete “open or” from “Geothermal wells – open or closed loop vertical bore”. Open loop wells used in conjunction with a heating and cooling system must comply with construction standards at least as stringent as a water supply well. This would require a

separation distance of at least 50 feet. An open loop heating and cooling system that discharges to the surface would require more water than one that returns the water to a subsurface aquifer.

Change “Geothermal wells – open or closed loop vertical bore” to “Geothermal aqueous closed loop wells”. Separation distance of 25 feet complies 15A NCAC 02C .0222 (e) (5) (D).

Add to Site Features “Geothermal Direct Expansion closed loop wells”. As these boreholes are often drilled diagonally outward from a central location at the surface, separation distance should be established as “25 feet from entire length of the borehole” to comply with 15A NCAC 02C .0223 (e) (6) (D).

Change “Geothermal wells – horizontal closed loop system” to "Horizontal Closed-Loop Geothermal System" as it is not included in definition of “well”. Separation distance of 5 feet complies with separation distance to any other dispersal field except designated dispersal field repair area for project site.

There are many types of “injection wells”, including “Geothermal wells”. Delete “injection well” unless it is specifically defined.

What is the separation distance from “Abandoned Wells”?

Page 60 Line 3 15A NCAC 18E .0701 COLLECTION SEWERS
15A NCAC 18E .0701 COLLECTION SEWERS
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.

At what point will DHHS have authority over collection sewers? At what point does the NC Department of Insurance Plumbing Inspector relinquish authority?

I have also attached a Word Document with these comments. Should you need additional clarification or have any questions regarding these comments, please feel free to contact me via phone or e-mail. Thank You.

Sincerely,
John Nykamp

John H Nykamp, REHS, NCWC
Environmental Heath Program Specialist
Guilford County Environmental Heath
400 W Market St suite 300
Greensboro, NC 27401
336-641-4807
jnykamp@myguilford.com

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From: Hoke, Chris
Sent: Friday, September 01, 2017 3:50 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish
Subject: FW: Comment on public rules

See below public comment – on-site rules.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

1931 Mail Service Center
Raleigh, NC 27699-1931

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From: anthony lamando [mailto:alamandotony@gmail.com]
Sent: Friday, September 01, 2017 3:38 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Comment on public rules

Chris,

I have been doing combined home and septic inspections for several years in the triangle area.
Every time I find a leaking septic tank where a well is present and we test the well water, the water is contaminated.
Many times the home that has a leaking systems does not have a well. Contaminating ground water even though it is unsubstantiated by a test is happening in tri county area.
You should mandate and well test if a septic system is determined to be leaking. You should mandate that the nearest well water to a leaking tank that does not have a well get tested.
One last question. Why are you allowing septic tanks to be sold without a coating or tar above the water line on the interior?? Everyone else in the country does it why not Wake County?

Tony

--
Advantage Inspection
Don't Expect What You Don't Inspect!!!!!!!
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From: Hoke, Chris
Sent: Thursday, October 26, 2017 2:25 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [cphcomment] Rules Comment
Attachments: ATT00001.txt

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: logan@tjpanel.com [mailto:logan@tjpanel.com]
Sent: Thursday, October 26, 2017 2:20 PM
To: cphcomment@lists.ncmail.net
Subject: [cphcomment] Rules Comment

Rule #:
.0909

Page #:
89

Line#:
1

Comment:
"Initial and repair dispersal fields utilizing an accepted product are sized at a minimum of
65 percent of the total area required for a conventional gravel wastewater system"

Panel Block Systems receive a 50% reduction of the total area required for a conventional gravel

wastewater system. When installed as alternating dual dispersal fields, Panel Block Systems should receive a greater reduction on the total area required than allotted by this rule. Conventional and 25% reduction systems aren't the only systems that can be utilized under this provision, thus this sentence needs to be amended or removed.

Suggestion:
To include the total percentage of area required by 50% reduction Panel Systems installed in alternating dual dispersal fields as the minimum sizing required ("sized at a minimum of 45% of the total area required for a conventional gravel wastewater system"). 50% reduction + an additional 10% (from installing system and repair, as allowed per the rule) = 60% reduction on the total area required for a conventional gravel wastewater system.

Or specify that system sizing reductions are increased 10% when installing system and repair for all systems. (Not just 25% alternatives)

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From: Hoke, Chris
Sent: Thursday, October 26, 2017 12:30 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [cphcomment] Rules Comment
Attachments: ATT00001.txt

Comment.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: logan@tjpanel.com [mailto:logan@tjpanel.com]
Sent: Thursday, October 26, 2017 12:26 PM
To: cphcomment@lists.ncmail.net
Subject: [cphcomment] Rules Comment

Rule #:
903,904,905,906,909,910

Page #:
78,78,82,82,88,89

Line #:
3,31,2,28,27,11

Comment:
Panel Systems should be addressed in each of these subsections.

Change:
Add

By:
T&J Panel, Inc.

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From: Hoke, Chris
Sent: Monday, October 23, 2017 12:19 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18 E Rule Comments
Attachments: On-Site Rules-DWells comments 10-23-17.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
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North Carolina Department of Health and Human Services

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From: Don Wells [mailto:dwells@sandec.com]
Sent: Monday, October 23, 2017 12:12 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: RE: [External] 18 E Rule Comments

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Chris, thanks for letting me know and attached are my comments.

Don Wells, LSS
Soil & Groundwater Hydrology Department Manager
Soil & Environmental Consultants, PA
8412 Falls of Neuse Road
Suite 104
Raleigh, NC 27615
(919) 846-5900 Phone
(919) 256-4514 Direct

(919) 846-9467 Fax
(919) 868-2777 Mobile
DWells@sandec.com
Visit us at sandec.com
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From: Hoke, Chris [mailto:chris.hoke@dhhs.nc.gov]
Sent: Monday, October 23, 2017 9:50 AM
To: Don Wells
Subject: RE: [External] 18 E Rule Comments

Hi Don,
You can email your comments to me in a PDF file. If you submit comments through the web link, that is sufficient. Thanks!

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Don Wells [mailto:dwells@sandec.com]
Sent: Monday, October 23, 2017 9:35 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] 18 E Rule Comments

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Chris, I wanted to reach out to you and ask a couple of questions. If I send my comments to you, are they to be mailed or can I email you a PDF of them?

Also if I submit comments via the web link, should I send them to you as well, or just via the link?

Let me know when you can.

Thanks

Don Wells, LSS
Soil & Groundwater Hydrology Department Manager
Soil & Environmental Consultants, PA
8412 Falls of Neuse Road
Suite 104
Raleigh, NC 27615
(919) 846-5900 Phone
(919) 256-4514 Direct
(919) 846-9467 Fax
(919) 868-2777 Mobile
DWells@sandec.com
Visit us at sandec.com
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From: Hoke, Chris
Sent: Wednesday, November 01, 2017 1:50 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18E Comments
Attachments: NCDEH 18E Rule Review Comments--Caldwell County Health Department--final.pdf; NCDEH 18E Rule Review Comments--Caldwell County Health Department--final.xlsx

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Connie Adams [mailto:connieadams@caldwellcountync.org]
Sent: Tuesday, October 31, 2017 9:10 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] 18E Comments

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Chris,

Please find attached comments on the proposed 18E rules from our department in Excell and PDF formats. If you have any questions or if I can be of assistance in addressing any of the issues indicated please do not hesitate to contact me.

Thanks for this opportunity to comment. And thanks for getting back with me earlier today—it was very helpful to know I had until midnight!

Connie Adams, Onsite Water Protection Specialist and Soil Scientist
Caldwell County Health Department
828-426-8537

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 5:04 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18E Public Comments
Attachments: Subchapter 18E - OrencoComments.xlsx

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: Joe Soulia [mailto:jsoulia@orenco.com]
Sent: Tuesday, October 31, 2017 4:58 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Nicholas Noble <nnoble@orenco.com>
Subject: [External] 18E Public Comments

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Hello Chris.

I work in the Government Relations office here at Orenco Systems. Please find comments for the proposed 18E rules, attached. Thank you.

Joe

Joseph Soulia
Senior Government Relations Representative jsoulia@orenco.com

(800) 230-9580
(541) 537-0772

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 9:59 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18E Rules Comments ATTACHED
Attachments: Ashton, Tom COMMENTS 15ANCAC18E.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: TWA220@aol.com [mailto:TWA220@aol.com]
Sent: Tuesday, October 31, 2017 9:58 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] 18E Rules Comments ATTACHED

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Thanks you for the opportunity.

Tom W. Ashton
Environmental Health Specialist
Professional Soil Scientist

American Manufacturing
P.O. Box 97
Elkwood, Virginia 22718

800-345-3132

TAshton@americanonsite.com

CELL 540-454-4672

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From: Hoke, Chris
Sent: Monday, October 30, 2017 9:56 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18E rules comments

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Kim Warren [mailto:kim.warren@chathamnc.org]
Sent: Monday, October 30, 2017 8:25 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] 18E rules comments

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I know a lot of work and a lot of thought has gone into the rules rewrite! We certainly can't please everyone but need to do what we can to protect the groundwater and the health of our citizens. I have a few comments below.

15A NCAC 18E .0401 DESIGN DAILY FLOW
Table II. Design flows for Facilities
Event Center – We have been sizing event centers at 5 gpd/person with no food preparation. I am curious as to how the current proposal is for 5 gpd/person with a full kitchen. Food service facilities are sized at 5 gal/meal served with multiuse articles. That does not include party-goers eating, drinking and dancing for hours. I think more design flow is needed for event centers.

If this rule is passed, can the existing event centers come back and request that we double their

occupancy based on the new rules?

I also have a question about the footnote that the designer may alternately use the maximum building occupancy assigned by the fire marshal to determine the flow. I have found that what applicants request from us can vary widely from the building occupancy. It seems it should be one way or the other. The fire marshal can post a building occupancy of 400 people when the system was designed for 200. That seems contradictory. Of course in some situations, the "building" is a tent that is being set up for the event, so it would be difficult to address the occupancy unless we specified a maximum tent size on the OP. If it is a pretty day, the tent is basically a moot point!

Day care facilities – 15 gal/person with no food preparation. How do you define food preparation? What does one do in a warming kitchen? A warming kitchen sounds to me like a domestic kitchen with no dishwasher. I believe many people prepare food and meals in domestic kitchens. If the day care does prepare food, are the kitchen wastes handled separately as a food preparation facility?

Food stand with up to eight seats – If the food stand has up to eight seats, it is not a food stand unless it falls under Senate Bill 7 (S.L. 2015-104). According to the state's position statement: "This applies to all sewage disposal systems approved to serve "existing" permitted food stands. "New" food establishments that include seating qualify as a restaurant and the associated sanitary sewage disposal system shall be designed in accordance with 15A NCAC 18A .1900 et seq." My interpretation of the preceding statements is that if a newly permitted food stand, permitted since the passage of Senate Bill 7, wants to add seats that it must comply with the restaurant rules and requirements.

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS
(b)(2) If the system has advanced pretreatment, or for any drip installation, the state approval calls for water testing 2 inches into the risers of the tanks. Do the innovative approvals supersede these rules? Should the rules state "or as specified in system approval"?

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS
(d) I have long maintained that if you want to make a meaningful change to these rules, require risers extending above grade on both ends of the septic tank. It provides easy maintenance and a reminder that there is a tank there that does not need to be driven over. The tank pumper needs access to both ends of the tank for pumping and for cleaning the effluent filter. The risers will probably pay for themselves after one pumping when the pumper has to locate and dig up the access openings.

15A NCAC 18E .0909 FILL SYSTEMS
Fill systems are ideally suited for the coastal plains, not the piedmont. They should be allowed east of I-95 only! Since I am certain this stipulation will not be made, I must say I am happy to see that the suitable slope has been changed from 15% in the current rules to 4%. That makes a lot more sense!

Respectfully submitted,

Kim Warren, REHS
Environmental Health Onsite Program Supervisor
Chatham County Public Health Department
80 East Street/P.O. Box 130
Pittsboro, NC 27312
(919)545-8319 phone, (919)542-8288 fax
kim.warren@chathamnc.org
www.chathamnc.org/environmentalhealth

Did you know that ticks transmit various illnesses right here in Chatham County? And did you know there are things you can do to prevent ticks from transmitting illnesses? Visit the Chatham County Public Health Department tick page to find out how to protect yourself from ticks!

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From: Hoke, Chris
Sent: Thursday, October 26, 2017 4:29 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 18E Rules

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

1931 Mail Service Center
Raleigh, NC 27699-1931

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and delete all records of this e-mail.

From: Alan Gaddis [mailto:arg619@northstate.net]
Sent: Thursday, October 26, 2017 4:21 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] 18E Rules

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Chris,
I talked to Trish at the On-Site conference about the design criteria for campgrounds and I understand the thought process for not changing the 120 gal/day/site. I wanted to suggest that there be added equalization storage tankage/space equal to the design daily flow. For example if the daily flow is permitted at 6000 gal/day there should be 6000 gallons of equalization space on hand. I manage a campground that does not have storage capacity and when everyone leaves at the same time (as they do on Sunday & the last day of holidays) the flow overruns the system capacity and washes out the biological activity. If the storage space were required as part of the design flow the increased cost would not be as much to the owner as it is after the fact. Please consider adding this to the design criteria required for these and possibly other systems.

Thanks and best regards,

Alan Gaddis
AG Environmental Management, LLC
6119 Asheton Drive
Trinity, N.C. 27370
336-561-9178
336-474-1866 FAX
arg619@northstate.net

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From: Hoke, Chris
Sent: Thursday, October 26, 2017 4:31 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] 1900 rule comments
Attachments: ARR_DEH_1900.docx

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Albert Rubin [mailto:rubin@ncsu.edu]
Sent: Thursday, October 26, 2017 4:28 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>; Angoli, Trish <trish.angoli@dhhs.nc.gov>; Deal, Nancy <Nancy.Deal@dhhs.nc.gov>
Subject: [External] 1900 rule comments

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Good afternoon Mr. Hoke - I sent these comments through the U.S. Post Office also. I am forwarding the comment letter as suggested by Ms. Angoli in her e-mail of 24 October 2017.

Thank you for all you do for us.

Be well. Do good.

--

--
Albert Robert (Bob) Rubin, Emeritus Professor
Biological and Agricultural Engineering
North Carolina State University

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:17 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Code Comments
Attachments: North Carolina code comments.docx.doc

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
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From: Darrell Maves [mailto:darrell@gag-simtech.com]
Sent: Tuesday, October 31, 2017 1:54 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Code Comments

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Hi Chris,

Please see attached comments on the proposed code. Please let me know if you need anything.

Thank you,

Darrell Maves
Sim/Tech Filter
1455 Lexamar Drive
Boyne City, Michigan 49712
Toll Free Phone: 888-999-3290

Local: 231-582-1020
Fax: 231-582-7324
Website: www.gag-simtech.com
Email: darrell@gag-simtech.com

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From: Hoke, Chris
Sent: Friday, October 06, 2017 10:52 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments and questions/Draft Rule considerations

From: Latt Moretz [mailto:latt@moldsofbethlehem.com]
Sent: Friday, October 6, 2017 10:41 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Comments and questions/Draft Rule considerations

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Chris,
Last night, I was reviewing and noticed I sent my draft not my "Comments and questions/Draft Rule considerations." Please disregard the previous e-mail.
Thanks,
Latt

Fiscal note Comments and questions/Draft Rule considerations

This is a start to the process. I hope to have more comments and considerations if I have more time to analyze.
In this response, there is a well-known, very seldom seriously talked about hidden solution that is the answer to improved quality for the environment, consumers, and products.

At the NCSTA 27th Annual Convention, Dr. Rubin's opening session comments, in summary for me was, before you should or can improve/move forward you must know HOW or IF what you are doing is working. Moving forward is not the solution if you are headed in the wrong direction. Example: What constitutes a two-compartment tank? Prior to the now accepted baffle walls being approved, walls in concrete tanks were not allowed to be slid into locking grooves. They were required to be poured in place to ensure structural integrality that would not allow passage to another compartment except through the clear zone, the 25 to 50% of the liquid level. If a partition wall allows scum or settled materials to pass to another compartment that is not within the clear zone, the wall is useless. The science did not change, so what did change that allowed current partitions wall approvals which obviously return some tanks to single compartment operating results, reducing effluent quality?

Fiscal Note Page 20: "There have also been some issues with larger concrete tanks that were not designed as traffic rated tanks. They were approved as part of a project specific submittal. These tanks have started to crack just a few years after installation." Did the submittal show traffic rated tanks needed because of traffic but were not used or were the tanks improperly installed in a traffic area? Was the soil evaluated and backfill determined to withstand the constant soil pressure for the large tanks in that "specific" environment? Not enough information to determine if a tank design or manufacturing problem existed or did improper use or installation and inspection problem occur. Equally concerning, "There have also been some issues with "plastic and fiberglass" "approved" units creeping, causing distortion and collapsing leading to multiple performance deficiencies, but interestingly not mentioned.

Fiscal Note Page21; Error in Table 17 Private Sector cost. I do not know about plastic testing

cost but the $600.00 for precast concrete might, but doubtful, cover the "test" but not the engineering design and construction for a tank for the "verification test."

Fiscal Note Page 22; "The criteria for plastic and fiberglass tanks has been in guidance for years."
Concrete spans over 5,000 years, from the Egyptian Pyramids to present day. Romans used a material remarkably close to modern day Portland Cement, invented in 1824. In 1836 concrete strength testing followed by Alvord Lake Bridge, CA in 1889, as the first reinforced concrete bridge--still standing. From World wonders, buildings, streets, military security barriers to septic tanks, concrete has the test of time and adversity, unmatched by any modern-day material.

Fiscal Note Page 22; "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. This is a material difference."

If testing of the "material" used, but not the actual tank is acceptable, then third party cylinder test breaks for concrete meets the same requirements proposed for approvals as allowed for plastic and fiberglass.

Thinner wall material tanks are more subject to deflection and puncture holes and holes in the forming process which can occur. Like concrete, plastic and fiberglass mix designs and wall thickness errors can occur.
"Tank structural integrity testing;" Concrete tank material strength, structural integrity and water tightness can be confirmed with the use of a rebound hammer, vacuum testing and water fill-ups, even on site. The vacuum test for tanks in North Carolina is currently five inches of mercury for 5 minutes. Why the proposal to reduce? Reducing vacuum test but proposing increasing psi for concrete is in conflict to one another. Have use results revealed tanks are not subject to the stresses engineering thought or has engineering been using the wrong formulas? If not and standards are reduced, quality is reduced.

The Most Important Component to "water tightness" is "structural integrity," even with watertight materials. If units or components not designed to move/deflect, connection such as seams in tanks, risers to tanks, risers stacked and lids to risers are compromised. This causes leaks and in cases lids not capable of proper installation on risers at grade. This can create a deadly condition in backyard playgrounds.

Material strength is important but is only a small portion of the structural integrity for "much thinner wall tanks." The proper backfill and compaction of that backfill is their major component to achieve "structural integrity." The draft rules address soils for absorption but overlook another very important critical use as "compacted backfill." Proper sizing, cleanliness and moisture content for compacted soils are required for much thinner wall tanks because they are particularly susceptible to creep, punctures and constant soil pressure suffocation than thicker wall concrete tanks. Backfill quality recording and compaction equipment is available and can be used by contractors and documented at time of installation and given to LHD. I discovered, typically the soil on site is just pushed around much thinner wall tanks like a concrete tank. The most significant "structural integrity" difference for tanks with a "much thinner wall than concrete," even under current rules is to have stricter installation overview.

It is understood that the tank walls and floor see nearly balanced loading when the tank is filled with water during normal service. It is also understood that a tank may be filled with water during backfilling at the time of installation, thus eliminating any condition where the tank must fully support the soil loads and uplifting pressure if present. However, although this condition is avoided both during installation and during normal operation, it does in fact occur in pump tanks

and during pumping of a septic tank, an operation which is strongly recommended and therefore occurring more often. Due to this, especially using compacted backfill soil as a tank's primary structural integrity, what percent of optimum density (compaction) must the backfill achieve? Is the specified percentage in accordance with standard proctor or modified proctor testing methods? What process is used to determine optimum moisture content for compaction? If granular materials are allowed for backfill (stone or sand), how is the backfill prevented from relaxing and migrating, suffocating the tank during a pumping operation? What inspection procedures are required immediately after pumping to ensure the tank has not been compromised?

How is long term creep monitored, as plastics are particularly susceptible to creep? FYI - here is a good article

https://www.eiseverywhere.com/ ehome/174282

How is long-term performance monitored, as plastics at or above grade are particularly susceptible to fracturing from contact damage, seasonal temperature changes and are more susceptible than concrete to decapitation from weed eaters, lawn mowers and aerators.

Draft Rules Page 125- 29 (c): Change to: Thermoplastic tanks shall either be IAMPO/ANSI Z1000 or CSA B66

Certified and meet all performance standards, testing, processes and approvals of Subchapter

18E and;

(1) long term creep and damage monitoring

Draft Rules Page 125- 29 (d): Change to: Glass-fiber-reinforced tanks shall meet all performance standards,

testing , processes and approvals of Subchapter 18E and;

1. all external surfaces shall have a minimum thickness of 0.2 inches. The baffle wall shall be a

minimum 3/16-inches thick; and

2. materials and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks; and
3. long term creep and damage monitoring.

Fiscal Note Page 22; "The proposed rules also include a provision for all the effluent filter, riser, and pipe penetration approvals to become renewable every five years." This requirement should only occur if the manufacturer makes changes, performance standards change or trouble with installation or performance occurs.

Draft Rules Page 121 line 34 (g); Pre-approved tanks is not defined. To clarify, are current approved tanks considered "pre-approved?" If yes, exactly what does this mean and what, if any, are their requirements to show compliance with the proposed draft rule changes? If "pre-approved" is considered only the first step in the proposed "two step process," these pre-

approved tanks also “shall conduct the structural loading requirements of paragraph (f) of this rule?” (draft rules page 120 (c) lines 27-33). If yes, does the currently assigned and permanently cast or molded identification number in existing inventories become the “temporary identification number?” If yes, explain the time and method for the transition between temporary and permanent numbered inventoried tanks. For tanks that are acceptable under current rule but not under proposed draft rules, such as the psi for concrete as an example, how does the State propose to assist the industry’s use of this inventory?

What is the estimated time and cost of finding engineering, construction adjustments, third party testing and third party witness(s) and plan creation for submittal review of the approved 1,364 septic and pump tanks posted on the State’s website. Keep in mind this number does NOT include all effluent filters, risers, and pipe penetration that must be re-approved under draft.

Fiscal Note Page 38; "The LHDs have many priorities that they must attend to on a daily basis." The "Private Sector" also has many priorities that they must attend to on a daily basis as well. Unlike public servants, number one priority for the private sector to stay employed, you must turn a profit. The increase cost of doing that has some good Industry Businesses considering going out of business. Smaller companies are typically at a great disadvantage over large companies who can absorb expensive cost change. Adding to LHDs “many priorities” is not a comfort that proper enforcement, documentation and record keeping associated with the proposed draft rules will happen. If draft rules are made permanent, what provisions can the industry expect to see at the State and LHDs level to implement and maintain such an enormous task?

Fiscal Note Page 38; "The cost of materials (plastic, concrete, steel, etc.) will impact the projected costs to tanks and appurtenances (effluent filters, risers, and pipe penetrations). If the cost of the materials increases, that could drive the cost of these products up, ultimately costing the homeowner more for the on-site wastewater treatment system."

The cost of material is only a small fraction of the increase cost. Labor cost for engineering, equipment, construction, testing, recording, reporting, submittals, renewal approvals and record keeping proposed in the rule changes was not included in the fiscal note provided.

The amount of time to respond in relation to the amount of time to get to this point is extremely unfair to the Industry and LHDs--specifically for those whose job involves the actual physical manufacturing and installation of products during the day and then often must do their office work at night. Unlike writing rules, which in time will pass, this is our daily battle. Therefore most of my comments and questions at this time are more in principle. I hope to be more specific to page and number if time allows.

We could gold plate tanks in NC. This will change their appearance which may or may not be an improvement depending on personal opinion or if you are the one paying for the gold. The appearance will change but their performance stays the same. Changing the rules while not enforcing product use according to their approval will improve North Carolina’s appearance but not performance. Without serious ground leveling changes, this draft, as written will reduce the performance of system quality and create inequality for products.

The solution for improvements, if you did not pick up on, can be addressed and are applicable in current rules. The major problem with current rules is not lack of content but structuring between product, installation and service that hinders follow through. A very disturbing General Statutes example is “access devices,” riser for septic tanks; G.S. 130A-335(b) “The access device shall :(f) (4) Come to within six inches of the finished grade. (5) Be visibility marked so that the access device can be readily located.” Access devices, risers for septic tanks should not and never were intended to be exposed for obvious safety and product protection reasons. If this is

happening, regardless of personal interpretations or local rules, to do so is breaking State Law. When the consumer is educated about this illegally-installed yard hazard, who will share in the responsibility for correction?

I hear a lot of chatter about performance, from products to personnel. How many “issues,” repairs are handled without permits and reporting obvious concerns? How many Pumpers, after servicing report this issue? They have extreme difficulty or can’t get the riser lid properly installed because of creeping. I talked with two pumpers this week. I always ask for the reporting documentation and pictures--my point, none. I insist they start following through. They may need them to cover their actions. Why do people in our industry resist doing their reasonable service that protects others, the environment, and themselves? Taking photos and sending them for reporting/research information or possible investigation is not that tasking. Our industry has an advantage over most long life performance products. From design to service, we have the network to see if what we are doing is going in the right direction. We aren’t using it. I am trying to make contacts and get pictures and documentation for up-to-date systems and component “issues.” I emphasize “up to date,” for example; concrete tank quality today is much improved over those made twenty years ago.

Like “some issues with larger concrete tanks that were not designed as traffic rated tanks,” other products have started to have “some issues” even though the criteria for plastic and fiberglass “has been in guidance for years.” If there are no material or design issues, this narrows the possible sources for issues to installation and inspection not following “guidance” requirements. Unfortunately, because of very little follow-through; no official documented causes have surfaced yet. I do know the attached pictures are from different NC counties.

Each site can vary, and for materials and designs that require certain specifications, there must be stricter installation overview, documentation and continued monitoring to ensure the intended performance is being met. These are real considerations that are not optional or loosely applicable to maintain the system quality and safety.

Latt Moretz

Molds of Bethlehem, Inc.
800-659-7815
828-495-7731 • 828-495-4381 FAX
www.moldsofbethlehem.com

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From: Hoke, Chris
Sent: Tuesday, October 24, 2017 9:06 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] comments for 15A NCAC 18E
Attachments: RULESCOMMENTS1022.xlsx

Trish, please see and fulfill his request for a copy of all comments. Thanks!

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Doug Lassiter [mailto:douglassiter@gmail.com]
Sent: Tuesday, October 24, 2017 5:27 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] comments for 15A NCAC 18E

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Mr. Hoke, these comments are in a format that may be easier to track within the current draft.
Specifically, we are also asking for a full copy of all comments, including from the On-Site Branch, under consideration along with their sponsor. This document should be available shortly after the cutoff date of Oct. 31. This will give us the opportunity to prepare for the revised Draft that will be presented to the Commission.
Thank you for your support and consideration

Doug Lassiter
NC Septic Tank Association

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:48 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments for Proposed 18E Rules
Attachments: DelawareFinalOnSiteRegulations_01112014.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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From: Colin Bishop [mailto:colin.bishop@anuainternational.com]
Sent: Tuesday, October 31, 2017 2:27 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Angoli, Trish <trish.angoli@dhhs.nc.gov>
Subject: [External] Comments for Proposed 18E Rules

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Chris,
We offer the following comments for the proposed 18E Rules:

1. TABLE XXIV. Effluent quality standards for advanced pretreatment systems:
Break out Total Nitrogen (TN) as an add-on parameter, not specific to just TS-II. This will allow for further utilization of nitrogen reduction technologies, which is better for the public health and the environment.

2. 5 year product renewal cycles as written in .1405, .1505, .1711:
a. The product renewal criteria places an undue burden on manufacturers to perform certain regulatory

tasks which are the under the authority of the Department or county agency to perform. The criteria also place as undue financial burden on manufacturers in a variety of ways. The impact for North Carolina citizens will be more costly systems in order to account for the additional burdens placed on manufacturers.
b. The goal of the product renewal sections appear to be a method to de-list components or systems. If the Department feels there is not sufficient ability to do this under the current regulations, then criteria could be developed that specifically address de-listing of components or products rather than having to continually renew approvals on components or products that have long-term track record of compliance. In essence, let's not penalize the good ones.
3. The rules need to recognize systems, such as the peat fiber biofilter, that have a long-term record of performance within North Carolina. Puraflo has been in use in North Carolina for almost 25 years. Yet, Puraflo, as well as in-ground and mounded pad dispersal, is not recognized in 18E. At some point when systems have demonstrated decades of performance, they should become "conventional" treatment and dispersal methods in regulation. An example of this is drip irrigation. We suggest you look at the Delaware regulations that were adopted in 2014. Peat biofilters and pad dispersal methods were adopted into regulation by Delaware because of the long-term track record of performance. This needs to happen in North Carolina as well. The Delaware regulations are attached.

4. System Operation Verification and Enforcement:
We encourage the Department to assemble a stakeholder group to look at how the regulatory community will more proactively address random system operation verification inspections and enforcement, where necessary. Oftentimes, regulations are "prescriptive heavy" in order to assure compliance. Public health and environmental protection will improve if the regulatory community becomes more involved with actual system operation.
We thank you for the opportunity to comment on the regulations. Being a North Carolina manufacturer, we would encourage the Department to engage us more fully in the future since we have a direct mutual interest in protecting the citizens of North Carolina.

Colin Bishop, REHS, RS
President

Anua
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From: Hoke, Chris
Sent: Monday, October 30, 2017 9:38 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments for rule change
Attachments: Copy of NCDEH 18E Rule Central Carolina Soil.xlsx

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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and delete all records of this e-mail.

From: Jason Hall [mailto:jhall@centralcarolinasoil.com]
Sent: Sunday, October 29, 2017 10:10 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Comments for rule change

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Chris,

Attached are a couple of suggested comments/changes on the new rules. Mostly setback considerations.

Thanks,

Jason Hall
Central Carolina Soil Consulting, PLLC
Office: 919-569-6704
Cell: 919-625-5948

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 12:26 PM
To: Michael, Larry; Angoli, Trish; Deal, Nancy; Martin, Bob
Subject: FW: [External] Comments on 15A NCAC 18E .0904
Attachments: Rewrite of 15A NCAC 18E .0904.pdf

Importance: High

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: Steve J Steinbeck [mailto:stevejsteinbeck@gmail.com]
Sent: Tuesday, October 31, 2017 12:16 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Comments on 15A NCAC 18E .0904
Importance: High

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Chris,
Trust you are doing well. I appreciate your long contribution to improving Public Health in NC.
Enclosed is a copy of the proposed rewrite of the referenced rule.
Please advise if you have any questions or comments.
Thanks in advance for your assistance with this rewrite.

I have also mailed you a copy of the attached rewrite.
Sincerely,

Steve J. Steinbeck

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:14 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments on 15A NCAC 18E Proposed Regulations
Attachments: PEI NC 18E Opposition 10-31-17.pdf; NCRule Review Comments Presby.xlsx; Presby. 18E Public Comments Cover Letter 10.31.17.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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Chris.hoke@dhhs.nc.gov

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From: mdmcculley@att.net [mailto:mdmcculley@att.net]
Sent: Tuesday, October 31, 2017 1:59 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Lee Rashkin <lee.rashkin@presbyeco.com>; Ashley Garrison <ashley.garrison@presbyeco.com>; Fred Vengrouskie <fred.vengrouskie@presbyeco.com>
Subject: [External] Comments on 15A NCAC 18E Proposed Regulations

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Hi Chris,

It’s been a while! Hope life has been treating you well! Please find attached public comments from Presby Environmental, Inc., with regard to the above-referenced matter, as well as my cover letter which also provides public comments on their behalf.

Best Regards,

Michael D. McCulley, Jr.
Attorney

Michael D. McCulley, Jr., P.A.
6102 Lydden Road
Wilmington, NC 28409
Ph 910-547-5185
mdmcculley@att.net

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 9:18 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments on proposed 15A NCAC 18E Draft Rules

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

1931 Mail Service Center
Raleigh, NC 27699-1931

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From: Caroline Edwards [mailto:cjedwards234@gmail.com]
Sent: Tuesday, October 31, 2017 12:46 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Comments on proposed 15A NCAC 18E Draft Rules

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Dear Chris Hoke,

As a LSS of NC and member and Past-President of the Consulting Soil Scientists of the Carolinas, Inc., I commend the Dept. for this rules revision process.

I have read and support the comments as provided to you by Larry Baldwin with CSSC Inc. and urge that the Dept. take them into serious consideration.

I also read and support the comments as provided to you by Jim Beeson of Piedmont Environmental Associates, PA.

Also, if I am reading this correctly, the new rules as written appear to require lateral flow or

mounding analysis once the wastewater system goes over 3000 gpd (pg 53), even for systems that do not require state review as determined in 18E .0302 (e) (Pg 25). There are situations where this is not necessary and I ask that this be changed.

Thank you and NCDEH for this very important effort for the citizens of NC. I look forward to the progress of the Rules revision.

Best regards,

Caroline J. Edwards
NC Licensed Soil Scientist #1220

Earthwise Designs
991 Duncan Rd
Rutherfordton, NC 28139

828)289-0122 cell.
828)245-7666
Cjedwards234@gmail.com

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From: Hoke, Chris
Sent: Thursday, October 26, 2017 12:28 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Comments on proposed LPP Rules, .0907
Attachments: KMorris Comments on LPP Rules 102617.pdf

Comments

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: Kathy Morris [mailto:kmorris@agriwaste.com]
Sent: Thursday, October 26, 2017 11:08 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Comments on proposed LPP Rules, .0907

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Please see attached

--
Kathy Morris, REHS
Senior Designer

Agri-Waste Technology, Inc. (AWT)
501 N. Salem St, # 203
Apex NC 27502
(919)819-3033 mobile/text

(919)545-0785 direct line
(919)859-0669 office

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 4:30 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] comments proposed rules
Attachments: StidhamRules920 comments.doc

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: mstidham@eztreat.net [mailto:mstidham@eztreat.net]
Sent: Tuesday, October 31, 2017 4:18 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] comments proposed rules

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Chris,
Please see attached comments. Thank you.

Michael Stidham, VP
E-Z Treat, Inc.
703-408-2916

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 10:46 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] CRUMPLER PLASTIC PIPE Amended Comments of EHL--18E Septic Rules
Attachments: CPP Septic Rule Comments 10-31-17.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: HLCrumpler@cpp-pipe.com [mailto:HLCrumpler@cpp-pipe.com]
Sent: Tuesday, October 31, 2017 10:18 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] CRUMPLER PLASTIC PIPE Amended Comments of EHL--18E Septic Rules

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To: Chris Hoke
NORTH CAROLINA DHHS
1931 Mail Service Center
Raleigh, NC 27699-1961
Phone: 919-707-5006
FAX: 919-870-4829
E-Mail: chris.hoke@dhhs.nc.gov

Dear Mr. Hoke:

Please see attached an amended copy of the rules that I hereby submit to REPLACE the copy I submitted to you yesterday via E-Mail. This copy has the corrected language I wish to present that better states my thoughts with less need for additional information or conversation. Thus please substitute this copy for my first submittal.

Regards,

Houston L. Crumpler, Jr.
CRUMPLER PLASTIC PIPE, INC.
PO Box 2068
Roseboro, NC 28382-2068
Phone: 910-525-4046
FAX: 910-525-5801
E-Mail: hlcrumpler@cpp-pipe.com

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From: Hoke, Chris
Sent: Sunday, October 22, 2017 4:16 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] CSSC comments on proposed 15A NCAC 18E Draft Rules
Attachments: NCDEH 18E Rule CSSC Review Comments.xlsx; NCDEH 18E Rule CSSC Review Comments.pdf

From: Larry Baldwin [mailto:lbaldwin@ec.rr.com]
Sent: Sunday, October 22, 2017 1:13 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Doug Lassiter <douglassiter@gmail.com>; Alex Baldwin <alexbaldwin80@gmail.com>; Amber Coleman <amber.coleman@stantec.com>; Carl Peacock <cdpeacockjr@yahoo.com>; Caroline Edwards <cjedwards234@gmail.com>; Connie Adams <connieadamslss@gmail.com>; Craig Turner <cturner@lmgroup.net>; Daniel Bliley <dbliley1@nc.rr.com>; Elwood Black <eblack@nc.rr.com>; George Lankford <gklankford91@gmail.com>; Hal Owen <halowen@earthlink.net>; Jason Hall <jhall@centralcarolinasoil.com>; Jeff Vaughan <jvaughan@agriwaste.com>; Jim Beeson <Jbeeson6@gmail.com>; Joe Hinton <josephinton@triad.rr.com>; John Havlin <jlhavlin@ncsu.edu>; John Roberts <john.roberts@threeoaksengineering.com>; John Williams <pnprojects@aol.com>; Karl Shaffer <shaffersoils@gmail.com>; Kevin Martin <kmartin@sandec.com>; Michael_Vepraskas@ncsu.edu; Mike Athanas <mike@michaelathanas.com>; Mike Eaker <mike@southeasternsoil.com>; Mike Vepraskas <sscmjv@ncsu.edu>; Mike Woods <michael.wood@threeoaksengineering.com>; Nick Howell <nhowell@lmgroup.net>; Robert Stott <1greywater@gmail.com>; Sarah Menser <sarahwheeler@live.com>; Scott King <scott.king@mbakercorp.com>; Scott Mitchell <scott@mitchellenvironmental.com>; Steve Stokes <steve.stokes@kci.com>; Tom Gulley <tgulley@gmail.com>; Walker Ferguson <walker@landrm.com>
Subject: [External] CSSC comments on proposed 15A NCAC 18E Draft Rules

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To: Mr. Chris Hoke

Please find comments from the Consulting Soil Scientists of the Carolinas, Inc regarding the proposed NCDEH 15A-NCAC-18E draft rules. The same file is attached in “excel” and “pdf” formats.
The CSSC were one of the stakeholders in the initial review of these rules.

We appreciate the efforts to finally re-write and reorganize these rules to be more efficient and to incorporate the many changes over the years. It is long over-due.
There are numerous areas where the rules can be better organized into a more logical fashion, improved / updated technical standards, and condensed to make them less redundant.

Please call or email me if you have any questions regarding these comments, as I’m the collator of comments for the CSSC. We look forward to working with you and NCDEH to make these standards the best possible for the State of NC.

Larry F. Baldwin, CPSS / NCLSS
Consulting Soil Scientists of the Carolinas, Inc.
(910) 471-0504 LBaldwin@ec.rr.com

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From: Hoke, Chris
Sent: Monday, October 30, 2017 10:00 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Edwin Andrews' comments on 18E Rules Revision
Attachments: Andrews18E Rules Revision Comments.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Edwin Andrews [mailto:andwater@aol.com]
Sent: Monday, October 30, 2017 9:08 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Edwin Andrews' comments on 18E Rules Revision

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I hope that you find this perspective helpful. Thanks for your effort....Good job.

Ed

Edwin Andrews III, PG, NCLSS

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:03 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] EHL- 18E Public Comment Period

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Ishwar.Devkota@wakegov.com [mailto:Ishwar.Devkota@wakegov.com]
Sent: Tuesday, October 31, 2017 12:41 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Eric.Green@wakegov.com; Michael.Orbon@wakegov.com
Subject: [External] EHL- 18E Public Comment Period

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Hello Chris,

Reference: EHL- 18E Public Comment

Please find our additional comments on proposed rules

1) Setback from driveways were suggested 3' before, we also like to recommend to include setbacks from "sidewalks" to be 3'.
2) Deck overhang or any other cantilever should provide enough clearance to maintain dispersal field else 3' setback is required from drip line..
3) Design flow for Air BnB be addressed in the Rules as well .. perhaps like Bed and breakfast homes

and inns.

thank you

Sincerely,
Ishwar

Ishwar Devkota, P.E .
Environmental Engineer
Phone: (919) 856-7439
Mobile: (919) 410 4627
Fax; (919) 743-4772
Ishwar.Devkota@Wakegov.Com

Wake County Environmental Services would like your feedback.
In order to participate please CLICK HERE!

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From: Hoke, Chris
Sent: Monday, October 30, 2017 2:08 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] EHL-18E Rule Comments
Attachments: CPP Comments on NC Septic Rules.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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919 870 4829 fax
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From: HLCrumpler@cpp-pipe.com [mailto:HLCrumpler@cpp-pipe.com]
Sent: Monday, October 30, 2017 1:06 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] EHL-18E Rule Comments

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To: Chris Hoke
NORTH CAROLINA DHHS
1931 Mail Service Center
Raleigh, NC 27699-1961
Phone: 919-707-5006
FAX: 919-870-4829
E-Mail: chris.hoke@dhhs.nc.gov

Please see attached my comments on the Proposed Septic Rule re-write changes.

Regards,

Houston L. Crumpler, Jr.
CRUMPLER PLASTIC PIPE, INC.
PO Box 2068
Roseboro, NC 28382-2068
Phone: 910-525-4046
FAX: 910-525-5801
E-Mail: hlcrumpler@cpp-pipe.com

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 4:48 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] FW: 18E comments

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Chad Gambill [mailto:cgambill@caldwellcountync.org]
Sent: Tuesday, October 31, 2017 4:40 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] FW: 18E comments

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Chris,

Here are some comments on the proposed 18E rules.

.0206 What is the definition of reuse or rather what is disuse?

.0803 e 1 Shouldn't this item end with "or" as does item 2 in this section?

.0105 Definition # 11 – Collection Sewer - includes effluent distribution lines…does this have implications later in the setbacks section for collection sewers?

.0202 e9 Are we going to accept applications with signature of the owners legal representative…if so does legal representative need to be defined? Please don't use the term "owners authorized agent" due to the confusion this causes with term "authorized agent" being used for EHSs and real-estate agents.

.0206 c - Does 130A-338 or 130-337 apply to this provision and lend statutory authority to the requirement of compliance inspections and the subsequent report required by .0206 d

.0301 c 4 Both a meets and bounds discription and a plat for an easement? I think one would be sufficient; as in the current language.

.601 Table IX – "Building or other foundation without artificial drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns or post." - I argue that patios, especially paving brick patios do not constitute a structural risk when in close proximity to the tank and therefore do not meet the intent of the rule requiring a setback, as long as accessibility as required by statute is maintained.

Also, the word streams in the item requiring the 50' setback needs to be clarified to be perennial or intermittent streams in order to remove ephemeral streams which is included in the definition of streams and has a setback listed of 15' later in the table.

.0703 The proposed rule calls for 3" gravity distribution line. Is 4" pipe not allowed for gravity distribution?

.0806 b "Tank outlet pipe shall …..and extending two feet beyond the tank outlet" Should this say "at least" 2' or something because just specifying 2' indicates we can't approve anything except exactly 2'.

.0901 a 1 "12" of naturally occurring soil is on the downslope side of the trench…" Should this say upslope side of the trench or are we not going to do slope correction anymore? This is also in .0901 d 3 and .902 d 3. Would the use of "downslope side in .902 d 3 result in infiltrator products losing their reduction in systems installed with the downslope side close to 36" where the back of the trench is >36"?

.0904 e "LDP….trenches shall be 12" wide. No more no less? It is very time consuming to install a 12" OD pipe in a 12" wide trench with protruding roots.

.0911 c 3 This provision has a circular reference to itself.

.1103 h 4 This wording is confusing – "The high water alarm float shall activate within six inches of the pump-on level or higher as needed…" So , put it anywhere basically.

.1103 i 4 "remain operable whenever the pump or pump circuit is inoperable" Is the pump circuit defined? Is it only from the closest protective device or is it the complete circuit from the main SEP? We have had problems with GFCI breakers in the main SEP that feed the control panels that have separate breakers for the pump and alarm. Would this be disallowed by this rule and require separate breakers in the Main SEP?

.1106 a "Two feet of residual pressure head"….can we not specify PH higher than 2'? Sometimes to meet the force main scour velocity on manifolds with only 2 or 3 taps higher PH is needed.

Sincerely,

Chad Gambill
Caldwell County Environmental Health Supervisor
2345 Morganton Blvd.
Lenoir, NC 28645
828-426-8579

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 5:08 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Influent TKN
Attachments: Influent TKN .xlsx

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: steve barry (via Google Sheets) [mailto:aqwastevebarry@gmail.com]
Sent: Tuesday, October 31, 2017 5:03 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Influent TKN

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steve barry has attached the following spreadsheet:

Influent TKN
Same data sent earlier as a pdf, now in spreadsheet.

Google Sheets: Create and edit spreadsheets online.
Google Inc. 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA
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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 5:07 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Influent TKN
Attachments: Influent TKN .pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: steve barry (via Google Sheets) [mailto:aqwastevebarry@gmail.com]
Sent: Tuesday, October 31, 2017 5:01 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Influent TKN

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steve barry has attached the following spreadsheet:

Influent TKN
See attached chart and data for influent TKN.

Google Sheets: Create and edit spreadsheets online.
Google Inc. 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA
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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 9:15 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] NC DPHHS Draft 15A NCAC 18E Onsite Rules- RGP Comments
Attachments: 15A NCAC 18A Draft Rules-RGP comments.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Bruce Stowe [mailto:bruces@roth-usa.com]
Sent: Monday, October 30, 2017 9:37 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Mike Morehouse <mikem@roth-usa.com>; Jim Kenney <jimk@roth-usa.com>; Steve Gibbs <steveg@roth-usa.com>
Subject: [External] NC DPHHS Draft 15A NCAC 18E Onsite Rules- RGP Comments

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Chris-
Please find comments attached.
As we are a tank manufacturer only, we confined our review and comments to the Draft Rules sections pertaining to onsite wastewater tanks only.

Please feel free to contact us with any questions.

Thank you for the opportunity to participate in this process!!

Kind Regards

Bruce
Bruce Stowe
Technical & Regulatory Affairs Manager

Roth Global Plastics and Roth Industries
P.O. Box 245
Syracuse, NY 13211
(315) 579-3338 Office
(315) 378-7232 Cell
(315) 475-0200 FAX
bruces@roth-usa.com
www.roth-usa.com

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From: Hoke, Chris
Sent: Thursday, October 05, 2017 10:19 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] On Sit Regulations Hearing
Attachments: Nitrogen Letter to Chris Hoke.pdf

Rule comments

From: Keith Dobie Sr. [mailto:keithdobie@bopaine.co]
Sent: Thursday, October 5, 2017 2:29 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] On Sit Regulations Hearing

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W. Keith Dobie Sr.

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From: Hoke, Chris
Sent: Wednesday, November 01, 2017 1:50 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] On-Site Rule Comments
Attachments: URule comments.odt

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Joe Lynn [mailto:joe.lynnoswps@yahoo.com]
Sent: Tuesday, October 31, 2017 9:27 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] On-Site Rule Comments

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Hello Mr. Hoke,

I think the proposed rules are a great improvement over the current rules. These changes are needed and have been needed for a long time. I started working on changing the 1900 Rules in 2001 when I worked for DENR. I like the complete reorganization of the rule layout. An index would be a good idea if it could be done.
I have a few negative comments and they are in the attachment.
I hope these rules get approved with or without my suggested changes.

Thank you
Joe

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From: Hoke, Chris
Sent: Tuesday, October 17, 2017 1:27 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] On-site Wastewater Rules Critique

FYI

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Joseph Anlauf [mailto:jjanlauf@gmail.com]
Sent: Tuesday, October 17, 2017 1:09 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] On-site Wastewater Rules Critique

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Chris,

I have the following critiques of the Draft On-site Wastewater Rules:

1. Section .0401 Design Daily Flow, Table II, Page 33, Food Establishments with Multi-use articles: 25 gpd/seat or 25 gpd/15sq.ft. based on the hours of operation plus 2.5 gpd/seat for every additional hour open is going to be fraught with problems. Enforcement will be very difficult if not untenable.
2. Section .0402 Effluent Characteristics, Page 36, (b) appears to attempt to force all commercial uses with a design flow over 1,500 gpd into advanced treatment unless tedious and expensive nutrient migration and mass loading analysis is performed. What happened to 3000 gpd? How about taking a page or two (2) out of the NCAC Subchapter 02T rules and incentivise the use of

advanced treatment. Less stick more carrot.
3. Section .0601 Location of Wastewater Systems, Table IX, Page 54, setback to water lines. This setback should include provisions for sleeving the pipe or making the pipes ferrous material when the setbacks cannot be met, see PWSS rules for the same included on Pages 57 & 58.
4. Section .0802 Pump Tank Capacity Requirements, Page 64, if flow equalization is provided why would you also require 24 hours of storage? Some lesser degree of storage should be considered if flow equalization if provided. Also 24 hours may be excessive considering that during long power outages many typical activities such as laundry and bathing do not occur at the same frequency.
5. I like the shorter leak test on tanks.
6. I do not see a specific reference to setbacks to "wetlands" in this draft. Understand that in the State of NC a "marsh" is coastal in nature. The word "wetland" not synonymous with "marsh" as in this State the NCDEQ Division of Coastal Management has jurisdiction over "marshes". I do not support a setback to freshwater wetlands and in seeing no specific reference to "wetlands" in the setback table it is my understanding that there is no setback.

Sincerely,

Joseph J. Anlauf, PE
Anlauf Engineering, PLLC
4721 W. Eckner Street
Kitty Hawk, NC 27949
(252)489-7143

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 4:28 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Proposed 18E Rules Comments - Carteret County EH
Attachments: Carteret County EH - Comments on Proposed 18E Rules.docx

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Len Gilstrap [mailto:leng@carteretcountync.gov]
Sent: Tuesday, October 31, 2017 4:17 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Proposed 18E Rules Comments - Carteret County EH

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Chris,

Attached are the comments on the proposed 18E rules from Carteret County
Environmental Health.

Thanks,
Len

Ann C. (Len) Gilstrap
EnvironmentaL Health Program Specialist
Carteret County Health Department

Environmental Health
3820 Bridges St.
Morehead City, NC 28557
Ph. 252-728-8499 Ext. 5504
Fax 252-222-7753
Visit our Website: http://www.carteretcountync.gov/139/Environmental-Health
“Like Us” on Facebook: www.facebook.com/CarteretCountyHealthDepartment

Please tell us how we doing by taking this very quick survey. We appreciate you feeback!
https://surveymonkey.com/r/CCHD-EH

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:46 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Proposed 18E Wastewater Treatment Rule Comments

Importance: High

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: David Swinney [mailto:dswinney@arhs-nc.org]
Sent: Tuesday, October 31, 2017 2:40 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>; Ralph Hollowell <rhollowell@arhs-nc.org>; Kevin Carver <kcarver@arhs-nc.org>
Cc: Angoli, Trish <trish.angoli@dhhs.nc.gov>; Deal, Nancy <Nancy.Deal@dhhs.nc.gov>; douglassiter@gmail.com
Subject: [External] Proposed 18E Wastewater Treatment Rule Comments
Importance: High

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Please see the below comments as they relate to the proposed 18E Wastewater Treatment and Dispersal System Rules. If you need further information or to clarify any of the below comments feel free to contact myself or Ralph Hollowell, Environmental Health Director. These comments reflect the discussion of ARHS staff which currently serve the citizens of Bertie, Camden, Chowan, Currituck, Gates, Pasquotank, and Perquimans counties.

Page 34; Day Care facilities: Clarification would be great to how to size day care facilities that have more than the "Warming Kitchen" or that have laundry in the facility. The Warming kitchen definition specifies; handwashing sink, domestic 2 compartment sink, heating appliance, and a refrigerator. What would be the design flow if a child care center has more than the domestic 2 comp. sink (commercial 2 comp. sink, 3 compartment sink or vegetable washing sink, etc.) or more than 1 refrigerator (2 or more refrigerators and/or a freezer). Also, most day care facilities in our area have laundry machines that are provided in the day care center.

Page 67; lines 13-15. Tank Structural Integrity. . . (a) Specifies that 10% of ALL tanks installed in each county should be tested for structural integrity on the job site or at the tank yard.
This office is OPPOSED to this, as this will place an ADDITIONAL BURDEN on the LHD Staff of requiring more time on the job site/tank yard and may NOT have the appropriate legal enforcement action that would need to be taken if the tanks do not meet the standards. This office would suggest that the State office perform TANK YARD inspections and be able to review and approve the manufacturing process/quality control of these tanks. The State issues the Tank manufacture the approval to make the tanks therefore the burden of inspection/quality control should lie with the State Office.

Page 77, Table XIX, Line 31: LTAR for Sand Lined trench
This office is OPPOSED to the increased LTAR for these systems. For almost 30 years this district has been installing Sand Lined Trench systems with the LTAR based on the most limiting layer (typically 0.2 to 0.4 LTAR) of soil and NOT the receiving sands. The MAJOR CONCERN that we anticipate is the increased loading rate, up to a 0.6, based on the receiving sand, will allow for drainfields to become much smaller and potentialy fail prematurely due to not having enough square footage/linear footage. This may then be interpreted as a Sand Lined Trench system failure and give these systems a black eye when in fact the failure may be due to the change in rule and not the type of system to begin with. As a proposed compromise if the client/applicant wishes to have the LTAR increased above the most limiting factor of naturally occurring soil assigned by the LHD (what has been done for the past 30 years) then place this LTAR increase in the section as a requirement for a special site evaluation (section f, beginning with line 3 of page 78) and not as a part of the basic rule.

Page 78, line 29-30. Pressure dosed gravity systems are required for field length exceeding 600 linear footage. What is the SCIENTIFIC reasoning behind this? Page 92, lines 10-11 only requires a pump if total lateral length exceeds 750 linear footage. If NO SCIENTIFIC reasoning can be given for this requiring a pump with 600 ft. of Sand Lined Trench then this office SUGGEST that both the rules on page 78 and 92 be made to a UNIFORM STANDARD. It may appear that this requirement of a pump with a 600 ft. Sand Lined Trench drainfield comes across as a PENALTY for using a Sand Lined Trench system, when other systems can have as much as 750 ft. before requiring a pump.

Page 113 part of TABLE XXXI, (which starts on page 112) Systems labeled IIIh. The proposal is to ELIMINATE the Certified Operator requirements for a Sand Lined Trench system and allow the owner to become their own Management Entity.
This office is OPPOSED to this proposal. This district has been installing Sand Lined Trench Systems for almost 30 years and feel we were very instrumental in having these systems placed in the State Rules to allow for usage in all 100 counties. ARHS was one of the first to use Sand Lined trench systems, and probably has the most of any county/district in the State, with a little over 5,000 in our 7 counties at this date. ARHS has been monitoring and inspecting these systems since the early 90's and feel that these systems should CONTINUE to require a YEARLY inspection by either the Management Entity or the LHD acting as the Management Entity. This was required originally as a verification that these systems are properly functioning and we suggest that this inspection continue. We feel that the removal of the inspection requirement may lead to future problems and give these systems a BAD REPUTATION, which this agency has WORKED SO HARD to overcome in the past by proving these system do work!

Thanks

David R Swinney, REHS
Environmental Health Specialist
Albemarle Regional Health Services

Office: 252-338-4470
Fax: 252-338-4475
dswinney@arhs-nc.org

Mail:
P O Box 72
Camden, NC 27921

UPS/FED EX
Camden Medical Park, Building B
160 US Hwy 158 W
Camden, NC 27921

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From: Hoke, Chris
Sent: Tuesday, October 03, 2017 11:54 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Proposed Rule Changes
Attachments: DOC100317-10032017103301.pdf

More comments

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Randy Duncan [mailto:RDUNCAN@myguilford.com]
Sent: Tuesday, October 03, 2017 10:47 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Proposed Rule Changes

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Hi Chris. My name is Randy Duncan and I work for Guilford County Health Department. My supervisor, Joe Johnson, requested I send you the same letter I sent to Trish Angoli last year regarding the proposed change to Rule .1961. Since I do not have the time to attend any of the public comment sessions, I hope this letter will be included in any decision making for this rule. Thanks, Randy Duncan 336-641-7833

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From: Hoke, Chris
Sent: Tuesday, October 10, 2017 9:07 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Proposed Rule Revisions to the .1900 On-Site Wastewater Rules

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Bill Hardee [mailto:Bill@Hardees-Septic-Tank.com]
Sent: Monday, October 09, 2017 5:16 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Proposed Rule Revisions to the .1900 On-Site Wastewater Rules

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Mr. Hoke,

I noticed that there is mention of concrete septic tanks with wire reinforcement and the light-weight fiberglass tanks but I see no mention of the concrete septic tanks with fiberglass reinforcement that they have started making. For servicing the tanks, the wire reinforcement was easy to pick up with a metal detector for those tanks that had no risers coming to above ground level. The concrete tanks with the fiberglass reinforcement are somewhat harder to locate, at times. I like the idea of putting some kind of marker over the access lids (both ends) for tanks whose accesses do not come to the surface.

Thank you for providing an avenue to comments.

Bill Hardee
Hardee’s Septic Tank Service
919-639-2060

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 2:50 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] RE: 18E Public Comment Period and Update
Attachments: Clearstream Comments_Draft Rule 15A NCAC 18E_10312017.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Thomas Bruursema [mailto:tbruursema@watertomorrowconsulting.com]
Sent: Tuesday, October 31, 2017 2:45 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: bill.lloyd94@gmail.com
Subject: [External] RE: 18E Public Comment Period and Update

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Dear Mr. Hoke,

Please find attached the comments from Clearstream Wastewater Systems, Inc. in regards to the proposed rule 15A NCAC 18E .0101-.1713: Wastewater Treatment and Dispersal Systems.

Best regards,

Tom

Tom Bruursema

President
WaterTomorrow Consulting LLC
Phone: (734) 272-9132
Email: tbruursema@watertomorrowconsulting.com

From: Angoli, Trish [mailto:trish.angoli@dhhs.nc.gov]
Sent: Thursday, October 26, 2017 3:50 PM
Subject: 18E Public Comment Period and Update

I just wanted to remind everyone that the public comment period for the proposed 18E rules ends Tuesday October 31st.

Comments should be sent to Chris Hoke, 1931 Mail Service Center, Raleigh, NC 27699-1961, 919-707-5006 (phone), 919-870-4829 (fax), or chris.hoke@dhhs.nc.gov.

Also, based on the number of comments we have received (and the complexity of some of the comments) we have revised our timeline. We do not want to rush this and we want to make sure that we have sufficient time to review and address all comments. Our revised target timeline is as follows:

November 8, 2017 Update the Commission for Public Health on the status of the proposed 18E rules

February 14, 2018 Commission for Public Health will adopt revised 18E rules. Rules will include changes made from comments received during the public comment period.

March 15, 2018 Rules Review Commission reviews 18E rules and either approves or objects to the rules

April 1, 2018 Effective date of the 18E rules if approved by the Rules Review Commission

Please let me know if you have any questions. Please remember to send your comments to Chris Hoke (not to me).

Thank you all very much for your continued assistance and patience with this process.
Tricia Angoli

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
http://publichealth.nc.gov

5605 Six Forks Rd
1642 Mail Service Center
Raleigh, NC 27699-1642

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 5:09 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] RE: Proposed 18E Rules

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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and delete all records of this e-mail.

From: Sheryl Ervin [mailto:SErvin@biomicrobics.com]
Sent: Tuesday, October 31, 2017 5:03 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Jim Bell <jbell@biomicrobics.com>; Angoli, Trish <trish.angoli@dhhs.nc.gov>
Subject: FW: [External] RE: Proposed 18E Rules

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Good Afternoon Chris,

Thank you for the opportunity for provide input on the North Carolina proposed rule revisions. Please find below Bio-Microbics comments on the proposed 18E rule revision:

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this Rule:

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Please let me know if you have any question. Thank you for the opportunity for provide input on the North Carolina proposed rule revisions.

Thanks,
Sheryl

Sheryl Ervin, P.G.
Director, Regulatory Affairs

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Shawnee, KS 66227 USA
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Welcome to BioMicrobics.com, where Architects, Builders and Property Owners can find useful information, advice, insights,
resources and inspiration for “Better Water Management”.

From: Jim Bell
Sent: Monday, October 30, 2017 1:05 PM
To: Sheryl Ervin <SErvin@biomicrobics.com>
Subject: FW: Proposed 18E Rules

From: Angoli, Trish [mailto:trish.angoli@dhhs.nc.gov]
Sent: Friday, August 11, 2017 1:24 PM
To: dph.ehs.ehl@lists.ncmail.net; ncrehs@lists.ncmail.net; Lassiter, Doug <douglassiter@gmail.com>; Cory Brantley <1installer@gmail.com>; smistry1940@gmail.com; Tim Bannister <tb@tcwwastewater.com>; cmcgee@agriwaste.com; tim@tjpanel.com; toneycjacobs@gmail.com; bpickens@bbhobbs.com; 'Carl Garrison' <carl@aquaworxinc.com>; 'Dunn, Mike' <mike@hootsystems.com>; 'Dill, Suzanne' <sued@multitrode.com>; 'Dick Bachelder' <bach@maine.rr.com>; 'Debra Stringer' <DStringer@stalite.com>; 'Davis, John' <soilhorizons@gmail.com>; 'David Morgan' <hdmorgan@ayrix.net>; Lentz, Dave (dlentz@infiltratorwater.com) <dlentz@infiltratorwater.com>; Wood, Tim <twood@infiltratorwater.com>; Woodward, Woody <Wwoodward@infiltratorwater.com>; 'Crumpler, Houston' <cppsales@cpp-pipe.com>; 'Crissman, Robert' <rcrissman3@triad.rr.com>; 'Cormier, Troy' <troy@hootsystems.com>; 'Coombs, Shawn' <shawn.coombs@ads-pipe.com>; chris.swedick@ads-pipe.com; 'Chip Hassett' <hassett@oakhillco.com>; 'Chapman, Larry' <n8527w@ellijay.com>; 'Catanzaro, Mike' <Mike.Catanzaro@pentairwater.com>; 'Casey Clugston' <wastexbox@aol.com>; 'Eric Valentine' <evalentine@americanonsite.com>; 'Fortune, Bill' <jwfortune@bellsouth.net>; 'Fowler, Scott' <ustire@vnet.net>; 'Goodwin, Craig' <craig@nwcascade.com>; 'Graham, Larry F.' <larrygraham54@gmail.com>; 'Hal House' <hhouse@emji.net>; 'Huguley, Sonny' <huguleys@bellsouth.net>; 'Jason Churchill' <jchurchill@orenco.com>; Jim Bell <jbell@biomicrobics.com>; 'Jim King' <jking@eljen.com>; 'Jim Langston' <jlangston@stayright.com>; 'Joe Walsh' <joe.walsh@ashtecs.com>; 'John Payne' <johnpayne@bnm-us.com>; 'John Williams' <pnprojects@aol.com>; 'Lee Starks' <lee.starks@ads-pipe.com>; 'Levitas, Steve' <slevitas@kilpatrickstockton.com>; 'Liehr, Sarah' <sarah_liehr@ncsu.edu>; 'Lubbers, Mark' <mlubbers@aquapoint.com>; 'Marie-Christine Belanger' <belm2@premiertech.com>; 'Matt Lee' <aquatestinc@yahoo.com>; 'McSwain, Keith' <carolinameter@gmail.com>; 'Michael Burch' <civitas@his.com>; 'Michael Halas' <halasm@bellsouth.net>; 'Mike Stidham' <mstidham@eztreat.net>;

'Millard, Mike' <mmillard@southeastpump.com>; 'Robert Huguley' <rhuguley@nc.rr.com>; 'Robert Rubin' <rubin@eos.ncsu.edu>; 'Russ Ayers' <russayers@embarqmail.com>; 'Schawel, Randy' <randy@aquaterragroup.net>; 'Sean McGuigan' <MSMcGuigan@gmail.com>; 'Smith, Tim' <Tim.Smith@Pentair.com>; 'Steinbeck, Steve' <stevejsteinbeck@gmail.com>; 'Steve Barry' <sbarry@aqwa.net>; 'Steve Dix' <spdix@comcast.net>; 'Suchecki, Ron' <ron@hootsystems.com>; 'Taylor, Kent' <kent@clearstreamsystems.com>; Admin (gsweet2e@gmail.com) <gsweet2e@gmail.com>; 'Thomas Teal' <tteal@glendon.com>; 'Tom Ashton' <twa220@aol.com>; 'Tyler, James' <jnjtyler@aol.com>; D'Amato, Victor (Victor.D'Amato@tetratech.com) <Victor.D'Amato@tetratech.com>; 'Wayne Peyton' <wayne@clearstreamsystems.com>; 'Wes Combs' <wesc@clarusenvironmental.com>; 'Hunley, Damon' <damon.hunley@ads-pipe.com>; 'Bishop, Colin' <colin.bishop@anua-us.com>; 'Kevin Sherman' <osmc2001@yahoo.com>; 'Nicholas Noble' <nnoble@orenco.com>; Sarah Osborne <sarah@soilservices.us>; 'Konsler, Tom' <tkonsler@bellsouth.net>; 'Michael D. McCulley, Jr.' <mdmcculley@att.net>; 'Keith Dobie' <keithdobie@bopaine.co>; 'Edge, John' <jedge@clcsales.com>; 'Gloger, Kelly' <solardelivered1@gmail.com>; 'Samuelson, Scott' <scott@fujicleanusa.com>; 'Verbridge, Lee' <lee@fujicleanusa.com>; 'Dr. Toshiro Otowa' <toshiro_otowa@fujiclean.co.jp>; 'Mark O'Rourke' <BWE.Mark@gmail.com>; 'Chris Petersen' <Chris.Petersen@ads-pipe.com>; William Fenner <WFenner@aquapoint.com>; 'ishwar.devkota@wakegov.com' <ishwar.devkota@wakegov.com>; John Harman (jackharman53@gmail.com) <jackharman53@gmail.com>; Darian Creed <hca@triadbiz.rr.com>; Kevin Davidson <kdavidson@agriwaste.com>; Todd Harrell <tharrell@aqwa.net>; Jimmy Shoaf <Jimmy@ShoafPrecast.com> (Jimmy@ShoafPrecast.com) <Jimmy@ShoafPrecast.com>; Phillip Shoaf <phillip@shoafprecast.com>; Jerome Coker (j.coker@capefearprecast.com) <j.coker@capefearprecast.com>; Latt Moretz (latt@moldsofbethlehem.com) <latt@moldsofbethlehem.com>; tpm@twave.com; Gabe Dellinger <gabe@dellingerprecast.com>; Jerry Pearce (jerry@pearceenvironmental.com) <jerry@pearceenvironmental.com>; 'csstephens@ncowcicb.info' <csstephens@ncowcicb.info>; ltolson@ncapha.org; 'aritter@ncbels.org' <aritter@ncbels.org>; Reid, Steve <steve.reid@ncdenr.gov>; 'chair@ncblss.org' <chair@ncblss.org>; president@sssnc.org; Larry Baldwin <LBaldwin@ec.rr.com>; 'Caroline Edwards' <cjedwards234@gmail.com>; Kathy Morris (kmorris@agriwaste.com) <kmorris@agriwaste.com>; 'Jason Hall' <jhall@centralcarolinasoil.com>; tgulley@gmail.com; 'Daniel J. Bliley' <dbliley1@nc.rr.com>; 'George Lankford' <gklankford91@gmail.com>; 'Hal Owen' <halowen@earthlink.net>; 'Craig Turner' <cturner@lmgroup.net>; 'Nick Howell' <nhowell@lmgroup.net>; 'Elwood Black' <eblack@nc.rr.com>; 'Barrett Kays' <blkays@aol.com>; Walker Ferguson NCLSS <walker@landrm.com>; 'larry@thompsonenv.com' <larry@thompsonenv.com>; Paul Cannon <pcannon@norweco.com>; Linda Malone (lmalone@polylok.com) <lmalone@polylok.com>; 'andwater@aol.com' <andwater@aol.com>; tbarbee5@carolina.rr.com; Jim Beeson <Jbeeson6@gmail.com>; william@gag-simtech.com; casey.davis@anuainternational.com; Michael Lash <mikel@lashengineering.com>; mike@southeasternsoil.com; robert@eberhartinc.com; karen_arm@bellsouth.net; jhgodfre@ncsu.edu; John Gray (jdgray@mindspring.com) <jdgray@mindspring.com>; josephinton@triad.rr.com; chris@smartwatersolutions.net; Jeffrey Kerr (jeff@marlinw.com) (jeff@marlinw.com) <jeff@marlinw.com>; mkocot@landworksengineering.com; Gary Hostetler (GHostetler@LindsayPrecast.com) <GHostetler@LindsayPrecast.com>; 'gary@gag-simtech.com' <gary@gag-simtech.com>; trminspections@ec.rr.com; Chris Murray (chris@piedmontsoil.com) <chris@piedmontsoil.com>; rpontello@sandec.com; Diana Rashash <diana_rashash@ncsu.edu>; Ashley Rollans <rollans.ashley@yahoo.com>; 'adrianpruett@yahoo.com' <adrianpruett@yahoo.com>; karl shaffer (shaffersoils@gmail.com) <shaffersoils@gmail.com>; carolyn.vaughn@anuainternational.com; Sid Gaskins <sid@watermanagementnc.net>; Ronnie Overbey <overbeys@bellsouth.net>; awinters@landrm.com
Cc: dph.ehs.osww@lists.ncmail.net
Subject: Proposed 18E Rules

Attached please find the following documents:
1. Proposed 18E rules that will be published in the September 1, 2017 NC Register.
2. Cross reference table for 18E and .1900 rules.

3. Rules proposed to be repealed.
4. Fiscal note for 18E rules that has been approved by the Budget Office and Commission for Public Health.

The public comment for the 18E rules will not start until September 1, 2017. The public comment period will run from September 1, 2017 through October 31, 2017.

The public hearing for the proposed rules will be the following:
* Monday October 2, 2017:
Division of Public Health Six Forks Campus
5605 Six Forks Road (Building 3)
Cardinal Room
Raleigh, NC 27699

Two proposed listening meetings are schedule for the following dates:
* Wednesday September 20, 2017:
Pitt County Cooperative Extension
Agricultural Auditorium
403 Government Circle
Greenville, NC 27834

* Wednesday October 4, 2017:
AB Tech Asheville
Ferguson Auditorium
340 Victoria Rd
Asheville, NC 28801

All meetings are scheduled to start at 10 am.

We will be sending everyone an email when the public comment period starts. Please do not send us any comments before September 1, 2017. We cannot accept those comments as part of the formal rule making process.

When we email you at the start of the public comment period, we will provide all the different ways to submit comments.

Please let me know if you have any questions.

Thank you all very much for your assistance and patience with this process.
Trish

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
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5605 Six Forks Rd
1642 Mail Service Center
Raleigh, NC 27699-1642

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North Carolina Public Records Law and may be disclosed to third parties.

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From: Sheryl Ervin <SErvin@biomicrobics.com>
Sent: Tuesday, October 31, 2017 5:03 PM
To: Hoke, Chris
Cc: Jim Bell; Angoli, Trish
Subject: FW: [External] RE: Proposed 18E Rules

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Thanks,
Sheryl

Sheryl Ervin, P.G.
Director, Regulatory Affairs

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Welcome to BioMicrobics.com, where Architects, Builders and Property Owners can find useful information, advice, insights,
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To: Sheryl Ervin <SErvin@biomicrobics.com>
Subject: FW: Proposed 18E Rules

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Sent: Friday, August 11, 2017 1:24 PM
To: dph.ehs.ehl@lists.ncmail.net; ncrehs@lists.ncmail.net; Lassiter, Doug <douglassiter@gmail.com>; Cory Brantley <1installer@gmail.com>; smistry1940@gmail.com; Tim Bannister <tb@tcwwastewater.com>; cmcgee@agriwaste.com; tim@tjpanel.com; toneycjacobs@gmail.com;

bpickens@bbhobbs.com; 'Carl Garrison' <carl@aquaworxinc.com>; 'Dunn, Mike' <mike@hootsystems.com>; 'Dill, Suzanne' <sued@multitrode.com>; 'Dick Bachelder' <bach@maine.rr.com>; 'Debra Stringer' <DStringer@stalite.com>; 'Davis, John' <soilhorizons@gmail.com>; 'David Morgan' <hdmorgan@ayrix.net>; Lentz, Dave (dlentz@infiltratorwater.com) <dlentz@infiltratorwater.com>; Wood, Tim <twood@infiltratorwater.com>; Woodward, Woody <Wwoodward@infiltratorwater.com>; 'Crumpler, Houston' <cppsales@cpp-pipe.com>; 'Crissman, Robert' <rcrissman3@triad.rr.com>; 'Cormier, Troy' <troy@hootsystems.com>; 'Coombs, Shawn' <shawn.coombs@ads-pipe.com>; chris.swedick@ads-pipe.com; 'Chip Hassett' <hassett@oakhillco.com>; 'Chapman, Larry' <n8527w@ellijay.com>; 'Catanzaro, Mike' <Mike.Catanzaro@pentairwater.com>; 'Casey Clugston' <wastexbox@aol.com>; 'Eric Valentine' <evalentine@americanonsite.com>; 'Fortune, Bill' <jwfortune@bellsouth.net>; 'Fowler, Scott' <ustire@vnet.net>; 'Goodwin, Craig' <craig@nwcascade.com>; 'Graham, Larry F.' <larrygraham54@gmail.com>; 'Hal House' <hhouse@emji.net>; 'Huguley, Sonny' <huguleys@bellsouth.net>; 'Jason Churchill' <jchurchill@orenco.com>; Jim Bell <jbell@biomicrobics.com>; 'Jim King' <jking@eljen.com>; 'Jim Langston' <jlangston@stayright.com>; 'Joe Walsh' <joe.walsh@ashtecs.com>; 'John Payne' <johnpayne@bnm-us.com>; 'John Williams' <pnprojects@aol.com>; 'Lee Starks' <lee.starks@ads-pipe.com>; 'Levitas, Steve' <slevitas@kilpatrickstockton.com>; 'Liehr, Sarah' <sarah_liehr@ncsu.edu>; 'Lubbers, Mark' <mlubbers@aquapoint.com>; 'Marie-Christine Belanger' <belm2@premiertech.com>; 'Matt Lee' <aquatestinc@yahoo.com>; 'McSwain, Keith' <carolinameter@gmail.com>; 'Michael Burch' <civitas@his.com>; 'Michael Halas' <halasm@bellsouth.net>; 'Mike Stidham' <mstidham@eztreat.net>; 'Millard, Mike' <mmillard@southeastpump.com>; 'Robert Huguley' <rhuguley@nc.rr.com>; 'Robert Rubin' <rubin@eos.ncsu.edu>; 'Russ Ayers' <russayers@embarqmail.com>; 'Schawel, Randy' <randy@aquaterragroup.net>; 'Sean McGuigan' <MSMcGuigan@gmail.com>; 'Smith, Tim' <Tim.Smith@Pentair.com>; 'Steinbeck, Steve' <stevejsteinbeck@gmail.com>; 'Steve Barry' <sbarry@aqwa.net>; 'Steve Dix' <spdix@comcast.net>; 'Suchecki, Ron' <ron@hootsystems.com>; 'Taylor, Kent' <kent@clearstreamsystems.com>; Admin (gsweet2e@gmail.com) <gsweet2e@gmail.com>; 'Thomas Teal' <tteal@glendon.com>; 'Tom Ashton' <twa220@aol.com>; 'Tyler, James' <jnjtyler@aol.com>; D'Amato, Victor (Victor.D'Amato@tetratech.com) <Victor.D'Amato@tetratech.com>; 'Wayne Peyton' <wayne@clearstreamsystems.com>; 'Wes Combs' <wesc@clarusenvironmental.com>; 'Hunley, Damon' <damon.hunley@ads-pipe.com>; 'Bishop, Colin' <colin.bishop@anua-us.com>; 'Kevin Sherman' <osmc2001@yahoo.com>; 'Nicholas Noble' <nnoble@orenco.com>; Sarah Osborne <sarah@soilservices.us>; 'Konsler, Tom' <tkonsler@bellsouth.net>; 'Michael D. McCulley, Jr.' <mdmcculley@att.net>; 'Keith Dobie' <keithdobie@bopaine.co>; 'Edge, John' <jedge@clcsales.com>; 'Gloger, Kelly' <solardelivered1@gmail.com>; 'Samuelson, Scott' <scott@fujicleanusa.com>; 'Verbridge, Lee' <lee@fujicleanusa.com>; 'Dr. Toshiro Otowa' <toshiro_otowa@fujiclean.co.jp>; 'Mark O'Rourke' <BWE.Mark@gmail.com>; 'Chris Petersen' <Chris.Petersen@ads-pipe.com>; William Fenner <WFenner@aquapoint.com>; 'ishwar.devkota@wakegov.com' <ishwar.devkota@wakegov.com>; John Harman (jackharman53@gmail.com) <jackharman53@gmail.com>; Darian Creed <hca@triadbiz.rr.com>; Kevin Davidson <kdavidson@agriwaste.com>; Todd Harrell <tharrell@aqwa.net>; Jimmy Shoaf <Jimmy@ShoafPrecast.com> (Jimmy@ShoafPrecast.com) <Jimmy@ShoafPrecast.com>; Phillip Shoaf <phillip@shoafprecast.com>; Jerome Coker (j.coker@capefearprecast.com) <j.coker@capefearprecast.com>; Latt Moretz (latt@moldsofbethlehem.com) <latt@moldsofbethlehem.com>; tpm@twave.com; Gabe Dellinger <gabe@dellingerprecast.com>; Jerry Pearce (jerry@pearceenvironmental.com) <jerry@pearceenvironmental.com>; 'csstephens@ncowcicb.info' <csstephens@ncowcicb.info>; ltolson@ncapha.org; 'aritter@ncbels.org' <aritter@ncbels.org>; Reid, Steve <steve.reid@ncdenr.gov>; 'chair@ncblss.org' <chair@ncblss.org>; president@sssnc.org; Larry Baldwin <LBaldwin@ec.rr.com>; 'Caroline Edwards' <cjedwards234@gmail.com>; Kathy Morris (kmorris@agriwaste.com) <kmorris@agriwaste.com>; 'Jason Hall' <jhall@centralcarolinasoil.com>; tgulley@gmail.com; 'Daniel J. Bliley' <dbliley1@nc.rr.com>; 'George Lankford' <gklankford91@gmail.com>; 'Hal Owen' <halowen@earthlink.net>; 'Craig Turner' <cturner@lmgroup.net>; 'Nick Howell' <nhowell@lmgroup.net>; 'Elwood Black' <eblack@nc.rr.com>; 'Barrett Kays' <blkays@aol.com>; Walker Ferguson NCLSS <walker@landrm.com>;

'larry@thompsonenv.com' <larry@thompsonenv.com>; Paul Cannon <pcannon@norweco.com>; Linda Malone (lmalone@polylok.com) <lmalone@polylok.com>; 'andwater@aol.com' <andwater@aol.com>; tbarbee5@carolina.rr.com; Jim Beeson <Jbeeson6@gmail.com>; william@gag-simtech.com; casey.davis@anuainternational.com; Michael Lash <mikel@lashengineering.com>; mike@southeasternsoil.com; robert@eberhartinc.com; karen_arm@bellsouth.net; jhgodfre@ncsu.edu; John Gray (jdgray@mindspring.com) <jdgray@mindspring.com>; josephinton@triad.rr.com; chris@smartwatersolutions.net; Jeffrey Kerr (jeff@marlinw.com) (jeff@marlinw.com) <jeff@marlinw.com>; mkocot@landworksengineering.com; Gary Hostetler (GHostetler@LindsayPrecast.com) <GHostetler@LindsayPrecast.com>; 'gary@gag-simtech.com' <gary@gag-simtech.com>; trminspections@ec.rr.com; Chris Murray (chris@piedmontsoil.com) <chris@piedmontsoil.com>; rpontello@sandec.com; Diana Rashash <diana_rashash@ncsu.edu>; Ashley Rollans <rollans.ashley@yahoo.com>; 'adrianpruett@yahoo.com' <adrianpruett@yahoo.com>; karl shaffer (shaffersoils@gmail.com) <shaffersoils@gmail.com>; carolyn.vaughn@anuainternational.com; Sid Gaskins <sid@watermanagementnc.net>; Ronnie Overbey <overbeys@bellsouth.net>; awinters@landrm.com
Cc: dph.ehs.osww@lists.ncmail.net
Subject: Proposed 18E Rules

Attached please find the following documents:
1. Proposed 18E rules that will be published in the September 1, 2017 NC Register.
2. Cross reference table for 18E and .1900 rules.
3. Rules proposed to be repealed.
4. Fiscal note for 18E rules that has been approved by the Budget Office and Commission for Public Health.

The public comment for the 18E rules will not start until September 1, 2017. The public comment period will run from September 1, 2017 through October 31, 2017.

The public hearing for the proposed rules will be the following:
* Monday October 2, 2017:
Division of Public Health Six Forks Campus
5605 Six Forks Road (Building 3)
Cardinal Room
Raleigh, NC 27699

Two proposed listening meetings are schedule for the following dates:
* Wednesday September 20, 2017:
Pitt County Cooperative Extension
Agricultural Auditorium
403 Government Circle
Greenville, NC 27834

* Wednesday October 4, 2017:
AB Tech Asheville
Ferguson Auditorium
340 Victoria Rd
Asheville, NC 28801

All meetings are scheduled to start at 10 am.

We will be sending everyone an email when the public comment period starts. Please do not send us any comments before September 1, 2017. We cannot accept those comments as part of the formal rule making process.

When we email you at the start of the public comment period, we will provide all the different ways to submit comments.

Please let me know if you have any questions.

Thank you all very much for your assistance and patience with this process.
Trish

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
http://publichealth.nc.gov

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 4:28 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] RE: Proposed 18E Rules
Attachments: NC Proposed 18E Rule Comments_David Lentz Infiltrator Water Technologies_Hoke_103117.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Lentz, Dave [mailto:dlentz@infiltratorwater.com]
Sent: Tuesday, October 31, 2017 3:57 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Angoli, Trish <trish.angoli@dhhs.nc.gov>; Wood, Tim <twood@infiltratorwater.com>; Woodward, Woody <Wwoodward@infiltratorwater.com>
Subject: [External] RE: Proposed 18E Rules

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Hello Chris,

I hope you are doing well. Please find attached Subchapter 18E comments by Infiltrator Water Technologies. Can you please confirm that you received this email and its attachment.

Sincerely,
Dave Lentz

David Lentz, Professional Registration/PE – CT, IL, NY Regulatory Director

Phone: (860) 577-7198 | Mobile: (860) 575-8099 | Fax: (860) 577-7793

4 Business Park Road, Old Saybrook, Connecticut 06475

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From: Angoli, Trish [mailto:trish.angoli@dhhs.nc.gov]
Sent: Friday, September 01, 2017 12:33 PM
Subject: Proposed 18E Rules

The public comment period for the proposed 18E rules starts today, Friday September 1, 2017, and runs through Tuesday October 31, 2017.

During the public comment period, there will be one public hearing and two listening meetings held on the following dates. All meetings are scheduled to start at 10 am.

Public Hearing
* Monday October 2, 2017:
Division of Public Health Six Forks Campus
5605 Six Forks Road (Building 3)
Cardinal Room
Raleigh, NC 27699

Listening Meetings
* Wednesday September 20, 2017:
Pitt County Cooperative Extension
Agricultural Auditorium
403 Government Circle
Greenville, NC 27834

* Wednesday October 4, 2017:
AB Tech Asheville
Ferguson Auditorium
340 Victoria Rd
Asheville, NC 28801

The following documents are attached to this email:
1. Proposed 18E rules published in the September 1, 2017 NC Register.
2. Cross reference table for 18E and .1900 rules.
3. Rules proposed to be repealed in the September 1, 2017 NC Register.
4. Fiscal note for 18E rules that has been approved by the Budget Office and Commission for

Public Health.

A copy of the proposed rules and fiscal not is also available online at http://cph.publichealth.nc.gov/.

Comments should be sent to Chris Hoke, 1931 Mail Service Center, Raleigh, NC 27699-1961, 919-707-5006 (phone), 919-870-4829 (fax), or chris.hoke@dhhs.nc.gov.

Please let me know if you have any questions, but do not send your comments to me. Please send them to Chris Hoke.

Thank you all very much for your assistance and patience with this process.
Tricia Angoli

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
http://publichealth.nc.gov

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From: Hoke, Chris
Sent: Wednesday, October 25, 2017 8:33 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Re: Proposed 18E Rules
Attachments: NC DHHS Sub Chapter 18E Rule Revision Comments.docx

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Alan Clapp [mailto:alanclapp@aol.com]
Sent: Tuesday, October 24, 2017 7:03 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Angoli, Trish <trish.angoli@dhhs.nc.gov>
Subject: [External] Re: Proposed 18E Rules

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Mr. Hoke,

I appreciate the opportunity to comment on the proposed wastewater rules. I also appreciate the amount of work and time put into this effort. Great strides have been made to update this rule set.

However, I do feel the septic tank portion of the rules need strengthening. I feel adding the ASTM Septic Tank standards will accomplish this.

Thanks again for the opportunity,

Alan
Alan Clapp
NC Licensed Soil Scientist
389 Clapp Farms Road
Greensboro, NC 27405
alanclapp@aol.com
P:336-698-9178
C:336-202-6808

---------- Forwarded message ----------
From: Angoli, Trish <trish.angoli@dhhs.nc.gov>
Date: Fri, Sep 1, 2017 at 12:32 PM
Subject: Proposed 18E Rules
To:
The public comment period for the proposed 18E rules starts today, Friday September 1, 2017, and runs through Tuesday October 31, 2017.

During the public comment period, there will be one public hearing and two listening meetings held on the following dates. All meetings are scheduled to start at 10 am.

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* Monday October 2, 2017:
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Cardinal Room
Raleigh, NC 27699

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340 Victoria Rd
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The following documents are attached to this email:
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2. Cross reference table for 18E and .1900 rules.
3. Rules proposed to be repealed in the September 1, 2017 NC Register.
4. Fiscal note for 18E rules that has been approved by the Budget Office and Commission for Public Health.

A copy of the proposed rules and fiscal not is also available online at http://cph.publichealth.nc.gov/.

Comments should be sent to Chris Hoke, 1931 Mail Service Center, Raleigh, NC 27699-1961, 919-707-5006 (phone), 919-870-4829 (fax), or chris.hoke@dhhs.nc.gov.

Please let me know if you have any questions, but do not send your comments to me. Please send them

to Chris Hoke.

Thank you all very much for your assistance and patience with this process.
Tricia Angoli

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
http://publichealth.nc.gov

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From: Hoke, Chris
Sent: Monday, October 02, 2017 2:46 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] review comment on proposed Engineer Option Rule

More comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Alan Hassett [mailto:hassett@oakhillco.com]
Sent: Monday, October 02, 2017 2:49 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] review comment on proposed Engineer Option Rule

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10/2/2017
Chris, as a North Carolina licensed PE with more than 20 years' experience with onsite systems in eastern U.S, west coast U.S, and Canada, I was surprised (twice) when reading the language in this proposed Engineer Option rule.
On one hand it is very restrictive – only pretreatment technologies; while on the other hand it is very liberal – any pretreatment technology not approved in NC – which could mean not approved or even not used anywhere else.
I suggest consideration of additional language such as ……. " pretreatment technologies or other onsite wastewater technologies, techniques or features approved and used for 5 years or more in other states but not approved in this state."

Should anyone wish to discuss this comment and/or subject with me, I can be contacted by email to hassett@oakhillco.com or directly via cell phone (610) 476-4368.
Thanks.
Chip
Alan (“Chip”) Hassett, P.E.

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From: Hoke, Chris
Sent: Thursday, October 05, 2017 10:21 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] review comment on proposed rule 15ANCAC18E.0601 (f)

Rule comments.
From: Alan Hassett [mailto:hassett@oakhillco.com]
Sent: Thursday, October 5, 2017 2:40 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] review comment on proposed rule 15ANCAC18E.0601 (f)

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10/ 5/2017

Chris, I have the following review comment on proposed rule 15ANCAC18E.0601 (f) . I suggest consideration of revised language such as:

(f) Initial and repair dispersal field systems subject to compaction and insufficient oxygen transfer 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.
Should anyone wish to discuss this comment and/or subject with me, I can be contacted by email to hassett@oakhillco.com or directly via cell phone (610) 476-4368.
Thanks.
Chip
Alan (“Chip”) Hassett, P.E.

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From: Hoke, Chris
Sent: Monday, October 30, 2017 2:48 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Review comments for 18E Rules
Attachments: 18E Rules review comments.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: William Fenner [mailto:WFenner@aquapoint.com]
Sent: Monday, October 30, 2017 2:45 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Review comments for 18E Rules

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Chris,

Please find attached my review comments for consideration.

Thank you for this opportunity to share my opinions, thoughts and observations regarding these proposed rules. With new rules being proposed now is the time to fix and update many rules which do not reflect nor account for advances in wastewater treatment technologies over the past three decades. We should be encouraging the use of technological systems that will produce the cleanest effluent economically feasible for every application.

Bill Fenner, P.E.

AquaPoint Regional Sales Manager
NC-VA-TN-GA-SC
252.207.8999

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From: Hoke, Chris
Sent: Monday, October 23, 2017 11:46 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] review comments on proposed rule 15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL

Comments

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Alan Hassett [mailto:hassett@oakhillco.com]
Sent: Monday, October 23, 2017 11:22 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] review comments on proposed rule 15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL

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10/23/2017

Chris, I have the following review comments on proposed rule 15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL :

1. Instituting renewal requirements on new approval applications is not objectionable. The prospective applicant then makes the go-no go decision to apply for approval in NC fully aware of this renewal requirement.
2. Conversely, imposing renewal requirements retroactively is very objectionable. Those

applicants who decided to withstand the cost and rigors of obtaining an approval in NC might have thought twice if “renewal” was in the forecast. In fact, as Trish said during her conference presentation on this topic, for DHHS “not renewing is easier than revoking”.

3. In any event, if “renewal for all” is the way it must be, it seems that existing approvals upon which renewal is imposed should have a longer time period than those approvals which were obtained with foreknowledge of a renewal requirement. For example: some period of time (10 years??) from when the approval was issued excluding the period of economic recession (2009-2016) might be palatable. Or some other economic wasteland period surrogate -- years of paltry building permit applications or dhhs travel limitation time periods.

Thank you.

Chip

Alan (“Chip”) Hassett

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From: Hoke, Chris
Sent: Monday, October 30, 2017 2:14 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Rules Comments
Attachments: T&J Rule Rewrite Comments.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

1931 Mail Service Center
Raleigh, NC 27699-1931

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From: logan@tjpanel.com [mailto:logan@tjpanel.com]
Sent: Monday, October 30, 2017 1:54 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Rules Comments

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Good Afternoon Mr. Hoke,

I wanted to make sure our comments on the Rules rewrite were able to be received from T&J Panel, Inc. We have a few issues we would like to point out, in regards specifically to the use of the "modifications to conventional septic systems" (i.e. LDP and PPBPS). If you could please let me know if you or someone was able to receive them, I know we are closing in on the final day of the comment period. I have attached them as a PDF, and also submitted them below, in the best format we had available to us. Please let me know if there is another format that I need to be submitting the comments via.

Thank you sincerely,

Logan Settle
T&J Panel
704-437-6073

T&J Panel, Inc. - Comments on proposed 18E rules:

* Rule: .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems

Comment: .0901(c)(4) "The total trench length required for products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval." This comment is not necessary under the section of "General Design and Installation Criteria for Subsurface Dispersal Systems." Mentioning "PIA" products solely in the category of "General Design & Installations Criteria", puts products, not specifically mentioned, at a disadvantage when it comes to educating the industry professionals. Modifications to Conventional Septic Systems (as LDP and PPBPS are referred to in the .1900 rules), cannot be omitted from this section, if you are going to include Approved/Innovative products in this section.

Add: If it is necessary for this comment to remain, add line (5) to say "The total trench length required for trench products approved under Section .0905 and .0904 shall be determined in accordance with rule .0905(c) and rule .0904(c)." The better option would be to strike the sentence in .0901(c)(4); as to not provide an unfair market advantage to products from the .1700 Section.

* Rule: .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems

Comment: .0901(d) states that "Wastewater system installation shall be in accordance with the following criteria:" followed by .0901(d)(12) which states "trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval." Mentioning "PIA" products solely in the category of "General Design & Installations Criteria", puts products not specifically mentioned at a disadvantage when it comes to educating the industry professionals. Modifications to Conventional Septic Systems (as LDP and PPBPS are referred to in the .1900 rules), cannot be omitted from this section, if you are going to include Approved/Innovative products in this section.

Add: If it is necessary for this comment to remain, add line (13) to say "Trench products approved under Section .0905 shall be installed in accordance with .0905(d). Add line (14) to say "Trench products approved under Section .0904 shall be installed in accordance with .0904(e)." The better option would be to strike the sentence in .0901(d); as to not provide an unfair market advantage to products from the .1700 Section.

* Rule: .0902 – Conventional Wastewater Systems

Comment: .0902(b) "Sites classified as suitable to soil depth may utilize shallow placement of dispersal system." Permeable, Porous Block Panel Systems have always been used hand in hand with conventional gravel systems. If you have the space and soil to install a conventional gravel system, you can also adequately install a PPBPS. It is important to remember that PPBPS are considered a "Modification to Conventional Septic Systems," and are able to be used in any way that a conventional septic system can be used.

Add: Add line "(e)" in section .0905, stating "Sites classified suitable as to soil depth may utilize shallow placement of dispersal system."

* Rule: .0903-Bed Systems, .0906-Sand Lined Trench Systems, .0907-Low Pressure Pipe Systems, .0909-Fill Systems

Comment: PPBPS's have been used in conjunction with these subsections for many years, and with much success. PPBPS should be addressed in each of these

subsections. It is important to remember that PPBPS are considered a "Modification to Conventional Septic Systems," and are able to be used in any way that a conventional septic system can be used.
Add: Add line in each section (perhaps beneath the line: "trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval"), stating "trench products approved under Section .0905 of this section shall be installed in accordance with manufacturer's specifications."

* Rule: .0902 – Conventional Wastewater Systems

Comment: .0902(f)(7) "the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter." There is some confusion around which products are allowed additional reductions in dispersal field area, when installed as dual alternating dispersal fields. The maximum reduction is stated here to be "25 percent", however some 25% reduction products have been given a 35% and 35% reduction when being installed as dual alternating dispersal fields. It would be beneficial to see a consistent formula that results in a fair reduction, equivalent to the reduction already achieved by a system when installed singularly, with a traditional repair area.
Add: Change .0902(f)(7) "the maximum reduction in dispersal field area is 25 percent for conventional gravel systems, the maximum reduction in dispersal field area is 35 percent for Chamber and Pipe systems, and the maximum reduction in dispersal field area is 60 percent for Panel Block Systems.

* Rule: .0907 – Low Pressure Pipe Systems

Comment: .0907(e)(16) "trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval." Again, specifically mentioning the PIA products as a viable LPP solution, while negligently omitting Panel Block Systems, is improper. PPBPS have been used in conjunction with LPP technology since its inception.
Add: .0907(e)(17) "trench products approved under section .0905 shall be installed in accordance with manufacturer's specifications."

* Rule: ALL

Comment: There are a lot of references in the Subsurface Dispersal System Subchapter to products approved under Section .1700. It is important to remember that "Modifications to Conventional Systems" (Large Diameter Pipe and Permeable, Porous Block Panel Systems), were not required to go through a "PIA" process, but are still viable, and in most cases, better dispersal system solutions. The language used throughout the .0900 Subchapter is very subjective towards products from the .1700 Section, and omits the applicability of LDP and PPBPS in every section outside of .0904 and .0905.

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From: Hoke, Chris
Sent: Thursday, October 26, 2017 9:17 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Rules Comments

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Keith Vernon [mailto:kvernon1957@hotmail.com]
Sent: Wednesday, October 25, 2017 10:01 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Re: [External] Rules Comments

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After thinking about it future today, I realized I over looked some on the rules update.
In 1999 we changed the rules to require effluent filters on the outlet line tee. Great idea. It helps to improve Effluent Quality and reducing TSS from entering the Drain field thus lengthening the life of the system. Which makes ONSITE waste water treatment a more viable option for the Buyer/Home Owner.
In the same rule we added an "outlet" boot made of rubber. Does a wonderful job of sealing the tank to the pipe. Only thing we didn't do it on the inlet end for the waste line.
I think it would a great advantage to having inlet boots or seals on both inlet and outlet for the pipe penetrations. There only needs to be one Inlet to these concrete septic and pump tanks.
Orange County has done this for about 15 years and everyone has realized the benefit.
The other needed improvement on septic tanks are risers. Those effluent filters or effluent

screens (which ever they are called) are items that need to be serviced.
It just makes sense to put access risers on the tank to be able to service those effluent filters. By having easy access folks will service them more often. Which in turn insure the quality of effluent that was the objective in the beginning.
It is not my intent to rewrite the rules, just share what I see ever day in the field. These are things that need to be addressed if we are to contine to grow and prosper.

Respectfully,
Keith Vernon
Vernon Septic Systems
Mebane, NC

From: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Sent: Wednesday, October 25, 2017 8:34 AM
To: Keith Vernon
Subject: RE: [External] Rules Comments

Thanks!

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Keith Vernon [mailto:kvernon1957@hotmail.com]
Sent: Tuesday, October 24, 2017 11:51 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Rules Comments

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I would like to submit my comments on the new rules.

First I would like to share my back ground. I am an installer of Onsite septic systems. I begun my career as an foreman for a company installing community LPP system that severed entire subdivisions. After two years of that I went out and started my own business . I enjoy my work and the people I work with(EHS, venders ,precasters and etc.).

I begun my career in April 1986. We have seen a few rules "changes" but no real up to date improvements during that time. It appears that we are as close now as ever.

After reading over the rules, I think that those who work on the rules update done an excellent job. Based on my years of being in the field installing and experiencing some of the things that need to be addressed.

A lot of attention was giving the soils section that clarified some things that may have been miss interpreted. That is a major improvement.

Tank manufacturing also stood out. It is a proven fact that we have a problem with "Mid Seam" concrete tanks leaking. This is documented by regulators as well as private inspector folks . I think we need to address this well over due issue. That is not say ALL mid seam tanks leak. I have been told by a gentlemen that has tremendous knowledge on precast tanks, that there is a mid seam tank design that will address this leaking issue. However the only way we will know for sure we have corrected this issue is to leak test them. Maybe in time we can relax this as seen to be fit.

Another issue that needs addressing, APPROVALS of manufactured products sold and installed in our state. Over time company's are bought and sold quite often it appears. Some times quality standards get compromised. I think we need have the right to review these products on a regular basis. That's not to say do a complete review, if a product is performing like the manufacture claimed it would when first approved, let them continue. However if industry professionals have some documented complaints, the product needs to be reviewed, contact the manufacturer and give the opportunity to correct the issues. If they cannot correct the issue OR refuses to correct the issue, then address it as need be.

I am impressed with the job the staff has done on this. I know with out a doubt that these updates were well thought out with a lot of feed back from folks out in the field ever day.

In closing I would like to say I Support the Changes and updates being proposed.

After all, we must do our best to protect our potable water supply. Well water, streams and lakes.

Without a clean and dependable water supply, we will be challenged to continue to grow.

Keith Vernon
Vernon Septic Systems
Mebane, NC

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From: Hoke, Chris
Sent: Wednesday, October 25, 2017 8:35 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Rules Comments

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Keith Vernon [mailto:kvernon1957@hotmail.com]
Sent: Tuesday, October 24, 2017 11:51 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Rules Comments

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miss interpreted. That is a major improvement.
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I am impressed with the job the staff has done on this. I know with out a doubt that these updates were well thought out with a lot of feed back from folks out in the field ever day.

In closing I would like to say I Support the Changes and updates being proposed.
After all, we must do our best to protect our potable water supply. Well water, streams and lakes.
Without a clean and dependable water supply, we will be challenged to continue to grow.

Keith Vernon
Vernon Septic Systems
Mebane, NC

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From: Hoke, Chris
Sent: Friday, October 27, 2017 10:38 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Rules

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: tbarbee5@carolina.rr.com [mailto:tbarbee5@carolina.rr.com]
Sent: Friday, October 27, 2017 10:33 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Rules

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Chris: good morning. A suggestion for rules update which may already be included.
All septic tanks need risers for access to effluent filters . Risers should extend 3" min above grade.
Thx.
Tim Barbee
704-589-0595

Sent from my iPhone

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From: Hoke, Chris
Sent: Wednesday, November 01, 2017 1:45 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Subchapter 18E - AQWA Comments
Attachments: Subchapter 18E - AQWA Comments.xlsx

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
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Chris.hoke@dhhs.nc.gov

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From: steve barry (via Google Sheets) [mailto:aqwastevebarry@gmail.com]
Sent: Tuesday, October 31, 2017 5:12 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] Subchapter 18E - AQWA Comments

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steve barry has attached the following spreadsheet:

Subchapter 18E - AQWA Comments
Same comments as before. Now in spreadsheet.Thanks Chris!

Steve

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From: Hoke, Chris
Sent: Tuesday, October 31, 2017 5:06 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] Subchapter 18E - AQWA Comments
Attachments: Subchapter 18E - AQWA Comments.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: steve barry (via Google Sheets) [mailto:aqwastevebarry@gmail.com]
Sent: Tuesday, October 31, 2017 4:58 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Cc: Deal, Nancy <Nancy.Deal@dhhs.nc.gov>
Subject: [External] Subchapter 18E - AQWA Comments

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steve barry has attached the following spreadsheet:

Subchapter 18E - AQWA Comments
Chris,
Attached are my comments. Please also include the following.

"The Branch has gone to extraordinary measures to ensure that these draft rules were available to everyone industry-wide. AQWA applauds their efforts. While we have some disagreements as noted in our written comments, they remain a vast improvement over the status quo. A huge round of applause to Nancy Deal and her staff of engineers on a herculean effort. We appreciate it greatly.

Respectfully submitted,

Steve Barry
President
AQWA Inc

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From: Hoke, Chris
Sent: Monday, October 30, 2017 10:02 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: [External] wastewater rules comments
Attachments: KMorris Comments on Rules 103017.pdf

Comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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-----Original Message-----
From: Kathy Morris [mailto:kmorris@agriwaste.com]
Sent: Monday, October 30, 2017 9:25 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: [External] wastewater rules comments

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Chris,
Here's another one.

Thanks

--
Kathy Morris, REHS
Senior Designer

Agri-Waste Technology, Inc. (AWT)
501 N. Salem St, # 203

Apex NC 27502
(919)819-3033 mobile/text
(919)545-0785 direct line
(919)859-0669 office

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From: Hoke, Chris
Sent: Monday, October 02, 2017 9:39 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: PDF File
Attachments: DOC100217-10022017092845.pdf

More “form” comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

919 707-5006 office
919 870 4829 fax
Chris.hoke@dhhs.nc.gov

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From: Murray, Angela C
Sent: Monday, October 02, 2017 9:36 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: PDF File

Chris, it is attached.

Angie Murray
NC Department of Health and Human Services
State Health Directors Office, Division of Public Health
5605 Six Forks Road
Raleigh, NC 27609
(Office) 919-707-5002
(Fax) 919-870-4829
angie.murray@dhhs.nc.gov
http://publichealth.nc.gov/

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From: Hoke, Chris
Sent: Monday, September 25, 2017 3:00 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: Send data from MFP07876072 09/25/2017 14:46
Attachments: DOC092517-09252017144616.pdf

More form comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

919 707-5006 office
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Chris.hoke@dhhs.nc.gov

1931 Mail Service Center
Raleigh, NC 27699-1931

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-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Monday, September 25, 2017 5:46 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Send data from MFP07876072 09/25/2017 14:46

Scanned from MFP07876072
Date:09/25/2017 14:46
Pages:2
Resolution:200x200 DPI

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From: Hoke, Chris
Sent: Monday, October 02, 2017 12:08 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: Send data from MFP07876072 10/02/2017 11:58
Attachments: DOC100217-10022017115755.pdf

More comments.

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-----Original Message-----
From: Murray, Angela C
Sent: Monday, October 02, 2017 12:05 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: FW: Send data from MFP07876072 10/02/2017 11:58

Chris, it is attached.

Angie Murray
NC Department of Health and Human Services State Health Directors Office, Division of Public Health
5605 Six Forks Road
Raleigh, NC 27609
(Office) 919-707-5002
(Fax) 919-870-4829
angie.murray@dhhs.nc.gov
http://publichealth.nc.gov/

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_____

-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Monday, October 02, 2017 2:58 PM
To: Murray, Angela C <angie.murray@dhhs.nc.gov>
Subject: Send data from MFP07876072 10/02/2017 11:58

Scanned from MFP07876072
Date:10/02/2017 11:58
Pages:4
Resolution:200x200 DPI

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From: Hoke, Chris
Sent: Wednesday, October 04, 2017 1:56 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: Send data from MFP07876072 10/04/2017 13:52
Attachments: DOC100417-10042017135226.pdf

More form comments.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Wednesday, October 04, 2017 4:53 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Send data from MFP07876072 10/04/2017 13:52

Scanned from MFP07876072
Date:10/04/2017 13:52
Pages:2
Resolution:200x200 DPI

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From: Hoke, Chris
Sent: Friday, October 27, 2017 11:10 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: Send data from MFP07876072 10/27/2017 11:02
Attachments: DOC102717-10272017110226.pdf

Comments.

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Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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-----Original Message-----
From: Murray, Angela C
Sent: Friday, October 27, 2017 11:07 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: FW: Send data from MFP07876072 10/27/2017 11:02

Angie Murray
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http://publichealth.nc.gov/

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_____

-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Friday, October 27, 2017 2:03 PM
To: Murray, Angela C <angie.murray@dhhs.nc.gov>
Subject: Send data from MFP07876072 10/27/2017 11:02

Scanned from MFP07876072
Date:10/27/2017 11:02
Pages:2
Resolution:200x200 DPI

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From: Hoke, Chris
Sent: Friday, October 27, 2017 11:11 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: FW: Send data from MFP07876072 10/27/2017 11:05
Attachments: DOC102717-10272017110534.pdf

Comments.

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-----Original Message-----
From: Murray, Angela C
Sent: Friday, October 27, 2017 11:08 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: FW: Send data from MFP07876072 10/27/2017 11:05

Angie Murray
NC Department of Health and Human Services State Health Directors Office, Division of Public Health
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_____

-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Friday, October 27, 2017 2:06 PM
To: Murray, Angela C <angie.murray@dhhs.nc.gov>
Subject: Send data from MFP07876072 10/27/2017 11:05

Scanned from MFP07876072
Date:10/27/2017 11:05
Pages:4
Resolution:200x200 DPI

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1900 RULES INSERT

SUBMITTED: GLENN HINES

1. Page 7, line 11: Should say within 5’ of house
2. Page 14, 15H NCAC 18E.0201 General: Second line owner should say installer
3. Page 15, line 3: expire 5 years not expire 12 months
4. Page 15, line 8: installer name not owner name
5. Page 15, Line 34: installer signature not owner
6. Page 16, line 2: installer not owner
7. Page 16, line 4: installer not owner
8. Page 17, line7: installer not owner
9. Page 17, line 24: installer not owner
10. Page 25, line 11: equal to 5000 not 3000
11. Page 26, line 5: greater than 5000 not 3000
12. Page 31, line 6: less or equal 5000 not 3000
13. Page 31, line 7: less than or equal 5000 not 3000
14. Page 32, line 32: water softener device adds
15. Page 36, line1: above 12-gallon student is too high for school
16. Page 49, line 28: and repair area (if required) not repair area
17. Page 49, line 32: repair area (if required) not repair area
18. Page 50, line 3-17: Change to repair required
19. Page 54: any public water line elimate any water line and irrigation line
20. Page 55: any other onsite drain field, change from 20’ to 10’
21. Page 56, line 5 and 6: any property line 10’ not 25’
22. Page 66, line 6: shall be 1250 not 1500
23. Page 66, line 32 – 36: inside grease trap
24. Page 67, line 26: with 1’ scum
25. Page 68, line 33: all septic tanks shall have min. 2 access to finish grader or higher
26. Page 71, line 22: SDR35 or sch 40
27. Page 74, line 1: bed system shall be limited to 720 gpc
28. Page 74, line 74: why 50 percent?
29. Page 74, line 19-20: new
30. Page 76, line 13: elimate entirely
31. Page 87, line 12-13: explain
32. Page 87, line 22: elimate entirely
33. Page 93, line 28-29: elimate, only use for systems that are maintained, more costly for residential
34. Page 120, Line 34,4500 gallons or less
35. Page 121, line 15-16: why??no justification
36. Page 122, line 11-13: all septic tanks have risers to finish grade or 6” above
37. Page 122, line 25: not inlet
38. Page 123, line 13: able to use removable or knockout seals
39. Page 123, line 15: all outlet and inlet opening to finish grade or 6” above

40. Page 127, line 1: reapprove of pipe penetration and seals
41. Page 127, line 12-20: waste of time and man power
42. Page 127, line 26-36: needs to be rewritten (state job to enforce codes not suspend)\
43. Page 127,128,129,130: elimate the entire performance approvals of RWTS.this is already done by NSF. This section needs rewrite for approval by NSF
44. Page 135, line 15 thru Page 138: this section needs to rewrite without 6 to 24 month approvals for the state
45. Page 135, line 3 thru 36, Page 136 thru 144: this section needs rewrite or elimate entirely.90 days for approval should be 15 days
46. Page 148, line 13 thru 18: elimate installers from this if installers has approval from NCWCICB

0.07%	561
0.15%	411
0.22%	364.4
0.29%	302
0.36%	293.3
0.44%	254
0.51%	253.6
0.58%	230
0.66%	220
0.73%	218
0.80%	217.6
0.87%	215.6
0.95%	211
1.02%	206
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1.17%	197.7
1.24%	197.4
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1.38%	192.7
1.46%	192.3
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1.68%	188
1.75%	187.1
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1.89%	183
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2.11%	180
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2.48%	175
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2.69%	171
2.77%	170
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2.91%	170
2.99%	169.4
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3.20%	167
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4.59%	151.4
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4.73%	150
4.81%	149.5
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4.95%	146
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5.46%	140.5
5.54%	140
5.61%	139.6
5.68%	138.3
5.75%	137.2
5.83%	137
5.90%	136.9
5.97%	136
6.05%	136
6.12%	135.9
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6.77%	131
6.85%	131
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7.06%	129.9
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7.28%	129
7.36%	128.6
7.43%	128.2
7.50%	128
7.57%	128
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7.79%	126.3
7.87%	125
7.94%	124.5
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8.67%	121
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10.85%	111.2
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11.43%	110.4
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11.58%	110.2
11.65%	110
11.73%	110
11.80%	109.8
11.87%	109.7
11.94%	109
12.02%	109
12.09%	109
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12.38%	108
12.45%	107.7
12.53%	107

12.60%	107
12.67%	107
12.75%	106
12.82%	105.7
12.89%	105.3
12.96%	105.1
13.04%	105
13.11%	105
13.18%	104.8
13.26%	104.2
13.33%	104
13.40%	104
13.47%	104
13.55%	104
13.62%	103.5
13.69%	103.3
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13.84%	103
13.91%	103
13.98%	102.8
14.06%	102
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14.42%	101.8
14.49%	101.4
14.57%	101.3
14.64%	101
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14.79%	101
14.86%	101
14.93%	100.8
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15.95%	99
16.02%	99
16.10%	98.6
16.17%	98.5
16.24%	98.5
16.31%	98.4
16.39%	98.4
16.46%	98.3
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16.61%	98.1
16.68%	98.1
16.75%	98
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16.90%	97.7
16.97%	97.4
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17.33%	96.8
17.41%	96.7
17.48%	96.65
17.55%	96.4
17.63%	96.2
17.70%	96.2
17.77%	96.1
17.84%	95.9
17.92%	95.7
17.99%	95.6
18.06%	95.5
18.14%	95
18.21%	95
18.28%	95
18.35%	94.8
18.43%	94.7
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18.57%	94.6
18.65%	94.5
18.72%	94.3
18.79%	94.24

18.86%	94
18.94%	94
19.01%	93.9
19.08%	93.8
19.16%	93.4
19.23%	93.4
19.30%	93.36
19.37%	93.2
19.45%	93.1
19.52%	93.1
19.59%	92.7
19.66%	92.5
19.74%	92.2
19.81%	92.1
19.88%	92
19.96%	92
20.03%	92
20.10%	92
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20.25%	91.9
20.32%	91.9
20.39%	91.9
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20.76%	91
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21.19%	90.6
21.27%	90.5
21.34%	90.4
21.41%	90.4
21.49%	90.4
21.56%	90.32
21.63%	90.2
21.70%	90
21.78%	89.9
21.85%	89.8
21.92%	89.4

22.00%	89.4
22.07%	89.2
22.14%	89.2
22.21%	89.2
22.29%	89.2
22.36%	89.2
22.43%	89.1
22.51%	89.1
22.58%	88.9
22.65%	88.7
22.72%	88.6
22.80%	88.4
22.87%	88.3
22.94%	88.1
23.02%	88.1
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23.16%	88
23.23%	87.9
23.31%	87.3
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23.89%	86.7
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24.18%	86.2
24.25%	86.2
24.33%	86.1
24.40%	86.1
24.47%	86
24.54%	86
24.62%	86
24.69%	86
24.76%	85.95
24.84%	85.9
24.91%	85.9
24.98%	85.7
25.05%	85.7

25.13%	85.7
25.20%	85.7
25.27%	85.6
25.35%	85.5
25.42%	85.5
25.49%	85.5
25.56%	85.4
25.64%	85.4
25.71%	85.3
25.78%	85.3
25.86%	85.2
25.93%	85.2
26.00%	85
26.07%	85
26.15%	84.8
26.22%	84.8
26.29%	84.8
26.37%	84.8
26.44%	84.8
26.51%	84.7
26.58%	84.6
26.66%	84.5
26.73%	84.3
26.80%	84.2
26.88%	84.2
26.95%	84.1
27.02%	84.1
27.09%	84.1
27.17%	84
27.24%	83.9
27.31%	83.8
27.39%	83.8
27.46%	83.6
27.53%	83.5
27.60%	83.4
27.68%	83.2
27.75%	83.2
27.82%	83.2
27.90%	83.1
27.97%	83.1
28.04%	83
28.11%	83
28.19%	83

28.26%	82.9
28.33%	82.7
28.40%	82.7
28.48%	82.6
28.55%	82.5
28.62%	82.4
28.70%	82.4
28.77%	82.4
28.84%	82.3
28.91%	82
28.99%	82
29.06%	81.8
29.13%	81.6
29.21%	81.5
29.28%	81.5
29.35%	81.5
29.42%	81.5
29.50%	81.4
29.57%	81.4
29.64%	81.4
29.72%	81.4
29.79%	81.3
29.86%	81
29.93%	81
30.01%	81
30.08%	81
30.15%	80.9
30.23%	80.8
30.30%	80.8
30.37%	80.8
30.44%	80.6
30.52%	80.6
30.59%	80.6
30.66%	80.4
30.74%	80.4
30.81%	80.3
30.88%	80.2
30.95%	80.2
31.03%	80
31.10%	80
31.17%	80
31.25%	79.9
31.32%	79.8

31.39%	79.8
31.46%	79.7
31.54%	79.7
31.61%	79.6
31.68%	79.6
31.76%	79.52
31.83%	79.5
31.90%	79.5
31.97%	79.4
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32.12%	79
32.19%	79
32.27%	79
32.34%	78.9
32.41%	78.9
32.48%	78.8
32.56%	78.7
32.63%	78.6
32.70%	78.6
32.77%	78.6
32.85%	78.3
32.92%	78.3
32.99%	78.2
33.07%	78.1
33.14%	78.04
33.21%	78
33.28%	78
33.36%	77.9
33.43%	77.9
33.50%	77.8
33.58%	77.8
33.65%	77.8
33.72%	77.65
33.79%	77.6
33.87%	77.5
33.94%	77.5
34.01%	77.45
34.09%	77.4
34.16%	77.2
34.23%	77
34.30%	77
34.38%	77
34.45%	77

34.52%	77
34.60%	76.9
34.67%	76.8
34.74%	76.8
34.81%	76.8
34.89%	76.8
34.96%	76.7
35.03%	76.7
35.11%	76.7
35.18%	76.7
35.25%	76.6
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35.47%	76.48
35.54%	76.4
35.62%	76.4
35.69%	76.2
35.76%	76.1
35.83%	76
35.91%	76
35.98%	75.8
36.05%	75.8
36.13%	75.8
36.20%	75.8
36.27%	75.7
36.34%	75.7
36.42%	75.6
36.49%	75.3
36.56%	75.1
36.64%	75
36.71%	75
36.78%	75
36.85%	74.9
36.93%	74.9
37.00%	74.9
37.07%	74.8
37.14%	74.8
37.22%	74.8
37.29%	74.72
37.36%	74.7
37.44%	74.7
37.51%	74.7
37.58%	74.5

37.65%	74.3
37.73%	74.3
37.80%	74.3
37.87%	74.24
37.95%	74.2
38.02%	74.1
38.09%	74
38.16%	74
38.24%	73.8
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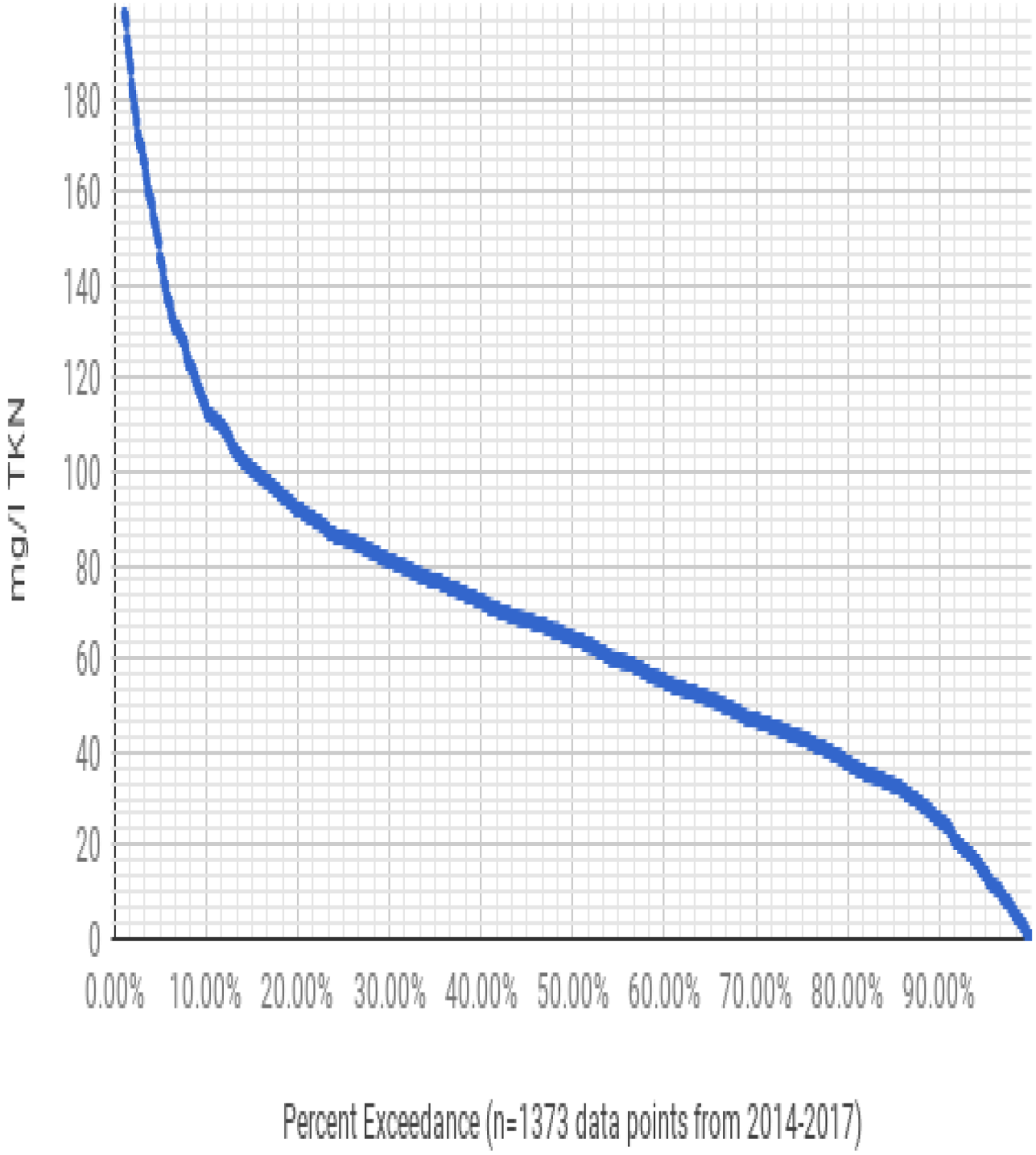
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95.99%	11.1
96.07%	11.04
96.14%	11
96.21%	11
96.29%	11
96.36%	11
96.43%	10.8
96.50%	10.7
96.58%	10.3
96.65%	10.3
96.72%	10
96.80%	9.3
96.87%	9.17
96.94%	9.03
97.01%	8.86
97.09%	8.74

97.16%	8.3
97.23%	8.27
97.31%	8.08
97.38%	8
97.45%	8
97.52%	7.84
97.60%	7.84
97.67%	7.5
97.74%	7.2
97.82%	6.74
97.89%	6.4
97.96%	6.39
98.03%	6.11
98.11%	5.9
98.18%	5.53
98.25%	5.3
98.32%	5.1
98.40%	4.82
98.47%	4.64
98.54%	4.46
98.62%	4.4
98.69%	4.3
98.76%	4
98.83%	3.94
98.91%	3.82
98.98%	3.2
99.05%	3.2
99.13%	3.17
99.20%	2.9
99.27%	2.8
99.34%	2.13
99.42%	1.78
99.49%	1.5
99.56%	1.3
99.64%	0.91
99.71%	0.7
99.78%	0.63
99.85%	0.52
99.93%	0.48
100.00%	0.44

TKN Influent



0.07%	561
0.15%	411
0.22%	364.4
0.29%	302
0.36%	293.3
0.44%	254
0.51%	253.6
0.58%	230
0.66%	220
0.73%	218
0.80%	217.6
0.87%	215.6
0.95%	211
1.02%	206
1.09%	198
1.17%	197.7
1.24%	197.4
1.31%	196
1.38%	192.7
1.46%	192.3
1.53%	190
1.60%	190
1.68%	188
1.75%	187.1
1.82%	186
1.89%	183
1.97%	181
2.04%	181
2.11%	180
2.18%	178
2.26%	178
2.33%	177
2.40%	175
2.48%	175
2.55%	172
2.62%	172
2.69%	171
2.77%	170
2.84%	170
2.91%	170
2.99%	169.4
3.06%	169
3.13%	167
3.20%	167
3.28%	166
3.35%	166
3.42%	164
3.50%	163
3.57%	162

3.64%	160
3.71%	160
3.79%	160
3.86%	159
3.93%	158
4.01%	158
4.08%	158
4.15%	157
4.22%	155
4.30%	154
4.37%	153.7
4.44%	153.1
4.52%	153
4.59%	151.4
4.66%	151
4.73%	150
4.81%	149.5
4.88%	149
4.95%	146
5.03%	145.5
5.10%	145
5.17%	144.8
5.24%	144
5.32%	143
5.39%	141
5.46%	140.5
5.54%	140
5.61%	139.6
5.68%	138.3
5.75%	137.2
5.83%	137
5.90%	136.9
5.97%	136
6.05%	136
6.12%	135.9
6.19%	134
6.26%	133.3
6.34%	133.1
6.41%	132.3
6.48%	132.1
6.55%	131
6.63%	131
6.70%	131
6.77%	131
6.85%	131
6.92%	131
6.99%	130
7.06%	129.9
7.14%	129.5
7.21%	129.1
7.28%	129
7.36%	128.6
7.43%	128.2
7.50%	128
7.57%	128

7.65%	128
7.72%	127
7.79%	126.3
7.87%	125
7.94%	124.5
8.01%	124
8.08%	123
8.16%	123
8.23%	123
8.30%	123
8.38%	122.6
8.45%	122
8.52%	122
8.59%	122
8.67%	121
8.74%	121
8.81%	120
8.89%	120
8.96%	119.1
9.03%	118.8
9.10%	118
9.18%	118
9.25%	117.9
9.32%	117
9.40%	117
9.47%	117
9.54%	116
9.61%	115.3
9.69%	115
9.76%	115
9.83%	115
9.91%	114.4
9.98%	114
10.05%	113
10.12%	112.5
10.20%	112.5
10.27%	112.4
10.34%	112.4
10.42%	112
10.49%	112
10.56%	112
10.63%	112
10.71%	111.8
10.78%	111.5
10.85%	111.2
10.92%	111
11.00%	111
11.07%	111
11.14%	111
11.22%	111
11.29%	110.8
11.36%	110.8
11.43%	110.4
11.51%	110.2
11.58%	110.2

11.65%	110
11.73%	110
11.80%	109.8
11.87%	109.7
11.94%	109
12.02%	109
12.09%	109
12.16%	108.8
12.24%	108.3
12.31%	108
12.38%	108
12.45%	107.7
12.53%	107
12.60%	107
12.67%	107
12.75%	106
12.82%	105.7
12.89%	105.3
12.96%	105.1
13.04%	105
13.11%	105
13.18%	104.8
13.26%	104.2
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13.40%	104
13.47%	104
13.55%	104
13.62%	103.5
13.69%	103.3
13.77%	103
13.84%	103
13.91%	103
13.98%	102.8
14.06%	102
14.13%	102
14.20%	102
14.28%	102
14.35%	102
14.42%	101.8
14.49%	101.4
14.57%	101.3
14.64%	101
14.71%	101
14.79%	101
14.86%	101
14.93%	100.8
15.00%	100.7
15.08%	100.3
15.15%	100.2
15.22%	100.2
15.29%	100
15.37%	100
15.44%	100
15.51%	100
15.59%	99.6

15.66%	99.4
15.73%	99.25
15.80%	99.2
15.88%	99.1
15.95%	99
16.02%	99
16.10%	98.6
16.17%	98.5
16.24%	98.5
16.31%	98.4
16.39%	98.4
16.46%	98.3
16.53%	98.2
16.61%	98.1
16.68%	98.1
16.75%	98
16.82%	97.8
16.90%	97.7
16.97%	97.4
17.04%	97.28
17.12%	97.1
17.19%	96.9
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17.55%	96.4
17.63%	96.2
17.70%	96.2
17.77%	96.1
17.84%	95.9
17.92%	95.7
17.99%	95.6
18.06%	95.5
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18.57%	94.6
18.65%	94.5
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18.79%	94.24
18.86%	94
18.94%	94
19.01%	93.9
19.08%	93.8
19.16%	93.4
19.23%	93.4
19.30%	93.36
19.37%	93.2
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19.52%	93.1
19.59%	92.7

19.66%	92.5
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20.83%	90.9
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20.98%	90.8
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21.41%	90.4
21.49%	90.4
21.56%	90.32
21.63%	90.2
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21.78%	89.9
21.85%	89.8
21.92%	89.4
22.00%	89.4
22.07%	89.2
22.14%	89.2
22.21%	89.2
22.29%	89.2
22.36%	89.2
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22.87%	88.3
22.94%	88.1
23.02%	88.1
23.09%	88
23.16%	88
23.23%	87.9
23.31%	87.3
23.38%	87.1
23.45%	87.03
23.53%	87
23.60%	87

23.67%	86.9
23.74%	86.8
23.82%	86.8
23.89%	86.7
23.96%	86.6
24.03%	86.4
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24.40%	86.1
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24.54%	86
24.62%	86
24.69%	86
24.76%	85.95
24.84%	85.9
24.91%	85.9
24.98%	85.7
25.05%	85.7
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25.78%	85.3
25.86%	85.2
25.93%	85.2
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26.07%	85
26.15%	84.8
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26.80%	84.2
26.88%	84.2
26.95%	84.1
27.02%	84.1
27.09%	84.1
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27.24%	83.9
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27.68%	83.2
27.75%	83.2
27.82%	83.2
27.90%	83.1
27.97%	83.1
28.04%	83
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28.77%	82.4
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29.06%	81.8
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30.59%	80.6
30.66%	80.4
30.74%	80.4
30.81%	80.3
30.88%	80.2
30.95%	80.2
31.03%	80
31.10%	80
31.17%	80
31.25%	79.9
31.32%	79.8
31.39%	79.8
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31.54%	79.7
31.61%	79.6

31.68%	79.6
31.76%	79.52
31.83%	79.5
31.90%	79.5
31.97%	79.4
32.05%	79.4
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32.19%	79
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32.34%	78.9
32.41%	78.9
32.48%	78.8
32.56%	78.7
32.63%	78.6
32.70%	78.6
32.77%	78.6
32.85%	78.3
32.92%	78.3
32.99%	78.2
33.07%	78.1
33.14%	78.04
33.21%	78
33.28%	78
33.36%	77.9
33.43%	77.9
33.50%	77.8
33.58%	77.8
33.65%	77.8
33.72%	77.65
33.79%	77.6
33.87%	77.5
33.94%	77.5
34.01%	77.45
34.09%	77.4
34.16%	77.2
34.23%	77
34.30%	77
34.38%	77
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34.52%	77
34.60%	76.9
34.67%	76.8
34.74%	76.8
34.81%	76.8
34.89%	76.8
34.96%	76.7
35.03%	76.7
35.11%	76.7
35.18%	76.7
35.25%	76.6
35.32%	76.6
35.40%	76.6
35.47%	76.48
35.54%	76.4
35.62%	76.4

35.69%	76.2
35.76%	76.1
35.83%	76
35.91%	76
35.98%	75.8
36.05%	75.8
36.13%	75.8
36.20%	75.8
36.27%	75.7
36.34%	75.7
36.42%	75.6
36.49%	75.3
36.56%	75.1
36.64%	75
36.71%	75
36.78%	75
36.85%	74.9
36.93%	74.9
37.00%	74.9
37.07%	74.8
37.14%	74.8
37.22%	74.8
37.29%	74.72
37.36%	74.7
37.44%	74.7
37.51%	74.7
37.58%	74.5
37.65%	74.3
37.73%	74.3
37.80%	74.3
37.87%	74.24
37.95%	74.2
38.02%	74.1
38.09%	74
38.16%	74
38.24%	73.8
38.31%	73.8
38.38%	73.7
38.46%	73.7
38.53%	73.5
38.60%	73.44
38.67%	73.4
38.75%	73.4
38.82%	73.4
38.89%	73.3
38.97%	73.3
39.04%	73.3
39.11%	73.2
39.18%	73
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39.33%	73
39.40%	72.8
39.48%	72.8
39.55%	72.8
39.62%	72.6

39.69%	72.5
39.77%	72.5
39.84%	72.5
39.91%	72.4
39.99%	72.4
40.06%	72.2
40.13%	72.1
40.20%	72
40.28%	72
40.35%	72
40.42%	72
40.50%	71.9
40.57%	71.7
40.64%	71.6
40.71%	71.4
40.79%	71.4
40.86%	71.1
40.93%	71
41.01%	71
41.08%	71
41.15%	71
41.22%	71
41.30%	71
41.37%	70.9
41.44%	70.9
41.51%	70.8
41.59%	70.6
41.66%	70.56
41.73%	70.5
41.81%	70.5
41.88%	70.5
41.95%	70.4
42.02%	70.2
42.10%	70
42.17%	70
42.24%	70
42.32%	70
42.39%	69.9
42.46%	69.9
42.53%	69.8
42.61%	69.8
42.68%	69.8
42.75%	69.7
42.83%	69.7
42.90%	69.6
42.97%	69.6
43.04%	69.5
43.12%	69.5
43.19%	69.25
43.26%	69.2
43.34%	69.2
43.41%	69.1
43.48%	69.1
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43.70%	69
43.77%	68.9
43.85%	68.9
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43.99%	68.8
44.06%	68.7
44.14%	68.65
44.21%	68.64
44.28%	68.6
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44.87%	68.3
44.94%	68.3
45.01%	68.3
45.08%	68.3
45.16%	68.2
45.23%	68.2
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45.52%	67.9
45.59%	67.9
45.67%	67.8
45.74%	67.7
45.81%	67.7
45.88%	67.6
45.96%	67.6
46.03%	67.5
46.10%	67.5
46.18%	67.5
46.25%	67.4
46.32%	67.4
46.39%	67.4
46.47%	67.3
46.54%	67.3
46.61%	67.28
46.69%	67.2
46.76%	67.2
46.83%	67.1
46.90%	67.1
46.98%	67
47.05%	67
47.12%	66.9
47.20%	66.8
47.27%	66.7
47.34%	66.6
47.41%	66.6
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47.56%	66.4
47.63%	66.4

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48.00%	66
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48.87%	65.3
48.94%	65.2
49.02%	65.2
49.09%	65.1
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50.91%	63.8
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58.70%	56.2
58.78%	56.2
58.85%	56.08
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58.99%	56
59.07%	56
59.14%	56
59.21%	55.92
59.29%	55.9
59.36%	55.9
59.43%	55.9
59.50%	55.7
59.58%	55.6
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59.72%	55.5
59.80%	55.5
59.87%	55.4
59.94%	55.3
60.01%	55.2
60.09%	55
60.16%	55
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60.31%	54.8
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60.67%	54.6
60.74%	54.32
60.82%	54.3
60.89%	54.3
60.96%	54.1
61.03%	54.1
61.11%	54.05
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61.33%	54
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61.47%	53.9
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63.73%	52.3
63.80%	52.2
63.87%	52.1
63.95%	52.1
64.02%	52.1
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64.75%	51.6
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65.40%	51
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68.46%	48.1
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68.61%	47.7
68.68%	47.7
68.75%	47.5
68.83%	47.4
68.90%	47.4
68.97%	47.36
69.05%	47.3
69.12%	47.2
69.19%	47.2
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76.62%	41.3
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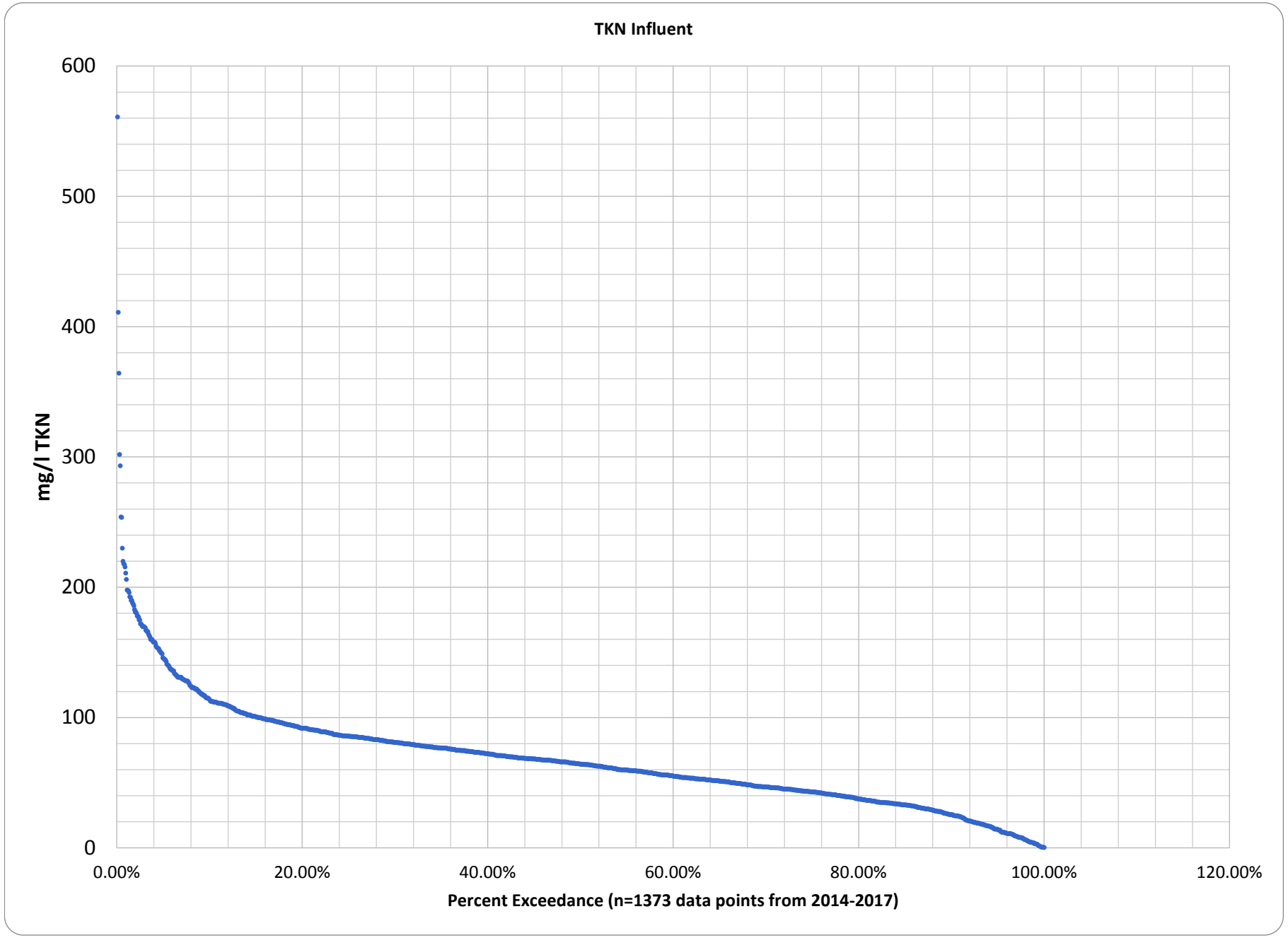
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91.48%	22
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93.01%	18.8
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93.74%	17.24
93.81%	17.1
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94.32%	15.8
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94.46%	15.7
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94.61%	14.6
94.68%	14.5
94.76%	14.5
94.83%	14.5
94.90%	14.4
94.97%	14.32
95.05%	13.8
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95.34%	12.3
95.41%	12.2
95.48%	12
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95.70%	11.99

95.78%	11.6
95.85%	11.6
95.92%	11.4
95.99%	11.1
96.07%	11.04
96.14%	11
96.21%	11
96.29%	11
96.36%	11
96.43%	10.8
96.50%	10.7
96.58%	10.3
96.65%	10.3
96.72%	10
96.80%	9.3
96.87%	9.17
96.94%	9.03
97.01%	8.86
97.09%	8.74
97.16%	8.3
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97.31%	8.08
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97.45%	8
97.52%	7.84
97.60%	7.84
97.67%	7.5
97.74%	7.2
97.82%	6.74
97.89%	6.4
97.96%	6.39
98.03%	6.11
98.11%	5.9
98.18%	5.53
98.25%	5.3
98.32%	5.1
98.40%	4.82
98.47%	4.64
98.54%	4.46
98.62%	4.4
98.69%	4.3
98.76%	4
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98.91%	3.82
98.98%	3.2
99.05%	3.2
99.13%	3.17
99.20%	2.9
99.27%	2.8
99.34%	2.13
99.42%	1.78
99.49%	1.5
99.56%	1.3
99.64%	0.91
99.71%	0.7

99.78%	0.63
99.85%	0.52
99.93%	0.48
100.00%	0.44


TKN Influent
600
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mg/l TKN
0.00%
20.00%
40.00%
60.00%
80.00%
100.00%
120.00%
Percent Exceedance (n=1373 data points from 2014-2017)

Comments on Rules 10-27-17

Kathy Morris, REHS # 790, SSSNC # 12227, Inspector # 4180-I, PG(retired) # 1118

Agri-Waste Technology, Inc.

501 N. Salem St, # 203

Apex NC 27502

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kmorris@agriwaste.com

.1103 Control Panels

(h)(1) minimum effluent depth in pump tank

The effect of increasing this from 12" to 18" will be to necessitate larger pump tanks on some sites where low LTARS require larger fields and thus larger dosing volumes. I think that " 12" or pump submergence per manufacturer's recommendation, whichever is greater, is adequate.

.1106 Pressure dosed gravity

(a)(1) Would like to see this as "minimum of 2' pressure head" instead of an absolute. One size does *not* fit all. I have encountered circumstances on oddly-shaped sites utilizing more than one manifold where a slightly higher head in one manifold was needed to balance flows among lines of different lengths across the entire system. And on retrofits, repairs, or other circumstances where supply line diameter is unusual, higher heads might be desirable in order to maintain adequate scour velocity.

Comments on LPP Rules 10-26-17

Kathy Morris, REHS # 790, SSSNC # 12227, Inspector # 4180-I, PG(retired) # 1118

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501 N. Salem St, # 203

Apex NC 27502

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kmorris@agriwaste.com

.0907 (a) 3 to 6' pressure head

See comment below on (e)(7)(A)

.0907 (d)(2) and (e) 3, lateral spacing

Total trench length is calculated based on a 5' minimum trench spacing, but if for some reason a 2'-wide trench is desired, the required spacing becomes 6' instead of 5'. This means that on space-limited sites, a 2'-wide trench might not be possible if the trench length was calculated using 5' spacing.

.0907 (e)(4), depth of media below pipe

In .1957, this was 5", going back to the days when we were putting LPP laterals in 4-6" wide ditch-witch trenches. As trenches have gotten wider, available storage below the pipe has increased. Advent of sleeved laterals made it impossible to cover a 4" sleeve placed 5" above the trench bottom with 8" of gravel, and increasing the under-pipe to 6" just makes it worse. So – this appears to be a pointless rule mod.

Although "other approved media" is mentioned, if one applies either 5" or 6" under-pipe requirements it appears to exclude polystyrene aggregate as currently available with a built-in sleeve centered in a bundle. In a 12" bundle there's only 4" below the sleeve. And of course, any bundle diameter greater than 8", regardless of where the sleeve is, means either a greater trench depth to accommodate thicker media (which spoils LPP's applicability in 24"-deep soils); or the need to import a fill cover (which wouldn't be appropriate on much of a slope).

.0907 (e)(5)(A) lateral length

The only generally-available reference material that I know of for this is the graph in Steven Berkowitz' 1986 paper. I've gone through the calculations on a few projects and have found that the graph is somewhat conservative. Here is as good a place as any to suggest that such widely-used reference materials be updated (if they haven't already) and put on the branch website.

.0907 (e)(6)(A), orifice protection

This appears to have the effect of *requiring* orifice shields and gravel if one wishes to place LPP trenches in minimum-depth soil, because 4" sleeves stick up too far about the minimum 8" media depth, and round bundles with center sleeves can't meet the under-pipe requirement. Is this the intention?

.0907 (e)(7)(A) and (14)(A) three-foot elevation difference

I don't know which came first: the 3-foot elevation difference limit in the Rules, or the 3-foot elevation difference limit in the 1982 Sea Grant publication that has served as the basic guidance for LPP designers for 35 years. The Sea Grant pub doesn't include a bibliography or other background for its statements of "what is best". It states the desirability of pressure heads from 2 to 4 feet, because "higher pressures cause local scouring", but then its 3' range allows heads of up to 5'.

Wake County's local rules have long allowed heads up to 7'. In my opinion, the advent of holes pointed up inside sleeves has eliminated potential for scouring. So… why impose this limit in elevation change across a single subfield? On steeper slopes, it requires multiple valves for adjusting pressure head. Even in the Piedmont, let alone the mountains, it can lead to subfields with only one or two laterals. I can think of two drawbacks to a greater range. One, already observed in Wake, is the problem of measuring/observing head in a 7+' standpipe on a bottom lateral. They tend to fall over under their own weight. However, few regulators and fewer operators set standpipes up on every lateral unless they're doing some serious troubleshooting – a sadly rare occurrence. The other drawback is a possible need to increase the diameter of the manifold relative to the laterals to accommodate an increased number of connections, but to some extent that cost is offset by the need for fewer valves. So – I think some kind of range limit might be appropriate, mainly to make it easier to achieve a gradual taper in flow rate down a slope with step-ups at tops of successive subfields, but I think the range should be increased to at least 5'.

The proposed increase in minimum pressure head from 2' to 3', if nothing else, is going to confuse a high percentage of operators. Thousands of existing LPP's were designed at 2', and operators have been taught for decades that in the absence of a set of plans, assume 2' (except in Wake). And a regulatorily-supported increase in minimum design head is going to encourage that subset of operators who believe in increasing the head on an existing system to more closely approach design PDR over actually troubleshooting a system. I think it's reasonable to start with a higher head on a flatter site, but I see no advantage to starting at a higher head on any significant slope.

.0907 (e) (7)(C) My comments have already been submitted on this, but here it is again:

When considering the amount of "taper" in flow rate from upper lines to lower lines, "10 to 30 %" doesn't adequately address the effect of the *number* of laterals, and "elevation difference" doesn't adequately address the horizontal component of slope. The amount of flow reduction possible from any lateral to the next one down is mostly limited by the available hole sizes; and for systems with many laterals, it's often not possible to keep the sum of the steps from one lateral to the next under 30% because the steps can't be made small enough. (For laterals of varying lengths we compare "instantaneous flow rate" instead of "flow per lateral"to identify the reduction between laterals.) In my opinion, the more laterals there are on a given slope, the greater overall reduction is needed to account for subsurface lateral water movement between trenches. The other component of "taper", draining volume of manifold, also grows with the number of laterals. I think a less restrictive way to address the desire to reduce the flow rate down the field is to consider the change from one lateral to the next rather than a top-to- bottom overall restriction. The problem with trying to quantify this approach, however, is that saying something like " at least" or "not more than" x% from one lateral to the next lowest" doesn't take into account the elevation difference between adjacent laterals, which can vary from top to bottom of the field, or varying lengths of manifold segments between adjacent laterals on sites with varying topography, or where the manifold path isn't perpendicular to the laterals (such as along an artificial boundary like a property line). It also wouldn't allow fiddling with the flow in bottom laterals of successive subfields to provide a little extra storage capacity for a greater draining volume, which has been a common design practice for a long time.

On almost-but-not-really flat sites, trying to get as *much* as a 10% reduction can lead to uneven distribution across the field.

I agree that reduction across a lateral field on a slope is desirable, but LPP sites and the flow charts that represent them are so highly variable that one-size-fits-all regulation does not, in fact, fit. If nothing else, I would like to see language added after that percentage range that allows "reasonable variation to accommodate unusual numbers of laterals and/or site-specific topography".

.0907 (e)(7)(D)

This is the only mention of “multiple throttling valves”. What exactly is meant by “multiple”? More than one? I think it would be useful to address preferred location for control valves more so than how many. See comments on (e)(12) below.

.0907 (e) (10)

This seems to fly right in the face of (e) (7)(C) by *limiting* the reduction in flow across a subfield to 15%.

Clarification needed on "1st and last". It's obvious when a manifold is fed from one end or the other, where I would assume "first" is the one closest to where the supply line enters the manifold, but what about feeding a manifold from its center? Does that give you two "first" laterals?

What's the difference between "flow rate" and " discharge rate"? Terminology should be consistently applied. To be consistent with the operator curriculum, "pump delivery rate" is a candidate, although there is some disagreement on whether it's okay to use that term for flows at other than "designed" head.

.0907 (e)(11)(B) reduction fittings

Why require Sch. 80 here, when the components on either side are Sch. 40 ? (e)(1) and (e)(9)

.0907 (e)(12) gate valves

Another terminology issue – gate valves is a more common term than the "throttling" valves mentioned only once (above). Could call them all "pressure regulating valves" to distinguish from isolation valves.

100' sounds purely arbitrary. I think it would be a better idea to get rid entirely of a pressure-regulating valve in the pump tank (replace it with an on-off isolation ball or globe valve) and specify that field or subfield pressure-regulating valves should be located together at the distal end of the supply line serving geographically-contiguous fields or subfields.

.0907 (e)(15) cover over the dispersal field?

This should be modified to specify 4" cover over the *trench media* rather than the dispersal field, unless the requirement is now to import fill over the entire lateral field.

Rule Number	Section	Change Needed
15A NCAC 18E .0103	Incorporation By Reference ASTM international	Add ASTM 1227 – 13 Precast Concrete Septic Tanks
15A NCAC 18E .0801	Tank Sizing	Incorporate Tank Sizing per ASTM 1227 – 13
15A NCAC 18E .0805	Tank Structural Integrity and Leak Testing	Incorporate Tank Performance, Integrity and Leak Testing Standards per ASTM 1227 – 13
15A NCAC 18E .1301	Operation and Maintenance of Wastewater Systems	Change IId to IIg to correspond to original IIIg innovative approval. Many counties with computer generated permits had to add IIg status to track "accepted" trench products as compared to IIa and IIc trenches and to differentiate from the IIIg innovative trench permits.
15A NCAC 18E .1400	Approval of Tanks and Appurtenances	Incorporate Septic Tank Standards per ASTM 1227 – 13
15A NCAC 18E .0506 15A NCAC 18E .0601 (e)	Saprolite	Treat saprolite the same as parent material and soil with regards to horizontal setbacks. Many coastal soil profiles consist of an A horizon over a C horizon (parent material) profile and do not follow the same setback requirements as saprolite even though both are taxonomically classified as a C horizons.
15A NCAC 18E .0504	Soil Wetness Conditions	Incorporate use of IRIS tubes for determination of soil saturation height.
15A NCAC 18E .0503(3)	Mineralogy	Expansive Mineralogy. I feel there should be another option for clay soils that are not formed from residuum. For example many coastal and mountain soils are classified as having mixed mineralogy. However this mixed mineralogy is not necessarily from expansive minerals. The mineralogy is from the colluvium from which the soils are formed. Mixed mineralogy

		meaning not more than 50% of any one mineral.
15A NCAC 18E .0105 15A NCAC 18E .0301 15A NCAC 18E .1301	Definitions Owners Responsibilities Operation and Maintenance	I like the Operation and Maintenance options for IIIb systems however enforcement actions must be in place for properties that do not follow requirements for inspection frequency. Also have a definition for Non-compliant system status?

Subchapter 18E comments submitted by: David Lentz, P.E., Infiltrator Water Technologies, Salisbury, NC, submitted on October 31, 2017

(Name)

Attachments:

Attachment 1 - Quick4 Plus Standard LP Chamber Controlled Demonstration Approvals
Attachment 2 - Department Comments, Concerns, and Demands for Scientific Data for the Installation the Quick4 Plus Standard LP Chamber in 20 Inches of Soil
Attachment 3 - July 24, 2014 Report on Dry Season Monitoring Required after Department Overrides I&E Committee Ballot to Accept Wet Season Monitoring Data and Move to Innovative Approval
Attachment 4 - June 3, 2014 I&E Committee Meeting Minutes Memorializing Favorable Committee Ballot to Move Quick4 Plus Standard LP Chamber to Innovative Status
Attachment 5 - July 18, 2017 I&E Committee Meeting Minutes Memorializing the Inconclusive Status of the Quick4 Plus Standard LP Chamber Controlled Demonstration Field Investigation

Rule Number	Page Number	Line Number	Comment	Proposed Change
Technical Comments				
0105	7	3	The terms "accepted", "innovative", and "provisional" systems are not defined.	Suggest adding a definitions, with reference to G.S. 130A-343, particularly given that the terms are capitalized throughout the rule.
105	9	34	"Infiltrative surface" means the designated interface where effluent moves from dispersal media or a distribution device into treatment media, naturally occurring soil, or fill. The definition of "long term acceptance rate" does not include fill at the beginning of line 34, but it should.	Propose following change: (41) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil, fill, or saprolite in a wastewater system after long-term use.
0105	14	10	The term "wastewater system" is used throughout the draft rules, but is not defined.	Suggest adding a definition, given the large number of references in the rule.
0105	8	19	Chambers, expanded polystyrene, and drip tubing are not described in the rules, except in the definitions.	Suggest removing dispersal media from definitions that are approved under current Rule .1969 because these products are regulated via their approvals.
0105	8	20	The definition of dispersal media indicates that drip tubing stores effluent flows prior to infiltration. This is false, as effluent is stored in a pump tank for a drip dispersal system.	Remove reference to drip tubing or amend definition of dispersal media to make it clear that drip tubing does not store effluent.
0207	21	10	House Bill 765 from the 2015 legislative session states the following: Where the professional engineer's designs, plans, and specifications call for the installation of a conventional wastewater system, such designs, plans, and specifications shall allow for the installation of an accepted system in lieu of a conventional system in accordance with the accepted system approval. This legislative provision for accepted systems was omitted from the rules.	Add the allowance for accepted systems at the end of Rule .0207(d) on line 34 on page 21, as follows: Accepted systems are allowed in accordance with G.S. 130A-336.1(e)(5).

Rule Number	Page Number	Line Number	Comment	Proposed Change
505	48	20	I opposed the rule allowance for 18 inches of soil depth. NCAC 18A .1956(1) requires "at least 24 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions" for conventional systems. The Department has required Infiltrator Water Technologies to undertake a 7-year-long (CDWS-2010-1, issued May 24, 2010 and presently active via CDWS 2010-I-R2B), extremely expensive field performance study of chambers in order to support an approval for the use of 8-inch-high chambers in 20 inches of soil. Infiltrator is not aware of any scientific studies conducted by the State of North Carolina to support the allowance of an 18-inch soil depth, such as in-ground installations of conventional systems with wet and dry season hydraulic performance monitoring and measurement of household water use. Without such support, an arbitrary change in regulation is unwarranted. Making such a change represents a double standard being applied between regulator and regulants, which is unacceptable. Its commensurate with the Department issuing a non-proprietary innovative approval for an aerobic, TS-II advanced wastewater pretreatment system (bubbler with a specified air flow installed in a tank of a certain volume and size), with no supporting scientific studies on the performance of the system and its ability to adequately meet TS-II wastewater quality standards. The subject of Infiltrator's above-referenced study, the Quick4 Plus Standard LP chamber, provides 2.44 sf/lf of unobstructed open bottom area when installed in a 36-inch-wide trench, and is rated at 100% of the sizing of a conventional gravel trench at 3 sf/lf. Conventional trenches are different technologies compared to a chamber, meaning that conclusions drawn from CDWS-2010-1 and subsequent 20-inch-soil approvals are not relevant or transferrable in any way to conventional systems. Conventional systems do not provide an unobstructed open bottom area like chambers and have reduced hydraulic capabilities as a result. Assuming a porosity of 35%, the unobstructed open bottom area is 1.05 sf/lf for a 3-ft-wide conventional trench, which is 57% less than the unobstructed open bottom area provided by the Quick4 Plus Standard LP chamber, resulting in significantly reduce hydraulic capacity. While the sizing is the same between conventional systems and the chamber, the infiltrative capacity is vastly different. Applying the Rule. 1969 criteria of structural integrity, chemical durability, hydraulic performance and wastewater treatment, there is no defensible way to compare the Infiltrator chamber study for use with conventional systems and 18 inches of soil depth. Since 2010, the Department has repeatedly demanded from Infiltrator the production of scientific justification for the placement of 8-inch-high chambers in 20 inches of naturally occurring soil in order for this configuration to be approved as innovative. The initial and current controlled demonstration/provisional approvals describing the required information are provided in Attachment 1. On more than one occasion, Infiltrator Water Technologies has petitioned the Department to end the above-referenced field studies and move to innovative status and been denied, with the Department requiring the production of additional scientific justification. For example: - November 27, 2013 OSWP Comments and Concerns, Infiltrator's Application for Innovative System Approval Modification, IWWS-2010-1: Quick4 Plus Standard LP Chamber - Reviewers express doubts and technical concerns regarding the installation of an 8-inch-high chamber in 20 inches of soil (Attachment 2). - June 3, 2014 I&E Committee meeting - A motion and second were carried for approval of the coastal plain controlled demonstration to move to innovative based on data for 55 installed systems monitored during the 2014 wet season, where the system performance met the terms of the controlled demonstration approval. The Department opted to override the favorable I&E Committee ballot (Attachment 4) and require the collection of additional dry season data, leading to the submission of a dry-season report on July 24, 2017 (I&E Committee meeting minutes and subsequent dry season report Attachments 3 and 4). - Following the issuance of an innovative approval for the coastal plain on October 31, 2014, the Department issued a Piedmont-based controlled demonstration approval directing the collection of additional field data for 8-inch-high chambers installed in 20 inches of soil (Attachment 1). This study has not been completed and is therefore inconclusive, yet the Department proposes allowing an 18-inch soil depth on a statewide basis. - Present day - The Department continues to require the collection of field data from Piedmont sites to support a statewide approval of the Quick4 Plus Standard LP chamber in 20 inches of soil (Attachment 5), while proposing the installation of conventional systems in 18 inches of soil for the less-robust conventional technology in its rules with no supporting science. The Department needs to adhere to the same standards of care and scientific investigation that it holds the regulated community to adhere to.	Restore all requirements from current-day NCAC 18A .1900 requiring a minimum total thickness of naturally occurring soil above saprolite, rock, or soil wetness conditions, or demonstrate to industry stakeholders that the Department has undertaken a scientific study of the same breadth and scope as has been required under CDWS-2010-1 and its successor approvals to generate defensible evidence supporting the proposed minimum 18-inch soil depth profile.
801	63	8	Upsizing of the septic tank when a garbage disposal is used is an added homebuilding expense that is not required in South Carolina, Tennessee, or Virginia.	Remove the third column of Table XIII requiring additional volume for homes with a garbage disposal.

Rule Number	Page Number	Line Number	Comment	Proposed Change
0805	67	30	I support the requirement for water filling septic tanks manufactured using porous materials for 24 hours , such that the concrete is allowed to become saturated prior to the watertightness test. This allows the tester to differentiate between loss of water volume due to absorption by the concrete and loss of water volume due to leakage. Non-porous materials, such as thermoplastics and FRP, do not require a pre-test saturation step and can be watertightness tested immediately after being filled. This test method is supported by the watertightness testing procedure in IAPMO/ANSI Z1000-2013, which recognizes and provides a methodology for porous and non-porous materials. I serve as the chairman of the IAPMO/ANSI Z1000-2013 Technical Subcommittee.	No proposed change
0902	73	6	I support the application of a bill of lading requirement, similar to Innovative wastewater system approval IWWS-2002-03-R3, to help verify that an adequate quantity of aggregate has been placed in the construction of a conventional trench. Installers in some areas of North Carolina verbally report using between 8 and 12 tons of stone to construct 100 feet of 3-foot-long by 1-foot-high trench under current Rule .1955. The depth of these trenches is not being verified during inspection. This equates to a sizing reduction by eliminating available sidewall infiltrative area. Using the widely recognized conversion factor of 1.5 tons/cubic yard of crushed stone, 100 feet of rock trench should require approximately 16.7 tons of stone ([3'W x 1'H x 100' L x 1.5 tons/cy] / [27 cy/cf] = 16.7 tons of stone). Use of less stone than 15 to 16.7 tons/100 feet equates to height and volume storage reductions compared to the minimum requirements in Rule .1955 and represents a preventable violation of the rule.	No proposed change
905	76	3	NCAC 18A .1956(3)(a)(ii) has required pressure dosing prefabricated permeable block panel systems where the design flow is more than 480 gallons per day. Proposed 15A NCAC 18E .0905 lifts this requirement seemingly without scientific justification.	Restore the requirement from current-day NCAC 18A .1956(3)(a)(ii) for pressure dosing prefabricated permeable block panel systems where the design flow is more than 480 gallons per day or share the scientific justification (i.e., provisional study or equivalent) with industry stakeholders.
907	80 81 81	21 1 10	The geometric and pipe shielding requirements applied to a gravel LPP system are not applicable to some PIA systems and differentiation needs to be added so LHDs understand that PIA systems do not need to adhere to these configuration specifications.	Proposed change: (e) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following, unless otherwise allowed in a PIA approval:
901 904 907	69 74 81	13 34 1	I opposed these rule allowances. NCAC 18A .1956(1) requires "at least 24 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions" for conventional systems. This requirement applies to gravelless trenches in NCAC 18A .1956(3)(a) and low pressure systems in NCAC 18A .1957(a). Both systems require at least 12 inches of soil above the infiltrative surface for installation. Proposed 15A NCAC 18E .0901, combined with 15A NCAC 18E .0904(c) and 15A NCAC 18E .0907((e)(4), remove this requirement for large diameter pipe and LPP systems, respectively, allowing installation in 20 inches of soil. The Department has required Infiltrator Water Technologies to undertake a 7-year-long (CDWS-2010-1, issued May 24, 2010 and presently active via CDWS 2010-I-R2B), extremely expensive field performance study of chambers in order to support an approval for the use of 8-inch-high chambers in 20 inches of soil. This configuration would be permissible for LDP and LPP systems under the proposed rules, apparently without supporting scientific justification or field research by the Department. Infiltrator is not aware of any scientific studies conducted by the State of North Carolina to support this change in regulation, such as in-ground installations of the proposed configuration with wet and dry season hydraulic performance monitoring and measurement of household water use. Without such support for LDP and LPP dispersal technologies, such an arbitrary change in regulation is unwarranted. Making such a change represents a double standard being applied between regulator and regulants, which is unacceptable. Its commensurate with the Department issuing a non-proprietary innovative approval for an aerobic, TS-II advanced wastewater pretreatment system (bubbler with a specified air flow installed in a tank of a certain volume and size), with no supporting scientific studies on the performance of the system and its ability to adequately meet TS-II wastewater quality standards. The subject of Infiltrator's above-referenced study, the Quick4 Plus Standard LP chamber, provides 2.44 sf/lf of unobstructed open bottom area when installed in a 36-inch-wide trench, and is rated at 100% of the sizing of a conventional gravel trench at 3 sf/lf. LDP and LPP are vastly different technologies compared to a chamber, meaning that conclusions drawn from CDWS-2010-1 are not relevant or transferrable in any way to LDP and LPP technologies. For instance, an 8-inch LDP is equivalent to a 2-ft-wide trench, equating to a 67% sizing reduction	Restore all requirements from current-day NCAC 18A .1900 requiring a minimum total thickness of naturally occurring soil above saprolite, rock, or soil wetness conditions, or demonstrate to industry stakeholders that the Department has undertaken a scientific study of the same breadth and scope as has been required under CDWS-2010-1 and its successor approvals to generate defensible evidence supporting the proposed change in soil thickness for LDP and LPP systems, as well as any other similarly affected systems.

Rule Number	Page Number	Line Number	Comment	Proposed Change
			based on the pipe diameter. LDP already receives the greatest sizing reduction of all dispersal products allowed in North Carolina and is now allowed in less soil. Additionally, LDP does not provide an unobstructed open bottom area, as soil is in direct contact with the product around its entire circumference. For LPP systems, assuming a porosity of 35%, the unobstructed open bottom area is 1.05 sf/lf for a 3-ft-wide trench, which is 57% less than the unobstructed open bottom area provided by the Quick4 Plus Standard LP chamber, resulting in significantly reduced hydraulic capacity. While the sizing is the same between LPP and chamber, the infiltrative capacity is vastly different. Applying the Rule. 1969 criteria of structural integrity, chemical durability, hydraulic performance and wastewater treatment, there is no defensible way to compare the Infiltrator chamber study for use with LDP and LPP. Since 2010, the Department has repeatedly demanded from Infiltrator the production of scientific justification for the placement of 8-inch-high chambers in 20 inches of naturally occurring soil in order for this configuration to be approved as innovative. The initial and current controlled demonstration/provisional approvals describing the required information are provided in Attachment 1. On more than one occasion, Infiltrator Water Technologies has petitioned the Department to end the above-referenced field studies and move to innovative status and been denied, with the Department requiring the production of additional scientific justification. For example: - November 27, 2013 OSWP Comments and Concerns, Infiltrator's Application for Innovative System Approval Modification, IWWS-2010-1: Quick4 Plus Standard LP Chamber - Reviewers express doubts and technical concerns regarding the installation of an 8-inch-high chamber in 20 inches of soil. Selected passages are highlighted in Attachment 2. - June 3, 2014 I&E Committee meeting - A motion and second were carried for approval of the coastal plain controlled demonstration to move to innovative based on data for 55 installed systems monitored during the 2014 wet season, where the system performance met the terms of the controlled demonstration approval (Attachment 4). The Department opted to override the favorable I&E Committee ballot and require the collection of additional dry season data, leading to the submission of a report on July 24, 2017 (I&E Committee meeting minutes and subsequent dry season report Attachment 3). - Following the issuance of an innovative approval for the coastal plain on October 31, 2014, the Department issued a Piedmont-based controlled demonstration approval directing the collection of additional field data for 8-inch-high chambers installed in 20 inches of soil (Attachment 1). This study has not been completed and is therefore inconclusive, yet the Department proposes the above-referenced changes for LDP and LPP on a statewide basis. - Present day - The Department continues to require the collection of field data from Piedmont sites to support a statewide approval of the Quick4 Plus Standard LP chamber in 20 inches of soil (Attachment 5), while proposing the same configuration for less robust technologies in its rules with no supporting science. The Department needs to adhere to the same standards of care and scientific investigation that it holds the regulated community to adhere to.	
909	86	1	I oppose these rule allowances. NCAC 18A .1957(b) allows fill systems to be installed on sites with uniform slopes of less than 15 percent. NCAC 18E .0909 lowered the slope allowance to a seemingly arbitrary 4 percent. I am not aware of a study that yielded supporting scientific justification for this dramatic change in allowable slope for fill systems. Without such support, the proposed change appears to be arbitrary and unwarranted.	Maintain the same slope limitations currently identified in NCAC 18A .1957(b)(1)(C).

Rule Number	Page Number	Line Number	Comment	Proposed Change
910	88 90	28 6	This comment was submitted previously by the Wastewater System Manufacturers Stakeholder Group, but was not addressed. Its is being resubmitted. The draft rules indicate that other artificial drainage devices, including surface diversions and French drains shall comply with NRCS/USDA guidance documents. Its is not clear how a product such as bundled expanded polystyrene can be used in drainage applications. Bundled expanded polystyrene products manufactured in-state at a Salisbury factory are used in drainage applications in North Carolina today. More broadly, this practice has been in use nationally for over a decade. These products are approved as accepted systems under current Rule. 1969 and should be provided with an administrative mechanism for usage. The proposed rule will cause a loss of business for a company manufacturing bundled expanded polystyrene products.	Ensure that manufactured products can be used for construction of artificial drainage system by allowing proprietary devices certified by nationally recognized certification bodies, as shown below. (e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance 6 documents. Proprietary drainage media products used for the construction of artificial drainage systems shall be certified by a nationally recognized certification body, as defined by G.S. 130A-4 343(a)(6). The EZflow product maintains two certifications by nationally recognized certification bodies and would therefore comply.
1103	93	24	A motor contactor breaks all current to the pump, but a solid-state relay controls current to the pump. Having a solid-state relay will serve the same purpose as the motor contractor, but attaching the requirement to break all current to the pump is not appropriate. The "breaks all current" modified is not needed for a solid-state relay.	Modify text as shown: (3) a motor contactor which breaks all current to the pump or solid-state relay ~~which breaks all current to the pump~~;
1401	121	19	I support the application of 4 inches of Mercury applied to any type of tank construction material for 5 minutes. This test method is also described in the National Precast Concrete Association Best Practices Manual for Onsite Wastewater Systems. There are multiple strength testing options for issuance of an initial septic tank approval. The Department can create a one-size-fits-all testing protocol that does not recognize that septic tanks develop strength differently depending upon the materials of construction. Another option is to maintain the Departments' current program, where separate policies for concrete and non-concrete construction materials are applied. The Department could continue applying its current framework that establishes separate requirements for concrete and non-concrete tanks, using the CSA B66 tank manufacturing standard, which Infiltrator also supports. Maintaining the current program would require manufacturers of CSA B66-certified tanks to undergo unannounced biannual manufacturing facility audits to verify the implementation of quality programs and periodically test production parts for conformance with the standard. The auditing requirement that accompanies certification goes well beyond what the vast majority of concrete precasters perform for quality control. Another supporting reason to have a separate requirement for thermoplastic tanks is that corrugated thermoplastic tanks are designed and manufactured to develop design strength when consolidated soil occupies the space between the corrugations and surrounds the tank. Performing a vacuum test on an above-ground thermoplastic tank provides little useful information about performance when properly installed in soil. Testing thermoplastic tanks above ground using elevated vacuum levels is comparable to assessing the worthiness of a concrete tank by dropping it from four feet above ground and determining that the concrete tank design is not suitable for use when cracks form upon impact. Thermoplastic tanks are regularly dropped from a 4-foot height off of a delivery truck and withstand the impact. Tanks manufactured from different materials have differing capabilities and develop strength through differing physical mechanisms, supporting the rationale for different approval and testing mechanisms.	No change or approve thermoplastic tanks when certified to meet the latest edition of CSA B66.

Rule Number	Page Number	Line Number	Comment	Proposed Change
			Establishing a one-size-fits-all strength requirement for all tank materials invariably places some tanks models at a disadvantage and others at an advantage. As an engineer with a Master's Degree in geotechnics and licensed to practice engineering in three states, my professional opinion is that there are no unique geotechnical properties exhibited by North Carolina soils that would warrant special testing outside of the CSA B66 standard. None of North Carolina's bordering states, including Virginia, Tennessee, Georgia, and South Carolina, implement a one-size-fits-all tank approval program for concrete and non-concrete tanks. All recognize IAPMO certification and conformance with dimensional requirement in the rule for Department approval. It is important to compare the proposed 15A NCAC 18E .1401 requirements with the national septic tank regulatory framework. Thirty-six states, including North Carolina, currently maintain a septic tank regulatory framework with different requirements for concrete and non-concrete tanks. Most states include requirements to meet IAPMO or CSA standards for thermoplastic tanks. These states include: Alabama, Arkansas, Alaska, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Florida, Hawaii, Iowa, Idaho, Illinois, Indiana, Kentucky, Kansas, Louisiana, Massachusetts, Maryland, Maine, Missouri, Mississippi, Montana, New Jersey, New Mexico, Ohio, Oklahoma, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, West Virginia, and Wyoming Whether North Carolina's septic tank rules require vacuum testing using 4 inches of Mercury for 5 minutes or establish differentiated non-concrete septic tank requirements using the CSA B66 standard, the North Carolina rules will fit into the national regulatory framework. On a final note, current 15A NCAC 18A .1900 already establishes differentiated requirements for another component of the onsite wastewater treatment system, the drainfield. This element of the onsite wastewater program appears to be functioning properly and without controversy. Producers of rock used in soil absorption systems must bear the burden of proof that their aggregate products meet ASTM D-448 through particle size analysis. Manufacturers of proprietary drainfield products approved under 15A NCAC 18A .1969 are held to a more stringent standard, being required to perform hydraulic, chemical, treatment, and structural evaluations in order gain Department approval. In contrast, producers of large-diameter gravelless pipe are required to meet ASTM F 667 requirements in accordance with 15A NCAC 18A .1956(3)(a). However, there is no materials testing, structural testing, or third-party certification of the large-diameter pipe product required in order for the product to be used in the field.	
1402	122	35	15A NCAC 18A .1954(a)(6) allows the invert of the outlet to be at least 2 inches lower than the invert of the inlet. Proposed 15A NCAC 18E .1402(d)(11) is prescriptive in requiring an exact invert drop between inlet and outlet of two inches. This prescriptive requirement represents an unwarranted burden on manufactures and should be removed, such that the proposed rule matched the existing rule.	Proposed change: (11) invert of the outlet shall be at least two inches lower in elevation than the invert of the inlet;
1402	123	12	The Branch has approved the use of two 5-inch -diameter openings in the baffle wall. Infiltrator requests an adjustment to allow a hole larger than 4 inches or the option for 4- or 5-inch holes.	Modify the text as follows: (E) two four- or five-inch openings, or one four- or 5-inch opening per 30 linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;
1403	125	29	The draft rules mix requirements for thermoplastic tanks between IAPMO/ANSI Z1000 and CSA B66 (certification). Both standards include materials standards, but CSA B66 includes a physical strength test requirement, while IAPMO/ANSI Z1000 does not. Requiring certification under CSA B66 achieves the same end result as requiring conformance with IAPMO and CSA certification.	Modify text to reference only the CSA B66 standard, consistent with current-day Branch thermoplastic tank policy.
1404	126	16	This comment was submitted previously by the Wastewater System Manufacturers Stakeholder Group, but was not addressed. Its is being resubmitted. A vacuum of 5 inches of mercury is required on risers "without deformation". Engineered structures are deformable (Mechanics of Materials, Beer and Johnston, 1981), thus when placed under a stress, strain will occur, which can be measured as a deformation. Achieving zero deformation under a 5-inch Hg applied vacuum-induced force, as prescribed in the proposed rule, is impossible for any material of construction (e.g., concrete, steel, titanium, carbon, plastic) and defies widely accepted engineering mechanics-of-materials principles. In other words, the requirement contains an impossible requirement to meet.	Modify text as shown: Documentation by a third-party of structural testing to five inches of mercury without permanent deformation or failure.

Rule Number	Page Number	Line Number	Comment	Proposed Change
1711	147	18	This proposed rule has the potential to add another costly and administratively burdensome requirement for industry. The requirements for re-approval are generally qualitative and highly subject to interpretation, with no clear path toward re-approval or denial. Notwithstanding the above, comments are provided below if the Department opts to keep this proposed rule language.	Strongly propose deleting this section in its entirety.
1711	147	21	Other states notify registrants of pending approval expiry (e.g., Alabama, New Mexico, Wisconsin, Washington). North Carolina should provide such notifications.	Add the following subsection: (b) Nine months prior to the approval expiration, the Department shall notify the manufacture of the pending PIA Approval expiration in writing, how to request re-approval, and where to request re-approval. (c) ~~(b)~~ Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request 21 to the Department that includes the following:
1711	147	24	By default, reporting of malfunction information must be limited to information that has been reported to the manufacturer. The proposed rule essentially requires a manufacturer to report information to which it may not have access or may not be aware. Systems of all types are repaired regularly with no notification made to the manufacturer. The manufacturer is not empowered to make users report malfunction or repair data, so it is limited to recording and reporting only what it receives.	(2) number of malfunctioning systems reported to the manufacturer, including location, reason for malfunction, and how the system was repaired, to the extend this information has been made available to the manufacturer;
1711	147	32	G.S. 130A-343(a)(6) references the accreditation of a nationally recognized certification body, and the rule language should carry this term forward from the general statutes, because the Branch need to verify that the body continues to be qualified to issue third-party certifications.	(6) current accreditation status of certification and listing by a nationally recognized certification body; and
1711	148	2	Limiting a provisional approval to reissuance once could place a manufacturer in an impossible position if gaining installations required to meet the terms of the approval is difficult and/or time-consuming. Take the Quick4 Plus Standard LP chamber approval, where the application was submitted in the fourth quarter of 2008, and its still underway 9 years later, with steady progress and effort put forth by the applicant.	Propose deleting as shown below: evaluation protocol to be completed. ~~A Provisional Approval may be re-issued only one time.~~
1712	148	14	The rule should be clear that a manufacturer is not required to authorize designers unless specifically required in the PIA approval.	Propose the following modified rule specification: (a) ~~All d~~Designers, installers, and Management Entities shall be authorized in writing by the manufacturer when required ~~and as defined~~ in the PIA approval.
Housekeeping Comments				
105	10	30	The title of NSF-ANSI Standard 40 should be updated. http://www.nsf.org/services/by-industry/water-wastewater/onsite-wastewater/residential-wastewater-treatment-systems	Use "NSF/ANSI 40" to be consistent with the manner in which NSF International refers to the standard.
105	11	13	Adverbs should not be hyphenated.	Use "slowly permeable layer"
1403	125	33	Typo	Change IAMPO to IAPMO.

Attachment 1

Quick4 Plus Standard LP Controlled Demonstration Approvals



North Carolina Department of Environment and Natural Resources
Division of Environmental Health

Beverly Eaves Perdue
Governor

Terry L. Pierce
Director

Dee Freeman
Secretary

May 24, 2010

Dave Lentz
Infiltrator Systems, Inc
PO Box 768
Old Saybrook, CT 06475

Subject: Controlled Demonstration Wastewater System Approval for the Quick4 Plus Standard Low Profile Chamber, CDWS-2010-01

Dear Mr. Lentz:

The Quick4 Plush Standard Low Profile Chamber, for a subsurface effluent disposal system, has met the requirements for a Controlled Demonstration System in accordance with the provisions of G.S. 130A-343 and 15A NCAC 18A .1969 and .1970, and is hereby approved per the enclosed CDWS approval document.

The enclosed approval document (CDWS-2010-01) presents the provisions for permitting up to 200 Quick4 Plush Standard Low Profile Chamber Systems as part of subsurface wastewater systems in North Carolina. Please refer to the enclosed approval document for details on the approved system description, use limitations, design criteria, installation procedures, responsibilities, permitting procedures, operation, maintenance and monitoring requirements.

You have the right to a formal appeal of this agency's approval of the Quick4 Plush Standard Low Profile Chamber. To pursue a formal appeal, you must file a petition for a contested case hearing with the Office of Administration Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. To get a copy of a petition form, you may write the Office of Administrative Hearings or call the office at (919) 733-0926 or from the OAH web site at http://www.ncoah.com/forms.shtml. The petition for a contested case hearing must be filed in accordance with the provisions of North Carolina General Statutes 130A-24 and 150B-23 and all other applicable provisions of Chapter 150B. Please note: If you wish to pursue a formal appeal, you must file the petition with the Office of Administrative Hearings within 30 days of the date of this letter, as provided in G.S. 150B-23(f). If you file a petition for a hearing with the Office of Administrative Hearings, you are required by law (NC General Statute 150B-23) to send a copy of your petition to the North Carolina Department of Environment and Natural Resources. Send the copy to the Office of General Counsel, North Carolina Department of Environment and Natural Resources, 1601 Mail Service Center, Raleigh, NC 27699-1601.

Local health departments are notified of approved wastewater systems via posting on the On-Site Water Protection Section web page of the Division's website (access through http://www.ncenvirohealth.org). Infiltrator Systems, Inc. is responsible for providing the local health departments of North Carolina with the appropriate manufacturer's literature related to the design, installation and operation of the Quick4 Plus Standard Low Profile Chamber.

Further note that all Controlled Demonstration Approvals are subject to modification, suspension or revocation if the Department determines that the approval is based on false, incomplete, or misleading information or if the Department finds that modification, suspension, or revocation is necessary to protect the public health, safety or welfare [NCGS 130A-343(c)].

The Division of Environmental Health appreciates your efforts to develop innovative on-site wastewater products for potential use in North Carolina. Please do not hesitate to contact us if you have any questions pertaining to this approval, or if we can be of further assistance to you.

Sincerely,

Terry L. Pierce

Enclosures

cc: OSWS Staff
Experimental/Innovative Advisory Committee
Local Health Departments

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF ENVIRONMENTAL HEALTH ON-SITE WATER PROTECTION SECTION

CONTROLLED DEMONSTRATION SYSTEM APPROVAL

CONTROLLED DEMONSTRATION WASTEWATER SYSTEM NO: CDWS-2010-1

Issued To: Dave Lentz
Infiltrator Systems Inc.
PO Box 768
Old Saybrook, CT 06475
800-221-4436; Fax: 860-577-7001
www.infiltratorsystems.com

For: Infiltrator Quick4 Plus Standard Low Profile (LP) Chamber

Approval Dates: May 24, 2010

In accordance with 15A NCAC 18A.1969, an application by Infiltrator Systems Inc. of Old Saybrook, CT for use of the Quick4 Plus Standard LP Chamber (gravel-less) nitrification trench system has been reviewed and has been found to meet the standards of a controlled demonstration system when all of the following conditions are met:

I. General

A. This Controlled Demonstration Approval arises from Infiltrator Systems Inc.'s application to modify Innovative Wastewater System No. IWWS-2010-1 (incorporated herein by reference), by allowing installation of the Quick4 Plus Standard LP chamber at a site having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil with the system sized at a rating of 3.0 square feet per linear foot (sf/lf). In response to Infiltrator Systems Inc.'s Application for Modification, the Innovative & Experimental Committee ("I&E Committee") recommended and the NC Onsite Staff approved the modification as a Controlled Demonstration system.

B. The purpose of this Controlled Demonstration is to evaluate the performance of a wastewater system that is constructed and operated as described herein.

C. The scope of this Controlled Demonstration Approval is as follows:

1. North Carolina field performance evaluation: This approval establishes the siting, sizing and testing criteria for the Quick4 Plus Standard LP in shallow soil profiles, as described in detail below. The field evaluation of at least 42 and up to 200 Quick4 Standard LP chamber systems in North Carolina shall be limited to evaluating the hydraulic performance and surge volume capability of the Quick4 Plus Standard LP chamber system.

D. Except for the criteria provided herein, the design, siting, permitting, operation and maintenance shall be governed by the provisions of the Infiltrator Systems Inc. Innovative Wastewater System Approval No. IWWS-2010-1 or most recent version, and the applicable laws and regulations of the State of North Carolina.

II. System Description, Siting, and Sizing Criteria

A. The Quick4 Plus Standard LP unit consists of a polypropylene arch-shaped injection molded chamber. The connected overall length is 4 feet, the height is 8 inches, and the slotted sidewall height is 6.3 inches. The nominal width is 34 inches, and the average open bottom width is 29.2 inches. The invert height is 3.3 or 9 inches. Twenty-five Quick4 Standard LP chambers are approximately equal to 100 feet.

B. For Group II, III, and IV soils, the nitrification trench assembly may be utilized on any site where a minimum of 20 inches and maximum of 24 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions and all other factors are provisionally suitable or suitable.

C. For Group I soils, the nitrification trench assembly may be utilized on any site where a minimum of 26 inches and maximum 30 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions and all other factors are provisionally suitable or suitable.

D. To determine the total trench bottom area (ft^2) required, the design daily sewage flow shall be divided by the applicable long-term acceptance rate. The minimum linear footage for the Quick4 Plus Standard LP chamber shall be determined by dividing the total trench bottom area by an equivalency factor of 3.0 square feet per linear foot (3.0 sf/lf).

EXAMPLE:

Assume: Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil.

Then: Total computed trench bottom area is:
360 gpd/0.5 LTAR = 720 ft^2

The required linear footage for Standard Infiltrator Systems is:
720 ft^2/3.0 ft = 240 linear ft.
(Where 3.0 ft. is the equivalency factor for the chamber system)

E. The Quick4 Plus Standard LP chamber system used in nitrification trenches shall be installed with a maximum trench width of 36 inches, and with a minimum trench depth of 8 inches. The minimum on-center trench spacing shall be 9 feet, and the minimum soil cover shall be 6 inches.

F. Each nitrification trench shall be installed with a minimum 2-inch-diameter inspection port located at the distal end of the trench. The observation port shall be extended directly to grade, without turns or elbows to facilitate access for periodic monitoring of ponding levels.

G. This Controlled Demonstration study shall be for nitrification trenches only. Successful demonstrated performance of the Quick4 Plus Standard LP in trenches shall be adequate to justify innovative approval in other types of system configurations.

H. The systems shall be for primary residences only, with a maximum daily design flow of 720 gallons per day.

I. The county health department shall conduct a soil evaluation prior to each system installation site and shall complete a soil evaluation sheet.

J. For systems included in the field performance evaluation:
   1. Pump systems shall be equipped with a pressure manifold and Aquaworx control panel to monitor effluent flow volume.

   2. Where water use records are not available, a water meter shall be installed on gravity systems to ascertain effluent flow volume.

III. Controlled Demonstration Criteria

A. The Controlled Demonstration study shall span a minimum of eighteen months from the date of the twenty-first Quick4 Plus Standard LP system installation for evaluation in each of the Piedmont and Coastal Plains physiographic regions. Successful demonstrated performance of the Quick4 Plus Standard LP in the Piedmont and Coastal Plains physiographic regions shall be adequate to justify innovative approval in the Mountain physiographic region.

B. Systems shall be installed for at least two wet seasons, defined as the time period beginning January 1 and ending April 30. A maximum of 200 systems may be installed. Sites shall be identified by street address, city, and zip code. Global positioning coordinates should be provided when available.

C. The hydraulic performance of 42 systems shall be monitored. Of the monitored sites, there shall be 21 systems installed in the Piedmont and 21 systems installed in the Coastal Plains. Water usage records shall be provided for all 42 monitored sites. All monitored systems shall be designed and installed using parallel distribution. Successful demonstrated performance of the Quick4 Plus Standard LP in parallel distribution shall be adequate justification for innovative approval in both parallel and serial distribution configurations.

D. The average ponding height across all trenches of an individual site during each site visit shall not exceed 5 inches. Ponding measurements shall be recorded in each trench. All measurements shall be reported for each individual site at each visit. To quantify the ponding behavior for the 42 designated systems, they shall be evaluated no sooner than 12 months after installation. The

designated systems shall be evaluated in December, March and July by an independent third-party. Visual inspection for evidence of malfunction shall also be conducted at the ground surface, and the homeowner or occupant shall be interviewed about system operation. Criteria for evaluation of each system are provided in Appendix A. Homeowner or occupant information shall be gathered where available, recognizing that the homeowner or occupant may not be available to answer questions.

E. Should any of the evaluated systems reveal an average ponding height greater than 5 inches, the following analysis shall be provided by the independent third-party:

1. Acquire property water usage records;
2. Investigate plumbing fixtures for broken seals or running water;
3. Evaluate and report condition of septic tank and effluent filter; and/or
4. Install continuous monitoring equipment to assess system use characteristics over an extended period.

Infiltrator Systems, Inc. may commission a North Carolina-licensed soil scientist to conduct an evaluation to determine if the observed effluent ponding resulted from the Quick4 Plus Standard LP chambers or other unrelated factors.

F. At the conclusion of the controlled demonstration period, it shall be determined whether the Quick4 Plus Standard LP chamber provides adequate hydraulic performance and surge capacity when installed in the soil profiles described herein. The performance standard is: a minimum of 20 of the 21 designated systems in each region tested, shall meet the hydraulic performance criterion of having an average ponding height not exceeding 5-inches during each monitoring event, and without indications of a malfunction based on visual inspection of the drainfield.

G. Systems determined to have malfunctioned as a result of improper siting, installation, or usage will not be considered in determining performance. In the event that such a system is identified, an alternate site will be substituted in the evaluation.

H. A written report summarizing the results of the review shall be developed by an independent third party, approved by both the NC Onsite Section and Infiltrator Systems Inc., and submitted along with any recommendations for changes as identified during the demonstration period. Copies of all ponding height measurement reports and soil evaluation sheets for monitoring systems shall be submitted with the final report.

I. Successful passage of the above criteria and compliance with the requirements in 15A NCAC 18A.1969, (g), (1) shall result in innovative approval of the Quick4 Plus Standard LP for sites having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil.

Approved by: _____ Date: 24 May 2010

Appendix A

North Carolina Controlled Demonstration Criteria for Evaluating the Performance of the Quick4 Standard LP in Shallow Soil

System Question	Response (Comment required for no response)	Comments
INSTALLATION		
What is the address of the site being evaluated?	Address:_____ City : _____ Zip : _____	
When was the system installed?	Month___ Day___Yr___	
What soil group and at what depth was the system installed?	Group: I Depth (in): 26 27 28 29 30 Group: II, III, IV Depth (in): 20 21 22 23 24	
Was the elevation of the top of the chamber equal to the elevation of the natural grade?	Yes No	If no, explain:
Was the system gravity fed or pressure dosed?	Gravity Pressure dosed	
Was the residence supplied by public water source? If no, is another means of water usage recording provided?	Yes No	If no, provide recording method:
MONITORING		
When was the system evaluated?	December, March, July Yr:_____	
Were water usage records obtained for determining average daily flow?	Yes No	If no, explain:
Were any wet areas observed above or near the drainfield?	Yes No	If yes, explain:
What were the ponding levels recorded for each trench? Calculate average.	T1___" T2___" T3___" T4___" Average Ponding Ht: ____"	
Was the homeowner or occupant available for interview?	Yes No	If no, explain:
Did the homeowner or occupant cite functional wastewater drainage within residence?	Yes No	If no, explain:
Did the homeowner or occupant cite backing of water in the home or surfacing near the drainfield?	Yes No	If yes, explain:
Did the homeowner or occupant cite system malfunction as a result of a system component other than the drainfield?	Yes No	If yes, explain:

North Carolina Department of Health and Human Services
Division of Public Health

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Penelope Slade-Sawyer
Division Director

July 7, 2014

Mr. David Lentz
Infiltrator Systems Inc.
PO Box 768
Old Saybrook, CT 06475

Subject: Infiltrator Systems Inc. Modified Controlled Demonstration Approvals, CDWS 2010-1-R1A and CDWS 2010-1-R1B

Dear Mr. Lentz:

Pursuant to G.S. 130A-343 and 15A NCAC 18A .1969 Infiltrator Systems Inc. submitted a proposal for modification of your gravelless trench controlled demonstration approval. The proposed modifications meet the requirements for Controlled Demonstration and are approved per the enclosed CDWS approval documents.

The enclosed approval documents (CDWS 2010-1-R1A and CDWS 2010-1-R1B) represent the formal status of Infiltrator Systems Inc. gravelless trench systems for use in North Carolina. Please refer to the enclosed approval document for details on the approved system description, use limitations, design criteria, installation procedures, responsibilities, permitting procedures, operation, maintenance, and monitoring requirements.

You have a right to a formal appeal of this decision. To pursue a formal appeal, you must file a petition for a contested case hearing with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. To get a copy of a petition form, you may write the Office of Administrative Hearings or call the office at (919) 431-3000 or from the OAH web site at http://www.ncoah.com/forms.html . The petition for a contested case hearing must be filed in accordance with the provision of North Carolina General Statutes 130A-24 and 150B-23 and all other applicable provisions of Chapter 150B. Please note: If you wish to pursue a formal appeal, you must file the petition form with the Office of Administrative Hearings within 30 days of the date of this letter, as provided in G.S. 150B-23(f). If you file a petition for a contested case hearing with the Office of Administrative Hearings, you are required by law (N.C. General Statute 150B-23) to serve a copy of your petition on the Office of General Counsel, N.C. Department of Health and Human Services, 2001 Mail Service Center, Raleigh, N.C. 27699-2001.

Local health departments are notified of approved wastewater systems by posting of the approval documents on the On-Site Water Protection Branch's homepage and by e-mail notice. You should make certain your distributors are aware of the modifications to the Controlled Demonstration approvals, as well as provide the local health departments of North Carolina with any appropriate manufacturer's

literature related to the design and installation of the Infiltrator Systems Inc. Quick4 Plus Standard low profile chamber. Please make certain that the On-Site Water Protection Branch and local health departments are provided with a list of the manufacturer's authorized installers, updated whenever there are any additions or deletions.

All controlled demonstration wastewater system approvals are subject to modification, suspension, or revocation if the Department determines that the approval is based on false, incomplete, or misleading information or if the Department finds that modification, suspension, or revocation is necessary to protect public health, safety, or welfare [NCGS 130A-343(c)], and are subject to suspension or revocation upon a finding that the information submitted in the application is falsified, or subsequent experience with the system results in altered conclusions about system performance or design [15A NCAC 18A .1969(k)(2)(A)].

The Environmental Health Section of the Division of Public Health appreciates your efforts to develop on-site wastewater products for use in North Carolina. Please do not hesitate to contact me or the staff if you have any questions pertaining to this approval or if you need further assistance.

Sincerely,

Larry D. Michael, REHS, MPH
Section Chief

Enclosures

cc: OSWP Staff
Innovative and Experimental Advisory Committee
Local Health Departments

NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

CONTROLLED DEMONSTRATION SYSTEM APPROVAL

CONTROLLED DEMONSTRATION WASTEWATER SYSTEM NO: CDWS-2010-1-R1A

Issued To: Dave Lentz
Infiltrator Systems Inc.
PO Box 768
Old Saybrook, CT 06475
800-221-4436; Fax: 860-577-7001
www.infiltratorsystems.com

For: Infiltrator Quick4 Plus Standard Low Profile (LP) Chamber Installations Located in the Coastal Plain Physiographic Region

Approval Dates: May 24, 2010
July 7, 2014 Modified Controlled Demonstration Criteria specific to Coastal Plain physiographic region

In accordance with 15A NCAC 18A .1969, an application by Infiltrator Systems Inc. of Old Saybrook, CT for use of the Quick4 Plus Standard LP Chamber (gravel-less) nitrification trench system has been reviewed and has been found to meet the standards of a controlled demonstration system when all of the following conditions are met:

I. General

A. This Controlled Demonstration Approval arises from Infiltrator Systems Inc.'s application to modify Innovative Wastewater System No. IWWS-2010-1 and CDWS 2010-1 (incorporated herein by reference), by allowing installation of the Quick4 Plus Standard LP chamber at a site having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil with the system sized at a rating of 3.0 square feet per linear foot (sf/lf). In response to Infiltrator Systems Inc.'s Application for Modification, the Innovative & Experimental Committee ("I&E Committee") recommended and the NC Onsite Staff approved the modification as a Controlled Demonstration system.

B. The purpose of this Controlled Demonstration is to evaluate the performance of a wastewater system that is constructed and operated as described herein.

C. This approval establishes the siting, sizing and testing criteria for the Quick4 Plus Standard LP in shallow soil profiles in the Coastal Plain physiographic region, as described in detail below. The field evaluation of the Quick4 Standard LP chamber systems in North Carolina shall be limited to evaluating the hydraulic performance and surge volume capability of the Quick4 Plus Standard LP chamber system.

D. Except for the criteria provided herein, the design, siting, permitting, operation and maintenance shall be governed by the provisions of the Infiltrator Systems Inc. Innovative Wastewater System Approval No. IWWS-2010-1 or most recent version, and the applicable laws and regulations of the State of North Carolina.

II. System Description, Siting, and Sizing Criteria

A. The Quick4 Plus Standard LP unit consists of a polypropylene arch-shaped injection molded chamber. The connected overall length is 4 feet, the height is 8 inches, and the slotted sidewall height is 6.3 inches. The nominal width is 34 inches, and the average open bottom width is 29.2 inches. The invert height is 3.3 or 9 inches. Twenty-five Quick4 Standard LP chambers are approximately equal to 100 feet.

B. For Group II, III, and IV soils, the nitrification trench assembly may be utilized on any site where a minimum of 20 inches and maximum of 24 inches of naturally occurring soil are present above saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizon, or soil wetness conditions and all other factors are provisionally suitable or suitable.

C. For Group I soils, the nitrification trench assembly may be utilized on any site where a minimum of 26 inches and maximum 30 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions and all other factors are provisionally suitable or suitable.

D. To determine the total trench bottom area (ft^2) required, the design daily sewage flow shall be divided by the applicable long-term acceptance rate. The minimum linear footage for the Quick4 Plus Standard LP chamber shall be determined by dividing the total trench bottom area by an equivalency factor of 3.0 square feet per linear foot (3.0 sf/lf).

EXAMPLE:

Assume: Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil.

Then: Total computed trench bottom area is:
360 gpd/0.5 LTAR = 720 ft^2

The required linear footage for Standard Infiltrator Systems is:
720 ft^2/3.0 ft = 240 linear ft.
(Where 3.0 ft. is the equivalency factor for the chamber system)

E. The Quick4 Plus Standard LP chamber system used in nitrification trenches shall be installed with a maximum trench width of 36 inches, and with a minimum trench depth of 8 inches. The minimum on-center trench spacing shall be 9 feet, and the minimum soil cover shall be 6 inches.

F. Each nitrification trench shall be installed with a minimum 2-inch-diameter inspection port located at the distal end of the trench. The observation port shall be extended directly to grade, without turns or elbows to facilitate access for periodic monitoring of ponding levels.

G. This Controlled Demonstration study shall be for nitrification trenches only. Successful

demonstrated performance of the Quick4 Plus Standard LP in trenches shall be adequate to justify innovative approval in other types of system configurations.

H. The systems shall be for primary residences only, with a maximum daily design flow of 720 gallons per day.

I. The county health department shall conduct a soil evaluation prior to each system installation site and shall complete a soil evaluation sheet.

J. For systems included in the field performance evaluation:
   1. Pump systems shall be equipped with a pressure manifold and Aquaworx control panel to monitor effluent flow volume.
   2. Where water use records are not available, a water meter shall be installed on gravity systems to ascertain effluent flow volume.

III. Controlled Demonstration Criteria

A. Systems may be installed and evaluated in the Coastal Plain physiographic region only, defined as located in any of the following counties:

Table I

Coastal Plain Counties		
Beaufort	Duplin	Pamlico
Bertie	Edgecombe	Pender
Bladen	Gates	Pasquotank
Brunswick	Greene	Perquimans
Camden	Hertford	Pitt
Carteret	Hoke	Robeson
Chowan	Hyde	Sampson
Columbus	Jones	Scotland
Craven	Lenoir	Tyrrell
Cumberland	Martin	Washington
Currituck	New Hanover	Wayne
Dare	Onslow	

B. Systems shall be installed for at least two wet seasons, defined as December 1 through April 30. A maximum of 150 systems may be installed in the Coastal Plain physiographic region. Sites shall be identified by street address, city, and zip code. Global positioning coordinates should be provided when available.

C. Water usage records shall be provided for all monitored sites for the wet season #1 monitoring event, unless the data are determined to be unavailable by the third party evaluator. All monitored systems shall be designed and installed using parallel distribution. Successful demonstrated performance of the Quick4 Plus Standard LP in parallel distribution shall be adequate justification for innovative approval in both parallel and serial distribution configurations.

D. Ponding measurements shall be recorded in each trench. All measurements shall be reported for each individual site at each visit.

E. The ponding behavior monitoring protocol for the designated systems shall be as follows:
   1. Three monitoring events will be conducted, two in the wet season (defined as December 1 through April 30) and one in the dry season.
   2. The monitoring events shall occur in the following calendar order: wet season #1, dry season, and wet season #2.
   3. A minimum of 21 sites will be monitored during each monitoring event.
   4. The manufacturer can forgo wet season #2 monitoring event if more than 21 sites are monitored during the wet season #1 monitoring event and during the dry season monitoring event (for example, visit at least double the number of sites during each of the two monitoring events for a minimum of 42 sites visited twice).
   5. For the 2014 dry season monitoring event, the third party evaluator must visit and monitor 42 of the 54 site locations monitored during the 2014 wet season, as identified in the *Infiltrator Quick4 Plus Standard LP Chamber Coastal Plain Field Study for Wastewater System CDWS-2010-1* (Coastal Plain Field Study), dated May 12, 2014.
   6. Pass/fail criteria is as follows:
      a. Average ponding depth across all trenches at a site must be less than five inches, and
      b. Equal to or greater than 95% of systems must pass during each sampling event.
   7. For the dry-season monitoring event, no water use data is required. Verification must be provided that the system has been in recent use prior to the monitoring event. However, no data will be excluded from consideration based on hydraulic overload unless data collection performed under Section III.G of CDWS-2010-1-R1A demonstrates that such an exclusion is warranted.
   8. Monitoring shall begin no sooner than 12 months after issuance of the Operation Permit by the county health department.

F. Monitoring events shall be conducted by an independent third party. Visual inspection for evidence of malfunction shall also be conducted at the ground surface, and the homeowner or occupant shall be interviewed about system operation at the time of the monitoring event Homeowner or occupant information shall be gathered where available, recognizing that the homeowner or occupant may not be available or willing to answer questions. Criteria for evaluation of each system are provided in an example form in Appendix A.

G. Should any of the evaluated systems reveal an average ponding height greater than 5 inches, the following analysis shall be provided by the independent third-party:
   1. Evaluate siting, site soil characterization, installation method, and/or signs of misuse;
   2. Acquire property water usage records;
   3. Investigate plumbing fixtures for broken seals or running water;
   4. Evaluate and report condition of septic tank and effluent filter; and/or
   5. Install continuous monitoring equipment to assess system use characteristics over an extended period.

   Infiltrator Systems, Inc. may commission a North Carolina-licensed soil scientist to conduct an evaluation to determine if the observed effluent ponding resulted from the Quick4 Plus Standard LP chambers or other unrelated factors.

H. At the conclusion of the controlled demonstration period, it shall be determined whether the Quick4 Plus Standard LP chamber provides adequate hydraulic performance and surge capacity when installed in the soil profiles described herein. The performance standard is: a minimum of 20 of the 21 designated systems or at least 95% of the average ponding measurements if more than 21 sites are monitored shall meet the hydraulic performance criterion of not exceeding 5 inches, and without indications of a malfunction based on visual inspection of the drainfield.

I. Systems determined to have malfunctioned as a result of improper siting, installation, or usage will not be considered in determining performance. In the event that such a system is identified, an alternate site will be substituted in the evaluation.

J. A written report summarizing the results of the review shall be developed by an independent third party, approved by both the On-Site Water Protection Branch and Infiltrator Systems Inc., and submitted along with any recommendations for changes as identified during the demonstration period. Copies of all ponding height measurement reports and soil evaluation sheets for monitoring systems shall be submitted. One electronic and two hard copies of the dry season monitoring report will be submitted to the Branch. The dry season monitoring report will contain supplemental dry season monitoring data and supporting tables. The dry season monitoring report will supplement the Coastal Plain Field Study already submitted.

K. Successful passage of the above criteria and compliance with the requirements in 15A NCAC 18A .1969(g)(1) shall result in innovative approval of the Quick4 Plus Standard LP for sites having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil in the Coastal Plain Physiographic region identified in Table I.

L. Eligibility for innovative approval in the Mountain physiographic region requires that the Quick4 Plus Standard LP chamber is approved as innovative for both the Coastal Plain and Piedmont physiographic regions, per approvals CDWS-2010-1-R1A and CDWS-2010-1-R1B, respectively.

IV. Responsibilities and Permitting

A. A pre-construction conference shall be required to be attended by the local health department (LHD) and Infiltrator Systems, Inc. or its authorized representative prior to beginning installation of the Quick4 Plus Standard LP chamber.
B. Infiltrator Systems, Inc.'s participation in the pre-construction conference can be either in person or by teleconference.
C. To ensure that each installation is eligible for monitoring, Infiltrator will provide written verification that the minimum number of monitoring ports are installed and that for systems that are not connected to a water purveyor, a method of flow measurement has been installed (i.e., Aquaworx control panel or flow meter).
D. LHD will verify that the system is constructed in accordance with the provisions of this approval.
E. LHD will inform the applicant in writing on the Improvement Permit and Construction Authorization that the system is a controlled demonstrational product with limited availability.
F. LHD will attach a copy of the controlled demonstration approval to all Improvement Permits and Construction Authorizations.
G. The LHD will notify the On-Site Water Protection Branch of all Improvement Permits, Construction Authorizations, and Operation Permits issued under this Controlled Demonstration Approval, and the On-Site Water Protection Branch will correspondingly notify Infiltrator.

H. Infiltrator shall maintain a list of installers authorized to install the Quick4 Plus Standard LP chamber.

Approved by: _____ Date: 7-16-14

Appendix A
North Carolina Controlled Demonstration Criteria for Evaluating the Performance of the Quick4 Standard LP in Shallow Soil

System Question	Response (Comment required for no response)	Comments
INSTALLATION		
What is the address of the site being evaluated?	Address:_____ City : _____ Zip : _____	
When was the system installed?	Month___ Day___Yr___	
What soil group and at what depth was the system installed?	Group: I Depth (in): 26 27 28 29 30 Group: II, III, IV Depth (in): 20 21 22 23 24	
Was the elevation of the top of the chamber equal to the elevation of the natural grade?	Yes No	If no, explain:
Was the system gravity fed or pressure dosed?	Gravity Pressure dosed	
Was the residence supplied by public water source? If no, is another means of water usage recording provided?	Yes No	If no, provide recording method:
MONITORING		
When was the system evaluated?	Month___ Day___Yr:_____	
Were water usage records obtained for determining average daily flow?	Yes No	If no, explain:
Were any wet areas observed above or near the drainfield?	Yes No	If yes, explain:
What were the ponding levels recorded for each trench? Calculate average.	T1___" T2___" T3___" T4___" Average Ponding Ht: _____"	
Was the homeowner or occupant available for interview or willing to answer questions?	Yes No	If no, explain:
Did the homeowner or occupant cite functional wastewater drainage within residence?	Yes No	If no, explain:
Did the homeowner or occupant cite backing of water in the home or surfacing near the drainfield?	Yes No	If yes, explain:
Did the homeowner or occupant cite system malfunction as a result of a system component other than the drainfield?	Yes No	If yes, explain:

NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

CONTROLLED DEMONSTRATION SYSTEM APPROVAL

CONTROLLED DEMONSTRATION WASTEWATER SYSTEM NO: CDWS 2010-1-R2B

Issued To: Dave Lentz
Infiltrator Systems, Inc.
PO Box 768
Old Saybrook, CT 06475
800-221-4436; Fax: 860-577-7001
www.infiltratorsystems.com

For: Infiltrator Quick4 Plus Standard Low Profile (LP) Chamber Installations Located in the Piedmont Physiographic Region

Approval Dates:		
	May 24, 2010	
	July 7, 2014	Modified Controlled Demonstration criteria specific to Piedmont physiographic region
	October 31, 2014	Modified number of systems allowed

In accordance with General Statute 130A-343 and 15A NCAC 18A .1969, an application by Infiltrator Systems, Inc. of Old Saybrook, CT for a revised approval of modifications to their previously approved chamber (gravel-less) nitrification trench system, and the conditions of approval thereof, has been reviewed and found to meet the requirements of any innovative system when all of the following conditions are met:

I. General

A. Scope of this Controlled Demonstration Approval
   1. Use, design, and installation requirements for the Infiltrator Systems Inc. Quick4 Plus Standard LP chamber system in shallow soil profiles in the **Piedmont** physiographic region.
   2. Monitoring proposal for evaluation of the Infiltrator Systems Inc. low profile chamber installations located in the **Piedmont** physiographic region.

B. This Controlled Demonstration is limited to 200 improvement permits issued with daily design flows up to 720 gallons per day. The field evaluation of the Quick4 Standard LP chamber systems in North Carolina shall be limited to evaluating the hydraulic performance and surge volume capability of the Quick4 Plus Standard LP chamber system.

C. Except for the criteria provided herein, the design, siting, permitting, operation and maintenance shall be governed by the provisions of the Infiltrator Systems Inc. Innovative Wastewater System

Approval No. IWWS-2010-1 or most recent version, and the applicable laws and regulations of the State of North Carolina.

II. System Description

A. Minimum pretreatment by septic tank as required in 15A NCAC 18A .1952.

B. The Quick4 Plus Standard LP unit consists of a polypropylene arch-shaped injection molded chamber. The connected overall length of a Quick4 Plus Standard LP chamber is 4 feet. The chamber sidewall slope is approximately 20 degrees toward the chamber center or away from the trench sidewall. Twenty-five Quick4 Plus Standard LP chambers are approximately equal to 100 feet.

Table I – Infiltrator Chamber Dimensions

Model	Length Overall (ft)	Height (in)	Bottom Width (in)	Average Open Bottom Width (in)	Slotted Sidewall Height (in)	Invert[1] Height (in)
Quick4 Plus Standard LP (polypropylene)	4	8.0	33.5	29.3	6.3	3.3 and 9.0

[1]Invert Height is for a 4-inch diameter Schedule 40 PVC Pipe

C. Each chamber unit shall be permanently marked as follows: Quick4 Plus Standard LP.

D. Each chamber unit is designed to mechanically interlock with the downstream chamber forming a complete nitrification trench that consists of an inlet plate or cap with a splash plate located below the inlet on the trench bottom and a solid end plate or cap to be located at the distal end of any chamber nitrification line.

E. In addition to conventional use as an end cap, the Quick4 Plus All-in-One 8 Endcap and the Quick4 Plus Periscope pipe appurtenances can also be used as an accessory with the Quick4 Plus Standard LP chamber to decrease the turning radius of a chamber line, as a drop-box in serial distribution, and for mid-line distribution pipe entry and exit. The Quick4 Plus All-in-One 8 Endcap can be used in all applications where the Quick4 Plus Standard LP chamber may be utilized.

III. Siting Criteria

A. The Quick4 Plus Standard LP nitrification trench assemblies may be utilized on any site which meets the following criteria in the **Piedmont counties** listed in Table II:
   1. Group II, III, or IV soils on any site where a **minimum of 20 inches and a maximum of 24 inches** of naturally occurring soil is present above saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizons, or soil wetness conditions and all other factors are provisionally suitable or suitable.
   2. Group I soils on any site where a **minimum of 26 inches and a maximum of 30 inches** of naturally occurring soil is present above saprolite, rock, or soil wetness and all other factors are provisionally suitable or suitable.

Table II – **Piedmont Counties**

Alamance	Durham	McDowell	Rowan
Alexander	Forsyth	Mecklenburg	Rutherford
Anson	Franklin	Montgomery	Stanly
Burke	Gaston	Moore	Stokes
Cabarrus	Granville	Nash	Surry
Caswell	Guilford	Northhampton	Union
Caldwell	Halifax	Orange	Vance
Catawba	Harnett	Person	Wake
Chatham	Iredell	Polk	Warren
Cleveland	Johnston	Randolph	Wilkes
Davidson	Lee	Richmond	Wilson
Davie	Lincoln	Rockingham	Yadkin

IV. System Sizing

A. The maximum long-term acceptance rate (LTAR) shall be as follows:

Table III

Textural Group		LTAR (gpd/sq ft)	
		Natural Soil	Saprolite
Soil/Group I (Sands)	Sands	0.8 - 1.0[1]	0.6 - 0.8
	Loamy Sand		0.5 - 0.7
Soil Group II (Coarse Loams)	Sandy Loam	0.6 - 0.8	0.4 - 0.6
	Loam		0.2 - 0.4
Soil Group III (Fine Loams)	Silt Loam	0.3 - 0.6	0.1 - 0.3
	Other Fine Loams		NA
Soil Group IV	Clays	0.1 - 0.4	NA

[1]For sites where the LTAR exceeds 1.0 gpd/ sq ft, use 1.0 gpd/sq ft.

B. To determine the total trench bottom area (ft^2) required, the design daily sewage flow shall be divided by the applicable long-term acceptance rate. The minimum linear footage for the Quick4 Plus Standard LP chamber shall be determined by dividing the total trench bottom area by an equivalency factor of 3.0 square feet per linear foot (3.0 sf/lf).

EXAMPLE:

Assume: Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil.

Then: Total computed trench bottom area is:

360 gpd/0.5 LTAR = 720 ft^2

The required linear footage for Standard Infiltrator Systems is:
720 ft^2/3.0 ft = 240 linear ft.
(Where 3.0 ft. is the equivalency factor for the chamber system)

C. Reductions in total trench bottom area shall not be granted for low profile chambers.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed ground absorption system. Refer to Rule .1970(p).

VI. Design Criteria

Refer to Siting Criteria (Section III) and Installation (Section VII) for details.

VII. Installation

A. The Quick4 Plus Standard LP chamber system used in nitrification trenches shall be installed with a maximum trench width of 36 inches, and with a minimum trench depth of 8 inches. The minimum on-center trench spacing shall be 9 feet, and the minimum soil cover shall be 6 inches.

B. Each nitrification trench shall be installed with a minimum 2-inch-diameter inspection port located at the distal end of the trench. The observation port shall be extended directly to grade, without turns or elbows to facilitate access for periodic monitoring of ponding levels.

C. This Controlled Demonstration study shall be for nitrification trenches only. Successful demonstrated performance of the Quick4 Plus Standard LP in trenches shall be adequate to justify innovative approval in other types of system configurations.

D. The Quick4 Plus Standard LP chamber system shall be installed only with the Infiltrator Quick4 Plus All-in-One 8 Endcap or Quick4 Plus 8 Endcap options at the ends of each chamber row.

VIII. Operation, Maintenance and Monitoring Requirements

A. The Infiltrator chamber system shall have a minimum classification as a Type IIIg system (other non-conventional trench systems) in accordance with Table V(a) of 15A NCAC 18A .1961(b).

B. Monitoring proposal for evaluation of the Infiltrator Systems Inc. low profile chamber installations located in the **Piedmont** physiographic region
   1. Systems may be installed and evaluated in the **Piedmont** physiographic region only, defined as located in any of the counties listed in Table II.
   2. The systems shall be for primary residences only, with a maximum daily design flow of 720 gallons per day.
   3. The county health department shall conduct a soil evaluation prior to each system installation site and shall complete a soil evaluation sheet.
   4. Systems shall be installed for at least two wet seasons, defined as the time period beginning December 1 through April 30. A maximum of 200 improvement permits may be issued in the

Piedmont physiographic region. Sites shall be identified by street address, city, and zip code. Global positioning coordinates should be provided when available.

5. Water usage records shall be provided for all monitored sites for the wet season #1 monitoring event, unless determined to be unavailable by the independent third party. All monitored systems shall be designed and installed using parallel distribution. Successful demonstrated performance of the Quick4 Plus Standard LP in parallel distribution shall be adequate justification for innovative approval in both parallel and serial distribution configurations.
6. For systems included in the field performance evaluation:
   i. Pump systems shall be equipped with a pressure manifold and Aquaworx control panel to monitor effluent flow volume.
   ii. Where water use records are not available, a water meter shall be installed on gravity systems to ascertain effluent flow volume.
7. Each nitrification trench shall be installed with a minimum 2-inch-diameter inspection port located at the distal end of the trench. The observation port shall be extended directly to grade, without turns or elbows to facilitate access for periodic monitoring of ponding levels.
8. This Controlled Demonstration study shall be for nitrification trenches only. Successful demonstrated performance of the Quick4 Plus Standard LP in trenches shall be adequate to justify innovative approval in other types of system configurations.
9. Ponding measurements shall be recorded in each trench. All measurements shall be reported for each individual site at each visit.
10. The ponding behavior monitoring protocol for the designated systems shall be as follows:
    i. Three monitoring events will be conducted, two in the wet season (defined as December 1 through April 30) and one in the dry season.
    ii. The monitoring events shall occur in the following calendar order: wet season #1, dry season, and wet season #2.
    iii. A minimum of 21 sites will be monitored during each monitoring event.
    iv. The manufacturer can forgo wet season #2 monitoring event if more than 21 sites are monitored during the wet season #1 monitoring event and during the dry season monitoring event (for example, visit at least double the number of sites during each of the two monitoring events for a minimum of 42 sites visited twice).
    v. Pass/fail criteria is as follows:
       a. Average ponding depth across all trenches at a site must be less than five inches, and
       b. Equal to or greater than 95% of systems must pass during each monitoring event.
    vi. For the dry season monitoring event, no water use data is required. Verification must be provided that the system has been in recent use prior to the monitoring event. However no data will be excluded from consideration based on hydraulic overload unless data collection performed under Section III.E of CDWS 2010-1-R1B demonstrates that such an exclusion is warranted.
    vii. Monitoring shall begin no sooner than 12 months after issuance of the Operation Permit by the county health department.
    viii. Monitoring shall begin after at least part of two wet seasons of operation, as determined from the time of Operation Permit issuance by the county health department.
11. Monitoring events shall be conducted by an independent third party. Visual inspection for evidence of malfunction shall also be conducted at the ground surface, and the homeowner or occupant shall be interviewed about system operation at the time of the site evaluation. Homeowner or occupant information shall be gathered where available, recognizing that the homeowner or occupant may not be available or willing to answer questions. Criteria for evaluation of each system are provided in an example form in Appendix A.
12. Should any of the evaluated systems reveal an average ponding height greater than 5 inches,

the following analysis shall be provided by the independent third-party:

i. Evaluate siting, site soil characterization, installation method, and/or signs of misuse;
ii. Acquire property water usage records;
iii. Investigate plumbing fixtures for broken seals or running water;
iv. Evaluate and report condition of septic tank and effluent filter; and/or
v. Install continuous monitoring equipment to assess system use characteristics over an extended period.

Infiltrator Systems, Inc. may commission a North Carolina-licensed soil scientist to conduct an evaluation to determine if the observed effluent ponding resulted from the Quick4 Plus Standard LP chambers or other unrelated factors.

13. At the conclusion of the controlled demonstration period, it shall be determined whether the Quick4 Plus Standard LP chamber provides adequate hydraulic performance and surge capacity when installed in the soil profiles described herein. The performance standard is: a minimum of 20 of the 21 designated systems or at least 95% of the average ponding measurements if more than 21 sites are monitored shall meet the hydraulic performance criterion of not exceeding 5 inches, and without indications of a malfunction based on visual inspection of the drainfield.
14. Systems determined to have malfunctioned as a result of improper siting, installation, or usage will not be considered in determining performance. In the event that such a system is identified, an alternate site will be substituted in the evaluation.
15. A written report summarizing the results of the review shall be developed by an independent third party, approved by both the On-Site Water Protection Branch and Infiltrator Systems Inc., and submitted along with any recommendations for changes as identified during the demonstration period. Copies of all ponding height measurement reports and soil evaluation sheets for monitoring systems shall be submitted with the final report.
16. Successful passage of the above criteria and compliance with the requirements in 15A NCAC 18A.1969(g)(1) shall result in innovative approval of the Quick4 Plus Standard LP for sites having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil in the Piedmont Physiographic region identified in Table II.
17. Eligibility for innovative approval in the Mountain physiographic region requires that the Quick4 Plus Standard LP chamber is approved as innovative for both the Coastal Plain and Piedmont physiographic regions.

IX. Responsibilities and Permitting

A. A pre-construction conference shall be required to be attended by the local health department (LHD) and Infiltrator Systems, Inc. or its authorized representative prior to beginning installation of the Quick4 Plus Standard LP chamber.

B. Infiltrator Systems, Inc.'s participation in the pre-construction conference can be either in person or by teleconference.

C. To ensure that each installation is eligible for monitoring, Infiltrator will provide written verification that the minimum number of monitoring ports are installed and that for the systems that are not connected to a water purveyor, a method of flow measurement has been installed (i.e., Aquaworx control panel or flow meter).

D. LHD will verify that the system in installed in accordance with the provisions of this approval.

E. LHD will inform applicant in writing on the Improvement Permit and Construction Authorization that the system is a controlled demonstration product with limited availability.

F. LHD will attach a copy of the controlled demonstration approval to all Improvement Permits and Construction Authorizations.

G. The LHD will notify the On-Site Water Protection Branch of all Improvement Permits, Construction Authorizations, and Operation Permits issued under this Controlled Demonstration approval, and the On-Site Water Protection Branch will correspondingly notify Infiltrator.

H. Infiltrator shall maintain a list of installers authorized to install Infiltrator chambers, including the Quick4 Plus Standard LP chamber.

X. Repair of Systems

The provisions of 15A NCAC 18A .1961(l) shall apply to the use of Infiltrator chamber systems for repairs to existing malfunctioning septic tank systems.

Approved by: _____ Date: 10-31-14

Attachment 2

August 6, 2013 and November 27, 2013 Department Comments, Concerns, and Demands for Scientific Data for the Installation the Quick4 Plus Standard LP Chamber in 20 Inches of Soil

Kaiser, Jonathan

From: Deal, Nancy <Nancy.Deal@dhhs.nc.gov>
Sent: Tuesday, August 06, 2013 5:37 PM
To: Lentz, Dave; Levitas, Steve (Slevitas@kilpatricktownsend.com)
Cc: Long, Layton; Tom Konsler (tkonsler@orangecountync.gov); Barkley, John
Subject: ISI Quick4 Plus Application

Dave: at the conclusion of our meeting on May 14, 2013 with you and other representatives of Infiltrator Systems, Inc., we identified action items needed to proceed with consideration of ISI's application for Innovative status of the Quick4 Plus Standard LP Chamber. These included:

1. Infiltrator would request further scientific justification from Dr. Tyler and submit that information to Layton Long.
2. Layton would review this information and consider making a request to the committee that they revisit the information.
3. The Section would also consider whether there are other relevant issues that should be articulated. Any such points will subsequently be sent to Infiltrator.

While items referenced in Number 3 above have not come to light, ISI must still provide further scientific justification from Dr. Tyler (or others) in order to justify a request that the Committee revisit the application. Because of changes in personnel, this information should now be submitted directly to me as the Branch Head. If ISI provides this by the middle to end of this week, I may be able to add reconsideration of the application to the August 19 agenda. However, that is dependent upon factors beyond my control and reconsideration may have to be deferred until next month.

We wish to continue providing alternative wastewater treatment technologies for use in NC through the innovations developed by manufacturers. ISI's contribution to this has been significant to date and will no doubt continue in the future. Please advise how ISI intends to proceed with this effort within the framework of the E & I Committee mechanism.

Respectfully,

Nancy Deal
NC Department of Health and Human Services
Branch Head, Onsite Water Protection, Division of Public Health
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http://ehs.ncpublichealth.com/oswp/

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North Carolina Department of Health and Human Services
Division of Public Health

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Laura Gerald, M.D., M.P.H.
State Health Director

MEMORANDUM

TO: Dave Lentz, Regulatory Director, Infiltrator Systems, Inc.

FROM: Nancy Deal, Head, On-Site Water Protection Branch

DATE: November 27, 2013

CC: On-Site Program Staff

RE: OSWP Comments and Concerns, Infiltrator's Application for Innovative System Approval Modification, IWWS-2010-1: Quick4 Plus Standard LP Chamber

Per previous conversations with you, I have solicited input from the On-site Water Protection Branch staff regarding the referenced application. The comments and concerns listed below reflect the current lack of consensus in the Branch regarding this application.

Legal Issues:

1. **Reviewer 1**: By requesting and receiving approval as a Controlled Demonstration, ISI and the Department have previously agreed that this system is appropriately classified as a Controlled Demonstration system per G.S. 130A-343(2), and that completion of the research and testing protocol incorporated in their existing CD approval is both necessary and sufficient to be accomplished prior to the system being reclassified as an Innovative System.

   Reviewer 2: I agree here. .1969 is pretty clear as to what needs to be done.

   Reviewer 3: I think the main question remains: why the comparison of other systems geometry, siting, etc. to justify performance support rather than presenting field performance data which has been the standard in the past? Specifically, does the current I & E approval standard provide for approval decisions to be based solely on comparative analysis?

   Reviewer 4: I would like to hear infiltrator respond to this concern. I feel that it would be important to see and evaluate the data that should be obtained and presented to the committee to adhere to the Controlled Demonstration.

2. **Reviewer 1:** To meet the criteria for an Innovative System, the conditions set forth in Rule .1969(g)(1)(A, B, and C) must be met. No new information has been provided, including any

evaluation of the performance of the installed systems approved under ISI's CD approval based upon their agreement that the installed systems are to be included in the approved research and testing protocol that was a condition of the approval. No new information has been collected or provided to support a revision of the current system classification – only an updated analysis based on research work performed many years ago.

Reviewer 2: I agree

Reviewer 3: I think the main question remains: why the comparison of other systems geometry, siting, etc. to justify performance support rather than presenting field performance data which has been the standard in the past? Specifically, does the current I & E approval standard provide for approval decisions to be based solely on comparative analysis?

3. **Reviewer 1:** Much of the assessment provided by ISI in support of this application relates to a comparison of the proposed system to the current Innovative Approval for 8-inch Chambers. This is not in accordance with Statutory and Rule requirements to demonstrate equal or superior performance to a conventional system and a system described in Rules .1955, .1956, .1957 or .1958, not to another Innovative System.

Reviewer 2: I agree somewhat. They did present data from a reputable source.

Technical Concerns:

4. Re: Table 1, Hydraulic Performance

Reviewer 1: As discussed above, the correct comparison in this table should be to a shallow conventional system (not to the existing Innovative System Approval). In doing so, the appropriate talbe would be as follows:

Parameter (Group II, III, and IV only)	Shallow Conventional System	Proposal Modified Innovative System	Percent Difference
Minimum depth – naturally occurring soil	24"	20"	-16.7%
Minimum separation to limiting layer	12"	12"	0
Minimum soil cover over gravel/chamber	6"	6"	0
Gravel/Chamber height	12"	8"	-33.3%
Minimum soil height – limiting layer to finished grade	30"	26"	+13.3%
Height – top of gravel/louvers to limiting condition	24"	18.3	- 23.8%
Drainfield sizing		1:1 ratio with rock	0
Trench Spacing	9' O.C.	9' O.C.	0
Effluent Storage Volume	8.28 gal/lf*	8.0 gal.lf	-3.4%

*- Note: Lentz calculation for gravel trench storage (7.85 gal/lf) does not account for the open volume of the 4-inch pipe, which provides 0.653 gallons/LF and thus the increases the total capacity as shown, assuming remaining gravel has 35% void volume

Reviewer 2: I think the comments here are warranted but may be a little late in the whole process. The concern should have been comparing a conventional trench to the LP chamber with 26 inches of soil. Based on the innovative approval, LP chambers are more or less considered 'equivalent' to conventional trenches (no reduction). If we consider LP chambers with 26 inches of soil as 'equivalent', then why wouldn't we consider shallow placed LP chambers 'equivalent' to shallow placed gravel? Losing 3% storage equals only 12 gallons for a 3 bedroom home.

Reviewer 4: The minimum 24 inches of soil depth, in my opinion, is applicable for justification for the minimum of 20 inches of soil depth with the 8 inch product. I am less certain that this basis of comparison alone is adequate to support the approval modification as is currently dictated by laws and rules. In reference to equivalent trench storage capacity as compared to conventional trenches, I feel that this design factor, (although being a useful characteristic of both alternative and conventional trench products) is of less importance as compared to the hydraulic performance of the trench bottom area.

5. **Reviewer 1:** There are two factors potentially contributing to "hydraulic performance" differences that have not been evaluated:

   a. The 8-inch chamber only allows for a maximum ponded depth of 8-inches vs 12-inches for a conventional trench. For long-term system performance, how does this reduction of available head impact projected LTAR at the trench bottom/side soil interfaces? Comparable head in the 8-inch chamber to the 12-inch gravel trench would only become available if saturated conditions were to extend up into the 6-inch cap fill (and would require saturated conditions to extend above the initial grade), which would not occur with ponding depths of up to 12-inches in the conventional gravel trench.

      Reviewer 2: This is irrelevant. The trench is not designed to have effluent saturate into the 6 inches of cover regardless of whether its shallow placed or not. The storage is in the trench. If there was a question of storage it should have been addressed when LP chambers were approved for innovative status prior to now.

   b. The marginal impact on the "site's" capacity to handle the total system flow by a 4-inch (16.7%) reduction in naturally-occurring soil thickness. This would appear to incrementally reduce the site's linear loading rate capacity, all other factors being equal. This may also result in reduction in the overall site's treatment capability if the site's overall hydraulic capacity were to be diminished.

      Reviewer 2: Disagree. Treatment occurs in the soil BELOW the trench. We are not reducing the vertical separation to an unsuitable horizon.

   c. **Reviewer 1:** It would be beneficial to seek additional "expert" review of the potential significance of these hydraulic performance issues. This could include seeking input from Dr. Aziz Amoozegar, NCSU and/or Dr. David Radcliffe, University of Georgia (Professor Radcliffe is a renowned expert on hydraulic performance simulations of alternative trench configurations using field-calibrated Quadrus II models).

      Reviewer 2: I agree we should not just take one person's word for it.

6. **Reviewer 1**: Tyler's supportive argument is in part based on Wisconsin research (much of which Jerry had a significant role in doing) on shallow and at-grade systems installed/evaluated in the 1970s and 1980s. The relevance of this research to the issue at hand is unclear. None of the sites reported appear to have a limiting condition as shallow as 20-inches, as proposed to be used for the approval by ISI. Wisconsin typically requires a 36-inch separation to the seasonally high groundwater table or bedrock from the infiltrative surface for gravity-flow systems (in-ground or at-grade). It would therefore appear that any of the gravity-flow sites evaluated and reported on have considerably thicker soil layers above a restrictive condition. Wisconsin allows a vertical reduction from 36 to 24-inches for pressure dispersal or advanced pretreatment only (and reduction to 12-inches with both advanced pretreatment and pressure dispersal). All "at-grade" systems are required to utilize pressure dispersal.

Attachment 3

July 24, 2014 Report on Dry Season Monitoring Required after Department Overrides I&E Committee Ballot to Accept Wet Season Monitoring Data and Move to Innovative Approval

Lentz, Dave

From: Lentz, Dave
Sent: Thursday, July 24, 2014 5:13 PM
To: PE Lorna Withrow (Lorna.Withrow@dhhs.nc.gov)
Cc: Deal, Nancy; P. E. Tricia Angoli (trish.angoli@dhhs.nc.gov); Wood, Tim (twood@infiltratorsystems.net); Woodward, Woody
Subject: CDWS-2010-R1A - Quick4 Plus Standard LP chamber dry-season monitoring report
Attachments: NC Q4+Std LP Final Supplemental Dry Season Report_July 2014 Monitoring Event_072414.pdf

Dear Lorna,

Please find attached the Soil Services, PLLC report pertaining to the July 2014 Controlled Demonstration (CDWS-2010-R1A) field survey activities at Coastal Plain Quick4 Plus Standard LP chamber installation sites. This dry-season monitoring report serves as a supplement to the wet-season monitoring report submitted to the Branch on May 14, 2014.

Soil Services, PLLC has recommended reclassification of the Quick4 Plus Standard LP chamber system to Innovative status for the Coastal Plain physiographic province based on 100% of the 45 surveyed sites passing the 5-inch maximum average effluent ponding height criterion established under CDWS-2010-R1A. Infiltrator requests that the Branch review the attached report and upon acceptance, initiate reclassification of the Quick4 Plus Standard LP chamber to Innovative status.

Can you please acknowledge receipt of this email and its attachment by responding to this message. If you would like to receive hard copies of the attached report, please indicate the desired number.

Please contact me at 860-577-7198 if you have any questions or require additional information.

Sincerely,
Dave Lentz

David Lentz, P.E.
(Licensed in CT, IL, and NY)
Regulatory Director

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SOIL SERVICES, PLLC

PO BOX 91115 ⋄ RALEIGH, NC ⋄ 27675

July 24, 2014

Ms. Lorna Withrow, P.E.
North Carolina Department of Health and Human Services
On-Site Water Protection - Division of Public Health
1642 Mail Service Center
Raleigh NC 27699-1642

Re: CDWS-2010-R1A – Quick4 Plus Standard LP Chamber
Coastal Plain Dry-Season Field Monitoring Results

Dear Ms. Withrow,

The following report details the results of Infiltrator Systems, Inc.'s (Infiltrator's) Controlled Demonstration field survey activities that were conducted on July 1, 2, and 23, 2014 in the Coastal Plain physiographic region of North Carolina for Quick4 Plus Standard LP chamber installations. The information presented serves as a supplement to the report submitted to the North Carolina Division of Public Health, Environmental Health Section, On-Site Water Protection Branch (Branch) on May 14, 2014. The background information, results, and conclusion for the aforementioned Controlled Demonstration are outlined below.

The purpose of this Controlled Demonstration field survey report is to document the performance of the Infiltrator Quick4 Plus Standard LP chamber wastewater system when constructed and operated as described in Branch wastewater system approval CDWS-2010-R1A. The objective is to determine if Quick4 Plus Standard Low Profile (LP) chamber installations are functioning in a manner that is protective of public health and the environment and whether this gravelless drainfield product has adequately met the minimum requirements under CDWS-2010-R1A for reclassification as an Innovative System in the Coastal Plain physiographic region of North Carolina.

Background Information

Infiltrator submitted the original application for Quick4 Plus Standard LP chamber approval in December 2008. The first approval of this product was Innovative Wastewater System No. IWWS-2010-1, issued on May 17, 2010. The Controlled Demonstration Approval of the Quick4 Plus Standard LP chamber (CDWS-2010-01) arose from Infiltrator's application to modify IWWS-2010-1, by allowing installation of the Quick4 Plus Standard LP chamber on sites having a minimum of 20 inches of Group II, III, or IV or a minimum of 26 inches of Group I suitable or provisionally suitable soil with the system sized at an equivalency factor of 3.0 square feet per linear foot (sf/lf). In contrast, a conventional pipe-and-gravel trench construction per 15A NCAC 18A requires 24 inches of Group II, III, or IV or a minimum of 30 inches of Group I suitable or provisionally suitable soil. In response to Infiltrator's application for modification, the Innovative & Experimental Committee ("I & E Committee") recommended and the Branch approved the modification as a Controlled Demonstration system on May 21, 2010.

In general terms, CDWS-2010-1 contemplated the installation of up to 200 Quick4 Plus Standard LP systems in the Piedmont and Coastal Plain physiographic provinces of North Carolina. Once the systems were installed for the longer of 12 months or two wet seasons and 18 months after the installation of the minimum number of systems required in CDWS-2010-1, field measurement of ponding height inside the chambers could commence.

The field assessment scope under CDWS-2010-1 included monitoring of a minimum 21 sites per physiographic province during December, March, and July. This combination of sites and monitoring events would yield a minimum of 63 data points per physiographic province. Inspections were to include individual measurement of ponding height inside each line of chambers, which were to be installed in a parallel distribution configuration. The minimum acceptance criterion for Innovative System approval was an average ponding height of less than 5 inches per individual site for 20 of 21 sites in each physiographic province. Demonstration of the successful performance of the Quick4 Plus Standard LP system using parallel distribution would constitute justification for innovative approval in both parallel and serial distribution configurations.

In March and April 2014, field data was collected from sites located in both the Piedmont and Coastal Plain physiographic provinces as described in CDWS-2010-1. This monitoring work revealed that there was an insufficient number of sites within the Piedmont that meet the minimum qualifying standards in CDWS-2010-1 in terms of age and proper construction and operation. A total of 54 Controlled Demonstration sites were evaluated in the Coastal Plain physiographic province in the March and April 2014 wet season field survey.

Based on the number of sites surveyed and the results of the wet season monitoring event, Infiltrator petitioned the Branch and I & E Committee to: 1) separate Controlled Demonstration approval CDWS-2010-1 into two approvals, based on physiographic province, and 2) reclassify the Quick4 Plus Standard LP chamber from Controlled Demonstration to Innovative approval in the Coastal Plain physiographic province. The results and petitions were presented to the I & E Committee on June 3, 2014, at which time the I & E Committee voted in favor of both petitions by Infiltrator. The Branch subsequently exercised its right to override the I & E Committee recommendation for immediate reclassification to Innovative approval by requiring additional dry season field monitoring of the sites surveyed in March and April 2014.

Based on the I & E Committee recommendation and Branch decision to require additional field monitoring, Infiltrator submitted a formal request to the Branch on June 19, 2014 to split CDWS-2010-1 into two Controlled Demonstration approvals. This request included proposed terms for supplemental dry season monitoring. On July 16, 2014, the Branch issued CDWS-2010-1-R1A and CDWS-2010-1-R1B, representing the split Controlled Demonstration approvals for the Coastal Plain and Piedmont physiographic provinces, respectively.

Under CDWS-2010-1-R1A, Infiltrator is required to submit field data from three monitoring events of a minimum of 21 sites, two in the wet season and one in the dry season; in addition, the Controlled Demonstration states the second wet season monitoring event may be forgone if more than 21 sites are monitored in both the first wet season monitoring event and the dry season monitoring event. As such, the data reported to the Branch and I & E Committee on June 3, 2014 of 54 sites meets the requirements of the wet season monitoring event, and the following dry-season field data is provided to complete the requirements of CDWS-2010-1-R1A for reclassification to Innovative approval status.

The investigation of Quick4 Plus Standard LP chamber installations in the Piedmont physiographic provinces is not reported herein.

Approved Independent Third Party

As with the March and April 2014 wet-season field surveys, Ms. Sarah Menser, LSS of Soil Services, PLLC completed all data collection and report preparation. Ms. Menser is a North Carolina Licensed Soil Scientist, Certified Wastewater Inspector, and Certified Subsurface Operator.

Results

System inspections were completed on July 1, 2, and 23, 2014 for the 51 sites listed in Attachment 1 to this letter. Of the sites evaluated, 3 sites (Sites 11, 32, 47) were inaccessible due to locked gates, 2 sites were vacant (Sites 39 & 40) and 1 site did not have ports for monitoring (Site 33). The remaining 45 sites that could be accessed met the minimum criterion for reclassification to Innovative approval set forth in CDWS-2010-1-R1A. The average ponding height of each of the 45 sites is shown in Figure 1 below. As shown, 36 of the 45 sites had zero inches of effluent ponding in the trenches, and the remainder showed less than 2.75 inches of effluent ponding. All of the sites where ponded effluent monitoring was performed passed the 5-inch maximum average height criterion established under CDWS-2010-R1A. Since all of the sites passed, no water usage data is reported. The occupants available for interview during the dry season monitoring did not report any issues with system malfunction, water backing up in the residence or poor water drainage from the residence.

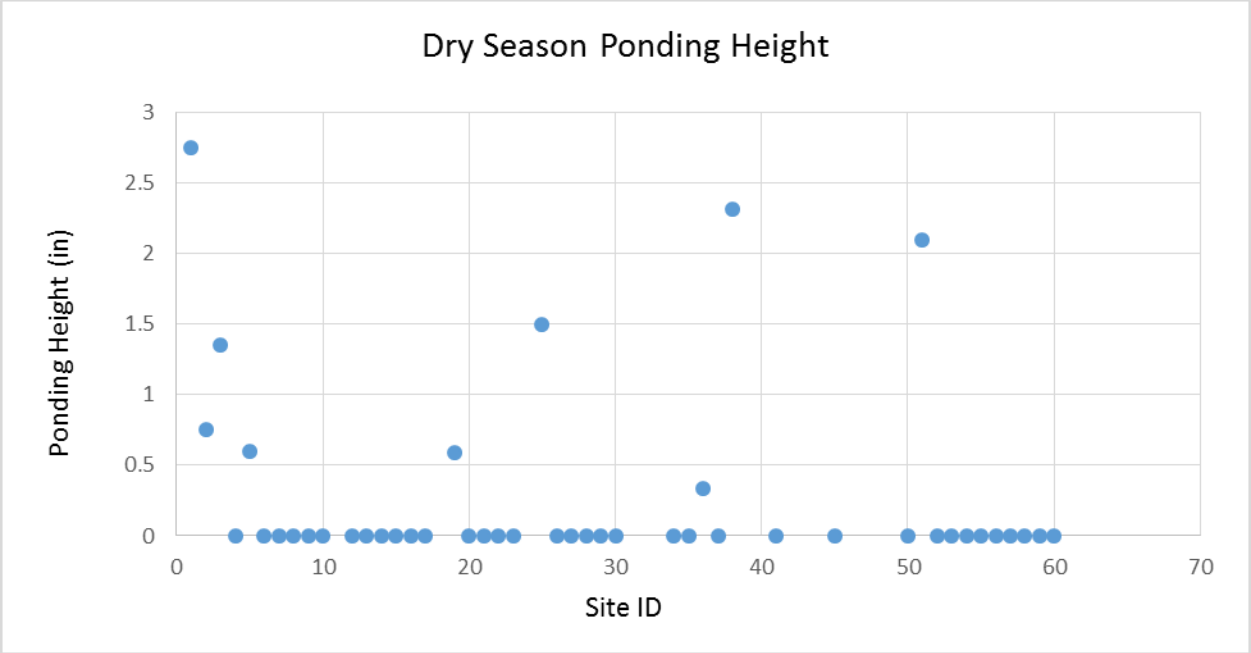


Figure 1: Dry Season Ponding Height

Conclusion

Based upon data reported to the Branch and I & E Committee on June 3, 2014 of 54 sites monitored in the wet season and the above-reported data for 45 sites monitored in the dry season, Soil Services, PLLC recommends reclassifying the Quick4 Plus Standard LP chamber system to Innovative Approval for the Coastal Plain physiographic province, thereby allowing use in 20 inches of suitable

Group II, III, and IV soil and 26 inches of suitable Group I soil. Soil Services, PLLC does not recommend any further field monitoring of wastewater systems installations located in the Coastal Plain physiographic province in support of the proposed reclassification of the Quick4 Plus Standard LP chamber to Innovative approval.

Please contact Sarah Menser at 919-896-1607 with any questions or concerns.

Sincerely,



Sarah Menser, LSS
Soil Services, PLLC

cc: Nancy Deal, North Carolina Department of Public Health
Patricia Angoli, P.E., North Carolina Department of Public Health
David Lentz, P.E., Infiltrator Systems, Inc.
Tim Wood, Infiltrator Systems, Inc.
William Woodward, Infiltrator Systems, Inc.

Attachment 1

Infiltrator Quick4 Plus Standard LP Chamber
Controlled Demonstration (CDWS-2010-1-R1A)
Dry Season Field Survey Data

Site ID	Address	City/Town	County	Zip Code	T1	T2	T3	T4	T5	T6	T7	T8	Ponding Avg.	Pass/Fail	Inspection Date
Wet Season Inspection 1															
1	110 Apple Dr	Havelock	Craven	28532	0	0	3.5	4.5	-				2.00	PASS	3/12/2014
2	112 Apple Dr	Havelock	Craven	28532	0	9	0	0	-				2.25	PASS	3/12/2014
3	100 Apple Dr	Havelock	Craven	28532	0	2.5	2.5	1.5	0	-			1.30	PASS	3/12/2014
4	103 Apple Dr	Havelock	Craven	28532	0	0	0	0	-				0.00	PASS	3/12/2014
5	109 Apple Dr	Havelock	Craven	28532	0	0	1.25	0	0.75	-			0.40	PASS	1/0/1900
6	114 Apple Dr	Havelock	Craven	28532	0	0	0	0	0	-			0.00	PASS	3/12/2014
7	192,194,196 Pine Hollow Rd. (Hwy 17)	Holly Ridge	Onslow	28445	0	0	0	0	-				0.00	PASS	3/11/2014
8	198,200,202 Pine Hollow Rd.(Hwy 17)	Holly Ridge	Onslow	28445	0	0	0	0	-				0.00	PASS	3/11/2014
9	103 Wood Thrush Ln	Holly Ridge	Onslow	28445	0	0	0	0	0	-			0.00	PASS	3/11/2014
10	173 Windfield Ln	Holly Ridge	Onslow	28445	1.75	2.25	0	0	0	-			0.80	PASS	3/11/2014
11	177 Windfield Ln	Holly Ridge	Onslow	28445	-								NA	NO ACCESS	3/11/2014
12	514 Old Folkstone Rd	Holly Ridge	Onslow	28445	0	0	0	0	0	-			0.00	PASS	3/11/2014
13	518 Old Folkstone Rd	Holly Ridge	Onslow	28445	0	0	0	0	0	-			0.00	PASS	3/11/2014
14	107 Wood Thrush Ln	Holly Ridge	Onslow	28445	1.75	0	0	0	-				0.44	PASS	3/11/2014
15	938-3 Parkertown Rd	Hubert	Onslow	28539	5	5.5	6	-					5.50	FAIL	3/7/2014
16	104 Patsy Ln	Hubert	Onslow	28539	5	3	2.5	1.5	1.25	-			2.65	PASS	3/7/2014
17	804 Cooke Dr	Hubert	Onslow	28539	14	11	8	8.5	11.5	-			10.60	FAIL	3/7/2014
18	221 Petteway Dr	Jacksonville	Onslow	28540	0	0	4	0	-				1.00	PASS	3/6/2014
19	162 River Winding Rd.	Jacksonville	Onslow	28540	0.13	0	2	0	0	0	0	0	0.27	PASS	3/6/2014
20	100 Constitution Ave	Jacksonville	Onslow	28540	0	0	0.25	0.5	0	0	0	0	0.09	PASS	3/6/2014
21	513 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	-				0.00	PASS	3/5/2014
22	182 COUNTRY SQUIRE LN	Jacksonville	Onslow	28540	0	0	0	0	-				0.00	PASS	3/6/2014
23	110 COURTNEY CT	Jacksonville	Onslow	28540	0	0	1.5	0	-				0.38	PASS	3/6/2014
24	105 COLE PORTER LN	Jacksonville	Onslow	28540	11	10	8	6.5	-				8.88	FAIL	3/6/2014
25	864 Ernest King Rd	Jacksonville	Onslow	28540	2.5	2.5	2	2.5	-				2.38	PASS	3/6/2014
26	318 Murphy Dr	Jacksonville	Onslow	28540	0	0	0	0	-				0.00	PASS	3/7/2014
27	508 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0	-			0.00	PASS	3/11/2014
28	512 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0	-			0.00	PASS	3/11/2014
29	510 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0	-			0.00	PASS	3/11/2014
30	206 Marissa Ct	Jacksonville	Onslow	28540	0	0	0	0	-				0.00	PASS	3/6/2014
31	332 King Rd	Jacksonville	Onslow	28540	-								NA	No Reading	3/6/2014
32	515 Cozy Crow Tr	Jacksonville	Onslow	28540	-								NA	NO ACCESS	3/11/2014
33	303 De Anza Ct	Maysville	Onslow	28555	-								NA	NO PORTS	3/7/2014
34	1615 Riggs Rd	Maysville	Onslow	28555	1.25	3	3	2.5	-				2.44	PASS	3/7/2014
35	1739 White Oak River Rd	Maysville	Onslow	28555	1.5	3	3.5	3.5	3.75	-			3.05	PASS	3/7/2014
36	2403 White Oak River Rd	Maysville	Onslow	28555	3	2.5	0	4.5	0	0	-		1.67	PASS	3/7/2014
37	2391 White Oak River Rd	Maysville	Onslow	28555	0.5	2	0.75	1.5	2	-			1.35	PASS	3/7/2014
38	2315 White Oak River Rd	Maysville	Onslow	28555	0	3	9	5	-				4.25	PASS	3/7/2014
39	2325 White Oak River Rd	Maysville	Onslow	28555	0	0	1.5	0.13	-				0.41	PASS	3/7/2014
40	2335 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0	-				0.00	PASS	3/7/2014
41	2307 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0	-				0.00	PASS	3/7/2014
42	818 FIVE MILE RD	Richlands	Onslow	28574	0	0	0	0	-				0.00	PASS	3/5/2014
43	105 Cherry Grove Dr.	Richlands	Onslow	28574	0	0	0	1.25	0	0	0	0	0.16	PASS	3/5/2014
44	810 FIVE MILE RD	Richlands	Onslow	28574	0	0	0	6	0	-			1.20	PASS	3/5/2014
45	211 Garden Folly Ln	Richlands	Onslow	28574	4	0	0	0	0	-			0.80	PASS	3/5/2014

Site ID	Address	City/Town	County	Zip Code	T1	T2	T3	T4	T5	T6	T7	T8	Ponding Avg.	Pass/Fail	Inspection Date
46	113 Cherry Ridge Ct	Richlands	Onslow	28574	0	0	0	0	-				0.00	PASS	3/5/2014
47	415 Fawn Meadow Dr	Richlands	Onslow	28574	0	0	0	0	-				0.00	PASS	3/5/2014
48	684 Batchelor Rd	Richlands	Onslow	28574	-								NA	No Reading	3/5/2014
49	103 Cherry Ridge Ct	Richlands	Onslow	28574	0	0	0	0	-				0.00	PASS	3/5/2014
50	201 Garden Folly Ln	Richlands	Onslow	28574	0	0	0	0	0	-			0.00	PASS	3/5/2014
51	104 Buckhaven Dr	Richlands	Onslow	28574	0	0	0	8	8	-			3.20	PASS	3/5/2014
52	100 Hidden Hollow Dr	Richlands	Onslow	28574	0	1	0	-					0.33	PASS	3/5/2014
53	205 Garden Folly Ln	Richlands	Onslow	28574	0	0	0	0	0	-			0.00	PASS	3/5/2014
54	110 Hidden Hollow Dr	Richlands	Onslow	28574	0	0	0	-					0.00	PASS	3/5/2014
55	173 Scuba Dr	Sneads Ferry	Onslow	28460	0	0	0	0	-				0.00	PASS	3/11/2014
56	177 Scuba Dr	Sneads Ferry	Onslow	28460	0	0	0	0	-				0.00	PASS	3/11/2014
57	153 Wrangler Ln	Sneads Ferry	Onslow	28460	3.5	1.5	1.5	1.5	-				2.00	PASS	3/11/2014
58	237 Chadwick Acres Rd	Sneads Ferry	Onslow	28460	0	0	0	-					0.00	PASS	3/11/2014
59	301 Chadwick Shores Dr	Sneads Ferry	Onslow	28460	0	0	0	-					0.00	PASS	3/11/2014
60	409 Lilley Grace Ct	Stella	Onslow	28582	1.5	1.5	0	2.5	-				1.38	PASS	3/7/2014
Wet Season Inspection 2															
1	110 Apple Dr	Havelock	Craven	28532	0	0	3	4.5					1.88	PASS	4/23/2014
2	112 Apple Dr	Havelock	Craven	28532	0	9.5	0	0					2.38	PASS	4/23/2014
15	938-3 Parkertown Rd	Hubert	Onslow	28539	3.25	4.5	4.5						4.08	PASS	4/23/2014
16	104 Patsy Ln	Hubert	Onslow	28539	0	0	0.5	0.75	6				1.45	PASS	4/23/2014
17	804 Cooke Dr	Hubert	Onslow	28539	0	0.75	0	2.5	0				0.65	PASS	4/17/2014
25	864 Ernest King Rd	Jacksonville	Onslow	28540	5	4.5	4.5	4.5					4.63	PASS	4/23/2014
34	1615 Riggs Rd	Maysville	Onslow	28555	1	2.5	1.75	2					1.81	PASS	4/23/2014
35	1739 White Oak River Rd	Maysville	Onslow	28555	2.5	0	0	0.125	0				0.53	PASS	4/23/2014
38	2315 White Oak River Rd	Maysville	Onslow	28555	3.25	5.5	0	0					2.19	PASS	4/23/2014
51	104 Buckhaven Dr	Richlands	Onslow	28574	3	1.5	3.5	7.5	5.25				4.15	PASS	4/23/2014
57	153 Wrangler Ln	Sneads Ferry	Onslow	28460	3.5	1.5	1.25	1.75					2.00	PASS	4/23/2014
Wet Season Inspection 3															
17	804 Cooke Dr	Hubert	Onslow	28539	3.5	2.75	1.75	2.75	4.13				2.975	PASS	4/23/2014
Dry Season Inspection 1															
1	110 Apple Dr	Havelock	Craven	28532	0	0	4	7					2.75	PASS	7/23/2014
2	112 Apple Dr	Havelock	Craven	28532	0	3	0	0					0.75	PASS	7/23/2014
3	100 Apple Dr	Havelock	Craven	28532	0	3.75	1	2	0				1.35	PASS	7/23/2014
4	103 Apple Dr	Havelock	Craven	28532	0	0	0	0					0.00	PASS	7/23/2014
5	109 Apple Dr	Havelock	Craven	28532	0	0	1.5	0	1.5				0.60	PASS	7/23/2014
6	114 Apple Dr	Havelock	Craven	28532	0	0	0	0	0				0.00	PASS	7/23/2014
7	192,194,196 Pine Hollow Rd. (Hwy 17)	Holly Ridge	Onslow	28445	0	0	0	0					0.00	PASS	7/2/2014
8	198,200,202 Pine Hollow Rd.(Hwy 17)	Holly Ridge	Onslow	28445	0	0	0	0					0.00	PASS	7/2/2014
9	103 Wood Thrush Ln	Holly Ridge	Onslow	28445	0	0	0	0	0	0			0.00	PASS	7/2/2014
10	173 Windfield Ln	Holly Ridge	Onslow	28445	0	0	0	0	0				0.00	PASS	7/2/2014
11	177 Windfield Ln	Holly Ridge	Onslow	28445									NA	NO ACCESS	7/2/2014
12	514 Old Folkstone Rd	Holly Ridge	Onslow	28445	0	0	0	0	0				0.00	PASS	7/2/2014
13	518 Old Folkstone Rd	Holly Ridge	Onslow	28445	0	0	0	0	0				0.00	PASS	7/2/2014
14	107 Wood Thrush Ln	Holly Ridge	Onslow	28445	0	0	0	0					0.00	PASS	7/2/2014
15	938-3 Parkertown Rd	Hubert	Onslow	28539	0	0	0						0.00	PASS	7/2/2014
16	104 Patsy Ln	Hubert	Onslow	28539	0	0	0	0	0				0.00	PASS	7/2/2014

Site ID	Address	City/Town	County	Zip Code	T1	T2	T3	T4	T5	T6	T7	T8	Ponding Avg.	Pass/Fail	Inspection Date
17	804 Cooke Dr	Hubert	Onslow	28539	0	0	0	0	0				0.00	PASS	7/2/2014
19	162 River Winding Rd.	Jacksonville	Onslow	28540	3	0	1.75	0	0	0	0	0	0.59	PASS	7/1/2014
20	100 Constitution Ave	Jacksonville	Onslow	28540	0	0	0	0	0	0	0	0	0.00	PASS	7/2/2014
21	513 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0				0.00	PASS	7/1/2014
22	182 COUNTRY SQUIRE LN	Jacksonville	Onslow	28540	0	0	0	0					0.00	PASS	7/1/2014
23	110 COURTNEY CT	Jacksonville	Onslow	28540	0	0	0	0					0.00	PASS	7/1/2014
25	864 Ernest King Rd	Jacksonville	Onslow	28540	3.25	0	2.75	0					1.50	PASS	7/2/2014
26	318 Murphy Dr	Jacksonville	Onslow	28540	0	0	0	0					0.00	PASS	7/2/2014
27	508 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0				0.00	PASS	7/1/2014
28	512 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0				0.00	PASS	7/1/2014
29	510 Cozy Crow Tr	Jacksonville	Onslow	28540	0	0	0	0	0				0.00	PASS	7/1/2014
30	206 Marissa Ct	Jacksonville	Onslow	28540	0	0	0	0					0.00	PASS	7/1/2014
32	515 Cozy Crow Tr	Jacksonville	Onslow	28540									NA	NO ACCESS	7/1/2014
33	303 De Anza Ct	Maysville	Onslow	28555									NA	NO PORTS	7/1/2014
34	1615 Riggs Rd	Maysville	Onslow	28555	0	0	0	0					0.00	PASS	7/2/2014
35	1739 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0	0				0.00	PASS	7/1/2014
36	2403 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0	2	0			0.33	PASS	7/1/2014
37	2391 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0	0				0.00	PASS	7/1/2014
38	2315 White Oak River Rd	Maysville	Onslow	28555	3.25	6	0	0					2.31	PASS	7/1/2014
39	2325 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0					NA	VACANT	7/1/2014
40	2335 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0					NA	VACANT	7/1/2014
41	2307 White Oak River Rd	Maysville	Onslow	28555	0	0	0	0					0.00	PASS	7/1/2014
45	211 Garden Folly Ln	Richlands	Onslow	28574	0	0	0	0	0	0			0.00	PASS	7/1/2014
47	415 Fawn Meadow Dr	Richlands	Onslow	28574									NA	NO ACCESS	7/1/2014
50	201 Garden Folly Ln	Richlands	Onslow	28574	0	0	0	0	0				0.00	PASS	7/1/2014
51	104 Buckhaven Dr	Richlands	Onslow	28574	0	0	0	7.5	3				2.10	PASS	7/1/2014
52	100 Hidden Hollow Dr	Richlands	Onslow	28574	0	0	0						0.00	PASS	7/1/2014
53	205 Garden Folly Ln	Richlands	Onslow	28574	0	0	0	0	0				0.00	PASS	7/1/2014
54	110 Hidden Hollow Dr	Richlands	Onslow	28574	0	0	0						0.00	PASS	7/1/2014
55	173 Scuba Dr	Sneads Ferry	Onslow	28460	0	0	0	0					0.00	PASS	7/2/2014
56	177 Scuba Dr	Sneads Ferry	Onslow	28460	0	0	0	0					0.00	PASS	7/2/2014
57	153 Wrangler Ln	Sneads Ferry	Onslow	28460	0	0	0	0	0				0.00	PASS	7/2/2014
58	237 Chadwick Acres Rd	Sneads Ferry	Onslow	28460	0	0	0						0.00	PASS	7/2/2014
59	301 Chadwick Shores Dr	Sneads Ferry	Onslow	28460	0	0	0						0.00	PASS	7/2/2014
60	409 Lilley Grace Ct	Stella	Onslow	28582	0	0	0	0					0.00	PASS	7/2/2014

Notes:
1. Sites 11, 31, 32, 33, and 48 were excluded from the study due to lack of site access or the home being vacant.
2. Sites 39 & 40 were occupied during the wet season monitoring event but vancant during the dry season monitoring event.
3. Site 47 was accessible during the wet season moitoring event but inaccessible during the dry season monitoring event.
4. Sites 15 and 17 were regarded as meeting the terms of CDWS-2010-1 because the average ponding during the first inspection was affected by nearby ponded surface water and precipitation. The follow-up inspections outside of a rainfall event showed the sites to be functioning properly.
5. Site 24 was excluded from the study for water use exceeding the daily design flwo by a factor of 2 to 3.

Attachment 4

June 3, 2014 I&E Committee Meeting Minutes Memorializing Favorable Committee Ballot to Move Quick4 Plus Standard LP Chamber to Innovative Status

I&E Committee Meeting Notes
June 3, 2014

Present at the meeting:
Edwin Stott, Chairman
Cory Brantley
Wayne Jones
Harold Kelly
Andy Smith

Committee voted to approve minutes from the May 6, 2014 meeting

Committee approved the agenda for the June 3, 2014 meeting

Old Business

Review and Discussion of Monitoring Results for Quick4 Plus Standard LP chamber (CDWS-2010-1) *Dave Lentz (Infiltrator Systems, Inc.) and Sarah Menser (Soil Services, PLLC) – Third-Party*

Dave Lentz:

- Retract statement made at the May meeting that they were going to abandon further work in the Piedmont (only about 8 sites currently that qualify), will continue to work on the controlled demonstration for the Piedmont
- Focus on the coastal area
- Propose to modify existing innovative approval (IWWS-2010-1) for Quick4 Plus Standard LP chamber to allow innovative installations in the coastal area only (proposed draft IWWS-2010-1-R1)
    - Proposal includes a table listing the counties where this type of installation would be allowable, the counties are indicated as "coast only" by the NC Geologic Survey
    - Added an allowance for 20" of suitable soil in Group III-IV soils and 26" in Group I soils. Basically a specific condition for a shallow vertical profile added into this approval
- Propose to modify existing controlled demonstration approval for the Infiltrator Quick4 Plus Standard Low Profile (LP) Chamber (CDWS-2010-1) to separate it into one for the piedmont and one for the coastal area.
    - Scope in both would be the same, but would allow recognition of the data on hand for the coast
    - Scope is written so that the compliance requirements would be satisfied by the data collected to date
    - Revisions to existing controlled demonstration approval to be criteria specific to coastal plain geographic region
- Propose same revised compliance requirements in the piedmont scope
- Hydraulic performance study [10:58]
    - Attempt to show a different way to look at the performance of the system other than what was stipulated in the existing approval scope.
- Existing approval requires samples to be collected one during March, one during July, and one during December; defines the wet season as beginning January 1 and ending April 30
- Request to not collect data in the required second and third periods (July and December)

Sarah Menser: Summary of the data presented at the May 6, 2014 I & E Committee meeting

- Recapped third-party study of the data from fifty-five (55) Coastal Plains sites
- Proposed if double the number of systems, could conclude study in a single wet season

- Emphasized ponding heights below 5" depth, vast majority were between 0"-1"
- All fifty-four (54) sites met the criteria
- Went from having twenty-one (21) sites to fifty-four (54) sites
- Went back and re-evaluated the eleven (11) sites with 2" or more; there was one site that was evaluated a third time
- Wettest season ended up with lots based on LTAR and age; looked for loading rates representative of coastal plains. 75% of the system were 1-2 years in age, 0.25-0.8 LTAR range
- Precipitation majority of rainfall (> 1.3" of 1.6") in first data collection day, March 7, 2014
- No sites with surfacing effluent; no homeowner interviewed indicated they had had surfacing
- Pump systems were 100% compliant
- Abnormally wet season
- Recommendation at the May 6, 2014 meeting was to move forward with the approval for the coastal plains area; additional monitoring is superfluous

Steve Levitas: Not asking to establish how the Committee modifies the controlled demonstration, asking for an ad hoc decision that is fair, rational, and reasonable.

Edwin Stott expressed concern about the method used to monitor and evaluate ponding levels in wastewater dispersal field trenches. A suggestion was made to revisit the method.

Trish Angoli indicated the draft approval utilized NSF testing procedure protocols available at that time.

Steve Levitas asked the Committee and Division to revisit the decision on the three data points (March, July, and December monitoring).

Cory Brantley responded that Tom Konsler (Past-Chair) was adamant about the three data points because of a concern about ponding over a period of time.

Edwin Stott: The request presented to the Committee is to (1) split controlled demonstration approvals to separate coastal plain and piedmont; and (2) pursue innovative approval for the coastal plain at this time and continue under the controlled demonstration in the piedmont.

Steve Levitas: Just one slight refinement on that, as Dave said it is a two-step process to get to innovative. A year ago we asked you to by-pass controlled demonstration and go straight to innovative, a modification innovative approval based on the process we are doing now. So we are actually asking that you modify the controlled demonstration first so that we will have satisfied the requirements of the controlled demonstration and therefore qualify for innovative. So it is a different request than the request we made a year ago

First motion made by Harold Kelly for Committee approval of the revised Quick4 Plus Standard LP chambers controlled demonstration approval separated, one revised controlled demonstration approval for the coastal plain and one for the piedmont. Motion seconded by Wayne Jones. A vote on the motion to approve separate, as written, the controlled demonstration to the coastal plain and piedmont was called for by Edwin Stott. The motion carried.

Second motion made by Harold Kelly for Committee approval of the coastal plains controlled demonstration move to innovative. Motion seconded by Wayne Jones. A vote on the motion to move the coastal plain controlled demonstration to innovative was called for by Edwin Stott. The motion carried.

Clarification Points:

- The appropriate applications and fees need to be submitted to the Branch
- Infiltrator proposal is to modify the existing controlled demonstration so that the controlled demonstration protocol for the coast matches their study and to separate the application for controlled demonstration in the piedmont
- Same protocol for the separate controlled demonstrations (coast; piedmont)

Infiltrator chamber endcap footprint area nitrification trench credit - final linear foot ratings assigned to the various chamber end cap models *Dick Bachelder - Infiltrator Systems, Inc.*

Infiltrator has revised the chamber endcap footprint area nitrification trench credit proposal to reflect rounded values for the final linear foot ratings assigned to the various chamber end cap models as requested in the May 6, 2014 Committee meeting. The formal request is framed in linear feet of credit per endcap.

Motion made by Harold Kelly for Committee approval of the revised endcap sizing with the linear foot adjustments and the exception of consecutive endcaps being given credit. Motion seconded by Edwin Stott. A vote on the motion to approve the revisions was called for by Edwin Stott. The motion carried.

New Business

None

Status of Pending I and E Applications

- Infiltrator Systems, Inc. (ISI): Application for Innovative Approval for the Quick4 Plus Standard LP chamber (IWWS-2010-R1); Approval is still within the Branch who await completion of monitoring required as part of CDWS-2010-R1)
- Infiltrator Systems, Inc. (ISI): Amended request to modify existing Innovative Approvals to include credit for endcap footprint for IWWS-1993-02-R13, IWWS-1997-02-R10, and IWWS-2010-01; Working with the Branch to establish final chamber end cap ratings for Committee review
- Orenco Systems, Inc.: Application for Innovative Approval for AdvanTex® wastewater system models AX20RT and AX25RT; Branch is working with Orenco to edit and reformat to the Draft Innovative Approval.
- Presby Environmental, Inc.: Application for Innovative Approval for Presby Advanced Enviro-Septic (AES) System; Subcommittee to meet again

Lorna Withrow: The two Clearstream revised controlled demonstration approvals were sent out Monday, June 2, 2014 via the listserve so participants should hopefully be receiving them in the next week depending on the server and the buffer.

All pending approvals discussed.

Announcements

The next Committee meeting will be Tuesday August 5, 2014, starting at 10 am, Cardinal Room, 5605 Six Forks Road, Raleigh, NC

Non-Committee Members in Attendance at Meeting
Sarah Menser, Soil Services, PLLC
Tom Ashton, American Manufacturing Company, Inc.
Steve Barry, AQWA
Woody Woodard, Infiltrator Systems, Inc.
Dave Lentz, Infiltrator Systems, Inc.
Tim Wood, Infiltrator Systems, Inc.
Jessica Barringer, Infiltrator Systems, Inc.
Dick Bachelder, Infiltrator Systems, Inc.
Steven Levitas, Kilpatrick Townsend
Doug Lassiter, NCSTA
Steven Berkowitz, OSWP
Ishwar Devkota, OSWP
Nancy Deal, OSWP
Sushama Pradhan, OSWP
Tricia Angoli, OSWP
Lorna Withrow, OSWP

Meeting recorded by Joanne Rutkofske, OSWP

Attachment 5

July 18, 2017I&E Committee Meeting Minutes Memorializing the Inconclusive Status of the Quick4 Plus Standard LP Chamber Controlled Demonstration Field Investigation

Technical Advisory Panel
Summary of Meeting

Date: Tuesday, July 18, 2017
Time: 9:00 am EST
Location: Alamance County Environmental Health, 209 N Graham-Hopedale Rd, Burlington, NC 27217-2971

Recorder: Lorna Withrow (OSWP)

Attendees: *[See attached list of meeting attendees]*

Meeting Objective(s):

(1) Status of .1900 Rules revision
(2) Address comments for the following applications requesting modification of current Innovative Approvals
- IWWS-1993-02-R16 – Quick4 and Arc chambers *(Infiltrator Water Technologies, LLC)*
- IWWS-1995-03-R7 – EZflow *(Infiltrator Water Technologies, LLC)*
- IWWS-2010-1-R4 – Low profile Quick4 and Arc chambers *(Infiltrator Water Technologies, LLC)*
- IWWS-2002-1-R1 – Bioclere *(AquaPoint.3, LLC)*

(3) Recent legislation impacts on .1900 Rules and OSWP policies

Decisions:

Topic	Decisions Reached
.1900 Rules revision	Target date for completion of draft Rules and fiscal note is July 28, 2017. Revised Rules are slated for adoption January 1, 2018.
Infiltrator Water Technologies, LLC - request for modification of current approval IWWS-1995-03-R7 1. Allow for installation in shallow systems per .1956(1). 2. Recognize that ASTM F405 has been replaced by F667/F667M. 3. Allow use of product in all bed systems.	Dave Lentz, PE *(Infiltrator)* 1. Disregard request since this is already addressed in the current approval. (Section III.C.) 2. Replace references to ASTM F405 with ASTM F667/F667M. (Section II.D.1.d.; Section II.D.3.d.) 3. When the applicant revises the draft to reflect the essential provisions (i.e. use/design flow, siting, and design criteria) of the "Brunswick" Bed/Fill approval IWWS-95-1 and addresses product-specific configuration and installation issues, the proposal will be reviewed again.
AquaPoint.3, LLC – request for modification of current approval IWWS-2002-1-R1 1. Chemical feed 2. Effluent filter requirement 3. Flange seal – fiber reinforced plastic (FRP) 4. Telemetry requirements 5. Operator certification level 6. Sampling parameters	William Fenner, PE *(AquaPoint)* 1. Chemical feed to assist the wastewater treatment system in complying with the required treatment standards will be determined by the designer on a project specific basis. 2. Specify that the effluent filter is to be sized to account for higher flow due to effluent recirculation (Section VI.A.2.) 3. Remove the phrase "with fiber reinforced plastic (FRP)" from the current language (Section VI.A.11.a.) 4. Propose language that a landline or alternative means of communication will be provided due to the growing decrease in landline usage. (Section VI.A.11.g.) 5. Issue has been tabled in light of current rule making efforts and the need for more discussion. (Section VIII.B.; Section IX.K.) 6. Branch agrees that there needs to be consistency among approvals and is working toward achieving that goal and will revisit other approvals to verify consistent verbiage. (Section VIII.F.)

Action Items:

Tasks	Responsible Party	Due Date
Revised applications for: • IWWS-1993-02-R16 – Quick4 and Arc chambers *(Infiltrator Water Technologies, LLC)* • IWWS-1995-03-R7 – EZflow *(Infiltrator Water Technologies, LLC)* • IWWS-2010-1-R4 – Low profile Quick4 and Arc chambers *(Infiltrator Water Technologies, LLC)*	Dave Lentz, PE *(Infiltrator)*	**Friday, August 18, 2017**
Revised draft approval for: • IWWS-2002-1-R1 – Bioclere *(AquaPoint.3, LLC)*	William Fenner, PE *(AquaPoint)*	**Friday, July 28, 2017**

Informational Items:

Tasks	Presenting Party
CDWS-2010-1-R2B (Piedmont) *(Infiltrator Water Technologies, LLC)* Status update: 22 qualified sites. 1st wet season monitoring completed in early 2017. Dry season monitoring currently being conducted. Hope to have a report to submit to the TAP late 2017 to early 2018.	Dave Lentz, PE *(Infiltrator)*
Pending Legislation: • S469 Clarify Roles of Geologists and Soil Scientists in Wastewater System Site Evaluations - Re-referred to the Committee On Rules, Calendar, and Operations of the House (06/30/2017) • H374 Wastewater Permit Extension - Re-referred to the Committee On Rules, Calendar, and Operations of the House (06/29/2017)	Nancy Deal, Branch Head *(OSWP)*
Reporting Requirements: All manufacturers with current approval that have requirement for reporting need to submit those reports. Letters will be forthcoming.	Lorna Withrow *(OSWP)*

Next Meeting:

Date: Tuesday, September 19, 2017
Time: 10:00 am EST
Location: Cardinal Conference Room (Building 3, Room 3-1-B12), 5605 Six Forks Rd Raleigh NC 27609

Next Meeting Agenda Items:

Topic	Responsible Party	Desired Action	Allocated Time
TBD		Choose an item.	
		Choose an item.	
		Choose an item.	

Technical Advisory Panel Meeting Attendance Log

Date: Tuesday, July 18, 2017
Location: Alamance County Environmental Health conference room, 209 N Graham-Hopedale Rd, Burlington NC 27217-2971
Time: 9:00 am EST

NAME	COMPANY / BUSINESS	EMAIL ADDRESS / CONTACT INFORMATION
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Teresa Davis	OSWP	Teresa1.davis@dhhs.nc.gov
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Scott Greene	OSWP	Scott.Greene@dhhs.nc.gov
Nancy Deal	OSWP	Nancy.Deal@dhhs.nc.gov
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Bill Fenner	AquaPoint	wfenner@aquapoint.com
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HAROLD KELLY	PERSON CO.	Hkelly@personcounty.net
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Technical Advisory Panel Meeting Attendance Log

Date: Tuesday, July 18, 2017
Location: Alamance County Environmental Health conference room, 209 N Graham-Hopedale Rd, Burlington NC 27217-2971
Time: 9:00 am EST

NAME	COMPANY / BUSINESS	EMAIL ADDRESS / CONTACT INFORMATION
Tim Bannister		tbe@townwastewater.com
Ishwar Devkota	Wake County	ishwar2.devkota@

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1		**NCDEH 18E Proposed Rules Review by:**		**Central Carolina Soil Consulting**	
2				*Jason Hall*	
3				*October 28, 2017*	
4	**Rule Number**	**Sub-Rule Number**	**PDF Page-#; Line-#**	**Comment**	**Suggested changes based on comment** ***(Alternate language, suggested definition, etc.)***
5					
6	18E .0504		Page 42, Lines 31-33 along with Page 43, Lines 1-2	The direct observation of water in a bore hole for 3 consecutive days to determine a "Soil Wetness Condition" needs removal from these rules. We have had conflicts with LHD's over this rules due to heavy rainfall conditions on lots with no soil morphological indicators of a perched or SHWT up here in the Piedmont. This rule is too vague and if enforces creates a huge problem for LSS mapping sites for future subdivisions since we are evaluating the land on soil properties with restrictive characteristics along with unsuitable landscape positions.	Total removal from the rules, use the current soil restrictive characteristics for SHWT and/or Perched water table.
7	18E .0505		Page 48, Lines 32-36	Why is the requirement increased from 12 inches to 24 inches below trench bottom using saprolite? My experience in the field doesn't show the need for double depth separation requirement from "Soil" material.	Reduce the required vertical separation for saprolite to 12 inches.
8	18E .0505		Page 49, Lines 1-2	The restrictive requirement for certain textures of saprolite needs removal. If the material being proposed meets other suitable characteristics such as color, texture, consistence, etc. then it should be considered for use. Too many times I've had sites that the LHD has called a saprolite a sandy clay loam texture that can only be used with pretreatment. Sometimes the actual soil horizon may be a BC with enough soil and structure to not be classified as saprolite but the LHD falls back on the SCL saprolite rule which either prevents permitting of the site or excessive costs associated with system installation.	Allow all textures of a "C" horizon for saprolite if other characteristics are usable. If a minimum include sandy clay loam saprolite as permittable without pretreatment.
9	18E .0601		Page 54, Table IX	Building foundation with drainage on the down slope side does not need a 15' setback. I think the 15' setback with foundation drains was set as a stand along number to make things simple.	Reduce the down slope requirement to 10 feet, not 15 feet.

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10	18E .0601		Page 54, Table IX	Surface water diversion is 15' in the proposed rules. This setback is too restrictive. I have proposed many swales along property lines with drain fields 10' off the property line and a 5' setback between the surface swale and drain field.	Reduce the required setback from a surface swale to a drain field to 5 feet.
11	18E .0601		Page 54, Table IX	Why is there a proposed 15' setback proposed on a storm water conveyance device (open or closed) or an ephemeral channel? I think the current rule with a 15' setback from a 2' vertical cut will be sufficient. Currently in Wake County we have conflicts on what is a storm water conveyance device. Does it have to be a dedicated drainage easement on a plat? A simple road ditch is a storm water conveyance device, we don't need to complicate permitting with this rule. Are we suppose to complete a DEQ evaluation on each small drainage on a property to determine if it meet an ephemeral channel?	Remove this completely. The 15' setback from vertical cuts and normal setbacks from gullies or drains (ephemeral channels) have not been an issue in the past and this rule complicates setback interpretation that has never been an issue.
12	18E .0601		Page 55, Table IX	Better define sediment detention basin. If it's only temporary then a 50' setback is not requirement.	Temporary sediment basins should not require 50' setbacks. We cannot permit cluster subdivisions with this setbacks since sediment and erosion control departments require these devices to sometimes stay on-site until most of the site is developed and they only hold water for short durations. reduce setback to 25 feet.
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1		**NCDEH 18E Proposed Rules Review by:**		**Consulting Soil Scientists of the Carolinas, Inc**	
2				*Compiled by: Larry Baldwin, NCLSS /CPSS; LBaldwin@ec.rr.com 910-471-0504*	
3				*October 22, 2017*	
4	**Rule Number**	**Sub-Rule Number**	**PDF Page-#; Line-#**	**Comment**	**Suggested changes based on comment** ***(Alternate language, suggested definition, etc.)***
5	All	All	All	We compliment the efforts to make these rules more logically organized, more consistent usage of terminology, and clarification of some rules. It is long over-due. Vast improvement of the several decades of pieced-meal current NCDEH rules.	
6	All	All	All	The proposed rules still need to be condensed and simplified. Current rules are ~74 pages long; Proposed rules are now ~149 pages long, or a +200% increase. The fiscal note directly addresses the need to make rules more efficient, simplified, consistent, and understable, but more work needs to be done.	NCDEH rules need to specify just the minimum criteria standards to be met. Regulatory reform mandates simplicity and efficiency of administrative rules. Much in current draft could be placed in approved product references, guidelines, BMP's, or an appendix which do not have to meet threshold of administrative law procedures. The rules should specify the minimum NCDEH standards to be met, and not attempt to specifically design a system through Rules, or evaluate all sites through Rules.
7	18E .0101		Pg-1 Lines 8-11	Further clarify G.S. authority under "Scope" of rules.	Current draft only references definition of "wastewater system" G.S. 130A-334-(15). Need to add for reference purposes authority under: G.S. 130A-333; 334-(1h), (15); 335-(a), (b).
8	18E .0102	(a)	Page-1 Lines 18-19	This rule needs to address re-development of properties with pre-1977 systems. Properties with exempt systems should be encouraged to upgrade their systems to better design standards or site locations while maintaining the same daily flow and wastewater strength. Currently properties are discouraged to re-develope and upgrade their exempt waste treatment systems to better standards.	Suggested rule language: The provisions of this Subchapter shall not apply to functioning wastewater systems in use prior to July 1, 1977 or their re-development, unless the wastewater strength changes or design daily flow increases.
9	18 E .0103		Pg-1 Lines 30-35; Pgs 2 - 5	References should not be in rules. Delete this and put into a appendix reference or BMP.	Delete references in the rules and refer to them in an appendix reference or BMP. References are subject to change that State may not agree upon or endorse, such as no State rules stricter than Federal minmum law. Will help shorten length of rules.
10	18 E .0104		Pg-5 Lines 6-25; Page 6	Acronyms should be spelled out once in the rules themselves and then abbreviated within the remainder of the respective rule.	Acronyms should be spelled out once in the rules themselves and then abbreviated within the remainder of the respective rule. Put Rule .0104 acronym reference pages into appendix. Will help shorten length of rules.

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11	18E .0105			Definitions from G.S.-130A-334 should be included into administrative rules for legal clarity of many terms. Especially the definitions for: "Engineered Option Permit", "Site plan", "Plat", "Repair", "Wastewater", "Wastewater system", etc.	Definitions from G.S.-130A-334 should be included into administrative rules for legal clarity of many terms. Especially the definitions for: "Engineered Option Permit", "Site plan", "Plat", "Repair", "Wastewater", "Wastewater system", etc.
12	18E .0105			Add definitions for "Licensed Engineer", "Licensed Soil Scientist", "Licensed Geologist", "Plat", "Site Plan"	Add definitions for "Licensed Engineer", "Licensed Soil Scientist", "Licensed Geologist", "Plat", "Site Plan"
13	18E .0105	All		Many definitions within this section are technical definitions that should be defined by the respective technical references cited (eg. Aggregate [Ped?], Apparent CEC, Horizon, Ksat, Lithochromic, Organic soil, Redoximorphic, Soil, etc….). Words have specific meanings. Use technical terms properly, in their proper context, and as cited by your technical references.	Only define the terms that have a specific meaning within the context of NCDEH rules. Many terms within this section are technical definitions that should be defined by their respective technical references cited within the rules (eg. Aggregate [Ped?], Apparent CEC, Horizon, Ksat, Lithochromic, Organic soil, Redoximorphic, Soil, etc….).
14	18E .0105	(1)……..	Page-7 Line 5-6; Page-7 Line 9; etc…….	The term "Aggregate", "Berm", etc……. are defined within the definitions. Where are they used within the rules??	Have the draft rules been thorougly reviewed to make sure definition terms are actually used within the rules? If a definition term is not used within the rules, then eliminate the defined term. There appears to be several of these terms that we cannot readily find within the draft rules.
15	18E .0105	(36)	Page-9 Lines 19-22	Last sentence in "Ksat" definition needs to be modified.	Last sentence in "Ksat" definition needs to be modified too: Results of in-situ Ksat are used to simulate a rate of effluent movement through the soil and may be used in calculating a design long-term application rate for wastewater dispersal.
16	18E .0105	(37)	Page-9 Lines 23-25	Definition of "Lateral water movement" needs modification.	Modify definition too: ….means the horizontal movement of subsurface water typically associated with a more permeable soil layer over a restrictive or less permeable soil layer." Lastly, what is the purpose of the last sentence in the definition, and how can short-term observations of water in a hole or well differeniate between a perched, apparent, or ponded soil wetness condition?? Suggest deleting last sentence within this definition.
17	18E .0105	(41)	Page-9 Lines 33-37	Modify "Long term acceptance rate" definition.	Modify "long term acceptance rate" definition too: ……means the design rate of effluent absorption by the soil from a wastewater dispersal system after long-term use. ……..is assigned based upon soil textural class, structure, consistence, mineralogy, depth, percentage coarse rock, ~~landscape position, topography~~, system type, or calculated from on-site test data, and is used to determine the dispersal field sizing requirements……..
18	18E .0105	(45)	Page-10 Line 14	Stated definition of "Matrix" refers to volume of a soil horizon. Soil matrix typically refers to a percentage area of the horizon being evaluated, not volume. Confusing.	Rewrite "Matrix" definition to: ……means dominant percentage area (>50%) of a soil parameter being evaluated. Soil matrix parameters typcially evaluated are soil color, mottles, structure, concretions, pores, cracks, roots, etc.

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19	18E .0105	(64)	Page-11 Lines 29-32	Is the term "Redoximorphic" used within the rules? If not, then no need to define it.	Is the term "Redoximorphic" used within the rules? If not, then no need to define it.
20	18E .0105	(67)	Page-12 Lines 4-12	Restrictive horizon within these rules is used as a parameter for site usability or unstuitability. Restrictive horizon needs a quantifier, not just a subjective or prescriptive qualifier, otherwise the definition is meaningless. Most subsoil horizons are capable of perching vertical water flow but at a rate that is still usable (eg. an arenic subsurface over a Bt horizon). Restrictive horizon needs a quantifier to define if the soil horizon is truly limiting or restrictive.	Restrictive horizon needs a quantifier such as <0.02 gal/day/sqft = <0.0013 in/hr. The NCDEQ 2T rules recognize <1 x 10-6 cm/sec = 0.0014 in/hr as restrictive permeability of pond liners. If sufficient area is provided even sites with a restrictive horizon could be utilized.
21	18E .0105	---	Page-12 Lines 4-12	Need to define the term "seasonal high water table".	Suggested definition for "seasonal high water table": Saturated soils where anaerobic conditions exist for durations of ≥14 to ~21 consecutive days which is of sufficient time to form ≤2 chroma mottles within ≥2% of the soil matrix. Seasonal high water table can be determined by evidence of soil wetness indicators, direct monitoring observations, or computer modeling.
22	18E .0105	(74)	Page -12 Lines 35-36	Definition of "Soil" first sentence should be modified. May want to further review SSSA or NRCS definitions of soil to be technically correct.	Change too: .....means the naturally occurring body of unconsolidated ~~porous~~ mineral and organic materials on the land surface. …….
23	18E .0105	(80)	Page-13 Lines 15-18	"Stream" definition should not include ephemeral channels which should only be considered in landscape position limitations.	Stream definition should not include ephemeral channels which should only be considered in landscape position limitations. Stream should have a readily observable water level, bed/bank conditions, or ordinary high water mark.
24	18E .0105	(81)	Page-13 Lines 19-20	Need to expand definition of "Suitable".	Suggested definition of "Suitable": means classification of a specific site evaluation parameter or the site. A site is classified as suitable for a wastewater system when all site evaluation parameters are either suitable or can be overcome with allowable system and/or site improvements.
25	18E .0105	(82)	Page-13 Lines 21-24	Need to include the previously defined term "berm" within the definition of "surface water diversion" as a type of diversion.	Need to include the previously defined term "berm" within the definition of "surface water diversion" as a type of diversion.
26	18E .0105	---	Page-13 Lines 28-31	There are effluent pretreatment standards for TS-I, TS-II, etc. This is a good time to set rule standards for "reuse / reclaim" pretreatment which should be addressed in these rule revisions.	There are effluent pretreatment standards for TS-I, TS-II, etc. This is a good time to set rule standards for "reuse / reclaim" pretreatment which should be addressed in these rule revisions.
27	18E .0105	(86)	Page-13 Lines 32-35	Within definition of "Third-party" need to change the term "body" to "responsible entity". Expand meaning of last sentence.	Within definition of "Third-party" need to change the term "body" to "responsible entity". Expand meaning of last sentence too: "The third-party person or responsible enity has knowledge of the subject area based upon relevant education, training, experience, and any required registration, certification, or licensing."

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28	18E .0105	(91)	Page-14 Lines 6-7	Need to modify definition of "Unsuitable".	Modify last sentence within definition too: ……. A site is classified unsuitable for a wastewater system when any one site evaluation parameter is unsuitable that cannot be overcome by system type, site improvements, or acceptable on-site testing.
29	18E .0105	(92)	Page-14 Lines 8-9	Need to clarify definition of "Vertical separation distance".	Modify too: …..means the vertical measurement from an infiltrative surface of the waste treatment system dispersal field to a limiting site condition.
30	18E .0105	(93)	Page-14 Lines 10-12	What is the difference between a "warming kitchen" and an undefined "kitchen"?? Is this definintion needed?	What is the difference between a "warming kitchen" and an undefined "kitchen"?? Is this definintion needed?
31	18E .0201		Page-14 Lines 28-30	Need sentence at end of this General permitting paragraph that an Engineered Option Permit is also available to the applicant with proper reference to Section .0207 .	Need sentence at end of this General permitting paragraph that an Engineered Option Permit is also available to the applicant with proper reference to Section .0207 .
32	18E .0202		Page-14 Line 35	Title of Section should be "Application Directly to NCDEH" for clarity.	Title of Section should be "Application Directly to NCDEH" for clarity.
33	18E .0203		Page-16 Line 19	Title of Section should be "Improvement Permit Issued Directly by NCDEH" for clarity.	Title of Section should be "Improvement Pemrit Issued Directly by NCDEH" for clarity.
34	18E .0203	(b)	Page-16 Lines 25-26	Need to state or incorporate the requirements of 130A-336(a)(1 thru 6) within these rules for clarity.	Need to state or incorporate the specific requirements of 130A-336(a)(1 thru 6) within these rules for clarity.
35	18E .0203	(b) (1)	Page-16 Lines 27 -28	Need to state or incorporate the requirements of 130A-334 within these rules for clarity.	Need to state or incorporate the specific requirements of 130A-334 within these rules for clarity.
36	18E .0203	(c)	Page-17 Lines 7	Sentence needs to be modified for clarity.	Modify sentence: ……..report shall be provided to the owner describing all unsuitable site parameters and citing all applicable rule(s) for denial, and why alternative systems and/or site improvements are not applicable for permit issuance.
37	18E .0204		Page-17 Line 23	Title of Section should be "Construction Authorization Issued Directly by NCDEH" for clarity.	Title of Section should be "Construction Authorization Issued Directly by NCDEH" for clarity.
38	18E .0204	(h)	Page-18 Line 22	Need to state or incorporate the requirments of 130A-336(a) within this rule for clarity.	Need to state or incorporate the requirments of 130A-336(a) within this rule for clarity.
39	18E .0204	(j)	Page-18 Lines 28-29	We appreciate the clarity of this rule, but needs to include the term "plat".	Modify rule: "Upon written request of the owner a revised CA(s) shall be issued for sites when the CA is greater than five years old, a plat is part of the IP issuance, and current technology can be considered to improve the wastewater system performance."
40	18E .0205	---	Page-18 Line 35	Title of Section should be "Operation Permit Issued Directly by NCDEH" for clarity.	Title of Section should be "Operation Permit Issued Directly by NCDEH" for clarity.
41	18E .0205	(b)	Page-19 Lines 4-5	Rule should state "Engineered Option Permit" for clarity, rather than just G.S. and Rule numbers.	Rule should state "Engineered Option Permit" for clarity, rather than just G.S. and Rule numbers.
42	18E .0205	(g) (2)	Page-19 Line 34	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the validity of the OP.	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the validity of the OP.
43	18E .0205	(i)	Page-20 Lines 4-6	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the compliance of the OP.	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the compliance of the OP.

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44	18E .0205	(j)	Page-20 Lines 7-9	State the particular part(s) or actual language of G.S. 130A, Article 11 and G.S. 130A Article 2 that pertains to the remedies, modification, suspension, or revoking of the OP.	State the particular part(s) or actual language of G.S. 130A, Article 11 and G.S. 130A Article 2 that pertains to the remedies, modification, suspension, or revoking of the OP.
45	18E .0205	(k)	Page-20 Lines 10-11	Why is a new application required for continued operation of an approved and compliant system simply because of a time expiration?	Why is a new application required for continued operation of an approved and compliant system simply because of a time expiration? If in compliance an OP should be renewed for continued operation of the system.
46	18E .0206	(b) (5)	Page-20 Lines 32-33	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the re-issance of the OP for an existing system.	State the particular part(s) or actual language of G.S. 130A, Article 11 that pertains to the re-issance of the OP for an existing system.
47	18E .0302	(a)	Page-24 Lines 36-37	G.S. 130A-336.1 needs to state Engineered Option Permit under Subsection .0207 of these rules for clarity.	Modify sentence to: "……unless the permit is issued in accordance with G.S. 130A-336.1 an Engineered Option Permit under Subsection .0207 of these rules." for clarity.
48	18E .0302	(d) (3)	Page-25 Lines 17-18	State review requirement for daily flow rates of ≥1500 gal/day/acre is artificially limiting for any suitable high LTAR sites. Where and how was this acreage flow rate determined? A daily flow rate / acre could be >10,000 gal/day/acre for suitable sites with a high LTAR of 1.0 gal/day/sqft and separate 1500 gal/day systems. A conservative daily rate of 6500 gal/day/acre = ~0.15 gal/day/sqft would account for any groundwater mounding or hydrologic mass overloading on high rate suitable sites. This acreage loading rate also aligns with NCDEQ 2T rules.	State review requirement for daily flow rates of 1500 gal/day/acre is artificially limiting for any suitable high LTAR sites. Where and how was this acreage flow rate determined? A daily flow rate / acre could be >10,000 gal/day/acre for suitable sites with a high LTAR of 1.0 gal/day/sqft and separate 1500 gal/day systems. A conservative daily rate of 6500 gal/day/acre = ~0.15 gal/day/sqft would account for any groundwater mounding or hydrologic mass overloading on high rate suitable sites. This acreage loading rate also aligns with NCDEQ 2T rules.
49	18E .0302	(e)	Page-25 Lines 21-22	Please state the section / subsection being referred to in S.L. 2013-413 and S.L. 2014-120 as to liability. Also insert word "properly" in sentence….. liable for a system properly approved or permitted in accordance with this Paragraph.	Please state the section / subsection being referred to in S.L. 2013-413 and S.L. 2014-120 as to liability. Also insert word "properly" in sentence….. liable for a system properly approved or permitted in accordance with this Paragraph.
50	18E .0303	(b) (1)	Page -26 Lines 6-8	The exceptions part of this rule needs to be moved to first part of .0303 (b) for clarity when an engineered design is or is not required.	The stated exclusion clause within .0303 (b)(1) is unclear as to its meaning??? "……..except where the system is limited to an individual wastewater system serving an individual dwelling unit or multiple individiual wastewater systems, each serving an individual dwelling unit." Please reword this exclusion clause for clarity to the reader.
51	18E .0303	(b) (16)	Page-27 Line 6	The LHD should not have the arbitrary discretion to require design by a licensed engineer. The rules should specify those requirements and this rule does so until this last arbitrary and discretionary requirement.	Recommend deleting 18E .0303 (b) (16).
52	18E .0303	----	----	Section .0510 "Special Site Evaluations" should be appropriately incorporated into Sections .0303, .0304, .0305 "Licensed or Certified Professionals" for consistency and logical order to rule requirements. Title should appropriately reference Licensed Soil Scientists etc rather than just "Special Site Evaluations".	Section .0510 "Special Site Evaluations" should be appropriately incorporated into Sections .0303, .0304, .0305 "Licensed or Certified Professionals" for consistency and logical order to rule requirements. Title should appropriately reference Licensed Soil Scientists etc rather than just "Special Site Evaluations".

	A	B	C	D	E
53	18E .0304	(a)	Page-27 Lines 33-36	Which parts of G.S. 130A Article 11 apply as stated within this rule? Also state what essential information is to be provided by rule. Delete "…any other information determined to be applicable by the LHD or the State" as this is quite arbitrary.	Which parts of G.S. 130A Article 11 apply as stated within this rule? Also state what essential information is to be provided by rule. Delete "…any other information determined to be applicable by the LHD or the State" as this is quite arbitrary.
54	18E .0304	(c) (2) (A)	Page-28 Lines 22-23	Ksat measurements should be for major diagnostic soil horizons that could influence the performance of the proposed system. As written it is implied that Ksat measurements are being required for every soil horizon that may be described, and that the soil horizons within and above the dispersal field are not significant or would be tested.	Ksat measurements should be for major diagnostic soil horizons that could influence the performance of the proposed system. As written it is implied that Ksat measurements are being required for every soil horizon that may be described, and that the soil horizons within and above the dispersal field are not significant or would be tested.
55	18E .0304	(c) (2) (D)	Page-28 Lines 28-30	Contaminant trasport assessment should only be required if non-domestic or high-strength industrial wastewater effluent is being proposed. The established buffer setbacks should already account for contaiminant transport concerns for domestic wastewater.	Contaminant trasport assessment should only be required if non-domestic or high-strength industrial wastewater effluent is being proposed. The established buffer setbacks should already account for contaiminant transport concerns for domestic wastewater. This distinction should be included within this rule.
56	18E .0304	(c) (4)	Page-29 Lines 2 - 19	These appear to be engineering / surveying requirements and should not be numbered within this part of soils / site evaluation rules.	These appear to be engineering / surveying requirements and should not be numbered within this part of soils / site evaluation rules. Put these rules into the engineering / surveying parts of this rule. It is confusing as to what is required and by who??
57	18E .0401	(b)	Page-31 Lines 26-27	Is this separate 1 bedroom flow rule needed and what are its' justification? If this separate flow rule is necessary then incorporate it into .0401 (a).	Is this separate 1 bedroom flow rule needed and what are its' justification? If this separate flow rule is necessary then incorporate it into .0401 (a).
58	18E .0401	(a)	Page-31 Lines 26-27	Need sentence within this subsection referencing and highlighting the allowance of calculated flow reduction based upon data, in Section .0403 and as mandated by S.L. 2017-10 Section 3.18.	Need sentence within this subsection referencing and highlighting the allowance of calculated flow reduction based upon data, in Section .0403 and as mandated by S.L. 2017-10 Section 3.18.
59	18E .0403	(e) (5)	Page-38 Lines 1-2	Sentence should state: "neither the State nor any LHD shall be liable for any resulting damages caused from increased / decrased flow rates or effluent strength by a system properly approved or permitted in accordance with this Paragraph."	Sentence should state: "neither the State nor any LHD shall be liable for any resulting damages caused from increased / decrased flows or effluent strength by a system properly approved or permitted in accordance with this Paragraph."
60	18E .0403	(g)	Page-38 Lines 9-10	Shouldn't tank size be include within this requirement?	"The design daily flow from Table II shall be used to determine minimum tank and pretreatment component capacities."
61	18E .0502	(b), (c), (e)	Page-39 Lines 21-22, 25-26	Need statement of modification to these unsuitable topographic parameters.	(b), (c), (e) need statement on end of each sentence stating ":……. unless this site parameter can be modified through special site evaluations and/or engineered design." Otherwise the unsuitable classification cannot be addressed or overcome.
62	18E .0502	(h)	Page-39 Lines 32-37 Page-40 Lines 1-2	There has to be a minimum slope % parameter where this requirement is not necessary such as ≤5%. Level to nearly level and convex slopes have little site variation as to depth or need for a slope correction. Is this requirement even needed, since the waste treatment and repair area are already evaluated specifically for usable soil depths??	There has to be a minimum slope % parameter where this requirement is not necessary such as ≤5%. Level to nearly level and convex slopes have little site variation as to depth or need for a slope correction. Is this requirementeven needed, since the waste treatment and repair area are already evaluated specifically for usable soil depths??

	A	B	C	D	E
63	18E .0503	---	All	The numbering & sub-numbering within this section appear to be inconsistent with other sections of the rules.	The numbering & sub-numbering within this section appear to be inconsistent with other sections of the rules.
64	18E .0503	(1)	Page-40 Lines 19-20	Modification to sentence is needed for clarification of texture parameter.	Modify to: "In place of field testing the LHD, State, or licensed / professional consultant may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928 which will take precedence over qualitative field testing."
65	18E .0503	(2)	Page-40 Lines 19-20 Page-41 Lines 1-2	Soil structure parameters are overly restrictive and should have more allowances.	-------Structure size for Blocky and Prismatic class should be >2 - 4 inches for suitable classification. Structure criteria is to infer soil conductivity and LTAR can always be lowered to meet this limitation. Need Ksat testing statement added to evaluate any suspected unsuitable structure classification, especially for saprolite and massive soil conditions. --------If compound structure condtions are encountered where one is unsuitable the dominant structural type should determine classification as to suitability, and if questionable lower LTAR, or verify structure and matrix permeability through Ksat testing.
66	18E .0503	(3) (A)	Page-41 Lines 4-14 Page-42 Lines 1-13	We received several comments on Clay Mineralogy parameter especially as to CEC testing methodolgy. The technical standards for determining site usability definitely need review.	CEC is an unreliable test indicator for shrink / swell mineralogy potential and site usability for waste treatment systems. For the same sample CEC testing is quite variable within and between labs. Post testing of CEC of sites approved by the qualitative method alone have shown CEC of +16 meq/100 grams. We recommend the following: ---CEC test results be allowed up to 24 meq/100 grams rather than the current 16.3 meq/100 grams, which still is within taxanomic "subactive" clay mineralogy classification vs. "semiactive to superactive" classification; ---Long-term Ksat testing for 24 - 48 hr durations should be allowed to determine if steady-state can be achieved with positive results and used as basis for site usability and final LTAR calculation; ---Large marginally usable areas should be considered with <<LTAR rates (<0.10 gla/daysqft) and alternative systems; ---Allow usage of COLE and Atterberg testing to be included as further supportive tools in the evaluation for final suitability determination.
67	18E .0503	(4)	Page-42 Line 14	Organic soils are no different than a peat pretreatment system. If all other site conditions are suitable, then orgainc soils should not be deemed unsuitable for any usage solely because of their organic content. Granted the number of natural sites will likely be minimal, but the sites should not be discriminatorily eliminated solely due to organic content of the soil.	If all other site parameters are determined to be suitable then organic soils should be suitable for a conventional or alternative waste treatment system. Organics have shown to be a very effective median for treatment and retention of bacteria, viruses, nutrients, heavy metals, etc and likely better than most sterile mineral soil types.

	A	B	C	D	E
68	18E .0504	(a) (2)	Page-42 Lines 31-33 Page-43 Lines 1-2	Perodic observation of a water table for durations of 3 days is too short. There is no logic or scientific basis for this duration and totally ignores ambient wetness conditions or successive rainfall events.	If periodic observations of a water table are to be conducted they should be during ambient wet site conditions, after a significant rainfall event of >0.5 inches without additional significant rainfall events occurring for a time period of >3 - 14 consecutive days to be consistent with curently established parts of this rule.
69	18E .0504	(c)	Page-43 Lines 6-8	Rule should also include "….where soil wetness condition is less than 18 inches from an existing fill surface shall be considered unsuitable with respect to soil wetness".	Rule should also include "….where soil wetness condition is less than 18 inches from an existing fill surface shall be considered unsuitable with respect to soil wetness".
70	18E .0504	(e) (4)	Page-44 Lines 9-10	Sentence should be modified.	Modified sentence: If the plan is disapproved, the authorized agent shall include specific changes and technical justifications for approval of the monitoring plan.
71	18E .0504	(e) (6)	page-44 Lines18-19	Sentence needs to be modified to allow greater flexibility for accurate rainfall data collection. Many rain guage stations have been added to the NOAA and NC monitoring data base that need to be taken advantage of for accuracy, consistency, and validity rather than just an on-site gauge.	Modify sentence: A rain (precipitation) guage is requied within a 10 mile radius of the site.
72	18E .0504	(e) (7)	Page-44 Lines 21-37 Page-45 Lines 1-13	The WRI rainfall method needs to be replaced with the 30 - 90 day running / moving average method for actual rainfall wetness conditions bracketed within 30 - 100% of normal rainfall. Many NOAA references available on this and used by climate analysts. It is standard practice for ambient rainfall and wetness conditions. The WRI method has never worked well, not peer reviewed, and poorly referenced.	The ultimate benchmark to be achieved is for water table monitoring and analysis to coincide with the depth to chroma 2 wetness indicators. Now is a good time to correct this rule.
73	18E .0504	(e) (8)	Page-45 Lines 17-18	Sentence needs to be modified for methodolgy, data, and accuracy.	Modify the sentence: If monitoring well data is collected during monitoring periods that span multiple years, the year which yeilds the most representative soil wetness condition shall be applicable based upon the data and methodology utilized.
74	18E .0504	(f) (1)	Page-45 Lines 21-26	Criteria for the water table moitoring / modeling procedure need to be simplified for better accuracy, consistency, and data collection.	This part of the water table monitoring / modeling procedure needs to be simplified for testing conditions as follows: ---Rainfall can be recorded daily, not hourly as currenlty required by this rule; --The water table monitoring time period can be conducted during any >3 month ambient wet time period with >2 water table fluctuations occurting at or above estimated or projected seasonal high water table level.
75	18E .0504	(g)	Page-46 Lines 33-37 Page-47 Lines 1-3	Criteria for modeling procedure needs to be modified to allow greater usage of this methodolgy on more sites. The current rule restricts its' use to Class III or IV soils with current or proposed drainage improvements.	This rule and methodolgy should allow usage of the water table modeling procedure for all Classes of soil types and regardles of whether drainage exists or is proposed. If the methodolgy works for the limited conditions within the former Rule if will work for all site conditions.

	A	B	C	D	E
76	18E .0505	---	Page-48 Line 19	Title should be modified.	Title should be: "Soil Depth to Rock, or Unsuitable Saprolite and Parent Material". Title needs to reflect the depth to an unsuitable site condition. Some sites have usable saprolite or parent materials such as a loose sandy C soil horizon. Reading of the title and rule sets up a contradiction with other rules and systems that do allow less vertical separation, or for deep and sand-lined systems.
77	18E .0505	(b)	Page-48 Lines 22-23	Depths to saprolite, rock, or parent material less than 18 inches are considered suitable or usable with alternative systems, adequate Ksat rate with adjusted LTAR, pretreatment, and/or site improvements. Main criteria is to maintain the minimum vertical spearation from the system infiltrative bottom to an unsuitable condition.	Depths to saprolite, rock, or parent material less than 18 inches are considered suitable or usable with alternative systems, adequate Ksat rate with adjusted LTAR, pretreatment, and/or fill site improvements. Main criteria is to maintain a vertical spearation from the system infiltrative bottom to an unsuitable condition. The rule as written sets up contraditions with other alternative system types and rules.
78	18E .0505	(c)	Page-48 Line 24	Modify and re-write sentence.	The required vertical soil depth is not from the soil surface for deep, sand-lined, or alternative systems. It should be from the unsuitable rock, saprolite, parent material condition up to the bottom of whatever the proposed dispersal field may be??? Vertical separations by other rules and system types could be 36, 24, 18, 14, 12, 9, or 6 inches. This rule needs serious re-consideration and re-write in context of the rules, and to avoid confusion and direct conflict with other rules, especially current Rule .1970.
79	18E .0506	(b), (c)	Page-48 Lines 32-36	With the knowledge and experience gained in working with saprolite materials the 24 inch vertical separation to unsuitable conditions should be reduced to 18 inches, and with alternative pretreatment <18 inches separation. If the saprolite is questionable Ksat or further site evaluations should be allowed for usage.	With the knowledge and experience gained in working with saprolite materials the 24 inch vertical separation to unsuitable conditions should be reduced to 18 inches, and with alternative pretreatment <18 inches separation. If the saprolite is questionable Ksat or further site evaluations should be allowed for usage.
80	18E .0506	(c) (1)	Page-49 Lines 1-2	With the knowledge and experience gained in working with saprolite materials finer textured soils should be allowed especially sandy clay loam. Textures with more clay content than sandy clay loam should be allowed for usage with positive Ksat testing and site evaluations results.	With the knowledge and experience gained in working with saprolite materials finer textured soils should be allowed especially sandy clay loam. Textures with more clay content than sandy clay loam should be allowed for usage with positive Ksat testing and site evaluations results.

	A	B	C	D	E
81	18E .0507	(a) & (b)	Page-49 Lines 18-21	Restrictive horizon should be updated to be better defined and quantitatively determined. The current unsuitable criteria is contradictory to deep, sand-lined, and many alternative systems.	Restrictive horizon should not have a thickness requirement, but a continuity requirement. A 1 inch restrictive horizon is as likely unsuitable as one >3 inches thick. Depth to restrictive horizon should only be a soil depth concern relative to system type which is addressed by other rules. Qualitative criteria should be a laminar horizon that contiguously occupies >50% of the available area and is identified by extreme resistence to auger boring, extremely hard / rigid / strongly cemented consistence, and obvious massive structure. A quantitative criteria could be <0.02 gal/day/sqft = 0.0013 in/hr which aligns with NCDEQ 02T rules for impermeable liners. Most restrictive horizons can be designed around through site improvements and/or system design types.
82	18E .0508	(a)	Page-49 Lines 1 - 2	Available space for systems under Sections .0900, .1500, or .1700. What about systems listed under Sections .1001, .1200, .1600 ??	Available space for systems under Sections .0900, .1500, or .1700. What about systems listed under Sections .1001, .1200, .1600 ??
83	18E .0508	(d) - (g)	Page-50 Lines 3 - 17	The numbering for .0508 (e) - (g) should be subordiante to (d).	The numbering for .0508 (e) - (g) should be subordiante to (d).
84	18E .0508	(f)	Page-50 Lines 13 - 14	The repair area exemption is for the property, not the system. The (f) provision appears to conflict with the property exemption granted for repair area under (d).	Delete .0508 (f), and abide under the conditions and exemption for properties as stated under (d), (e), & (g) .
85	18E .0509	(b)	Page-50 Line 28	18 inch vertical separation is not consistent or corrent relative to other rules for site suitability. Lesser vertical separations are possible with alternative system types and design, and as to other factors such as water table…….	Delete (b) or expand it to make it correct and in context with all other rules.
86	18E .0509	(e)	Page-50 Lines 35 - 36	Need to include the "Engineered Option Permit" Rule .0207 as to options for a site classified as unsuitable.	Need to include the "Engineered Option Permit" Rule .0207 as to options for a site classified as unsuitable.
87	18E .0510		Page- 51-53	This entire Rule section for Special Site Evaluations needs to be incorporated into Rules .0303, .0304, .0305 Licensed or Certified Professionals etc for proper sequencing, logical order, consolidation, and to reduce repetitiveness of rules.	This entire Rule section for Special Site Evaluations needs to be incorporated into Rules .0303, .0304, .0305 Licensed or Certified Professionals etc for proper sequencing, logical order, consolidation, and to reduce repetitiveness of rules.
88	18E .0601 18E .0602	All All	Page- 54-59	Several of required buffer setbacks have been changed or eliminated. Need explanations and validations for all changes. This entire section will take more time to digest and justify several of these buffer setbacks, and the exemption language.	Several of required buffer setbacks have been changed or eliminated. Need explanations and validations for all changes. This entire section will take more time to digest and justify several of these buffer setbacks, and the execmption language.
89	18E .0700 18E .0800 18E .1100 18E .1400	All	All pertinent Section pages.	All of these Sections address tanks, pumps, controls, materials, and their specifications or approvals. These Sections need to be organized together preferrably at the end of the rules, and revised / condensed as much as possible. Some could be put into construction references rather than into set Rules. Product approval and process rules need to be grouped together and condensed.	All of these Sections address tanks, pumps, controls, materials, and their specifications or approvals. These Sections need to be organized together preferrably at the end of the rules, and revised / condensed as much as possible. Some could be put into construction references rather than into set Rules. Product approval and process rules need to be grouped together and condensed.

	A	B	C	D	E
90	18E .0900 18E .1000 18E .1200 18E .1500 18E .1600	All	All	All of these Sections address the variuous types of wastewater systems, siting design, siting criteria, credits, and etc. These Sections need to be organized in a logical sequencing order, revised, and condensed as much as possible. We recommend organizing all systems in the following order: 1--treatment level and credits; 2--dispersal method and credits; 3--types of approved systems that meet those criteria. The techincial specifications and requirements of each particular approved system should be kept as a reference document for its' specific requirements rather than trying to put them into Rules, as they will be subject to change by the manufacturer.	All of these Sections address the variuous types of wastewater systems, siting design, siting criteria, credits, and etc. These Sections need to be organized in a logical sequencing order, revised, and condensed as much as possible. We recommend organizing all systems in the following order: 1--treatment level and credits; 2--dispersal method and credits; 3--types of approved systems that meet those criteria. The techincial specifications and requirements of each particular approved system should be kept as a reference document for its' specific requirements rather than trying to put them into Rules, as they will be subject to change by the manufacturer.
91	18E .1002	All	All	This would be a good time to set effluent standards for Recycle/Reuse pretreatment systems, and siting criteria for subsurface dispersal, rather than just recycling for non-potable uses. Then include these standards into Rule with other subsurface system types.	This would be a good time to set effluent standards for Recycle/Reuse pretreatment systems, and siting criteria for subsurface dispersal, rather than just recycling for non-potable uses. Then include these standards into Rule with other subsurface system types.
92	18E .1300	All	Pages 111 - 120	This Section regarding Operation & Maintenance should be incorporated into Section .1300 Responsibilities and condensed as much as possible for logical order, efficiency, and reduce redundancy.	This Section regarding Operation & Maintenance should be incorporated into Section .1300 Responsibilities and condensed as much as possible for logical order, efficiency, and reduce redundancy.
93	18E .1306	(c)	Page-199 Lines 19-20	This rule should also specify the Engineered Option Permitas as an option for repair of malfunctioning systems.	This rule should also specify the Engineered Option Permitas as an option for repair of malfunctioning systems.
94	All	All	All	This is our first overview of these rules with inputs of several of other parties. There are numerous other areas we feel these Rules may need updating with current standards, or can be revised, condensed, and made more efficient. We feel another draft will be forthcoming after consideration of all the inputs, and will wait for a review of the revised draft. There are many portions of these Rules that the Rules Review Commission will likely have concerns regarding authority, ambiguity, clarity, length, and rule structure.	This is our first overview of these rules with inputs of several of other parties. There are numerous other areas we feel these Rules may need updating with current standards, or can be revised, condensed, and made more efficient. We feel another draft will be forthcoming after consideration of all the inputs, and will wait for a review of the revised draft. There are many portions of these Rules that the Rules Review Commission will likely have concerns regarding authority, ambiguity, clarity, length, and rule structure.
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	A	B	C	D	E
1		**NCDEH 18E Proposed Rules Review by:**		**Caldwell County Health Department**	
2				*Compiled by: Connie Adams*	
3				*October 31, 2017*	
4	**Rule Number**	**Sub-Rule Number**	**PDF Page-#; Line-#**	**Comment**	**Suggested changes based on comment** ***(Alternate language, suggested definition, etc.)***
5					
6	18E .0105	(48)	pg 10 line 22		Mottle means a color (OR, an area of soil with munsell color) differing from the matrix color of a soil horizon
7	18E .0105	(53)	pg 10 line35 to 36	The definition of off-site system given here is quite expansive and appears to include anything from a drainfield that crosses 10' over onto a neighbor's property to a system with a 1 mile supply line to a common area with 10 drainfields on it. Further on in the rules there are requirements that off-site systems have multi-party agreements (.0204 (f);p18 line 20) and a certified operator to maintain the system (page 113 Table XXXI). These requirements are reasonable for the latter situation, but not for the former. There is a need to distinguish within the rules between 1) offsite systems with small encroachments that are within sight or adjacent to the facility's location and 2) remote situations that are likely to be unattended and unnoticed if special effort is not made to establish a responsible party.	I suggest something like the following: "Local off-site system means a wastewater system where all or part of the drainfield is located on an adjacent property to the lot the facility is located on. Local off-site systems shall not be further than 100 feet (or some reasonable number) from the common property line." (or something like that) "Remote offsite system means a wastewater system where all or some system components are located on property that is not adjacent to the lot the facility is located on or is more than 100 feet from a common property line of an adjacent property. Remote systems are often located in clusters on common property areas and do not have an obvious party that has responsibility for maintaining the site and observing the system for proper function."
8	18E .0105	(57)	pg 11 line 8-9		"parent material" means the mineral matter that is. . . or by decomposition of rock and has not gone through soil forming processes.

	A	B	C	D	E
9	18E .0105	(80)	pg 13 line 15-18	Per the "Methodology for Identification of Intermittent and Perennial Streams and their Origins", 2010 version, which I suspect is the source for these terms, "ephemeral streams" primarily carry stormwater runoff and only run for a short time after major precipitation events (pg 5 of the manual). Is it your intention to expand the definition of a stream this way? In the past I understood stream to mean a water way that carried water >50% of the time from Nov to April.	"This includes intermittent and perennial streams as defined by DEQ. . ." (suggest dropping ephemeral streams--currently they are not subject to these setbacks. Since they are above water table and carry water for a short time, the 50' setback is not needed.) OR make sure the setbacks in Table IX accurately reflect the difference in function between ephemeral and intermittent/perennial streams.
10	18E .0105	(82)	pg 13 line 23	Interceptor drains and foundation drains are not surface water diversions--they are listed separately under artificial drainage definition and so are already covered by the law	"Surface water diversions include waterways, swales and ditches."
11	18E .0202	(e)(2)	pg 15 lines 9-13	Other possible types of permits one might apply for include repair and system redesign for a CA.	
12	18E .0202	(e) (9)	pg 15 lines 34	Provision for an agent to act for the owner is needed.	"Signature of owner or person authorized to act on owners behalf"
13	18E .0203	(b)(7)	pg 17 line 1	Does all wastewater fall under DSE, NSF-40, TS1 or TS2? Small businesses like restaurants might have higher strength than DSE without needing pretreatment.	Can DSE be assumed if left unstated?
14	18E .0203	(f)	pg 17 line 16	This rule appears to require that permit be revoked when a new IP is applied for. This is unreasonable: people should be able to see if they have an option for another site without the existing approved area being revoked or suspended--I suggest that it be revoked before a new permit for the same design unit can be released or issued. This also saves the LHD from extra paperwork in the event a new permit cannot be issued.	(4) a new Improvement Permit is issued for the same design unit on the same property.
15	18E .0204		pg 18 line 27	This rule appears to require that permit be revoked when a new CA is applied for. This is unreasonable: people should be able to see if they have an option for another site without the existing approved area being revoked or suspended--I suggest that it be revoked before a new permit for the same design unit can be released or issued. This also saves the LHD from extra paperwork in the event a new permit cannot be issued.	(4) a new Construction Authorization is issued for the same design unit on the same property.

	A	B	C	D	E
16	18E .0204	(d)	pg 18 line 5-7	"A building permit shall not be issued until CA's for all wastewater system components serving the facility have been issued" The meaning of this is not clear to me, and I think part of it is that some words like "wastewater system" have not been used as defined by the statute and by 18E .0105. Does the revision shown to the right get at your intended meaning? If the intent was to provide in the rules for partial CA's, for example to allow long supply lines to offsite area to be built before lots are sold and well before drainfield design can be finalized, I strongly agree with that intent. There is a real need for that kind of flexibility on some projects.	"(d) A CA shall be issued for each ground absorption system serving a facility. Separate CA's may be issued for individual components. A building permit shall not be issued for a design unit until CA's for all components of the ground absorbtion system serving that design unit have been issued.
17	18E .0204 (e) and 18E .0205 (d)		pg 18 line 9; pg 19 line 22	Are multi-party agreements only needed between a developer and a homeowners association?	". . . a draft multi-party agreement among all parties involved in managing or using the system shall be submitted. . ."
18	18E .0204	(f)	pg 18 line 20	This looks like a multi-party agreement is required for any offisite system, even if there is only a small encroachment onto a neighbors property. I can see requiring a multi-party agreement for a remote off-site system on common property in a developemtn. but for a small encroachment onto an adjacent property the easement can adequately cover any maintenance issues between the parties.	see recommendation above for defining local and remote offsite systems in definitions. Somehow exclude small simple encroachments from this requirement.
19	18E .0205	(c)(4)	pg 19 line 14	Is there a pressing state interest in having trench depth and width on OP? It seems like unnecessary information, and adds to clutter on OP. Leave this up to the local health department. It is important to have an as-built diagram of what was installed, reflecting changes compared to what was on the CA.	"as-built drawing of dispersal field as actually installed."
20	18E .0206	all	pg 20 line 18 to pg 21 line 4	Really appreciate having this important function codified. For reconnects when a new structure or trailer is connected to an existing system, and for footprint expansions, having legal authority to make sure that the system is not encroached on by the change is incredibly useful in preventing catastrophes.	
21	18E .0206	(a) (2)	pg 20 line 22	what do you mean by "reuse of an existing system"? If a house has been abandoned for a couple of years, is it necessary to look at septic system before it is put back into use? To what end?	remove this line
22	18E .0207	(b)	pg 21 lines 14 and 15	Good precise statement regarding roles of LSS and LG in the permitting process.	

	A	B	C	D	E
23	18E .0301	(c)(4)	p 24 line 20	Do you mean to require both description and survey map? Not always necessary and a burden on the public. Is "deed" the correct term here?	"specified in a recorded easement by metes and bounds description or attached survey map. . ."
24	18E .0302	(d)	pg 25 lines 11 to 18	Glad to see this exception left in the rules. It is really important that properties with several or many small drainfields spread out over a large area not be treated as large systems with the attendant additional regulatory requirements. There is no technical reason to impose the added requirements for lateral flow and state review on these sites. This rule as set up appears to adequately address the state's need to balance the potential impact of very concentrated areas of septic disposal (ie, >3000 gpd **drainfields**) with its interest in not having to go through those extra regulatory steps for facilities/wastewater systems that do not have those potential impacts even though the overall wastewater system is over 3000 gpd. Note small typo in (1)--structure of sentence does not match 2 and 3.	"(1) individual ground absorbtion systems serving individual design units have a design daily flow less than or equal to 1500 gpd"
25					
26	18E .0402	(b)	pg 36 lines 15 and 16	Appreciate that pretreatment is not being required for flows less than 1500 gpd--that would be onerous for small restaurants and similar small businesses.	
27	18E .0501	(c)	pg 38 line 36	Sometimes it is necessary to describe soils to greater depths to achieve 36" trench depth, in saprolite, and steep slopes.	"(c) Soil profiles shall be evaluated to the following minimum depths: "
28	18E .0501	(c)	pg 39 line 1	On the other hand, if I am permitting a site for drip, is it really necessary to evaluate all the way to 48"?	add: "(3) to a depth 24" below the proposed infiltrative surface"
29	18E .0503 through .0507	all		Statements regarding suitability determination are inconsistent, sometimes included, sometimes not, sometimes a maximum, sometimes a minimum, sometimes with effluent strength indicated. Suggest that a consistent format be used in all of these sections, or that one statement regarding suitablity based on these criteria be made in .0509. It may be that .0509 (b) would be adequate.	
30	18E .0503	(2)	pg 40 line 21 through page 41 line 3	Suggest that section on structure reference the USDA-NRCS Field Book for Describing and Sampling Soils. This will provide uniform guidance across the state for this characteristic.	
31	18E .0503	(3)(A)	pg 41 line 11 through pg 42 line 3	Will this rule prevent possible future improved techniques for CEC determination from being used?	

	A	B	C	D	E
32	18E .0504	(b)(1)	pg 41 lines 29 through 30	Chroma 2 or less colors can also result from organic matter in A horizon and not reflect soil wetness. In Soil Taxonomy, one way this is handled is to specify chroma 2 or less and value of 4 or more. This excludes common A horizon colors like 2/2 or 2/3 that do not indicate wetness.	"Colors of chroma 2 or less that are lithochromic or due to organic matter in A horizon shall not be considered indicative of a soil wetness condition."
33	18E .0504	(c)	pg 43 lines 5-8	Do you intend to consider sites with SWC between 12-18 inches suitable? Why? Contradicts .0509 (b). I also think this should go after the alternative procedures--it shouldn't matter how SWC is determined as to depth for suitability.	"Site Suitability as to Soil Wetness: Sites where the soil wetness condition is less than 18" below the naturally occurring soil surface shall be considered unsuitable with respect to soil wetness. Sites where the soil wetness condition is 18" or more shall be considered suitable with respect to soil wetness." (additional language for group I soils may be needed) (locate after (g) or (h))
34	18E .0505	(a) and (b)	pg 48 lines 20-23	This is an example of inconsistent suitability statement. Why is this one specified for DSE and gravity distribution? Other limiting conditions do not have this specified, even though they also might have a reduced soil depth needed based on pretreatment or pressure dispersal. It is cleaner and easier to read without this specified. If DSE is specified, statement as to suitable depth for other treatment levels should be added.	"(a)soil depths to saprolite, rock or parent material 18 inches or greater shall be considered suitable as to soil depth. (b) Soil depths to saprolite, rock or parent material less than 18 inches shall be considered unsuitable as to soil depth. "
35	18E .0508	(a)	pg 49 line 30	typo	". . .provided shall meet all. . ."
36	18E .0509	(b)	pg 50 line 28	Is it the intention to make vertical separation 18" now? Per definitions "vertical separation" is between infiltrative surface (trench bottom) and unsuitable horizon. I think this is a typo and that likely intention was depth from soil surface to limiting condition. Note that this contradicts .0504 which sets limit for SWC at 12".	"(b) The minium depth from soil surface to any limiting conditions shall be 18 inches"
37	18E .0510	(d)	pg 53 lines 17 to 27	Is it the state's intention that projects with an overall design daily flow greater than 3000 gpd but whose drainfields are small and dispersed over a large area be subject to these requirements? Groundwater mounding and lateral flow are very expensive for the applicant and time consuming. As is nutrient migration analysis. On sites where the actual drainfields are small and spread out, and not vertically stacked on one hillside, there is no more need to worry about a mounding analysis than in a housing development with 1/2 or 1 acre lots. This would be an unnecessary burden on certain kinds of development, especially camps and parks. In addition, this requirement appears to contradict the intention of 18E .0302 (d).	"(d) For individual ground absorption systems serving individual design units with design daily flow greater than 3000 gpd, the special site evaluation shall include sufficient site-specific data to predict . . ." OR "(d) For sites serving systems that are greater than 3000 gpd and that do not meet the exception to state review under 18E .0302 (d), the special site evaluation shall include sufficient site-specific data to predict . . "

	A	B	C	D	E
38	18E .0510	(a)(5)(A)	pg 52 line 6	I assume "greater than or equal to" is a typo and should be "less than"	
39	18E .0601	Table IX	pg 54 line 5	"stream" should specify "intermittent and perennial".	"Any other coastal water, canal, marsh, intermittent or perennial stream, or other surface waters"
40	18E .0601	(h)	pg 56 lines 1 through 3	There is no reason for increased setbacks for individual ground absorbtion fields or dispersal fields that meet the requirements of 18E .0302 (d)	"(h) In addition to the requirements of paragraph (a) of this Rule, wastewater systems with a proposed design daily flow greater than 3000 gpd that are subject to state review shall be located the minimum setbacks from the site features in Table X."
41	18E .0601	Table XI	pg 56 line 14	The exact meaning of public water supply source vs. private needs to be clarified. Specifically, are shared wells that serve fewer than 15 houses or 25 people (ie, do no meet criteria to be considered a Public Water Supply subject to DWR rules) considered a public or private water supply?	
42	18E .0806	(b)	pg 68 line 29	As written the rule could tie us to requiring exactly 2 feet. Which would be irritating and at times counter productive.	"(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending at least 2 feet beyond the tank outlet."
43	18E .0901	(a) (1)	pg 69 line 17	very consequential typo--please correct!! If 12" on downslope side, there will be less than 12" to unsuitable on the upslope side!	"(1) 12 inches of naturally occurring soil is on the **upslope** side of the trench between the infiltrative surface and any limiting condition. . . "
44	18E .0901	Table XVI and XVII	pg 70	Am I calculating this correctly? It looks like the upper end of DSE strength would almost double or triple drainfield size based on mass loading, so presumably HSW would more than double required drainfield size based on this? Is that the intent? Effectively, 0.4 LTAR soil would have to get LTAR of 0.2 or less for high strength effluent.	
45	18E .0901	Table XVII	pg 70 line 21	Typo in title	"TABLE XVII. LTAR and mass loading rate for wastewater systems in saprolite. . . "
46	18E .0901	(d) (3)	pg 71 lines 14 through 17	very consequential typo--please correct!! If 12" on downslope side, there will be less than 12" to unsuitable on the upslope side!	"(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the **upslope** side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I 15 soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the **upslope** side of the infiltrative surface and a soil wetness condition;. "
47	18E .0901	(d) (5)	pg 71 line 19	Sometime more than 6" of final cover is desirable, and trenches can be deeper than 18".	"(5) final soil cover over the dispersal field shall be to a minimum depth of six inches after settling. . ."
48	18E .0901	(d) (9)	pg 72 line 3	typo--replace effluent with more appropriate term.	"(9) serial and sequential distribution may be used when approved by the authorized agent. The stepdown or dropbox in an individual trench shall be constructed to allow full utilization of the upstream trench prior to . . ."

	A	B	C	D	E
49	18E .0901	(d) (10)	pg 72 line 9	typo--this paragraph is about step downs, not drop boxes. Also, how do you propose for installer to "demonstrate" performance? Suggest dropping that language here and in (11). Setting construction standards to ensure performance is more effective.	(10) step-downs shall be constructed 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 equivalent State-approved pipe. The installer shall demonstrate that the step-downs perform as designed
50	18E .0901	(d) (11)	pg 72 line 10 through 13	How do you propose for installer to "demonstrate" that drop boxes perform as designed? Suggest dropping that language-- setting construction standards to ensure performance is more effective.	
51	18E .0902	(c) and (d)	pg 72 lines28 through 37	By basing trench length on equivalent trench width of 3' (prescribed in (c)) and then installing trenches of 2' actual width on 6' centers as allowed under (d) (2) and (d)(3), you can get a 33% reduction in area required for the drainfield. Is this the intention?	"(c) The LTAR shall be determined in accordance with Rule .0901 (b) of this Section. Actual trench width shall be used to determine trench length in accordance with Rule .0901 (c). . . "
52	18E .0902	(e)	page 73 line 9	Shallow systems need to be defined. Do you mean <18" trench depth with fill for cover? It used to mean <36" trench depth. May also need to define "shallow placement" in .0902 (a) (pg 72 line 26)	Suggest adding definition of "shallow system" to .0105: "Shallow system means a trench system installed with trench depths of less than 18" and which requires fill for cover to achieve minimum cover requirements" OR, be that explicit in this rule (and subsequent rules where applicable?)
53	18E .0902	(e) and (f)	pg 73 lines 9 through 29	Are these two supposed to be under .0901? They apply to most systems, not just gravel. Especially (e) which is shallow trench depth with fill for cover.	
54	18E .0904	(e)(1)	pg 75 line 19	Have there been issues with 14" and 16" trenches? I will get a lot of push back from installers on the 12" trench width.	
55	18E .0904	(e)(3)	pg 75 line 21	This is a big change--former rule was to use sand when soil group is IV. What is prompting this change?	
56	18E .0904	(e)(4)	pg 75 line 23	What????	
57					
58					
59					
60					
61					
62					



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closed 1955 re-opened 2014

Benjamin O. Paine Company

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October 5, 2017

Chris Hoke

Office of Regulatory and Legal AffairsDivision of Public Health
1931 Mail Service Center
Raleigh, NC 27699-1931Dear Ms. Angoli

Dear Chris

A member of our staff attended the hearing held in Raleigh on October 2, 2016 for the revised onsite wastewater regulations. He has reported that some manufacturers of small wastewater treatment systems testified and asked for more lenient total nitrogen standards. We wish to be put on record as opposed to more lenient nitrogen standards than those proposed in the draft regulations. In fact, we feel what is being proposed is quite lenient when compared to many other states. The following are some but not necessarily all of the reasons why we feel more lenient nitrogen standards make no sense for North Carolina:

1. North Carolina has many coastal embayments. The biggest threat to coastal embayments is nitrogen contamination. Much of the state's ground water eventually migrates into the coastal embayments.
2. Twenty milligrams per liter of nitrogen is a very lenient standard and attainable by most quality secondary treatment systems with properly controlled recycle. True biological nutrient removal systems such as ours are not necessary for 20 mg./L. We would prefer to see a limit of 14 mg/L. as NJ does or even < 10 mg/L as is often required by several states.
3. From a commercial point of view raising the limit puts the poorer performing systems on an equal footing with the better systems. The better systems, in general, now cost no more than the poorer performing ones, so if the nitrogen standards are loosened the environment and the public loses and a few inferior manufacturers gain.

4. We believe the state of North Carolina should be challenging manufacturers of onsite wastewater treatment systems to constantly produce better systems, embrace new ideas and not work to maintain the status quo and in this case certainly not go backwards.

P.S. We are particularly interested in North Carolina regulations because we have office, assembly and storage facilities located in Powells Point, NC and use several North Carolina companies as suppliers for components of our system.

Very truly yours

W. Keith Dobie Sr.

Keith Dobie

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Comments on proposed 15A NCAC 18A

Pressurized Systems (regarding filtration)

Page 64 line 9 states “approved effluent filter shall be in the compartment immediately prior to discharge”. This should apply to pressurized systems as well, where the pump tank is the compartment immediately prior to discharge. Simply putting a gravity filter in the septic tank is not good enough. Not only can debris enter the pump tank from the pump tank access, but the smaller debris can reform into much larger debris in the pump tank as well as biological growth can slough off the tank walls, piping and pumps. On page 132 lines 16 and 17 the proposed code even mentions solids accumulating in the pump tank and turbine pump intake holes are not much different in sizing than the discharge holes on pressurized laterals. Just as this part of the code shows the importance of filtering at the discharge so should the section on pressure distribution. There are many options, such as pressure filters, filtered pump vaults, pump screens, and more. Page 81 lines 4 and 5 state “the maximum lateral length shall yield no more than a 10 percent difference in discharge rate between the first and last orifice along the lateral”. No matter how precise you are with your calculations on pump size, hole size etc. This 10% cannot be maintained if even just some of the discharge holes become clogged by debris from the pump tank. This can only be prevented with filtration at the discharge of the system. We have seen a code change recently in another health department code that states “Pump discharge filters are required where the distribution orifice size is ¼ inch diameter or smaller. Maximum pump discharge filter opening/screening size shall not exceed the maximum orifice size in the distribution network.”

Orifice Protection

Page 81 lines 10 through 14 talk about protecting orifices with piping, tubing or orifice shields. It would be our concern in systems with discharge holes pointed down that when using pipe or tubing to sleeve the laterals, the discharge holes could be blocked by the pipe or tubing. If holes are pointed down there should either be a method of centering the laterals in the sleeve or only using orifice shields in this circumstance. Another concern is the crushing of the corrugated pipe during backfill. In traffic areas the pipe requires a foot of backfill and, while the field is not a traffic area after it is installed, it does tend to get traffic from the very machine that is doing the backfilling which has caused many instances of crushed pipe.

Turn-ups on pressurized laterals

We would recommend that lines 30 to 33 on page 81 also state that the turn-ups should be white in color to differentiate them from grey electrical conduit that may be used on electrical components. We would also recommend that the turn-ups be long radius sweeps to allow for better access for inspection

and cleaning equipment (if filters are not used on the pump) as a normal 90 degree bend is often too tight to pass this equipment.

Risers and Riser Covers

Page 123 lines 33 and 34 state “the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening”. We are happy to see the term “nominal” applied so that various 24” risers and riser materials are not excluded because they are slightly less than 24”. However, later on, on page 124 lines 31 and 32 state “tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.” The key term here is “minimum”, where we believe that it should be “nominal” instead as it was on page 123.

Page 123 line 25 states “tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds”. There is an ASTM spec that can be reference here, ASTM 1227 07-C, that other codes use and that spec references 59 pounds as the minimum weight.

Gary Koteskey
President

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From: Hoke, Chris
Sent: Monday, September 18, 2017 2:27 PM
To: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: Onsite Rules Comments
Attachments: DOC091817-09182017142220.pdf

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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-----Original Message-----
From: DPH Director Office [mailto:NoReply@dhhs.nc.gov]
Sent: Monday, September 18, 2017 5:22 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Send data from MFP07876072 09/18/2017 14:22

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Division of Public Health, On-Site Water Protection Branch October 23, 2017

North Carolina Department of Health and Human Services

Attn: Chris Hoke; JD

1931 Mail Service Center

Raleigh, NC 27699-1931

chris.hoke@dhhs.nc.gov

RE: Public Comments on the Proposed 18 E Rules

Chris, below are my comments to the proposed rules. Each is identified by the proposed rule section.

Soil Wetness Conditions; .0504

Current and proposed rule in .0504 (b) (2) reads as; "A soil wetness condition shall also be determined by direct observation or indication of saturated soils or 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 of chroma 2 or less. A soil wetness condition caused by saturated soils or perched water table shall be confirmed to extend for three consecutive days.

Don Wells comment; 3 days is way too short to observe water in soil. I proposed to replace the current "3 days" with **120 days** to parallel site monitoring as described in procedures in section (e) of soil wetness rules. This is consistent with other sections of this rule.

Soil Morphology; .0503

(1) Texture; Don Wells comment; Allow the "applicant" to also substitute laboratory determination of soil texture and rule would read as follows;
"In place of field testing, the LHD, **the applicant** or the State may substitute laboratory determination of the soil texture class when conducted in accordance with ASTM D6913 and D7928".

With adding the Applicant, then also add the following; When laboratory testing of soil texture is proposed by the applicant, the LHD shall be notified 48 hours before samples are to be collected by the licensed professional representing the applicant, in accordance with G.S. 89C, G.S. 89E, G.S. 89F. Samples shall be representative of the soil horizon being evaluated for texture. Split samples shall be made available to the LHD when requested.

This would be consistent with other similar rules for submitting lab samples.

(2) Structure; Don Wells comment; Allow site testing for determining the site loading rate as follows; “Where sites are Unsuitable with respect to soil structure, it may be classified Provisionally Suitable after a special investigation indicates that a modified or alternative system can be installed in accordance with rules.”

(3) Clay Minerology; Currently and as proposed, clay minerology greater than 16 milliequivalents/100 grams of clay is unsuitable. Don Wells comment; when laboratory results for CEC are between 16 to 24 milliequivalents/100 grams of clay, allow site testing for determining the site loading rate as follows; Where sites are Unsuitable with respect to Clay Minerology, it may be classified Provisionally Suitable after a special investigation indicates that a modified or alternative system can be installed in accordance with rules.

Saprolite; .0506

Don Wells comments; Recommend treating saprolite (C horizon) as a component of the soil and subject to the same rules. No increased vertical separation, and remove the one-inch of suitable soil equals two inches of saprolite. Have the saprolite section reference a 12-inch minimum vertical separation to an unsuitable condition such as lithic bedrock contact or soil wetness condition.

Some LHD classifies the saprolite texture with finer texture such as sandy clay loam. In my opinion, the downward movement of clay is a soil formation process, therefore keep it within the same conversation. There are a lot site conversations about “is this C or BC material” and “is this more the 50% B or 50% C”, etc, and this creates a lot of confusion in the field and I feel we should look at the bigger picture, does the site treat and move water. We already allow having pretreatment in saprolite if the concern is “treatment”. Then the main question is; does the saprolite material move water. I recommend expanding the current Table III to include other saprolite/soil textures.

Soil Depth; .0505

To follow from above, the depth to saprolite should be removed as an unsuitable condition. The depth to unsuitable characteristics should be to lithic bedrock or CR horizons. When you have C horizons (saprolite) then the Table III in Saprolite section (.0506) above can be applied as part of the evaluation process. Many case studies have been completed in saprolite to show that it does move water in certain conditions, therefore it should be treated as part of the useable formation.

Don Wells comments; Remove Saprolite from the rule heading and have the following; **15A NCAC 18E .0505 Depth to Rock or Parent Material**. Remove the word “saprolite” from this section.

Now if we have to keep saprolite in this rule section then allow a new section like the following; (d) Where sites are Unsuitable with respect to soil depth, it may be classified Provisionally Suitable after a special investigation indicates that a modified or alternative system can be installed in accordance with rules.

Again, looking at past research and site testing and the saprolite material itself as part of soil formation process and being useable under certain conditions.

Restrictive Horizons; .0507

Don Wells comments; Recommend allowing site testing to be used on a site with "unsuitable due to restrictive horizons". Add a section as follows; (c) Where sites are Unsuitable with respect to restrictive horizons may be classified Provisionally Suitable after a special investigation indicates that a modified or alternative system can be installed in accordance with rules.

The above comments are based on my experience in the field of Soil Science and evaluating soils/sites across North Carolina.

Sincerely

Donald Wells



NC Licensed Soil Scientist, 1099

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October 31, 2017

Chris Hoke
1931 Mail Service Center
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chris.hoke@dhhs.nc.gov.

Dear Mr. Hoke:

The purpose of this letter is to provide further explanation and to express our continued opposition to the North Carolina draft 18E regulations. Last year Presby Environmental, Inc. provided a detailed response to numerous 18E proposed rules. Although some of the minor suggestions we made were incorporated in the last 18E revision, overall the document totally disregards and unfairly regulates our wastewater treatment and disposal methods and technical practices by continuing to implement arbitrary and outdated prescriptive regulations.

In summary, once again Presby requests that the following modifications be made to the draft 18 E regulations proposed by the North Carolina Division of Public Health:

1. The removal of all pressure distribution requirements and sizing advantages granted to systems that utilize pressure distribution over those that utilize the gravity disposal of NSF/ANSI Standard 40 Class I treated effluent;
2. Approval of vertical separation reductions based on the quality of effluent as defined by NSF/ANSI Standard 40 Class I treatment systems, not the method of dispersal such as pressurized systems; and
3. The removal of all daily design flow (GPD) and linear footage limitations imposed on systems utilizing the gravity flow of NSF/ANSI Standard 40 Class I treated effluent above that required for pressure distribution systems; and
4. The inclusion of a definition of high strength wastewater.

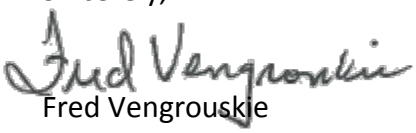
Opposition to Items 1-3, are also included in our comments submitted in 2016.

There is no reasonable basis to treat NSF/ANSI Standard 40 Class I treatment systems utilizing gravity flow less favorably than pressure distribution systems. Therefore, unless the Division of Public Health alters its position of favoring pressure distribution systems over the health and environmental benefits of utilizing NSF/ANSI Standard 40 Class I treatment systems we will have no option but to continue our opposition to the draft 18E rules with the North Carolina Commission of Public Health and the North Carolina Rule Review Commission.

We regard the department's position favoring the disposal of wastewater by pressure distribution over the health and environmental benefits of disposing of treated wastewater to be unreasonable and contrary to the best and most currently available application of environmental practices. To continue this position would be an egregious error in representing the interests of the citizens and the future of the onsite wastewater industry in North Carolina.

We sincerely hope that the North Carolina Division of Public Health will reconsider its position regarding this matter.

Sincerely,



Fred Vengrouskie
Government Relations Representative
fred.vengrouskie@presbyeco.com

MICHAEL D. MCCULLEY, JR., P.A.
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6102 LYDDEN ROAD
WILMINGTON, NC 28409
(910) 547-5185

VIA EMAIL

October 31, 2017

Mr. Chris Hoke
chris.hoke@dhhs.nc.gov

Re: Public Comments on 15A NCAC 18E .0101-.1713

Dear Chris,

I hope you're doing well. Please be advised that I represent Presby Environmental, Inc. ("PEI"), with regard to 15A NCAC 18E .0101-.1713, which is currently proposed for adoption. I write to provide the attached comments from PEI and to identify some of their key concerns with regard to the proposed regulations.

EXISTING AES APPROVAL SHOULD NOT BE MODIFIED

As a preliminary matter, it is my understanding that there will be no detrimental changes to PEI's existing Innovative Approval (issued in 2015) as the result of these proposed regulations. To the extent that there are any such changes, PEI opposes them as a matter of policy and objects as a matter of law. PEI's North Carolina Approval required a substantial investment over several years and was issued just 2 years ago. It is PEI's position that, under these circumstances, any newly imposed limitations or reduction in siting and sizing criteria to the existing Advanced Enviro-Septic approval would require, among other things, a level of due process not afforded by the current 18E rulemaking process and would therefore be invalid.

REQUIRING EXCLUSIVE USE OF PRESSURE DISPERSAL MUST BE SCRUTINIZED

The proposed 18E regulations rely heavily on the prescriptive use of pressurized dispersal. PEI respectfully disagrees with this approach and questions whether sufficient data is available to justify the exclusive use of pressure dispersal in situations where gravity dispersal of treated effluent would arguably perform as good or better, especially over the life of the system. Given the public interest in healthy market conditions and encouraging innovation, regulations which prescribe the exclusive use of any particular technology must be seen as an extreme measure and therefore carefully scrutinized in terms of supporting data.

THE 18E RULES SHOULD SEEK TO PROVIDE A LEVEL PLAYING FIELD

Related to concerns with regard to prescriptive pressurized distribution, PEI is generally concerned that the proposed regulations fail to create a level playing field, given their consistent bias towards pressure distribution. PEI questions whether there is sufficient data available to justify a bias

towards pressure distribution and therefore opposes the proposed 18E regulations to the extent that they unfairly limit the application of other technologies.

"HIGH STRENGTH WASTEWATER" SHOULD BE DEFINED

PEI submits that the term "High Strength Wastewater" or its equivalent is highly relevant and important given the subject matter of the proposed 18E regulations and therefore should be defined under 15A NCAC 18E .0105.

Thank you for your consideration of PEI's concerns. We look forward to working together with NC Onsite Wastewater Staff and other stakeholders to improve the proposed 18E regulations as much as possible prior to adoption.

Yours truly,

Michael D. McCulley, Jr.

From: Hoke, Chris
Sent: Monday, September 18, 2017 3:30 PM
To: Teague, John
Cc: Michael, Larry; Deal, Nancy; Angoli, Trish; Martin, Bob
Subject: RE: Comment about proposed rule 15 NCAC 18E .0206

Thanks John.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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From: Teague, John [mailto:jteague@alexandercountync.gov]
Sent: Monday, September 18, 2017 3:07 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: Comment about proposed rule 15 NCAC 18E .0206

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

(c) Prior to construction, relocation of a structure, the expansion of an existing facility's footprint, or other site modifications which do not increase design flow or change wastewater strength and require the issuance of a building permit, an authorization shall be issued upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.
(d) For authorizations issued in accordance with this Rule the authorized agent shall provide written documentation to the owner that describes the site modification, system use and design flow, number of bedrooms, number of occupants and includes a site plan showing the location, dimensions, and setbacks of existing and proposed structures to the existing system and repair area.

What do authorized agents do if existing structures do not meet setbacks to the existing septic system?

I believe that it is very important that rule .0206 needs to address the issue of what actions should be taken if an existing system is already noncompliant when the authorized agent goes out to check setbacks for new building additions/expansions. Example, authorized agents are asked to go out for an inspection for a new garage and find that the new garage will meet the current setback rules; however, there is an existing garage, pool or other building over part of the septic system or a drive over the drainfield. Maybe the septic tank is on this property but part of the drainfield is on another property (property has been divided since permit issued). What do authorized agents do now? Issue the permit? Deny the permit? Issue the Permit for the new addition and a NOV for the existing system?

These are the BIG questions authorized agents are having problems with currently. What are our alternatives? What can authorized agents legally do? In the past 20 years that I have been working as an EHS, most authorized agents have been issuing Authorization of Existing System permits for additions such as pools, garages, etc. When situations like these came up, the authorized agent would issue a denial letter for the addition until the existing system was brought into compliance. This way the owners bring the system into compliance before they can do the addition. Otherwise, they may do the addition and never fix the system because they spent the money on the addition.

Authorized agents are issuing an Authorization of the existing system, which I consider stating that the existing system is ok, functioning correctly, and is in compliance with the current rules and regulations. But in the past couple of years, some applicants have requested the state look at some sites authorized agents have denied permits to and authorized agents have been told to issue the permits because the proposed additions meet the setbacks even though the existing systems are not meeting the setback requirements (pools over drainlines, decks over tanks, buildings over drainlines and/or tanks etc.). Authorized agents were also told not to issue a NOV unless the system is failing.

The rule as written is saying the same thing. Issue the permit if the addition meets the setbacks. It never addresses the issue if the existing structures, pools, property lines etc. must meet the setbacks also. If an authorized agent issues a permit for an addition where the existing system knowingly has a building, a pool, etc. located on top of it (because we had to locate the existing system to make sure the proposed structures meet the setbacks and to measure for setbacks to the existing structures to show on the site plan) and knowing the existing system does not currently meet the setback rules according to the Laws and Rules for Sewage Treatment and Disposal are the authorized agents not showing negligence and could be held liable if the system fails.

I would just like clarification on what the authorized agents are to do in these situations and think it should be addressed in the rules so all counties are being consistent across the state. Issuing a permit for an existing system inspection is fine if everything meets the setbacks including existing structures and etc. Issuing an existing system inspection permit if only the proposed addition meets the setbacks but the existing structures do not sounds like authorized agents are approving the existing system when we know it is in noncompliance.

Is this what the rule is wanting the authorized agents to do? If the existing structures do not meet the setbacks are the authorized agents supposed to issue a (NOV) notice of violation or just make a statement that the existing structures do not meet the setbacks and issue the permit anyway? I see no difference in a malfunctioning system and a system that does not meet the setback rules. Both mean the system is noncompliant. A system that does not meet the setback rules if brought into compliance at the time of the Existing System Inspection may prevent premature system

failures and prevent homeowners from costly repairs in the near future. If the failing system must be brought into compliance then why does the system that does not meet the setbacks not have to be brought into compliance as well? These situations should be addressed in the rules so all counties will be more consistent across the state.

Thank you for your time and consideration in this matter

John Teague
Environmental Health Specialist
Alexander County Health Department
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From: Hoke, Chris
Sent: Tuesday, September 05, 2017 3:35 PM
To: Gibson, Bert
Cc: Deal, Nancy; Angoli, Trish; Michael, Larry
Subject: RE: comment on flow rate

Thanks Bert. I am sharing your comments with our program staff.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs
Division of Public Health
North Carolina Department of Health and Human Services

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From: Gibson, Bert [mailto:bgibson@alexandercountync.gov]
Sent: Tuesday, September 05, 2017 2:50 PM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: comment on flow rate

Chris, I have an item that I believe will require clarification down the road. If it could be addressed now, it may alleviate some comments.

For Churches: Definitions

"Full kitchen" means all the appliances in a warming kitchen plus a warewashing machine or equipment.

"Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

On the warming kitchen, I read it to say that they can have 1 heating appliance and no 3 compartment sink.

On the Full kitchen, I read it to say that they have to have a dishwasher of some sort (or a 3 compartment sink?) to be a full kitchen.

I like the idea of what these are saying but I know there will be some issues on what a warming kitchen is unless it is more clearly defined.

Bert Gibson
Alexander County Environmental Health Supervisor
828-632-1000 ext.313

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SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

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

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 not discharge effluent to the land surface, surface waters, or directly to groundwater.

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

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

15A NCAC 18E .0102 APPLICABILITY

(a) The provisions of this Subchapter shall not apply to ~~functioning~~ wastewater systems in use prior to July 1, 1977, unless the wastewater strength changes or design daily flow increases. This provision does not affect the requirements for system operation, maintenance, and management in accordance with Section .1300 of this Subchapter.

(b) If the existing facility's design daily flow increases or wastewater strength changes, the owner shall submit an application in accordance with Rule .0202 of this Subchapter. The owner shall submit this application to the LHD prior to any change of flow or wastewater strength.

(c) All wastewater systems shall comply with Section .1300 of this Subchapter~~, except for the wastewater systems that meet the requirements of Paragraph (a) of this Rule~~.

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, and contact information for where a copy of the documents may be obtained from.

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

United States Department of Agriculture – Natural Resources Conservation Service (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	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	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	
C890	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
C990	Forty dollars ($40.00) each plus six dollars and ten cents ($6.10) shipping and handling

Commented [BS1]: Should name the referenced standards

C1644	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D448	Thirty nine dollars ($39.00) each plus six dollars and ten cents ($6.10) shipping and handling
D1784	Thirty nine ($39.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D1785	Fifty dollars ($50.00) plus six dollars and ten cents ($6.10) shipping and handling
D2241	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2466	Forty four ($44.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D2564	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2729	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2774	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D3034	Fifty dollars ($50.00) each plus six dollars and ten cents ($6.10) shipping and handling
D6913	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
D7928	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
F667	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O	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 02C	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

Commented [BS2]: Should name the referenced Rule

15A NCAC 02H	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	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 02U	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 13B	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
NSF International PO Box 130140, Ann Arbor, MI 48105 http://www.nsf.org/	
Standard 40	One hundred five dollars ($105.00) each plus shipping and handling
International Association of Plumbing and Mechanical Officials (IAPMO) 4755 E Philadelphia St, Ontario, CA 91761 http://www.iapmo.org/Pages/IAPMOgroup.aspx	
IAPMO/ANSI Z1000	One hundred dollars ($100.00) each
Canadian Standards Association 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
North Carolina Plumbing Code	
	Available at no charge at:

Commented [BS3]: Should specify the Edition

	http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/2012_NCBuildingCode_amendments/PlumbingCode-2012NCAmendments100517.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
American Association of State and Highway Transportation Officials (AASHTO) 444 North Capital Street, NW, Suite 249, Washington, DC 20001 https://www.transportation.org/	
Standard Specifications for Highway Bridges (AASHTO H5 and H10)	Three hundred eighty dollars ($380.00) each plus shipping and handling

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

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

15A NCAC 18E .0104 ABBREVIATIONS

As used in this Subchapter, the following abbreviations mean:

(1) ABS: Acrylonitrile-Butadiene-Styrene;

(2) ACEC: Apparent Cation Exchange Capacity;

(3) ANSI: American National Standards Institute;

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

(5) ATO: Authorization to Operate;

(6) BOD_5: Five-Day Biochemical Oxygen Demand;

(7) CA: Construction Authorization;

(8) CBOD: Carbonaceous Biochemical Oxygen Demand;

(9) CFR: Code of Federal Regulations;

(10) CSA: Canadian Standards Association;

(11) DDF: Design Daily Flow;

(12) DEQ: Department of Environmental Quality;

(13) DIP: Ductile Iron Pipe;

(14) DOT: Department of Transportation;

(15) DSE: Domestic Strength Effluent;

(16) EOP: Engineered Option Permit;

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

(18) gpd: Gallons per Day:

(19) IP: Improvement Permit;
(20) IPWW: Industrial Process Wastewater;
(21) LC: Limiting Condition;
(22) LDP: Large Diameter Pipe;
(23) ~~LG~~PG: ~~Licensed~~ Professional Geologist;
(24) LHD: Local Health Department;
(25) LPP: Low Pressure Pipe;
(26) LSS: Licensed Soil Scientist;
(27) LTAR: Long Term Acceptance Rate;
(28) mg/L: Milligrams/Liter;
(29) NEMA: National Electrical Manufacturers Association;
(30) NH_3: Total Ammonia Nitrogen;
(31) NOI: Notice of Intent to Construct;
(32) NOV: Notice of Violation;
(33) NSF: NSF International;
(34) OP: Operation Permit;
(35) PE: Professional Engineer;
(36) PIA: Provisional, Innovative, and Accepted;
(37) PPBPS: Prefabricated Permeable Block Panel System;
(38) psi: Pounds per square inch;
(39) PVC: Poly Vinyl Chloride;
(40) RV: Recreational Vehicle;
(41) RWTS: Residential Wastewater Treatment Systems;
(42) SDR: Standard Dimension Ratio;
(43) SWC: Soil Wetness Condition;
(44) TKN: Total Kjeldahl Nitrogen;
(45) TL: Trench Length;
(46) TN: Total Nitrogen;
(47) TSS: Total Suspended Solids;
(48) TW: Trench Width;
(49) USDA-NRCS: United States Department of Agriculture – Natural Resources Conservation Service;
(50) VIP: Visual Inspection Protocol; and
(51) WS: Water Supply Class.

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

Commented [BS4]: Preferred by the Geologists

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

15A NCAC 18E .0105 DEFINITIONS

The following definitions shall apply throughout this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material (crushed rock or gravel) screened to size for various uses.

(2) "Apparent Cation Exchange Capacity" (ACEC) means the sum of exchangeable bases plus total soil acidity at a pH of 7.0. ACEC is expressed in milliequivalents per 100 grams of soil (meq/100g of soil) or centimoles per kilogram of soil (cmols/kg of soil). The apparent soil ACEC is calculated by determining the ACEC using the neutral normal ammonium acetate method, pH of 7.0 neutral normal, and then dividing by the percent clay as determined by particle size distribution (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.

(3) "Approved" means that which the State 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 soil wetness condition or intercept lateral flowing ground or surface water. Artificial drainage systems include the following: groundwater lowering system, interceptor drain, foundation drain, and surface water diversion.

(5) "Authorized agent of the LHD" referred to as authorized agent, means a person who has been authorized by the State 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) "Bed" means an excavation with a width greater than three feet containing dispersal media and one or more laterals.

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

(9) "Berm" means a raised drainage feature used to divert stormwater runoff.

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

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable ~~appliances~~appurtenances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

(12) "Complete data set" means analytical results for all required influent and effluent constituents (as specified in the effluent quality 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.

(13) "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.

(14) "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 dosing activation elevation settings.

(15) "Design daily flow" means the 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.

(16) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater design daily flows are based. Multiple design units can comprise a facility.

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

(18) "Dispersal media" means the media used to provide void space through which effluent flows and is stored prior to infiltration (e.g., washed gravel or crushed stone, polystyrene aggregate, chambers, pipe, drip tubing with emitters, etc.).

(19) "Dose volume" means an amount of effluent delivered during a dosing event as determined by the activation levels in a demand dosing system or by a timer in a time dosing system.

(20) "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.

(21) "Effluent" means the liquid discharge from a pretreatment component.

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

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

(24) "Flood pool elevation" means the maximum water surface elevation of a reservoir, equal to the elevation of the spillway.

(25) "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.

(26) "Full kitchen" means all the appliances in a warming kitchen plus a warewashing machine or equipment.

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

(28) "Gravity distribution" means gravity delivery of effluent to and within each lateral.

(29) "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 distance beneath a dispersal field.

(30) "Horizon" means a layer of soil, approximately 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.

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

Commented [BS5]: May cause problem, depending how vertical setback described under "system".

(32) "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.

(33) "Interceptor drain" means subsurface 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. Interceptor drains are a type of artificial drainage.

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

(35) "Jurisdictional wetland" means land established as a wetland by DEQ or the US Army Corp of Engineers under Section 404 of the Federal Clean Water Act.

(36) "Ksat" or saturated hydraulic conductivity, means the value of water flow (flux) 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.

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

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

(39) "Limiting condition" means soil conditions (morphology, wetness, depth, restrictive horizon, or organic matter content) or site features (topography, slope, landscape position, or available space) that restrict design options or prohibit permitting a wastewater system.

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

(41) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil or saprolite in a wastewater system after long-term use. The LTAR, in units of gallons per day per square foot (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.

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

(43) "Management Entity" means the person, entity, company, or firm designated by the owner of the 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 can 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 (ORC) for the wastewater system.

(44) "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.

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

(46) "Mean high-water mark" or normal 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 most stringent high-water mark shall be applied.

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

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

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

(50) "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.

(51) "NSF-40 systems" means individual residential wastewater treatment systems (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.

(52) "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.

(53) "Operator in Responsible Charge (ORC)"

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

Commented [BS6]: Need a definition

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

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

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

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

(58) "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 formed artificially.

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

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

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

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

(63) "Public management entity" means a city (G.S. 160A, Article 16), county (G.S. 153A, Article 15), interlocal contract (G.S. 153A, Article 16), joint management agency (G.S. 160A, Articles 461 and 462), county service district (G.S. 153A, Article 16), county water and sewer district (G.S. 162A, Article 6), sanitary district (G.S. 130A, Article 2), water and sewer authority (G.S. 162A, Article 1), metropolitan water district (G.S. 162A, Article 4), metropolitan sewerage district (G.S. 162A, Article 5), public utility [G.S. 62-3(23)], county or district health department (G.S. 130A, Article 2), or other public entity legally authorized to operate and maintain wastewater systems.

(64) "Redoximorphic features" means a color pattern of a horizon due to a loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation and reduction of iron (Fe) coupled with its removal, translocation, or accrual, or a soil matrix color controlled by the presence of Fe^{+2}.

(65) "Repair area" means an area that has been classified suitable consistent with the rules in this Subchapter. The repair area 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.

(66) "Residential Wastewater Treatment Systems," referred to as RWTS, means approved individual advanced pretreatment systems which are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable rules in this Subchapter.

(67) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent. Restrictive horizons may occur as:

(a) physical root restrictions due to high bulk density;

(b) strong pedogenic cementation or induration, physically root restrictive;

(c) plinthite; or

(d) fragipan characteristics.

The horizon suffixes d, m, and x from the USDA-NRCS Field Book for Describing and Sampling Soils can be used to describe restrictive horizons. Restrictive horizons are recognized by their resistance in excavation or in using a soil auger.

(68) "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.

(69) "Saprolite" means the body of porous material formed in place by weathering of rock that has a massive, rock-controlled structure and retains the fabric (arrangement of minerals) of its parent rock in 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.

(70) "Septic tank" means a water-tight, structurally sound, covered receptacle designed for primary treatment of wastewater and 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.

(71) "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 relief line or device to the succeeding trench at a lower elevation. All trenches are fed through the proximal end.

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

(73) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level and passes through a relief line or device to the succeeding trench, in a single uninterrupted flow path.

(74) "Soil" means the naturally occurring body of porous 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

Commented [BS7]: Not sure why removed from draft

volume as rock, saprolite, or coarse-earth fraction (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.

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

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

(77) "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 aggregates.

(78) "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 (2.0 - 0.05 mm in size), silt (less than 0.05 mm or greater than 0.002 mm in size), and clay (less than 0.002 mm in size) particles.

(79) "State" means the Department of Health and Human Services, Division of Public Health, Environmental Health Section, On-Site Water Protection Branch. The mailing address for the State is as follows: 1642 Mail Service Center, Raleigh, NC 27699-1642.

(80) "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.

(81) "Suitable" means classification of a specific site evaluation parameter or the site. A site is classified suitable for a wastewater system when all site evaluation parameters are suitable.

(82) "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, interceptor drains, foundation drains, swales, and ditches. Surface water diversions are a type of artificial drainage.

Commented [BS8]: Need separate foundation drain definition

(83) "Swales" mean natural or constructed elongated, sloped depressional drainage features used to collect runoff and direct the flow to an effective outlet to prevent surface water convergence downslope. Swales can be used in conjunction with a berm.

(84) "TS-I systems" means advanced pretreatment systems which are approved in accordance with TS-I effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(85) "TS-II systems" means advanced pretreatment systems which are approved in accordance with TS-II effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(86) "Third-party" means a person or body 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 body has knowledge of the subject area based upon relevant training and experience.

(87) "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.

(88) "Treatment media" means the non- or slowly-degradable media used for physical, chemical, and biological treatment in a wastewater treatment component.

(89) "Trench" means an excavation with a width of three feet or less containing ~~dipsersal~~ dispersal media and one or more laterals.

(90) "Unstable slopes" means areas showing indications of mass downslope movement.

(91) "Unsuitable" means classification of a specific site evaluation parameter or the site. A site is classified unsuitable for a wastewater system when any one site evaluation parameter is unsuitable.

(92) "Vertical separation distance" means the vertical measurement from the infiltrative surface (or treatment media?) to a limiting condition.

(93) "Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

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

SECTION .0200 – PERMITS

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

15A NCAC 18E .0201 GENERAL

(a) Any person owning or controlling a facility containing water-using fixtures connected to a water supply source shall discharge all wastewater into a collection sewer directly connected from the facility to ~~an approved~~ wastewater system approved pursuant to Article 11, GS 130A and the Rules of this Subchapter to serve ~~permitted for~~ that specific ~~use~~facility.

Commented [BS9]: Belongs here

(b) Wastewater system ~~permits~~ permitting and approvals issued in accordance with the rules of this Subchapter shall ~~be~~follow a three-tier process. Upon receipt from the owner of an application which includes a site plan or plat, the LHD shall perform a soil and site evaluation to determine if the site is suitable or unsuitable in accordance with Section .0500 of this Subchapter. If the site is classified suitable, the LHD shall issue an IP which states that ~~a~~ one or more specific trench type(s) can be installed in a specific location on the site, based on the proposed facility ~~type~~ listed in the application. The LHD shall issue a CA with the design details for the wastewater system, allowing the construction of the system and facility to commence. After the wastewater system has been installed, the LHD shall inspect the wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP, allowing the system to be placed in use and the facility to be occupied. A PE, LSS, or LG may be needed to perform the soil and site evaluation, geologic or hydrogeologic evaluation, or wastewater system design if required in G.S. 89C, 89E, or 89F.

(c) In lieu of an IP, CA and OP, site approval, approval for wastewater system construction and system operation may alternately proceed pursuant to conditions and criteria of an Engineered Option Permit (EOP) as set forth in S.G. 130A-336.1 and Rule .0207 of this Section.

(d) The LHD shall perform an existing system evaluation and authorization to convey to a local code enforcement official that a proposed construction, location or relocation activity is consistent with the system's design flow, wastewater characteristics, and setbacks, in accordance with the Rules of this Subchapter.

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

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

15A NCAC 18E .0202 APPLICATION

~~(a) Any person owning or controlling a facility containing water using fixtures connected to a water supply source shall discharge all wastewater directly to an approved wastewater system permitted for that specific use.~~

(b) An application for an IP, CA, and existing system authorization shall be submitted to the LHD for each site prior to the construction, location, or relocation of a residence, place of business, or place of public assembly. An application for a CA shall be submitted to the LHD for each system prior to its repair.

(c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

(d) When an IP, CA, or existing system authorization expires~~, or is~~ revoked, or withdrawn in writing by the Owner, a new application shall be required prior to evaluation for a new IP, CA, or existing system authorization.

(e) 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 facility or use;

(C) expansion or increase in design daily flow; 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) site for the proposed wastewater system showing setbacks to property line(s), surface waters, drainage features ~~or~~and other fixed reference point(s), as applicable;

(C) existing and proposed vehicular traffic areas;

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

(E) all existing and proposed artificial drainage;

(4) designation of the permit requested: five-year expiration (with site plan) or non-expiring (with plat);

Commented [BS10]: Belongs in "201" under "General"

Commented [BS11]: Have we explained basis for revocation? Can say: "or revoked pursuant to the Rules of this Subchapter"

(5) location, Parcel Identification Number or other property identification, 911 address (if known), acreage, and general directions to the property;

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

(7) information needed to determine design daily flow and effluent strength of the facility(s) served including number and function of individual design units, number of bedrooms, ~~or~~ and number of occupants;

(8) notification if the property contains any of the following, when applicable:

(A) previously identified jurisdictional wetlands;

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

(C) site is subject to approval by other public agencies, such as the Coastal Area Management Act, U.S. Army Corp of Engineers, etc.; and

(9) signature of owner.

(f) The application for a CA shall contain:

(1) the information required in Paragraph (e) of this Rule;

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

(3) the proposed wastewater system type ~~in accordance with Table XXXI of Rule .1301 of this Subchapter~~ specified by the owner that meets the conditions of the IP, this Subchapter, and the provisions of GS 130A, Article 11.

(g) 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, including drainfield(s) and repair area(s), 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 design daily flow of the facility served including number and function of individual design units, number of bedrooms, or number of occupants; and

(5) signature of owner.

(h) The application shall state that submittal of a signed application constitutes 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, a 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 that includes the items contained in G.S. 130A-336(a)(1) through (6) and the following information:

(1) a site plan or plat as defined in G.S. 130A-334 showing the location of the initial wastewater system and repair area including dimensions from two fixed reference points;

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

(3) location(s) of existing and proposed public or private water supplies, including private drinking water wells and springs and associated water lines;

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

(5) design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(6) the proposed initial wastewater system and repair system types ~~in accordance with Table XXXI of Rule .1301 of this Subchapter~~, including LTARs for each system;

(7) required effluent quality standard - DSE, NSF-40, TS-I, or TS-II in accordance with Table III of Rule .0402 and Table XXIV of Rule .1201 of this Subchapter;

(8) easements, rights-of-way, encroachments agreements, as applicable; and

(9) permit conditions, such as site-specific site modifications, installation requirements, maintenance of the groundwater lowering system, etc.

(c) When the site is classified unsuitable, ~~the IP application shall be denied and~~ 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, this information shall be included in the report. When the IP is denied, the owner shall be informed in writing of any other alternatives, and of the right to an informal or formal appeal, pursuant to G.S. 130A-335(g).

(d) An IP for which a plat is provided shall be valid without expiration. An IP for which a site plan is provided shall be valid for five years from the date of issue.

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

(f) An IP shall be suspended or revoked ~~or suspended if~~:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(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; or

(4) a new application for an IP is filed for the same design unit on the same property by the owner.

(g) An IP shall be applicable to both initial and repair dispersal field areas identified and approved on the IP.

Commented [BS12]: Not sure why this level of specificity needed at the IP stage. Don't many just specify "25-% reduction system"?

Commented [BS13]: Law requires prior to denial

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, the ~~and~~ rules of this Subchapter, and the requirements of G.S. 130A, Article 11 are met.

(c) The CA shall contain 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 widths, lengths, and depth on the downslope side of the trench;

(3) if a Management Entity is 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.

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

(e) 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 the LHD for approval. 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.

(f) 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.

(g) The CA shall be valid for a period equal to the period of validity of the IP.

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

(i) A CA shall be suspended or revoked ~~or suspended~~ if:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(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; or

(4) a new application for an CA is filed for the same design unit on the same property.

(j) Upon written request of the owner, revised CAs shall be issued for sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance, pursuant to G.S. 130A-335(f1).

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 prior to the system being covered and determined that the system has been installed in accordance with this Subchapter and any conditions of the IP, CA. The OP shall be issued prior to the system being placed into use or reuse.

(b) If the wastewater system has been permitted in accordance with G.S. 130A-336.1 and Rule .0207 of the Section, an ATO shall be issued by the authorized agent pursuant to G.S. 130A-336.1(m) and Rule .0207(h) of this Section.

(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXI of Rule .1301 of this Subchapter and the system code assigned under Rule .1713(9) of this Subchapter;

(2) facility description including ~~design daily flow,~~ number of bedrooms, maximum number of occupants or people served, design daily flow, and wastewater strength;

(3) a site plan or plat showing the location of the proposed or existing facility, the entire wastewater system as installed from two fixed reference points, including the location and dimensions of the repair area;

(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; and

(8) approved engineered plans and specifications and record drawings if required in Rule .0303(b) 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 designed by an authorized designer or PE, the information in Rule .0303(e) of this Subchapter shall be provided to the authorized agent prior to issuance of the OP.

(f) When an authorized agent determines that the system installation does 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. 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. A copy of the report shall be provided to the owner and the installer.

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

(1) wastewater strength and design daily flow remain unchanged;

(2) the system is operated and maintained in accordance the G.S. 130A, Article 11, and 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) OP has not expired or been revoked.

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

(i) At the compliance inspection frequency specified in Table XXXI of Rule .1301 of this Subchapter, an authorized agent shall determine whether a system complies with the conditions of the OP, this Subchapter, and G.S. 130A, Article 11.

(j) An authorized agent may 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 as specified in G.S. 130A, Article 11, this Subchapter, and all conditions imposed by the OP.

(k) When an OP expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, OP, or existing system authorization, as applicable.

(l) All documentation related to a wastewater system shall be maintained in the county where the permit is issued.

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

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;

(2) reuse of an existing system; or

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

(b) Approvals for reconnecting a facility to or resuming use of an existing system ~~which has a valid OP or to which Rule .0102 of this Subchapter applies~~, shall be issued upon determination of the following:

(1) the site complies with its OP or Rule .0102 of this Subchapter, as applicable;

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

(3) the design daily flow and wastewater strength for the proposed facility, as determined in accordance with Section .0400 of this Subchapter, do not exceed that of the existing system;

(4) the facility meets required setbacks; 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 which do not increase design flow or change wastewater strength and require the issuance of a building permit, an authorization shall be issued upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.

(d) For authorizations issued in accordance with this Rule the authorized agent shall provide written documentation to the owner that describes the site modification, system use and ~~design flow,~~ number of bedrooms, number of occupants, design flow, and wastewater characteristics, and includes 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 ENGINEER OPTION PERMIT

(a) An owner choosing to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 shall employ the services of a PE to prepare signed and sealed drawings, specifications, plans, and reports for the design, construction, operation, and maintenance of the wastewater system.

(b) Prior to the submittal of an NOI for an EOP system as required by G.S. 130A-336.1(b), an LSS shall conduct soil and site evaluations and, as applicable, an LG shall evaluate geologic and hydrogeologic conditions. These evaluations shall be in accordance with the rules of this Subchapter.

(c) The NOI for an EOP System shall be submitted by the owner or a PE authorized as the legal representative of the owner to the LHD in the county where the facility is located. The NOI shall be submitted on the common form provided by the State. The common form is available by accessing the State's website at http://ehs.ncpublichealth.com/rules.htm#oswprules. It shall include all the information specified in G.S. 130A-336.1(b) and the following:

(1) the LSS's, LG's, and installer's name, license number, address, e-mail address, and telephone number;

(2) information required in Rule ~~.0201~~.0202 of this ~~Subchapter~~ 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 shall reference any existing permit issued for a private drinking water supply, public water supply, 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, LG, and installer, as applicable.

(d) The PE 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(k)(1). 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 manufacturers endorsement of the proposed use.

(e) 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, or the LHD fails to act within 15 business days.

(f) If the owner chooses to increase the design daily flow or change the wastewater strength discharging to the wastewater system prior to construction, a new NOI shall be submitted to the LHD. The owner shall request in writing that the PE invalidate the prior NOI with a signed and sealed letter sent to the owner and LHD.

(g) 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. The owner shall be responsible for preventing modifications or alterations of the site for the wastewater system or the system repair area due to any construction activities for the facility before or after construction of the wastewater system, unless approved by the PE, LSS, or LG, as applicable.

(h) Prior to providing written confirmation for the ATO, the PE shall submit the following to the LHD:

(1) documentation that all reporting requirements identified in G.S. 130A-336.1(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; and

(5) record drawings.

The LHD shall use the common form for written confirmation.

(i) The owner of the wastewater system approved in accordance with the EOP 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) and Section .1300 of this Subchapter.

(j) For repair of a malfunctioning EOP system, this Rule shall be followed in conjunction with Rule .1306 of this Subchapter. The Management Entity shall notify the LHD within 48 hours of the system malfunction.

(k) The owner of an EOP system who wishes to change the use of the facility shall contact the PE, LSS, LG, and installer, as applicable, to determine whether the current system would continue to meet the requirements of the rules of this Section for the proposed change of use. The PE, LSS, LG, or installer shall determine what, if any, modifications shall be necessary for the wastewater system to continue to meet the requirements of the rules of this Section following the proposed change of use. A NOI reflecting the change of use and any required modifications to the system shall be submitted to the LHD and follow the EOP permitting process.

(l) The LHD is responsible for the following activities related to the EOP system:

(1) file all EOP documentation consistent with current permit filing procedures at the LHD;

(2) submit a copy to the State of the NOI common form and written confirmation of ATO;

(3) review the performance and operation reports submitted in accordance with Rule .1305(c) and Table XXXI of Rule .1301 of this Subchapter;

(4) perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(d) and Table XXXI of Rule .1301 of this Subchapter;

(5) investigate complaints regarding EOP systems;

(6) 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 a NOI for repairs; and

(7) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

(m) The Owner may contract with another licensed professional to complete an EOP project. A revised NOI shall be submitted to the LHD.

(n) 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 as provided for in accordance with G.S. 130A-336.1 and the applicable statutes for their respective professions.

Commented [BS14]: Reverse order?

Commented [BS15]: Reverse order?

History Note: *Authority G.S. 130A-335; 130A-336.1;*

SECTION .0300 – RESPONSIBILITIES

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

15A NCAC 18E .0301 OWNERS

(a) The person owning or controlling the system shall be responsible for the following, as applicable~~owner shall~~:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, 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 the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State 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;

(9) prevent encroachment on the initial wastewater system and repair area by utilities, structures, vehicular traffic areas, etc.;

(10) provide necessary records of title to the LHD when seeking an exemption for a lot or tract of land from the minimum setback requirements in Rule .0601(a) of this Subchapter; and

(11) 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 person owning or controlling the system. An easement or encroachment agreement shall be required for the permitting of the following wastewater system installations:

(1) common area with other wastewater systems;

(2) area with multiple or third-party ownership or control;

(3) proposed off-site area; or

(4) system and the facility are located on different lots or tracts of land and cross a property line or right-of-way.

(c) Necessary easements, rights-of-way, or encroachment agreements, as applicable, shall be obtained prior to the issuance of an IP. Terms of the easement, right-of-way, or encroachment agreement shall provide that the easement, right-of-way, or encroachment agreement meets the following criteria:

(1) appurtenant to described property, runs with the land, and is not affected by change of ownership or control;

(2) valid for as long as the wastewater system is required for the facility that it is designed to serve;

(3) describes and specifies the uses being granted and shall include ingress, egress, and regress, system installation, operation, maintenance, monitoring, 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;

(4) specified in a deed by metes and bounds description and attached survey map, the area or site required for the wastewater system and repair area, including collection sewers, tankage or raw sewage lift stations, distribution devices, and dispersal fields; and

(5) shall be recorded with the register of deeds in the county (or counties) 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 STATE

(a) The permitting of a wastewater system and enforcement of wastewater system provisions of G.S. 130A and the rules of this Subchapter shall be the responsibility of agents authorized by the State in accordance with G.S. 130A, Article 4 and 15A NCAC ~~01O~~ 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.

(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 State shall review and approve the wastewater system design layout, including plans and specifications for all wastewater systems, which serve a facility with a design daily flow greater than 3,000 gpd, as determined in Section .0400 of this Subchapter. The State 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(b)(13) of this Section;

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

Commented [BS16]: Somehow, we "lost" current Rules .1965, .1966, .1967 and .1968, unless its determined these aren't needed (perhaps should be some reference to the applicable statutes?).

Commented [BS17]: Its "zero" 1 "O", not "O" 1 "zero".

Commented [BS18]: Should the Health Departments participation in Post-Construction Conference for EOP be mentioned

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

(d) State review is not required when the design daily flow for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and all the following are met:

(1) individual ground absorption system(s) serving individual design units with a design daily flow less than or equal to 1,500 gpd;

(2) initial and repair dispersal fields for each individual ground absorption system(s) are 20 feet from any other individual wastewater system;

(3) total design daily flow for all ground absorption system(s) on a lot or tract of land is less than 1,500 gpd per acre.

(e) State review is not required when a PE calculates the proposed design daily flow 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. In accordance with S.L. 2013-413 and S.L. 2014-120, neither the State nor any LHD shall be liable for a system approved or permitted in accordance with this Paragraph.

(f) For systems that require State 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 State. 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 State.

(g) The State will provide technical assistance to the LHD as may be 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 130A-335;

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

15A NCAC 18E .0303 LICENSED OR CERTIFIED PROFESSIONALS

(a) Prior to the issuance of an IP or CA, plans and specifications shall be required by the authorized agent where there is a limiting condition and a groundwater lowering system is required. These plans and specifications shall be prepared by a person or persons who are licensed or registered to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, 89E or 89F.

(b) Any wastewater system which meets one or more of the following conditions shall be designed by a PE if required in G.S. 89C and plans and specifications shall comply with Rule .0304 of this Section:

(1) the system has a design daily flow 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 other than a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) the system requires pumping more than 1,000 feet horizontally;

(4) elevation head is greater than 100 feet;

(5) 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;

(6) the pump system has ~~one~~ an intermediate high point greater than five feet relative elevation;

(7) the system includes a pressure sewer receiving effluent from two or more pump tanks;

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

(9) the system requires use of sewage pumps prior to the septic tank or other treatment system, except for systems subject to 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;

(10) an individual system ~~uses~~is required to use more than one pump or siphon in a single pump tank;

(11) the system includes a collection sewer prior to the septic tank or other treatment system serving two or more buildings, except for systems subject to the North Carolina Plumbing Code;

(12) the system includes structures which have not been pre-engineered;

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

(A) the State has determined that the wastewater generated by the proposed facility has a pollutant strength which is lower than or equal to domestic wastewater and does not require specialized treatment or management; or

(B) the State has pre-approved a predesigned treatment system or process and management method proposed by the facility owner which shall enable the IPWW to have a pollutant strength which is lower than or equal to domestic wastewater;

(14) 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;

(15) 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; and

(16) any other system so specified by the LHD.

(c) 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:

Commented [BS19]: We have had situations where the installer chooses, but is not required, to provide duplex pumps, and we have felt this shouldn't mandate PE design – typically involves "off-the-shelf" duplex pumping/control appurtenances.

Commented [BS20]: Other PE-requirements in draf:
-EOP
-Flow Reduction per Session Law
-Pipe materials, pumps, controls other than those specified to be used in the Rules of this Subchapter
-Presenting alternate pump tank capacity calculation
-When other than 2 tanks in series proposed for tanks receiving grinder pump or solids pump influent
-Proposed reduced grease tank capacity
-Tanks >3500 gallon, traffic rated, or deeper than 36 inches of cover

(1) certification at the appropriate Level according to the system design specifications as required by G.S. 90A-72;

(2) notification to the LHD upon completion of the system installation or 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 when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter; and

(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(d) 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.

(e) 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 is based on periodic observations of construction and a final inspection for design compliance.

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

(a) Plans and specifications required to be prepared by a LSS, PE, or other North Carolina licensed professional shall contain the information necessary for construction of the wastewater system in accordance with G.S. 130A, Article 11, and this Subchapter, and shall include the information in Paragraphs (b) through (d) of this Rule, and any other information, determined to be applicable by the LHD or the State.

(b) Applicant information and design daily flow determination:

(1) 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;

(2) name, address, and phone number for owner and all consultants; and

(3) design daily flow and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed design daily flow and wastewater strength.

(c) Special Site Evaluation including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:

(1) 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:

(A) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;

(B) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;

(C) soil and site based criteria for dispersal field design and site modifications;

(D) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(e) of this Subchapter; and

(E) recommended effluent quality standard for proposed initial and repair dispersal field areas with justification; and

(2) hydraulic assessment reports on site-specific field information which shall include, as applicable:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation and at every distinct horizon within and beneath the treatment zone;

(B) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;

(C) groundwater mounding analysis (level sites) or lateral flow analysis (sloping sites) in accordance with Rule .0510(d) of this Subchapter; and

(D) contaminant transport assessment showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property; and

(3) site evaluation plan showing:

(A) site topography;

(B) proposed site modifications;

(C) location of existing and proposed site features listed in Rule .0601 of this Subchapter;

(D) proposed facility location;

(E) location and proposed initial and repair dispersal field area and type; and

(F) location of LSS soil pits, hand auger borings, deep borings, and in-situ Ksat tests as appropriate; and

(4) site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the information listed in Subparagraph (3) of this Rule and the following:

(A) 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;

(B) existing and proposed private wells or water supply sources within 200 feet of existing or proposed system component locations;

(C) 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;

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

(E) 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;

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

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

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

(1) collection systems and sewers:

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

(B) proximity to utilities and pertinent features;

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

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

(2) tank information:

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

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

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

(D) identification number for State approved tanks;

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

(F) anti-buoyancy calculations and provisions; and

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

(A) information required in Subparagraph (d)(2) of this Rule;

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

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

(D) control panel, float switches and settings, and high-water alarm components, location, and operational description under normal and high-water conditions;

(E) emergency storage capacity calculations, timer control settings, and provisions for stand-

by power; and

(F) lighting, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (d)(2) and (3) of this Rule;

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

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

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

(A) 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);

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

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

(D) flow distribution device design;

(E) artificial drainage system locations, elevations, discharge points and design details;

(F) site preparation procedures;

(G) construction and system testing phasing; and

(H) final landscaping and compliance with erosion control requirements; and

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

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

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

Wastewater systems with a design daily flow less than or equal to 3,000 gpd that are required to be prepared by a LSS, PE, or other North Carolina licensed professional shall include the following information in the plans and

specifications:

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

(2) Rules .0304(c)(1) through (c)(3) of this Section for Special Site Evaluations and submittals prepared under Rule .0510 of this Subchapter; and

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

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

SECTION .0400 DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

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

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum design daily flow for dwelling units shall be based on:

(1) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit, except when the conditions in Paragraph (b) of this Rule apply;

(2) 60 gpd per person when occupancy exceeds two persons per bedroom; or

(3) greater of Subparagraphs (1) or (2) of this Paragraph.

(b) The minimum design daily flow for dwelling units with one bedroom, no more than two occupants, and 400 square feet of living space or less is 175 gpd.

(c) Table II shall be used to determine design daily flows for facilities other than dwelling units.

(d) The minimum design daily flow from any facility other than a dwelling unit shall be 100 gpd. For facilities with multiple design units, the minimum design daily flow shall be 100 gpd per design unit. The design daily flow of the facility is the sum of all design unit flows.

(e) Design of wastewater systems for 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 ~~one~~facilty.

(f) Unless otherwise noted in Table II, the design daily flow for laundry facilities is not included. Where laundry is not specified for a facility in Table II, but is proposed to be provided, the design daily flow shall be adjusted to account for the proposed usage and machine water capacity. Applicant shall provide cut-sheets for laundry machines proposed for use in facilities.

(g) HVAC unit ~~or ice machine~~ condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system.

Commented [BS21]: Based on comments received

(h) Unless otherwise noted in Table II, the design daily flow per unit includes employees.

(i) Food service facilities and other facilities that are projected to generate wastewater with constituent levels greater than domestic strength, as defined in Rule .0402 of this Section, are identified in Table II. Any facility which has a food service component that contributes 50 percent of the design daily flow shall be considered to generate high

strength wastewater. Determination of wastewater strength is based on projected or measured levels of one or more of the following: BOD, TSS, FOG, or TN. Table III identifies the constituent limits for DSE. Excess concentrations of other constituents may result in a high strength wastewater classification on a site-specific basis.

TABLE II. Design daily flow for Facilities

Facility type	**Design daily flow**
Commercial	
Airport, 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, booth, or bowl
Bed and breakfast homes and inns	Dwelling unit design daily flow 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*	2 gal/person with toilets and hand sinks; 3 gal/person with addition of a warming kitchen; 5 gal/person with full kitchen
Markets open less than four days/week	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 (slips on dock) 5 gal/boat slip, dry storage (warehouse)
Motels/hotels	120 gal/room includes the following: No cooking facilities in individual rooms 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/ hour 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 (not retails 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, food preparation not included
Camps/Campgrounds	
Summer camps (overnight stay)**	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 multi use service; or 3 gal/meal served with single-service articles
Temporary Labor Camp or Migrant Housing Camp (overnight stay)**	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/RV in an RV park**	~~120~~ 100 gal/space
Recreational Park Trailer (Park Model) in an RV park**	~~175~~ 150 gal/space
Bathhouse for campsites and RV park sites with no water and sewer hook ups (maximum of four people per campsite)	70 gal/campsite
Food preparation facilities	
Food Establishments with multiuse articles, and Franchised or Food Chain Establishment with single service articles**	25 gal/seat or 25 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less; 40 gal/seat, open >6 to 16 hrs/day; Add ~~2.5~~ 4.0 gpd/seat for every additional hour open
Food Establishments with single service articles, excluding Franchised and Food Chain Establishment**	20 gal/seat or 20 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less 30 gal/seat, open >6 to 16 hrs/day Add ~~2~~3.0 gpd/seat for every additional hour open
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

Commented [BS22]: Can consider, based on previous data received and Industry Recommendation/Comment

	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/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/≤ 12 hr shift with the following: No food preparation Warming kitchen only Single service articles No laundry Add 1 gal/person/hr for more than 12 hr shift
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 hours/day Food preparation not included Retail space not included
	325 gal/toilet or urinal meeting the following: Open 16 to 24 hours/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 larger
Country club/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, stadiums*, and other similar facilities	250 gal/toilet or urinal; or 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 as 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	2 gal/seat with no kitchen, school, day care, or camp 3 gal/seat with warming kitchen; no school, day care, or camp 5 gal/seat with full kitchen
Public or private assembly halls used for worship, recreation, regularly scheduled meetings, events, or amusement – building occupancy* (for churches, flow should be in addition to sanctuary 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

*Designer may alternately use the maximum building occupancy assigned by the local fire marshal in determining design daily flow.

**Facility has potential to generate high strength wastewater

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

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

15A NCAC 18E .0402 EFFLUENT CHARACTERISTICS

(a) Effluent quality standards are listed in Table III.

Table III. Effluent quality standards for domestic strength effluent

Constituent	**DSE (maximum) mg/L**
BOD	≤ 350
TSS	≤ ~~200~~100
TN*	≤ 100
FOG	≤ 30

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

(b) Wastewater systems with an adjusted design daily flow in accordance with Rule .0403 of this Section or a design daily flow greater than ~~or equal to~~ 1,500 gpd, and with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Section or otherwise determined by the State, authorized agent, or licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, shall be designed to account for high strength wastewater as follows:

(1) utilize advanced pretreatment to produce DSE or better prior to dispersal, or

(2) Alternately, a licensed consultant may justify not using advanced pretreatment by providing mass loading calculations and performing a nitrogen migration analysis as follows~~the following~~:

(~~1~~A) mass loading calculations, when projected or measured BOD or TSS exceed DSE, based on site-specific projected or measured effluent characteristics and projected or measured water use data. Calculations shall demonstrate that the mass loading rate calculated based upon the design flow or the adjusted design flow, as applicable, and the projected or measured effluent characteristics does not exceed the allowable soil or site mass loading rate~~s does not exceed the mass loading rate~~ identified in Table XVI or Table XVII of Rule .0901 or Table XX or Table XXI of Rule .0907 of this Subchapter; and

(~~2~~B) site-specific nitrogen migration analysis, when projected or measured TN exceeds DSE, based on site-specific projected or measured effluent nitrogen levels. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

(3) The requirements in Subparagraphs (1) and (2) of this Paragraph shall not apply if wastewater strength is specifically characterized and determined not to exceed DSE. This shall be based on at least two effluent samples collected during normal or above-normal operating periods from the existing or comparable facility, that have been analyzed for at least BOD, TSS, TN, and FOG.

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 and the State may approve a proposed adjusted design daily flow relative to the values in Table II. The water use information provided to support the proposed adjusted design daily flow shall meet the requirements of Paragraphs (b) or (c) and Paragraph (d) of this Rule.

(b) Documented data from the facility or a comparable facility justifying an adjusted design daily flow and meeting the following criteria:

(1) the submitted data shall consist 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;

(2) a hydraulic peaking factor shall be derived by dividing the highest monthly flow from the 12 monthly readings by the sum of 30 consecutive daily water consumption readings;

(3) the adjusted design daily flow shall be determined by taking the numerical average of the greatest 10 percent of the daily readings and multiplying that average by the hydraulic peaking factor; and

(4) an alternative method of determining the adjusted design daily flow is to multiply the highest monthly flow from the 12 monthly readings by 1.5 and then divide by the number of days in the month.

(c) Proposed use of extreme water-conserving fixtures shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from the projected use of the specified fixtures at the proposed facility. Cut sheets of the proposed fixtures shall be provided.

(d) The proposed adjusted design daily flow calculations in accordance with Paragraphs (b) or (c) of this Rule shall account for projected increased constituent concentrations due to reduction in water use. Calculation shall be provided to verify the conditions in set forth in ~~accordance with~~ Rule .0402(b) of this Section shall be met.

(e) In accordance with S.L. 2013-413 and S.L. 2014-120, a PE can propose an adjusted design daily flow in accordance with the following:

(1) design daily flows less than those listed in Rule .0401 of this Section that are achieved through engineering design which 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 projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;

(4) proposed adjusted design daily flows for wastewater systems determined to be less than 3,000 gpd shall not require State review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and

(5) neither the State nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE can propose and the State approve an adjusted design daily flow for a facility made up of individual dwelling units when the following criteria are met:

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

(2) adjusted design daily 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 design daily flows based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The design daily flow from Table II shall be used to determine minimum pretreatment component capacities.

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

SECTION .0500 – SOIL AND SITE EVALUATION

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

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site to determine if a wastewater system can be installed. 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) horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) soil wetness;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability and LTAR for each profile description; and

(7) available space.

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation.

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

(1) 48 inches from the ground surface; or

(2) to an unsuitable soil condition determined in accordance with this Section.

(d) Owners may be required to dig pits when necessary for evaluation of the site as determined by the authorized agent.

(e) Soil profiles shall be excavated and described to reflect variations in soil and site characteristics across both initial and repair areas.

(f) Site evaluations shall be completed in accordance with this Section. Based on the evaluation of the soil and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable (S) or unsuitable (U).

(g) A limiting condition initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(c), (d), or (e) of this Section are met.

(h) The authorized agent shall specify the overall site classification and suitability in accordance with Rule .0509 of this Section.

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

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 considered suitable with respect to topography.

(b) Unstable slopes shall be considered unsuitable with respect to topography.

(c) Slopes greater than 65 percent shall be considered unsuitable with respect to topography. -

(d) Areas subject to surface water convergence shall be considered unsuitable with respect to topography, unless the surface water can be diverted from the site.

(e) Slope patterns (topography) that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system shall be considered unsuitable with respect to topography.

(f) Depressions shall be considered unsuitable with respect to landscape position except when, with site modifications, the site complies with the requirements of this Section and is approved by an authorized agent.

(g) A jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ shall be considered unsuitable with respect to landscape position, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ.

(h) For all sites, except where a drip dispersal system is proposed, additional required soil depth (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 (inches)

MSD = minimum soil depth (inches)

TW = actual trench width (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 by an authorized agent in accordance with the following:

(1) Texture – The texture of each soil horizon in a profile shall be classified into four general groups and 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 are 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

In place of field testing, the LHD or the State may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified granular, blocky, platy, prismatic, and absence of structure and suitability determined based on 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	**Size (diameter)**	**Classification**
Granular	N/A	suitable
Blocky	≤ 1 inches (2.5 cm)	suitable
	> 1 inches (2.5 cm)	unsuitable
Platy	N/A	unsuitable
Prismatic	≤ 2 inches (5 cm)	suitable
	> 2 inches (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 suitability shall be determined based on Table VI.

Table VI. Clay mineralogy (consistence) field method results, associated mineralogy, and suitability classification

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	Slightly expansive	suitable

Nonplastic, slightly plastic		
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 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 must be greater than 35 percent and the organic matter component must be less than 0.5 percent.

Table VII. Clay mineralogy laboratory method results, mineralogy, and associated suitability classification

ACEC (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 48 hours before samples are to be taken by the licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F. The authorized agent and the consultant 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 consultant 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 CONDITIONS

(a) Soil wetness conditions 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 evaluation for soil wetness indicators and field observations, and may be further characterized by well monitoring, computer modeling, or a combination of

monitoring and modeling as required by this Rule. All sites shall be evaluated by an authorized agent using Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule.

(b) Basic Field Evaluation Procedures:

(1) A soil wetness condition shall be determined by the indication of colors of chroma 2 or less (Munsell Color System) at greater than or equal to two percent of soil volume in mottles or matrix of a horizon. Colors of chroma 2 or less that are lithochromic shall not be considered indicative of a soil wetness condition; or

(2) A soil wetness condition shall be determined by the periodic observation or indication of saturated soils or 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 of chroma 2 or less. A soil wetness condition resulting from saturated soils or a perched water table shall be confirmed to persist for three consecutive days.

(3) The shallowest depth to soil wetness condition determined by Subparagraph (b)(1) or (b)(2) of this Rule shall take precedence.

(c) Site Suitability as to Soil Wetness: Initial suitability of the site as to soil wetness shall be determined based upon the findings of the Basic Field Evaluation Procedures made in accordance with Paragraph (b) of this Rule. Sites where the soil wetness condition is less than 12 inches below the naturally occurring soil surface shall be considered unsuitable with respect to soil wetness.

(d) Alternative Procedures for Soil Wetness Determination: The owner shall have the opportunity to submit documentation that the soil wetness condition and resultant site classification be alternately determined and reclassified by monitoring, computer modeling, or a combination of monitoring and modeling, in accordance with Direct Monitoring Procedure, Monitoring and Modeling Procedure, or Modeling Procedure made in accordance with Paragraphs (e), (f), or (g) of this Rule. This determination shall take precedence over the determination made in accordance with the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule, when the conditions of Paragraphs (e), (f), or (g) of this Rule are met. Determination by one of these Monitoring or Modeling procedures shall also be required when:

(1) the Owner proposes to use a wastewater system requiring a deeper depth to a soil wetness condition than the depth determined by the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule; or

(2) the Owner proposes to use sites with Group III or IV soil within 36 inches of the naturally occurring soil surface and where artificial drainage systems are existing or are proposed or on such sites when fill is proposed to be used in conjunction with artificial drainage systems. Final determination of soil wetness condition for these sites shall be made in accordance with the Modeling Procedure in Paragraph (g) of this Rule.

(e) Direct Monitoring Procedure: Soil wetness conditions may be determined by observation of the water surface in wells during periods of high-water elevations utilizing the following monitoring procedures and interpretation method.

(1) The owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal that includes a site plan, well and soil profile at each monitoring location, and a monitoring plan no later than 30 days prior to the start of the monitoring period. Soil wetness and rainfall monitoring shall be conducted by a third-party consultant or by the owner. A third-party consultant is qualified when licensed or registered in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, if required. The Owner shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the LHD.

(2) The owner shall submit a site plan showing proposed sites for wastewater systems, shall provide the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the soil wetness conditions, and specify any proposed fill and drainage modifications.

(3) The owner shall submit a monitoring plan indicating the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well, and proposed method of analysis. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a design daily flow greater than 600 gpd shall have one additional well per 600 gpd increment.

(4) The authorized agent shall be given the opportunity to conduct a site visit and verify the appropriateness of the proposed plan. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil/site conditions. Prior to installation of the wells the authorized agent shall approve the plan. If the plan is disapproved, the authorized agent shall include specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend five feet below the naturally occurring soil surface, or existing soil surface for fill installed prior to July 1, 1977 meeting the requirements for consideration of a site with existing fill in accordance with G.S. 130A-341 and the rules of this Subchapter. However, a well or wells which extend(s) down only 40 inches may be used if they provide a continuous record of the water table for half of the monitoring period, and one or more shallower wells may be required on sites where shallow lateral water movement or perched soil wetness conditions are anticipated.

(6) 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). A rain (precipitation) gauge is required within one-half mile of the site. Daily rainfall shall be recorded beginning no later than December 1 through April 30 (the end of the well monitoring period).

(7) Interpretation Method for Direct Monitoring Procedure: The following method of determining depth to soil wetness condition from water surface observations in wells shall be used when the 60-day weighted rainfall index for the January through April monitoring period equals or exceeds the site's long-term (historic) 60-day weighted rainfall index for January to April rainfall with a 30 percent recurrence frequency (wetter than the 9th driest year of 30, on average). The 60-day weighted rainfall index for the monitoring period and historic rainfall record shall be computed as:

$$WRI_{60} = 0.5P_D + P_J + P_F + P_M + 0.5P_A$$

Where WRI_{60} = 60-day weighted rainfall index for January to April

P_D = Total December rainfall (inches)

P_J = Total January rainfall (inches)

P_F = Total February rainfall (inches)

P_M = Total March rainfall (inches)

P_A = Total April rainfall (inches)

The State shall prepare contour maps for each county where this interpretation procedure is proposed. Contours shall be prepared following standard interpolation procedures using normalized data collected from all National Weather Service Stations, or equivalent, from which appropriate data are available, prior to February 1 of the monitoring season. Data from each station shall be normalized by fitting a 2-parameter gamma distribution to the 60-day weighted rainfall index computed for the most recent three decades of historic data, in accordance with procedures outlined in Chapter 18 of the National Engineering Handbook, USDA-NRCS. From this fitted distribution, the 60-day weighted rainfall index for January through April rainfall with a 30 percent, 50 percent, 70 percent and 80 percent recurrence frequency shall be computed for each Station, to provide the raw data points from which the contour maps shall be prepared. From these maps, the site's 60-day weighted rainfall index for the January through April monitoring period shall be compared to the long-term (historic) January to April 60-day weighted rainfall index at different expected recurrence frequencies. The soil wetness condition shall be determined as the highest level that is continuously saturated for the number of consecutive days during the January through April monitoring period shown in Table VIII.

TABLE VIII. Weighted rainfall index related to number of consecutive days of continuous saturation

Recurrence Frequency Range January to April 60-Day Weighted Rainfall Index	**Number of Consecutive Days of Continuous Saturation for Soil Wetness Condition**
30% to 49.9%	3 days or 72 hours
50% to 69.9%	6 days or 144 hours
70% to 79.9%	9 days or 216 hours
80% to 100%	14 days or 336 hours

(8) If monitoring well data is collected during monitoring periods that span multiple years, the year which yields the highest (shallowest) soil wetness condition shall be applicable.

(f) Monitoring and Modeling Procedure: A combination of monitoring and modeling may be used to determine a soil wetness condition utilizing the following monitoring procedures and interpretation method.

(1) The procedures described for the Direct Monitoring Procedure in Subparagraphs (e)(1) through (e)(6) of this Rule shall be used to monitor water surface elevation and precipitation for determining soil wetness conditions by a combination of direct observation and modeling, except that the rainfall gauge and each monitoring well shall use a recording device and a data file (DRAINMOD compatible) shall be submitted with the report to the LHD (devices shall record rainfall hourly and well water level daily).

(2) The groundwater simulation model DRAINMOD shall be used to predict daily water levels over a 30-year historic time period after the model is calibrated using the water surface and rainfall observations made on-site during the monitoring period. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(A) Weather input files, required to run the DRAINMOD, shall be developed from hourly rainfall gauge data taken within a half-mile of the site and from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants. Daily maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for 30 days prior to this 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 Users Guide, and guidance is also available in Reports 333 and 342 of the University of North Carolina Water Resources Research Institute. DRAINMOD soil data files on file with the State shall be made available upon request to the owner or owner’s consultants.

(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 least squares analysis of the daily observations over the whole monitoring period (mean absolute deviation between measured and predicted values no greater than eight inches), and to achieve the best possible match between the highest water table depth during the monitoring period (measured vs predicted) that is saturated for 14 consecutive days.

(D) For sites intended to receive over 1,500 gpd, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(E) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD or Owner may request a technical review by the State prior to approval of the soil wetness condition determination.

(g) Modeling Procedure: A soil wetness condition may be determined by application of DRAINMOD to predict daily water levels over a 30-year historic time period after all site-specific input parameters have been obtained, as outlined in the DRAINMOD Users Guide. This modeling procedure shall be used when a groundwater lowering system is proposed for a site with Group III or IV soils within 36 inches of the naturally occurring soil surface. This procedure shall also be used to evaluate sites with Group III or IV soils within 36 inches of the naturally occurring soil surface, where the soil wetness condition was initially determined using a procedure described in Paragraphs (e) or (f) of this Rule and where artificial drainage systems are proposed or when fill is proposed to be used in conjunction with artificial drainage systems. The soil wetness condition shall be determined as the highest level predicted by the model 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 nine years in 30).

(1) Weather input files, required to run DRAINMOD, shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants.

(2) 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 proposed drainage features and surface storage and drainage parameters, shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide. DRAINMOD soils data files on file with the State shall be made available upon request to the owner or owner's consultants. Inputs shall include:

(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, or other accepted values consistent with the simulation model; and

(F) A sensitivity analysis shall be conducted for the following model parameters: soil input files for 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 soil wetness condition. 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 soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(4) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD shall submit the groundwater simulation analysis to the State for technical review prior to approval of the soil wetness condition determination.

(h) A report of the investigations made for the Direct Monitoring Procedure, Monitoring and Modeling Procedure or Modeling Procedure in accordance with Paragraphs (e), (f), or (g) of this Rule shall be prepared prior to approval of the soil wetness condition determination. Reports prepared by a licensed professional shall bear the professional seal of the person(s) whom conducted the investigation. A request for technical review of the report by the State shall include digital copies of monitoring data and digital copies of 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 TO ROCK, SAPROLITE, OR PARENT MATERIAL

(a) Soil depths to saprolite, rock, or parent material 18 inches or greater shall be considered suitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(b) Soil depths to saprolite, rock, or parent material less than 18 inches shall be considered unsuitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(c) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

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 as to depth to saprolite may be reclassified suitable in accordance with this Rule.

(b) A 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable soil condition. If any of the vertical separation is suitable soil, then one-inch of suitable soil equals two inches of saprolite.

(c) An investigation of the site using pits, at locations approved by the authorized agent, shall be conducted. The following physical properties and characteristics shall be present in the 24 inches (or less if combined with soil) of saprolite below the proposed infiltrative surface:

(1) 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;

(2) clay mineralogy shall be suitable in accordance with Rule .0503(3) of this Section;

(3) greater than 2/3 of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

(4) the saprolite wet consistence shall be nonsticky or slightly sticky and nonplastic or slightly plastic;

(5) the saprolite shall be in an undisturbed, naturally occurring state;

(6) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock; and

(7) lab determinations may be used to supplement field determinations. Split samples shall be made available to the LHD when requested.

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

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 located at depths less than 18 inches below the naturally occurring soil surface shall be considered unsuitable as to depth to restrictive horizons.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 18 inches below the naturally occurring soil surface shall be considered suitable as to depth to restrictive horizons.

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 sufficient 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 shell meet all required setbacks in Section .0600 of the Subchapter and provide access for operation and maintenance activities.

(b) The dispersal field for the initial wastewater system or the repair area shall not be altered so that the specified system(s) cannot be installed or function as permitted.

(c) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to determine that initial and repair dispersal field 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 distance to a limiting condition along the entire trench length in accordance with Rule .0901(d)(3) of this Subchapter.

(d) 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) design daily flow is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(4) designed for DSE.

(e) Repair area shall be required for any proposed additional flow or increase in wastewater strength from an existing facility meeting the requirements of Paragraph (d) of this Rule.

(f) Repair area shall be required when any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Paragraph (d) of this Rule was previously utilized.

(g) Although a lot or tract of land is exempted under Paragraph (d) of this Rule from the repair area requirement of Paragraph (a) of this Rule, the maximum feasible area, as determined by the authorized agent, shall be allocated for a repair area and documented on the IP, CA, and OP.

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

15A NCAC 18E .0509 is proposed for adoption as follows:

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most limiting condition determined in Rules .0502 through .0508 of this Section shall be used to determine the overall site classification as suitable or unsuitable. The overall site shall be classified suitable if there is sufficient soil and area for a wastewater system that complies with the minimum vertical separation distance to a limiting condition consistent with this Subchapter.

~~(b) The minimum vertical separation distance to any limiting conditions shall be 18 inches.~~

Commented [BS23]: This is superseded by (a) and (c), and not really correct.

(c) Sites classified unsuitable due ~~to soil wetness~~ limiting conditions may be reclassified suitable when modifications are made to meet the requirements in Sections .0900 or .1200 of this Subchapter for the depth from the initial soil surface to a limiting condition and minimum vertical separation distance from the infiltrative surface to a limiting condition~~to the water table~~.

(d) Sites classified unsuitable due to soil wetness conditions because of the presence of lateral water movement may be reclassified suitable as to soil wetness conditions when such water is intercepted and diverted to prevent saturation of the wastewater systems.

(e) A site classified unsuitable may be approved for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. A Special Site Evaluation in accordance with Rule .0510 of this Section shall be provided to the authorized agent that demonstrates that the proposed system can be expected to overcome the unsuitable soil or site conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by individuals qualified by training and experience and licensure in North Carolina in accordance with G.S. 89C, G.S. 89E, and G.S. 89F, to consult, investigate and evaluate soil and rock characteristics, groundwater hydrology, design artificial drainage systems, or design wastewater systems. The proposed wastewater system or artificial drainage system shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review the substantiating data if requested by the LHD.

(f) 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 adversely impact ground and surface water quality. Any site for a wastewater system that is proposed with one or more of the following shall require a Special Site Evaluation by a person or persons who are licensed or registered to consult, investigate, or evaluate soil characteristics and hydrologic and hydraulic testing and analysis in accordance with G.S. 89F or G.S. 89E:

(1) proposal submitted in accordance with Rule .0504(h) of this Section;

(2) proposal submitted in accordance with Rule .0509(e) of this Section;

~~(~~

(3) advanced pretreatment is required for any of the following:

(A) vertical separation distance to a limiting condition is proposed to be reduced. The vertical separation distance to rock or tidal water shall not be reduced to less than 12 inches;

(B) less than 18 inches of naturally occurring soil to an unsuitable soil condition, excluding soil wetness;

Commented [BS24]: What about separate Subparagraph for artificial drainage (groundwater lowering) system?

Commented [BS25]: This Subparagraph (3) belongs after (4) and (5), and directly before (6)

(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 which requires artificial drainage of Group II or III soils;

(E) proposed use of a groundwater lowering system to meet vertical separation distance requirements to a soil wetness condition;

(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent;

(G) bed systems with a design daily flow greater than 1,500 gpd; or

(H) increased LTAR is proposed on a site with a design daily flow greater than 1,500 gpd;

(4) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the design daily flow is greater than 600 gpd; or when the texture of the receiving permeable horizon is silt loam;

(5) DSE drip dispersal systems meeting the following soil and site conditions:

(A) depth from the naturally occurring soil surface to any unsuitable soil condition 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 soil wetness condition 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 depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches;

(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and driplines are installed in new fill material;

(F) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition;

(G) proposed LTAR exceeds that assigned by the LHD;

(H) design daily flow exceeds 1,500 gpd; or

(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~~–2 gpd/ft^2 for Group IV soils; or 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 0.1 gpd/ft^2 ;

(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 limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface, ir within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.~~05~~12 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; or

(E) the system is proposed to be installed in new fill, 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;

(8) TS-II and drip dispersal systems which meet the following criteria:

(A) Subparagraphs (7)(A), (B), or (~~C~~E) 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; or

(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 0.15 gpd/ft^2 ~~; or~~

(9) site-specific nitrogen migration analysis is required to verify that the nitrate concentration at the property line will not exceed groundwater standards;

(10) LHD or State determines that the combination of soil conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances will potentially result in hydraulic overload; or

(11) design daily flow greater than 3,000 gpd, unless the following conditions are met, and a Special Site Evaluation isn't required based solely on design daily flow:

(A) the requirements of Rule .0302(d) of this Subchapter are met; or

(B) ~~. (b) If~~ the adjusted design daily flow is less than or equal to 3,000 gpd, ~~a Special Site Evaluation is not required~~.

(c) The Special Site Evaluation shall include hydrologic and hydraulic testing and analysis, in accordance with Rule .0304(c)(2) of this Subchapter.

(d) For sites serving systems with a design daily flow 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 (level sites) and the rate of lateral and vertical flow away from the trenches (sloping sites). The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, and in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the State. The site shall be considered unsuitable if the data indicate any of the following:

(1) the groundwater mound which 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 assessment indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

History Note: *Authority G.S. 89E; 89F; 130A-335(a1), (e) and (f);*

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

15A NCAC 18E .0601 is proposed for adoption as follows:

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 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 (feet)
Any public or private water supply source, including a private drinking water well or spring*	100
Surface waters classified Water Supply Class I (WS-I), from mean high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal pool elevation	100
~~Lake, pond, or stormwater~~ Stormwater detention pond, from flood pool elevation	50
Any other coastal water, canal, marsh, stream, lake, pond, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
Any water line, including fire protection and irrigation water lines	10
Geothermal wells – open or closed loop vertical bore	50
Geothermal wells – horizontal closed loop system	10
Building foundation with artificial drainage	15

Building or other foundation without artificial drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	15
Above ground swimming pool	5
Top of slope of embankment or cuts of two feet or more vertical height	15
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25
Surface water diversion, as measured on the ground surface from the edge of the diversion	15
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15
Permanent stormwater retention basin or sediment detention basin	50
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
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	15
Utility transformer, ground-surface mounted	10

(b) Wastewater systems on sites not ~~listed~~ described in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:

(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or

(2) the private water supply is a well for which a variance for a reduced separation has been issued.

(c) The wastewater system sited in accordance with Paragraph (b) of this Rule shall be located the maximum feasible distance and never less than 50 from the private water supply.

(d) Wastewater systems shall not be located closer than 100 feet to springs and uncased wells located downslope from the dispersal field and used as a source of drinking water.

(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source.

(f) 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.

(g) If effluent is conveyed under areas subject to vehicular traffic or areas subject to soil disturbance or compaction, one of the following shall be used:

(1) DIP;

(2) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DIP;

(3) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DOT traffic rated culvert pipe;

(4) Schedule 40 pipe (PVC, Polyethylene, or ABS) with 30 inches of compacted cover 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.

(h) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed design daily flow 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 X.

TABLE X. Minimum setbacks from wastewater systems greater than 3,000 gpd to site features*

Feature	Setback (feet)
Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer	500
Any other public water supply source, unless a confined aquifer	200
Any private water supply source, unless a confined aquifer	100
Surface water classified WS- I, from mean high-water mark	200
Surface waters classified WS-II, WS-III, B, or SB, from mean high-water mark	100
Waters classified SA, from mean high-water mark	200
Any property line	25

*Increased setbacks for separate dispersal fields that are part of wastewater systems with a design daily flow greater than 3,000 gpd shall not apply to one or more field(s) that are designed for ~~less than~~ 1,500 gpd or less when a Special Site Evaluation in accordance with Rule .0510 of this Subchapter demonstrates that the wastewater system will comply with the performance requirements in Rules .0501(a) and .0510(d) of this Subchapter.

(i) ~~In addition to the requirements of Paragraph (a) of this Rule, collection~~ Collection sewers shall be located the minimum setbacks to site features shown in Table XI. Setbacks for site features not shown in Table XI shall meet the requirements of Paragraph (a) of this Rule.

TABLE XI. Minimum setbacks from collection sewers to site features

Feature	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft*
Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 ft*
Any other stream, canal, ~~march~~marsh, coastal water, lakes, pond, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Building foundation with artificial drainage	10
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5
Subsurface groundwater lowering system, ditch,or device, as measured on the ground surface from the edge of the feature	10
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10
Permanent stormwater retention basin or sediment detention basin	10

Bio-retention area, injection well, or infiltration gallery	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
Utility transmission and distribution line poles and towers, including guy wires	5
Utility transformer, ground-surface mounted	5

*Pipe materials other than DIP 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.

(j) The minimum setback from water lines to collection sewers shall be 10 feet. If a 10-foot setback is not maintained, the following criteria shall be met:

(1) 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) 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 maximum setback from the water line.

(k) Crossings of collection sewers and a water line may occur with the following:

(1) 18 inches clear vertical separation distance is maintained, with the sewer line passing under the water line; or

(2) the water line crosses under the sewer line or 18 inches clear vertical separation distance is not maintained and the following criteria are met:

(A) collection sewer shall be constructed of DIP with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

(B) water line shall be constructed of ferrous materials and with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(l) Collection sewers may cross a storm drain if:

(1) 12 inches clear vertical separation distance is maintained;

(2) collection sewer is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) collection sewer is encased in concrete or DIP for five feet on either side of the crossing.

(m) Collection sewers may cross a stream if:

(1) 36 inches of stable cover is maintained;

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) sewer line is encased in concrete or DIP for 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.

(n) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints. Pipe shall be anchored for 10 feet on either side of the crossing.

(o) Septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems shall not be located in areas subject to frequent flooding (areas inundated at a 10-year or less frequency), unless designed and installed to be watertight and to remain operable during a 10-year storm. Mechanical or electrical components of treatment systems shall be above the 100-year flood level or otherwise protected against a 100-year flood.

History Note: *Authority G.S. 130A-334; 130A-335(e) and (f);*

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, or 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 design daily flow 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, or other instrument conveying fee title or that is described in a recorded plat;

(2) insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basement, property lines, or 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 as determined by an authorized agent shall be required. The minimum setbacks in Table XII shall be required in all cases.

TABLE XII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	Minimum setback (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 those lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, and the wastewater system will be installed in Group I soils, the wastewater system shall be located as far as possible, but not less than 10 feet from any other wastewater system.

(d) For those lots or tract of land which, on July 1, 1982, are specifically described in a deed or recorded plat and the minimum horizontal setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems cannot be met, the maximum feasible horizontal distance as determined by the authorized agent shall be required. The minimum setback shall not be less than 10 feet

(e) Any rules and regulations of the Commission for Public Health or any local board of health in effect on June 30, 1977, which establish greater minimum distance 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);

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, AND PIPE MATERIALS

15A NCAC 18E .0701 is proposed for adoption as follows:

15A NCAC 18E .0701 COLLECTION SEWERS

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 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) Three-foot minimum cover shall be provided for all collection sewers, except as provided for in Rule .0601(g) 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 traffic-bearing loads.

(7) Manholes shall be used for collection sewers at any bends, junctions, and at a maximum of every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation

difference exceeds 2.5 feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water supply source, or within 50 feet of any private water supply 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 buildings, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required at 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) Collection sewers may require additional ventilation provisions. Air relief valves shall be provided as needed for force mains.

History Note: *Authority G.S. 130A-335(e), (f), (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 Rule .0601(a) of this Subchapter. If the raw sewage lift station is a sealed, watertight chamber the setbacks requirements for collection sewers in Rule .0601(i) of this Subchapter shall apply.

(b) Raw sewage lift stations shall meet the following design and construction standards:

(1) sealed, watertight chamber shall be a prefabricated unit with a sealed top cover, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent;

(2) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;

(3) pumps shall be listed by Underwriter's Laboratories or an equivalent third-party electrical testing and listing agency;

(4) pumps shall be grinder pumps or solids-handling pumps capable of handling 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;

(5) minimum pump operating flow rate shall be 2.5 times the average design daily flow;

(6) systems shall be designed so that the pump-off time does not exceed 30 minutes;

(7) raw sewage lift stations serving single buildings shall be designed for pump run-times between three to 10 minutes at average flow;

(8) 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

(9) all other applicable requirements for pump tanks and dosing systems in accordance with Rule .0802 and Section .1100 of this Subchapter shall also apply to raw sewage lift stations.

History Note: *Authority G.S. 130A-335(e), (f), (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 nominal size Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or non-perforated polyethylene with a minimum fall of 1/8-inch per foot if the installation requirements of Paragraph (b) of this Rule are met.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, or alternative pipe materials described in Paragraph (c) of this Rule, may be substituted for Schedule 40 ~~PVC~~ pipe 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 at a uniform grade, and with an ~~minimum~~ 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 cover is placed and compacted over the stone or gravel envelope; and

(5) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the excavation separating the trench from the distribution device.

(c) Alternative pipe materials allowed from the distribution device to the dispersal field, when installed in accordance with Paragraph (b) of this Rule, are as follows:

(1) PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241; or

(2) PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034.

(d) 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.

(e) Alternative gravity pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. The pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule.

(f) Pipe used for gravity distribution laterals shall be corrugated plastic tubing certified as complying with ASTM F667 or smooth-wall plastic pipe certified as complying with ASTM D2729. The corrugated tubing or smooth-wall

pipe shall have three rows of holes, each hole between ½-inch and ¾-inch 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 Section and is approved by the State.

(g) Pump discharge piping shall be of Schedule 40 PVC or stronger material and pressure rated for water service at two times the operating pressure. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(h) Alternative pressure rated pipe materials are allowed in place of Schedule 40 PVC from the pump tank to the distribution device or dispersal field are when designed and certified by a PE. The proposed pipe shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material. 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 and shall comply with the requirements of Rule .0701(4) of this Section.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 is proposed for adoption as follows:

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.

(2) Individual dwelling units with five bedrooms or less shall be sized based on Table XIII.

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons) without a garbage disposal	Minimum liquid capacity (gallons) with a garbage disposal
4 or less	1,000	1,250
5	1,250	1,500

(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 XIV.

TABLE XIV. Septic tank capacity for facilities not listed in Table XIII

Design daily flow (gpd) (Q)*	Minimum septic tank liquid capacity (V) calculation (gallons)
Q ≤ 600	V = 2Q
600 < Q < 1,500	V = 1.17Q + 500
1,500 ≤ Q ≤ 4,500	V = 0.75Q + 1,125
Q > 4,500	V = Q

*For individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit, the minimum septic tank capacity is 1,500 gallons

(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. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second or final compartment of the septic tank. 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) approved effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

History Note: *Authority G.S. 130A-334; 130A-335(e), (f), (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 based on one of the following, but shall never be less than 1,000 gallons:

(1) equal to the required septic tank capacity in Group IV soils;

(2) equal to two-thirds of the required septic tank capacity in Group I, II, or III soils; or

(3) based on the following:

(A) pump submergence or as recommended by the pump manufacturer;

(B) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(C) flow equalization storage, if applicable; and

(D) 24-hour emergency storage above the high-water alarm activation level.

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

(1) pump submergence or as recommended by the pump manufacturer;

(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(3) flow equalization storage, if applicable; and

(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this Rule.

Commented [BS26]: Have one or the other but not both?

(c) The emergency storage capacity may be calculated as the sum of freeboard space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

(d) The emergency storage capacity requirement shall be determined based on the following and in accordance with Table XV:

(1) type of facility served;

(2) classification of surface waters which would be impacted by a pump tank failure; and

(3) availability of standby power devices and emergency maintenance personnel.

TABLE XV. 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	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

History Note: *Authority G.S. 130A-335(e), (f), (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 in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. 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 liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(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 2:1 length to width ratio.

Commented [BS27]: Makes more sense to put (d) before (b) and (c).

(d) When the required minimum grease tank capacity for a facility is greater than 1,500 gallons, the grease tank shall have a 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(e) The grease tank liquid capacity shall be calculated by one of the following:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

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 and recreational areas;

0.8 if along other roads)

(f) An approved grease rated effluent filter shall be in the second or final compartment of the grease tank. 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) approved grease rated effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank(s).

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

History Note: *Authority G.S. 130A-335(e), (f), (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), (f1);*

15A NCAC 18E .0805 is proposed for adoption as follows:

15A NCAC 18E .0805 TANK ~~STRUCTURAL INTEGRITY~~MATERIAL VERIFICATION AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

(3) A concrete tank manufacturer enrolled in a third-party quality assurance and quality control program as described in Subparagraph (a)(2) of this Rule is not subject to 10 percent testing of all tanks installed.

Commented [BS28]: See some alternate language below

(a) All tank manufacturers shall comply with quality assurance procedures in accordance with accepted industry standards. All tanks are subject to materials and watertightness testing on the job site or at the place of manufacture or distribution.

(1) At least one tank per year, per model shall be tested by the manufacturer for watertightness as described in this Rule. Records of testing shall be maintained by the manufacturer for three years and shall be available to the LHD or State if requested.

(2) Precast concrete manufacturers on at least a quarterly basis or whenever their mix formula is changed shall verify the compressive strength of their, such as by breaking cylinders or by other frequency or means that conform with accepted practice. Records of testing shall be maintained by the manufacturer for three years and shall be available to the LHD or State if requested.

(3) Reinforced precast concrete tanks shall be subject to testing by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations. The LHD shall test at least one tank annually on the job site a tank from each manufacturer that provides tanks in the county.

(4) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

(b) Tanks installed under the following conditions shall be leak tested at the site using leak testing methods described in this Rule:

(1) soil wetness condition is present within five feet of the elevation of the top of a mid-seam pump tank;

(2) advanced pretreatment when required in their approval issued pursuant to Section .1500 or .1700 of this Subchapter; ~~or~~

(3) systems designed by a PE when required in the approved ~~design~~ plans and specifications;

(4) tank is poured or otherwise constructed in place; or

(5) the LHD or State identifies conditions that have occurred during tank installation or must approve for reuse an existing tank if determined to be needed to verify the tank's watertight integrity.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested.

(E) Tank shall be approved if there is no visible flowing leakage and the water level in the tank has not fallen after sitting for one hour.

(2) Vacuum test procedure

(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 2.5 inches of mercury.

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) 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)(17) and (e)(8) of this Subchapter marked over.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0806 is proposed for adoption as follows:

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.

(c) 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 and shall be level for two feet after exiting the tank.

(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.

(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

(f) The tank excavation shall be large enough to allow for tank and backfill installation and inspection. The tank excavation shall be separated from the dispersal field by at least two feet of undisturbed soil. The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approval material, and installed in accordance with the tank manufacturer's instructions and industry standards. When rock or other protruding obstacles are encountered, the bottom of the tank excavation shall be backfilled with sand, gravel, stone, or other approved equivalent material to three inches above rock or obstacle.

Commented [BS29]: Not sure why this was deleted from earlier draft?

(g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section.

History note: Authority G.S. 130A-335(e), (f), (f1);

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 is proposed for adoption as follows:

15A NCAC 18E .0901 GENERAL DESIGN AND INSTALLATION CRITERIA FOR SUBSURFACE DISPERSAL SYSTEMS

(a) Unless otherwise required or allowed by other Rules in this Section or Subchapter, the design and installation criteria for dispersal systems shall be as prescribed by this Rule.

(b) Wastewater systems shall be used on sites classified suitable in accordance with Rule .0509 of this Subchapter. The site shall meet the following minimum criteria:

(1) 12 inches of naturally occurring soil is on the downslope side of the trench between the infiltrative surface and any limiting condition; and

(2) 18 inches of separation between the infiltrative surface and any soil wetness condition in Group I soils, unless pressure dispersal is utilized.

(b) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be used, as applicable;

(2) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 30 inches of the ground surface (36 inches for Group I soils) or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(3) LTARs determined from Table XVII shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface;

(4) for shallow systems, the LTAR shall be based on the most limiting, naturally occurring soil horizon or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(5) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type; and

(6) the LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III of Rule .0402(a) of this Subchapter.

(c) 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 determined by dividing the design daily flow by the LTAR.

(2) The minimum trench length shall be determined by dividing the required infiltrative surface area by the equivalent trench width. The authorized agent may approve trench widths between two and three feet. The following equation shall be used to calculate the minimum line length required:

TL = (DDF ÷ LTAR) ÷ ETW

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

ETW = equivalent trench width (feet)

(3) The area occupied by step-downs and drop boxes shall not be included as part of the minimum required infiltrative surface area.

(4) The total trench length required for trench products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval.

(5) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate to the infiltrative surface area ~~on the soil~~ doe~~s~~ not exceed the mass loading rates identified in Tables XVI and XVII.

TABLE XVI. LTAR and mass loading rate for wastewater systems based on Soil Group and texture class

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.8 – 1.2	0.0015~~1~~ – 0.~~002~~2700~~2~~3
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.6 – 0.8	0.0011~~3~~ – 0.0015~~1~~
		Loam		
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6	0.00057 – 0.0011~~3~~
		Silt Loam		
		Clay Loam		

Commented [BS30]: Make this (1)

		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.1 – 0.4	0.00019 – 0.00076
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XVII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	**Saprolite Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.6 – 0.8	0.~~0012~~0011 – 0.0015
		Loamy Sand	0.5 – 0.7	0.00095 – 0.0013
II	Loams	Sandy Loam	0.4 – 0.6	0.00076 – 0.~~0012~~0011
		Loam	0.2 – 0.4	0.00038 – 0.00076
		Silt Loam	0.1 – 0.2	0.00019 – 0.00038
III	Sandy Clay Loam**		~~0.05 – 0.15~~	~~0.000095 – 0.00029~~

*Mass loading rate is based on the combined load of BOD and TSS.

** Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

(d) Wastewater system installation shall be in accordance with the following minimum criteria:

(1) an engineer's level, laser level, or equivalent shall be used for the following:

(A) staking (flagging) or marking on the soil 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) 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 distance to a limiting condition along the entire trench length in accordance with Subparagraph (d)(3) of this Rule;

(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and a soil wetness condition, unless pressure dispersal is utilized;

(4) the pipe shall be centered laterally in the trench;

(5) final soil cover over the dispersal field shall be to a depth of six inches after settling. The finished grade over the wastewater system shall be sloped to shed surface water. Surface water runoff, including stormwater, shall be diverted away from the wastewater system;

(6) Schedule 40 PVC or other State-approved equivalent pipe may be used as needed to connect sections of trench and overcome site limitations. The bottom area of trench where solid piping is installed shall not be included as part of the minimum area required for infiltrative surfaces;

(7) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meeting the following criteria:

(A) separated by 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;

(8) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate that the distribution devices perform as designed;

(9) serial and sequential distribution may be used when approved by the authorized agent. The effluent in an individual trench shall be constructed to allow full utilization of the upstream trench prior to overflowing to the next downslope trench through either a stepdown or drop box in accordance with Subparagraphs (d)(10) and (d)(11) of this Rule. The overflow elevation of the upstream trench shall be below the outlet invert of the septic tank, or inlet invert elevation in a drop-box if used;

(10) step-downs shall be constructed 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 equivalent State-approved pipe. The installer shall demonstrate that the drop boxes perform as designed;

(11) drop boxes shall be separated from the trench by two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is one-inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed;

(12) a pressure dispersal system shall be used when the total length of trenches exceeds 750 feet when installed in saprolite.

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval;

(13) Activities that result in soil disturbance or soil compaction shall not occur over the initial and repair dispersal field areas; and

(~~13~~14) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

Commented [BS31]: Shouldn't we retain this?

Commented [BS32]: Still not sure why this was removed from prior draft (is elsewhere under Owner responsibilities, but also need here as relates to installation?

15A NCAC 18E .0902 is proposed for adoption as follows:

15A NCAC 18E .0902 CONVENTIONAL WASTEWATER SYSTEMS

(a) A conventional wastewater system consists, at a minimum, of an approved septic tank and a gravity distribution dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Conventional wastewater systems shall be used on sites that have been classified suitable in accordance with Rules .0509 of this Subchapter. Sites classified suitable as to soil depth may utilize shallow placement of the dispersal system and may require cover above the initial grade.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. ~~An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section~~.

Commented [BS33]: Conflicts with .0901(c) and not needed.

(d) Conventional wastewater system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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 in a single trench bottom not to exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent;

Commented [BS34]: Relocate to .0901?

(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 not exceed 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, or alternate aggregates approved in accordance with Section .1700 of this Subchapter. The aggregate shall be distributed uniformly across the infiltrative surface and over the pipe and placed 12 inches deep with six inches below the pipe and two inches over the pipe; and

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregate which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregate installed.

(e) Shallow systems shall not be installed on slopes greater than 30 percent and shall be installed in accordance with Paragraph (d) of this Rule and the following:

(1) soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches, with the dispersal field crowned at one-half percent as measured from the centerline of the dispersal field; and

(2) the type and placement of soil cover shall be approved by the authorized agent. The cover material shall have not more than 10 percent by volume of fibrous organics, building rubble, rocks, or other debris and shall be Soil Groups II or III.

(f) 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 (d) 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 are of the same system type and are each sized at 75 percent of the total area required in accordance with Rule .0901(c) of this Section;

(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 resistant to corrosion;

(5) effluent flow diversion valves placed below finished grade shall be installed in a valve box and be operable from the ground surface;

(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(7) the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter.

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

15A NCAC 18E .0903 is proposed for adoption as follows:

15A NCAC 18E .0903 BED SYSTEMS

(a) This Rule provides for the permitting of bed systems receiving DSE. Bed systems shall be limited to 600 gpd design daily flow, unless allowed for a bed system approved under Section .1700 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter. Beds may be permitted on sites that meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) topography or available space limits the design options for the site.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a ~~conventional~~ trench system as calculated in accordance with Rule .0901(c) of this Section.

(d) Bed system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(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 a maximum of three-foot centers;

(4) the ~~lateral~~ aggregate design criteria shall meet the requirements of Rule .0902(d)(~~3~~4) and (~~4~~5) of this Section ~~for gravity and pressure dosed gravity distribution systems~~;

(5) ~~trench~~ 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) if pressure dispersal is used, the pressure dispersal conveyance system shall be designed in accordance with applicable portions of Rules .0907~~(d) and (e)~~ or .0908~~(c) and (e)~~ of this Section or in accordance with a PIA approval.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .0904 is proposed for adoption as follows:

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch or 10-inch (inside diameter) corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rules .0901 and .0902 of this Section shall apply.

Commented [BS35]: Are .0902(e) and (f) applicable to LDP? Include this here, if they are, or otherwise address "shallow" and "alternating dual" in .0904 explicitly. Are we limiting "shallow" to <30% slope? Didn't think so

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2. To calculate trench length in accordance with Rule .0901(c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe and an equivalent trench width of two and one-half feet shall be used for 10-inch pipe.

(d) LDP tubing, filter wrap, and fittings shall meet the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated tubing 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 (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated tubing shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the minimum requirements in Table XVIII; and

(6) the large diameter pipe with filter wrap shall be encased in a black polyethylene sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

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 0.5 inches of water

(e) LDP system installations shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be and minimum of 12 inches wide;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet);

(3) backfill material 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 II or III;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight and 10-inch LDP shall be three times the trench width or six feet, whichever is larger.

Commented [BS36]: Five feet for 8-inch is technically justified, on storage capacity and equivalent footprint basis

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) A PPBPS ~~utilize~~ utilizing both horizontal and vertical air chambers ~~in a 16-inch PPBPS and are~~ constructed to promote downline and horizontal distribution of effluent, may be used in accordance with this Rule. PPBPS systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

Commented [BS37]: Need to retain current Rule language here pending outcome of the pending hearing, which will ultimately determine what further changes are necessary

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2 for DSE. An equivalent trench width of six feet shall be used for a 16-inch PPBPS to determine trench length in accordance with Rule .0901(c) of this Section.

Commented [BS38]: Again, retain current language pending hearing outcome, after which further clarifications likely will be warranted.

(d) PPBPS installation shall be in accordance with Rule .0901(d) of this Section, the following, and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on center;

(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, or whenever the design flow exceeds 480 gallons per day;

Commented [BS39]: Consistent with current rule and Department's previous position/recommendation to CHS and no basis presented to alter at least PD.

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet; and

(5) trenches shall be constructed level in all direction with a plus or minus one-half inch tolerance from side-to-side and maximum fall in a single trench bottom shall not exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent.

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 may be used on sites originally classified unsuitable due to soil wetness, soil morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches are limited to 1,500 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site shall meet the following criteria:

(1) texture of the receiving permeable horizon is sand, loamy sand, sandy loam, loam, or silt loam;

(2) structure of the receiving permeable horizon is classified suitable;

(3) 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 1/3 of the required thickness of the receiving permeable horizon;

(5) the naturally occurring receiving permeable horizon shall be less than 60 inches below the natural soil surface;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum separation distances to a soil wetness condition:

(A) 18 inches with 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.

(c) If a groundwater lowering system is required to meet the minimum vertical separation distance in Paragraph (b)(6) of this Rule to a soil wetness condition that is not related to lateral water movement, the following conditions apply to the groundwater lowering system:

(1) shall extend into the receiving permeable horizon;

(2) shall be prepared by a person or persons who are licensed to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial

drainage systems if required in G.S. 89C, G.S. 89E, or G.S. 89F;

(3) shall have a suitable outlet accessed by the artificial drainage system. The outlet location and elevation must be shown on the artificial drainage system plan with relative water level elevations and dispersal field site elevations labeled; ~~and~~

(4) all artificial drainage system components are integral to the wastewater system and subject to ownership and easement requirements of Rule .0301(b) and (c) of this Subchapter; and.

(5) artificial drainage system shall be maintained to provide the required minimum separation in Paragraph (b)(6) of this Rule between a soil wetness condition and the infiltrative surface.

(6) except as otherwise required in this Rule, the requirements of Rule .0910 of this Section shall apply.

Commented [BS40]: Not sure why removed from draft. Perhaps redundant, but critical

(d) The LTAR shall be determined in accordance with Table XIX for all DSE sand-lined trench systems. The LTAR shall be one of the following:

(1) LTAR set forth in Table XIX based on the texture of the receiving permeable horizon; or

(2) 10 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

(e) There shall be no reduction in trench length comparted to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

TABLE XIX. LTAR for sand lined trench systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**Distribution type**	**LTAR (gpd/ft$^{2)}$**
Sand or Loamy Sand	Gravity Distribution	0.3 – 0.6
	Pressure Dispersal	0.4 – 0.7
Sandy Loam or Loam	Gravity Distribution	0.2 – 0.4
	Pressure Dispersal	0.3 – 0.6
Silt Loam	Gravity Distribution	≤ 0.3*
	Pressure Dispersal	≤ 0.4*

* For Silt Loam soils, LTAR shall not exceed these values and shall be field verified and no greater than 10 percent of in-situ Ksats.

(f) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(g) Sand lined trench dispersal field installation shall be in accordance with Rule .0901(d) of this Section and 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 have a minimum center-to-center spacing three times the trench width, but no less than five feet on centers;

(3) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters: two runs within a trench between one and one half and two feet wide; and 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 six inches of sand lined trench media;

(4) the sand lined trenches shall be constructed to extend into the naturally occurring receiving permeable horizon;

(5) the infiltrative surface shall be no deeper than 24 inches below finished grade. The top of the media for a media filled trench shall be at or below the naturally occurring soil surface. Drip tubing shall be installed a minimum of six inches below the natural grade;

(6) sand used to line the trench shall be sand in texture. If required by the LHD in the CA, the installer shall provide written laboratory verification of the media textural classification and quality prior to the sand lined trench being installed. When laboratory analysis is required, the material shall be determined to be clean, uncoated fine, medium, or coarse sand with 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.002 millimeters;

(7) pressure dosed gravity distribution shall be used when the total dispersal field line length exceeds 600 linear feet in a single system;

(8) pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system;

(9) if pressure dispersal is used, the pressure dispersal network shall be designed in accordance with Rules .0907(e) or .0908(e) of this Section, except that the trenches used shall comply with the requirements of this Paragraph, as applicable, ~~shall have a maximum width of three feet~~ and system sizing is based on infiltrative surface area and not an aerial loading rate;

(10) no depressions are allowed over the dispersal field area, including no linear depressions over the trenches;

(11) finished grade shall provide for positive surface drainage away from all system components, with the dispersal field crowned at 1/2 percent as measured from the centerline of the dispersal field. The finished grade requirements shall be made a condition of the CA; and

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(h)) Advanced Pretreatment Sand Lined Trench Systems may be approved in accordance with Rule .1207 of this Subchapter. Other sand lined trench systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) 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 a three to six-foot pressure head to distribute effluent across the entire dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR for an LPP system is an aerial loading rate, and shall be determined ~~in accordance with Rule .0901(b) of this Section, except for the following~~as follows:

(1) LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 24 inches of the naturally occurring soil surface or to a depth of 12 inches below infiltrative surface, whichever is deeper; and

(2) Tables XX and XXI shall be used to determine the LTAR for LPP systems.

(3) LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III or Rule .0402(a) of this Subchapter.

TABLE XX. LTAR for LPP systems based on Soil Group and texture

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.4 – 0.6	0.00076 – 0.~~0012~~0011
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.3 – 0.4	0.00057 – 0.00076
		Loam		
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3	0.00029 – 0.00057
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.05 – 0.2	0.000095 – 0.00038
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

Commented [BS41]: LPP and Drip should be relocated to be after Fill and Artificial Drainage (especially since Drip refers multiple times to provisions in the "Fill" section

TABLE XXI. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate (lbs/day/ft^2)*
I	Sands	Sand	0.3 – 0.4	0.~~0006~~00057 – 0.~~0007~~00076
		Loamy Sand	0.25 – 0.35	0.~~0000475~~000048 – 0.~~0006~~00067
II	Loams	Sandy Loam	0.2 – 0.3	0.00038 – 0.~~0006~~00057
		Loam	0.1 – 0.2	0.00019 – 0.00038
		Silt Loam	0.~~005~~05 – 0.1	0.000095 – 0.00019

*Mass loading rate is based on the combined load of BOD and TSS.

(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 determined by dividing the design daily flow by the LTAR; and

(2) the minimum trench length shall be determined 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 (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

(3) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate ~~on the soil~~ to the drainfield area ~~does~~do not exceed the mass loading rates identified in Tables XX and XXI.

(e) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the LPP distribution network shall be constructed of small diameter pressure rated Schedule 40 PVC laterals placed in gravel or other approved media filled trenches;

(2) the trench width shall be one to two feet;

(3) trenches shall be located no less than three times the trench width on centers, with a minimum spacing of five feet on centers;

(4) trenches shall include a minimum of ~~eight~~nine inches of approved gravel or other approved media, with no less than ~~six~~ five inches vertical separation distance from the discharge piping to 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 discharge rate between the first and last orifice along the lateral;

(B) minimum orifice size shall be 5/32-inch for 2/3 of the field lateral lines, with no orifices sized smaller than 1/8-inch in any lateral line; and

(C) 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 three or four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

(B) specially designed and approved orifice shields; or

(C) State-approved equivalent tubing or pipe;

(7) the following additional design provisions are required for sloping sites:

(A) separately valved manifolds are 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 bottom lines 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 (pipe full) flow rate into the upper lines, relative to the lower lines, depending on the amount of elevation difference; 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, such as with State-approved automatically alternating valves, without requiring simultaneous adjustment of multiple throttling valves, or as otherwise approved by the State;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and protected with valve boxes, or approved equivalent protective access devices. Turn-ups shall terminate at or above the ground surface and be installed in a valve box or equivalent for protection and accessibility;

(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 15 percent variation in discharge rate between the first and last laterals when feeding the manifold from the downhill side;

(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 enters the manifold to the distal end of the manifold;

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees ~~or threaded fittings (Schedule 80 PVC only)~~; and

(C) cleanouts shall be installed at the ends of the supply manifold and shall be enclosed in valve boxes for protection and accessibility from the ground surface;

(12) gate valves or other State approved valves shall be provided for pressure adjustment at the field in the supply line just prior to the supply manifolds ~~whenever the supply line exceeds 100 feet in length or the dispersal field is not visible from the pump tank~~;

(13) valves shall be installed in a valve box or other approved access device and be readily accessible from the ground surface;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the flow rate shall be based upon delivering three feet to six feet of static pressure head at the distal end of all lateral lines;

(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;

(15) the dispersal field shall be covered to a depth four inches after settling; and

(16) 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) 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 ~~DES~~DSE. Drip systems shall also comply with the provisions of Section .1600 of this Subchapter, and ~~Except~~except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply. Drip systems used with advanced pretreatment effluent shall

Commented [BS42]: Not sure where this came from? Guess saddle taps could be used but don't think they ever are?

Commented [BS43]: Valve in tank should only be "on" or "off" and not for throttling

comply with Rule .1204 of this Subchapter.

(b) Drip dispersal systems receiving DSE shall meet the following soil and site criteria:

(1) A minimum of 18~~Eighteen~~ inches of naturally occurring suitable soil above a limiting condition and~~,~~ 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any unsuitable limiting condition shall be 12 inches. A groundwater lowering system may be used to meet the vertical separation distance to a soil wetness condition only when 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 soil wetness exists within the first 12 inches below the naturally occurring soil surface. A groundwater lowering system~~ may be~~ shall not be used to meet this initial site requirement for a new fill system. ~~the vertical separation distance to a soil wetness condition only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface~~; and

(C) minimum vertical separation distance to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any soil wetness condition. A groundwater lowering system may be used to meet the vertical separation distance requirement from the drip tubing in new fill only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface.

(3) For existing fill, the soil and site, ~~shall meet the following criteria:(A)~~ criteria in Rule .0909(d) and (e) of this Section are applicable~~, except as otherwise specified in this Subparagraph;~~ and

~~(B)~~ the minimum vertical separation distance from the drip tubing in existing fill to any limiting condition shall be 24 inches.

(c) The LTAR for a drip dispersal system is an aerial loading rate. Tables XXII and XXIII shall be used to determine the LTAR for all DSE drip dispersal systems:

(1) Table XXII 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 XXIII 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 tubing without emitters (blank tubing) shall not count towards the minimum dripline length required; and

(5) the design daily flow shall be divided by the LTAR, determined from Table XXII or XXIII, 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 (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

TABLE XXII. LTAR for DSE drip dispersal systems based on Soil Group

Soil Group	USDA Soil Textural Class		LTAR (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~~0.15
		Silty Clay	
		Clay	

Commented [BS44]: This is consistent with anaerobic drip approval; no basis to increase. Note also requirement for NSF-40 drip

TABLE XXIII. LTAR for DSE drip dispersal systems based on Saprolite Group

Saprolite Group	Saprolite Textural Class	LTAR (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

(d) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) depth from the naturally occurring soil surface to any unsuitable soil condition 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;

(2) depth from the naturally occurring soil surface to any soil wetness condition 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;

(3) 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;

(4) depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches and Group IV soils are encountered within 18 inches of the naturally occurring soil surface;

(5) driplines are installed in new fill material and Group IV materials are encountered within 18 inches of the naturally occurring soil surface;

(6) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition and the LHD or State requires such an evaluation to determine its projected effectiveness;

(7) verify a proposed LTAR that exceeds the LTAR assigned by the LHD;

(8) the design daily flow exceeds 1,500 gpd; and

(9) the LHD or State determines that the combination of soils conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances creates the potential for hydraulic overloading of the proposed site.

(e) 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, final cover provisions, and any other site-specific design requirements identified by the designer;

(2) dripline shall be installed 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 may be allowed within any contiguous section of dripline containing drip emitters;

(4) six inches of cover over the dripline shall be maintained;

(5) the requirement for 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;

(6) minimum required soil cover shall be uniform over the entire drip dispersal field;

(7) drip dispersal fields shall be graded to shed surface water and as needed to establish final vegetative cover;

(8) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by an appropriately licensed individual; and

Commented [BS45]: Are there really any times when a groundwater lowering system is used that a SSE wont by required? Probably should strike this last sentence.

(9) the drip dispersal field 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) A fill system (including new and existing fill) is 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 slopes in all directions. The fill pad shall be constructed when the wastewater system is installed.

Commented [BS46]: Perhaps should include "fill pad"

(b) New fill systems may be installed on sites that meet the following requirements:

(1) the first 18 inches below the naturally occurring soil surface consist of suitable soil;

(2) no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;

(3) systems shall be installed only on sites with uniform slopes less than four percent. 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

Commented [BS47]: Reducing from 15 percent (current) to 4 seems extreme. Is this justified, mountain and piedmont folk?

(4) the area of suitable soil shall be large enough to include the basal area of dispersal field and the toe slopes 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 limiting condition. If pressure dispersal is used, the minimum separation distance shall be 18 inches;

(2) trenches shall be installed with a minimum of 18 inches separating the infiltrative surface and any soil wetness condition. This separation requirement may be met with the use of a groundwater lowering system only in Soil Groups I and II with suitable structure. If pressure dispersal is used, the minimum separation distance shall be 12 inches;

(3) fill systems with a design daily flow greater than 480 gpd shall use pressure dispersal systems;

(4) fill material soil texture shall be classified sand or loamy sand (Soil 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) for the establishment of a vegetative cover;

(5) minimum cover shall be six inches of settled soil;

(6) additional fill may be added to facilitate drainage and accommodate landscaping requirements at the site provided the infiltrative surface is less than 30 inches below the finished grade;

(7) 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 or organic litter (O horizon) shall be removed before the additional fill material is incorporated;

(8) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;

(9) 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;

(10) the outside edge of the trench shall be located at least five feet horizontally from the top of the side slope;

(11) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;

(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 shall 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; and

(13) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(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 (if not readily available to the LHD) indicating that the fill material was placed on the site prior to July 1, 1977;

(2) the fill material shall have sand or loamy sand (Group I) soil texture for a 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. The fill shall not have discreet layers containing greater than 35 percent of shell fragments;

(4) if 24 inches of Group I fill material is present, additional fill with soil texture classified Group I may be added to meet the separation requirements of Subparagraph (e)(5) of this Rule;

(5) soil wetness condition, as determined by Rule .0504 of this Subchapter, 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 factors 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 design daily flow shall not exceed 480 gpd;

(2) pressure dispersal shall be used. LPP systems shall meet the requirements of Rule .0907(c), (d), and (e) of this Section. Drip dispersal systems shall meet the requirements of Rule .0908 (c) and (e) 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 distance to any limiting condition 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 shall be determined in accordance with Rule .0901(c) of this Section and the following:

(1) the LTAR shall be based on the hydraulic conductivity of 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 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 distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) Other fill systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) 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 which were originally classified unsuitable due to a soil wetness condition. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Artificial drainage systems may be used on the following sites:

(1) Group I or II soils with suitable structure and clay mineralogy; and

Commented [BS48]: Reference in here neededto Special Site Evaluation?

(2) the artificial drainage system shall be designed to maintain the required minimum vertical separation distance to a soil wetness condition as specified in Rule .0901(d)(3) of this Section.

(c) Artificial drainage systems shall be designed in accordance with the following, as applicable.

(1) 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 artificial drainage system design;

(B) artificial drainage system 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 artificial drainage 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) artificial drainage equation input parameters shall be based upon field determinations 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 North Carolina State Climate Office station. A source of these data is the WETS tables published on the Natural Resource Conservation Service Website: www.wcc.nrcs.usda.gov/climate/wedlands.html. This monthly value shall be divided by 14 to give the drainage coefficient (inches per day). For systems designed for over 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 artificial drainage system effectiveness at sites with the following conditions: three of more effective soil layers; Group III or IV soils within 36 inches of the naturally occurring soil surface; or sites requiring a pump drainage system; and

(F) the modeling procedure set forth in Rule .0504(g) of this Subchapter shall be followed.

(2) Artificial drainage 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 required in this Rule, the requirements in Section .1100 of this Subchapter are applicable 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 2.5 times the projected peak inflow rate to the station.

(3) Plans and specifications for artificial drainage systems shall include the following information in addition to the information in Subparagraphs (c)(2) and (c)(3) of this Rule:

(A) location of existing and proposed artificial 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 envelop and filter fabric detail, cover, and cleanout detail;

(C) all relevant elevations with reference to an established benchmark;

(D) specifications for all artificial drainage system materials and installation procedures;

(E) the entire artificial drainage system 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 artificial drainage systems serving two or more lots shall have adequate width, in no case less than 20 feet plus the width of the artificial drainage system.

(d) Interceptor drains shall be used on sites where soil wetness conditions are based on lateral water movement that can be intercepted and diverted to prevent saturation of 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) An approved privy shall consist of a pit, floor slab, and seat assembly housed in a building which affords privacy and reasonable protection from the weather and shall meet the following criteria:

(1) the pit shall consist of an excavation with a bottom surface area of 3.5 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 saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizons, or soil wetness condition;

(4) the pit bottom shall not be in a depression;

(5) the pit shall be curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In clay soils, partial curbing may be acceptable if sufficient stability can be provided;

(6) the privy floor slab shall be constructed of reinforced concrete;

(7) where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction shall be acceptable. The floor slab shall be constructed of the following:

(A) rot resistant joists covered with tight tongue-and-groove rot resistant flooring;

(B) other approved flooring materials to provide strength, durability and prevent entrance of flies and mosquitoes to the privy pit; and

(C) where wood construction is used, floors shall be anchored to the sills. The minimum sill size is four-inch by four-inch;

(8) the pit shall be vented through approved screened PVC Schedule 40 pipe or approved equal, 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) not have any bends in the pipe; and

(D) shall be black colored pipe; and

(9) 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) the privy building shall afford a reasonable degree of protection from bad weather conditions;

(2) 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 completely covered with soil; and

(3) 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 immediately adjacent shall be kept clean;

(2) a hinged seat cover shall be provided and kept closed when the privy is not in use;

(3) privy shall have a hinged door that can be locked when not in use;

(4) flies shall always be excluded from the pit;

(5) garbage and trash shall be kept out of the pit; and

(6) privy building shall not be used as a storage building.

(d) When a new pit is required, an IP, CA, and OP shall be obtained.

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

SECTION .1000 – NON-GROUND ABSORPTION SYSTEMS

15A NCAC 18E .1001 is proposed for adoption as follows:

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code.

(b) Use of chemical or portable toilets for human waste are governed by G.S. 130A-33(h).

(~~b~~c) When an alternative toilet is used, the rest of the wastewater generated by any other plumbing fixture in the facility shall be discharged to a wastewater system that is approved under this Subchapter.

(d) Residual removal from incinerating, composting, mechanical toilets, vault privies, and chemical or portable toilets shall be performed only by person(s) that hold a current NC Septage Management Firm permit per Rule 15A NCAC 13B .0832(a)(1), and all waste shall be taken to an approved disposal site, per G.S. 130A-291.1(d). This requirement also applies to removal of wastewater from a temporary domestic wastewater holding tank approved pursuant to G.S. 130A-291.2.

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

15A NCAC 18E .1002 is proposed for adoption as follows:

15A NCAC 18E .1002 WASTEWATER RECYCLE/REUSE

Commented [BS49]: Needs further work/additions, also assuring consistency with new 2U rules.

(a) Wastewater recycling systems that produce treated wastewater may be used for toilet flushing as long as the wastewater recycling system meets:

(1) the North Carolina Plumbing Code requirements; and

(2) 15A NCAC 02U as adopted by the Environmental Management Commission.

(b) Recycled wastewater shall be not used for body contact or human consumption.

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

SECTION .1100 – DOSING SYSTEMS AND CONTROLS

15A NCAC 18E .1101 is proposed for adoption as follows:

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used for discharging effluent into laterals when:

(1) total lateral length exceeds 750 linear feet in a single system; or

(2) discharging to a pressure dosed gravity distribution or pressure dispersal system.

(b) Alternating pumps or siphons ~~or pumps~~ shall be used and discharge to separate dispersal fields for the following:

(1) design daily flow from a single system exceeds 3,000 gpd, or

(2) total length of trench exceeds 2,000 linear feet in a single system.

(c) If alternating pumps or siphons are not required in accordance with Paragraph (b) of this Rule, the pumps or siphons may discharge to a single dispersal field.

(d) The dose volume from pressure dosed gravity distribution systems shall be designed to fill the installed linear footage of the laterals pipes between 66 and 75 percent at each dosing event. The lateral capacity for large diameter pipe (LDP) system and for trench products with a PIA approval is equivalent to the capacity of a four-inch corrugated pipe. Dose volumes for LPP systems shall be calculated in accordance with Rule .0907(e)(14)(B) of this Subchapter. Dose volumes for drip dispersal systems shall be calculated in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from dosing systems shall be designed to achieve scour velocity in the supply line and optimize the distribution of the effluent throughout the dispersal field.

(f) All dosing systems shall have their performance demonstrated using clean water prior to issuance of an OP. The test shall include a demonstration and documentation of the following:

(1) pump/siphon delivery rate;

(2) float control levels;

(3) operating pressure head, when applicable; and

(4) structural integrity of the piping network.

History Note: *Authority G.S. 130A-335(e), (f), (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 ½-inch solids or be a screened, high head pump designed for effluent;

(2) designed to meet the discharge rate and total dynamic head of the effluent distribution system;

(3) removable without requiring entrance into the tank; and

(4) listed by Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency, unless a PE specifies the proposed pump model.

(b) Air locking of the pump and siphoning from the pump tank when pumping downhill shall be prevented using a vent or anti-siphon holes (3/16-inch minimum).

(c) A pressure-rated threaded union, flange, camlock, or similar disconnect device shall be provided in each pump discharge line.

(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line back into the pump tank, unless drainback of effluent to the pump tank has been justified by the system designer and method to do so is approved by the authorized agent. These back-flow prevention devices shall be located on the pump side of the disconnect device.

Commented [BS50]: Belongs here, generic for all

Commented [BS51]: There are cases when this is desired, such as dosing to an advanced pretreatment system to prevent freezing.

(e) A shut-off 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. Shut-off 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), (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 requiring use of a pump. The panel enclosure shall be NEMA 4X or equivalent. Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency shall list the panel. The panel shall include for each pump:

(1) an independent overload protection (if not integral with the pump motor);

(2) a circuit breaker(s);

(3) a motor contactor or solid-state relay which breaks all current to the pump;

(4) a latching hand-off automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be manually deactivated;

(5) a pump run light;

(6) an elapsed time meter; and

(7) an event counter.

(b) An automatic pump sequencer shall be provided in systems requiring multiple pumps and shall remain operable whenever any pump or pump circuit 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 any other form of telemetry that allows the Management Entity to properly monitor system performance and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel shall be mounted 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible.

(e) A NEMA 4X outside junction box shall be installed above grade on or adjacent to the pump tank access riser when the control panel is more than 10 feet from the access riser.

(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 grips, duct seal, or other suitable material or methods shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.

(g) Dual and multiple fields shall be independently dosed by separate pumps which 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 State may approve other equivalent methods of dosing dual or multiple fields.

(h) Floats or similar State approved devices designed for detecting liquid levels in DSE shall be provided to control pump cycles:

(1) a minimum of ~~18~~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 ~~sealed~~ 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, as needed, to provide 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 device shall be visible and located on the outside of the panel enclosure;

(3) provide for manual testing, and shall enable the audible alarm to be silenced by the system user. The alarm shall automatically reset after testing and when an alarm condition has cleared;

(4) remain operable whenever the pump or pump circuit is inoperable;

(5) have an enclosure that is watertight, corrosion resistant, and rated NEMA 4X or equivalent; and

(6) be mounted outside the facility and always accessible.

~~(j) All pump systems shall have their performance demonstrated using clean water prior to issuance of an OP. The test shall include a demonstration and documentation of the following:~~

~~(1) pump delivery rate;~~

~~(2) float control levels;~~

~~(3) operating pressure head, when applicable; and~~

~~(4) structural integrity of the piping network.~~

(~~k~~j) For systems designed by a PE, the PE may propose other panel construction and location criteria that meet these 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), (f1);*

Commented [BS52]: Given the comments received, 12-inches will be sufficient here, in conjunction with item No. (2).

Commented [BS53]: Recommend relocating to .1101

15A NCAC 18E .1104 is proposed for adoption as follows:

15A NCAC 18E .1104 SIPHON DOSING

Siphons and siphon tanks may be used when 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 or otherwise designed to 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; and

(3) siphon tanks shall have a functioning high-water alarm that is audible and visible by system users and weatherproof if installed outdoors in a NEMA 4X enclosure or equivalent. 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), (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) advanced pretreatment or dispersal systems, if required by the manufacturer or system designer; or

(2) when a dosing system is required in accordance with Rule .1101 of this Section and in conjunction with an adjusted design daily flow granted in accordance with Rule .0403 of this Subchapter.

(b) Flow equalization systems designed under a PIA approval issued in accordance with Section .1700 of this Subchapter and G.S. 130A-343(i) shall incorporate timed dosing to control the maximum amount of effluent that shall be delivered to the advanced pretreatment or dispersal field in a specific period.

(c) The timed dosing system shall be integrated with the pump tank control sensors to assure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section shall be present prior to the start of any scheduled dose event.

History Note: Authority G.S. 130A-335(e), (f), (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 among individual laterals with two feet of residual pressure head;

(2) a pressure regulating valve incorporated in the supply line just prior to the 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) observation ports located inside or outside of the pressure manifold box to verify flow to individual laterals;

(6) feeder lines with sufficient slope and size to convey all effluent received from manifold by gravity, remaining no more than half-filled; and

(6) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A dissipator box may be used to dissipate flow in a pressure dosed system designed for pressure dosed gravity dispersal of effluent in a serial or sequential manner. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, of adequate capacity, and approved by the authorized agent.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

15A NCAC 18E .1201 is proposed for adoption as follows:

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a design daily flow up to 3,000 gpd shall meet the following conditions:

(1) RWTS or PIA approval in accordance with Sections .1500 or .1700 of this Subchapter;

(2) design that meets one of the effluent quality standards specified ~~on~~ in the OP and defined in Table XXIV prior to dispersal of the effluent to the soil;

(3) compliance with the siting and sizing requirements of this Section; and

(4) compliance with Rules .1302(d) and .1709 of this Subchapter.

TABLE XXIV. Effluent quality standards for advanced pretreatment systems

Constituent	Effluent Quality 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

Commented [BS54]: Vary by Design Flow (≤30 for ≤ 1500 gpd; ≤20 for >1500 to ≤ 3000 gpd; ≤15 for >3000 to ≤ 10,000 gpd; ≤10 for >10,000

Commented [BS55]: Vary by Design Flow: ≤ 200 for > 3000 gpd

(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 high strength effluent and approved by the State on a product or project-specific basis.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1202 is proposed for adoption as follows:

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) The initial site evaluation shall be conducted and depth to limiting conditions determined in accordance with Section .0500 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) Only one of the following modifications to system siting and sizing criteria may be approved, unless otherwise identified in this Rule:

(1) reduction in depth to limiting condition and vertical separation distance;

(2) setback reduction; or

(3) LTAR increase.

Commented [BS56]: Put LTAR as 2nd in this list; setback reduction 3rd

(c) The minimum required vertical separation distance to a limiting condition may be reduced with the use of advanced pretreatment in accordance with Table XXV. Table XXVI provides the minimum depths and vertical separation distances 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 distance to a limiting condition is proposed in accordance with this Rule.

Table XXV. Minimum vertical separation distance to soil wetness condition (SWC) or limiting condition (LC) based on effluent quality

Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					
Soil Group	**Distribution Method**	**Effluent Quality 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 XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality

Minimum depth (inches)* from naturally occurring soil surface to LC**					
Type of Fill	**Distribution Method**		**Effluent Quality Standard**		
		DSE*	**NSF-40**	**TS-I**	**TS-II**
New Fill (≤1,500 gpd) (slope ≤ 4%)	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 (≤480 gpd)	Gravity	36 of Group I Fill/Soils			
	LPP	24 of Group I Fill/Soils			
	Drip	24 of Group I Fill/Soils			
Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					
Type of Fill	**Distribution Method**	**Effluent Quality Standard**			
		DSE*	**NSF-40**	**TS-I**	**TS-II**
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	24 to LC 18 to SWC	18	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 (≤480 gpd)	Gravity	36	36	36	36
	LPP	18	18	12	12
	Drip	18	18	12	12

*For comparison

**Minimum depth after adjustment for slope correction

(d) The LTAR may be modified when the following criteria are met:

(1) for advanced pretreatment systems meeting NSF-40 effluent quality standards the LTAR may be increased by up to a factor of 1.33 when compared to the rate assigned by the authorized agent for a new system using DSE in soils which are Group I or II with suitable structure;

(2) for advanced pretreatment systems meeting TS-I or TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.0 when compared to the rate assigned by the authorized agent for a new system using DSE when pressure dispersal is utilized;

(3) for advanced pretreatment systems meeting TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.5 when compared to the rate assigned by the authorized agent for a new system using DSE and all the following conditions are met:

(A) a minimum of 36 inches of Group I soils from the naturally occurring soil surface;

(B) depth to a soil wetness condition below the naturally occurring soil surface is a minimum of 24 inches;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) pressure dispersal shall be utilized;

(4) a Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when an increased LTAR for TS-I or TS-II systems is proposed in accordance with Subparagraphs (d)(2) or (d)(3) of this Rule on sites that also meet one of the following conditions:

(A) Group III or IV soils occur within three feet of the infiltrative surface; or

(B) site requires artificial drainage of Group II or III soils;

(5) the LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section;

(6) for trench dispersal products subject to a specific dispersal field area reduction when receiving DSE in accordance with the rules or a PIA approval, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule; and

(7) design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system, unless documentation is provided in a Special Site Evaluation on a case-by-case basis, submitted and approved pursuant to Rule .0510 justifying the proposed LTAR increase with the existing infiltrative surfaces.

(e) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter, as applicable, shall be met, except as shown in Table XXVII of this Rule; and

(2) when any other siting or sizing modifications are applied (reduced depth to limiting condition, vertical separation distance or increased LTAR) for a TS-I or TS-II system in accordance with Paragraphs (c) and (d) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII.

Commented [BS57]: Based on comments received, think something like this is needed, and technically can be justified on case-by-case basis.

Table XXVII: Setbacks for wastewater systems meeting NSF-40, TS-1 or TS-II effluent quality standards

Commented [BS58]: Make changes as needed to be comparable to changes made to .0600 in "Features"

Feature (structure, water source, etc.)	Setback (feet) according to Effluent Quality Standard			
	DSE*	NSF-40	TS-I	TS-II
Surface waters classified WS-I, from mean 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 pool elevation	100	70	70	50
Any other coastal water, canal, marsh, stream, perennial waterbodies, streams, or other surface waters, from mean high-water mark	50	35	35	25
Lake or pond, from flood pool elevation	50	35	35	25
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25	25	20	15
Surface water diversion, as measured on the ground surface from the edge of the diversion	15	15	10	10
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15	15	10	10
Permanent stormwater retention basin or detention basin	50	50	35	25
Any other dispersal field except designated dispersal field repair area for project site	20	20	10	10

*For comparison

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1203 is proposed for adoption as follows:

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

(a) No reductions in depth to limiting condition, vertical separation distance or setback requirements shall be taken. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) The LTAR may be modified when the following criteria are met:

(1) For advanced pretreatment systems meeting TS-I or TS-II effluent quality standards, the LTAR may be increased by up to a factor of 2.0 compared to that assigned by the authorized agent for a system using DSE.

(2) For advanced pretreatment systems meeting TS-II effluent quality standards, LTAR may be increased by up to a factor of 2.5 compared to that assigned by the authorized agent for a system using DSE when the following conditions are met:

(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a soil wetness condition below the naturally occurring soil surface.

(3) When the LTAR for a system is proposed to be increased in accordance with this Rule, the following conditions shall also be met:

(A) Special Site Evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(B) pressure dispersal shall be utilized;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) 25-foot setback shall be maintained to all property lines unless one of the following criteria are met: 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.

(4) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

(c) For trench dispersal products that are subject to a specific percent dispersal field area reduction when receiving DSE in accordance with this Subchapter or a PIA approval, when any LTAR adjustments are taken in accordance with this Rule, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when compared to a conventional wastewater system.

(d) Design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

Commented [BS59]: Provide "out" similar to what's recommended for up 1500 gpd systems in .1202(d).

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1204 is proposed for adoption as follows:

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) Drip dispersal systems may utilize the following siting and sizing criteria when used with advanced pretreatment and a design daily flow less than or equal to 1,500 gpd. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site characteristics shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems

(A) a minimum of 18 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be 12 inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: a minimum of 18 inches of naturally occurring suitable soil above a limiting condition and 12 inches of naturally occurring suitable soil above a soil wetness condition; and the minimum vertical separation distance shall be 12 inches to a soil wetness condition and 18 inches for any other limiting condition; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 18 inches;

(2) TS-I Systems

(A) a minimum of 15 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be nine inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: a minimum of 12 inches of naturally occurring suitable soil above a limiting condition; nine inches vertical separation distance to a soil wetness condition, and 12 inches vertical separation distance to any other limiting conditions; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 12 inches; and

(3) TS-II Systems

(A) a minimum of 13 inches of naturally occurring suitable soil above a limiting condition and the minimum vertical separation distance to any limiting condition shall be six inches;

(B) for new fill, the requirements of Subparagraph (2)(B) of this Paragraph shall be met; or

(C) for existing fill, the requirements of Subparagraph (2)(C) of this Paragraph shall be met.

(c) Site modifications shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems may utilize a groundwater lowering system (existing or proposed) to meet the vertical separation distance requirements to a soil wetness condition 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 distance to the projected (drained) soil wetness condition shall be 12 inches. The addition of fill material shall not be used to meet this requirement; and

(2) TS-I and TS-II Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition. The minimum vertical separation distance to the projected (drained) soil wetness condition shall be 12 inches. The groundwater lowering system may be used with the following:

(A) 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

(B) on new fill sites.

(d) Table XXVIII 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 (d)(5), (d)(6), and (d)(7) of this Rule.

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

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft²)**		
			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 – 0.15	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(1) The LTAR shall be based on the ~~hydraulic conductivity of 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 greater.

Commented [BS60]: This implies measurement of KSAT, which isn't done unless SSE required.

(2) The design daily flow shall be divided by the LTAR, determined from Table XXVIII or XXIX, 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 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 (ft²)

DDF = design daily flow (gpd)

LTAR = in gpd/ft²

DL = dripline length (feet)

LS = two-foot line spacing

(3) The minimum dripline length calculated in Subparagraph (d)(2) 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. This shall not change the minimum area required for the system calculated in Subparagraph (d)(2) of this Rule. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA approval.

(4) Sections of tubing without emitters (blank tubing) required to meet 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.

(5) LTAR adjustment limitations for NSF-40 Systems

(A) 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

(B) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(6) LTAR adjustment limitations for TS-I Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(7) LTAR adjustment limitations for TS-II Systems

(A) 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;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(8) Table XXIX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the ~~hydraulic conductivity of the~~ most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

Commented [BS61]: See previous comment

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

Saprolite Group	Saprolite Textural Class	LTAR (area basis) (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

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter shall be required to permit advanced pretreatment drip dispersal systems for the following:

(1) NSF-40 Systems

(A) 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 0.1 gpd/ft^{2}; or

(B) 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 0.2 gpd/ft^{2} for Group IV soils.

(2) TS-I Systems

(A) site has less than 18 inches of naturally occurring soil to any unsuitable limiting condition;

(B) Group III soils are present and a groundwater lowering system (existing or proposed) is used to meet the vertical separation distance requirements to a soil wetness condition;

(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 0.12 gpd/ft^{2};

(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; or

(E) system is proposed to be installed in new fill, Group IV soils are encountered within 18 inches of the naturally occurring soil surface, and the LTAR is proposed to exceed 0.05 gpd/ft^{2}.

(3) TS-II Systems

(A) site meets the requirements of Subparagraphs (2)(A), (B), or (E) of this Paragraph;

(B) 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 0.15 gpd/ft^{2}; or

(C) 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.

(f) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the required minimum depth to a limiting condition or vertical separation distance reduction is proposed compared to the requirements for DSE in Rule .1202(c) of this Section. A minimum of 18~~Eighteen~~ inches of naturally occurring soil to an unsuitable limiting condition shall be required to take setback reductions. The following LTAR limitations shall be applicable:

(1) 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;

(2) 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

(3) for NSF-40, TS-I, and TS-II Systems, Table XXVIII may be used to determine the LTAR when only setback reductions to artificial drainage systems are taken.

(g) Drip dispersal installation shall be in accordance with Rule .0908(e) of this Subchapter.

(h) Drip dispersal systems with a design daily flow 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 limiting condition, vertical separation distance, or setback reductions 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 nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 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 receiving TS-I or TS-II effluent quality may be proposed in accordance with the requirements of this Rule. Except as otherwise required in this Rule, the requirements of Rule .0906 of this Section shall apply.

(b) The site meets the criteria in Rule .0906(b) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If artificial drainage is proposed to meet the required minimum vertical separation distance to a soil wetness condition that is not related to lateral water movement, the following conditions shall apply:

(1) site shall comply with the requirements of Rule .0906(c) of this Subchapter; and

(2) vertical separation distance requirement to a soil wetness condition may be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXX shall be used to determine the LTAR for a sand-lined trench system receiving TS-I or TS-II ~~effluent and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soils overlying the permeable receiving layer~~. The LTAR shall be one of the following:

(1) the rate set forth in Table XXX; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon or the rate set forth in Table XXX, whichever is less.

TABLE XXX. LTAR for advanced pretreatment sand lined systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**LTAR (gpd/ft²)** *
Sand or Loamy Sand	0.6 – 1.0
Sandy Loam or Loam	0.4 – 0.8
Silt Loam	No greater than 20% of in-situ ~~Ksats~~ Ksats** or ≤ 0.5, whichever is less

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

**In-situ Ksat measurements shall be taken when silt loam receiving horizon is proposed to be used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam, and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(f) Setback reductions in accordance with Table XXVII of Rule .1202(e) of this Section may be applied with sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(g) of this Subchapter and pressure dosed gravity distribution or pressure dispersal shall be required.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1206 is proposed for adoption as follows:

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Bed systems receiving NSF-40 effluent quality, or better, on sites with a design daily flow not to exceed 600 gpd may be approved when the following requirements have been met:

(1) the soil and site shall meet the following criteria:

(A) the vertical separation distance requirements of Rule .0901(d)(3) of this Subchapter are met;

(B) soil texture is Group I, II or III; and

(C) sites limited by topography, available space, or other site constraints;

(2) Table XVI in Rule .0901(c) of this Subchapter is used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the LTAR may be increased by a factor of 1.125 with no further reduction in bed size allowed;

(3) setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used; and

(4) bed system installation shall be in accordance with Rule .0903(d) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow less than or equal to 1,500 gpd may be approved when the following requirements have been met:

(1) The soil and site meet the following criteria:

(A) a minimum of 30 inches of Group I or II soils below the naturally occurring soil surface and no soil wetness condition 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 soil wetness condition exists within the first 12 inches below the naturally occurring soil surface;

(C) the requirement for 30 inches of Group I or II soils or 36 inches of Soil Group I 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;

(D) 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

(E) 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the ~~hydraulic conductivity of the~~ most limiting, naturally occurring soil horizon within 36 inches of the ground 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 design daily flow 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 may be reduced by up to 25 percent when the system is designed to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality; Group I Soil is present in the first 36 inches of naturally occurring soil; no soil wetness condition exists within the first 30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom;

the bed or beds shall not be located directly beneath the advanced pretreatment components, and pressure dispersal is used; effluent shall be distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there shall be 100 percent dispersal field repair area.

(3) A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter shall be required when the vertical separation distance to a limiting condition is reduced and on sites with slopes greater than two percent.

(4) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be proposed in accordance with the following:

(A) the setbacks shall be measured from the nearest edge of the gravel bed;

(B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the gravel bed sidewall, or from the projected toe of the slope that is required to meet 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 XXVII of Rule .1202(e) of this Section are allowed. No other setback reductions are allowed.

(5) Bed system installation shall be in accordance with Rule .0903(d) of this Subchapter and the following:

(A) pressure dispersal shall be used whenever effluent is distributed to a bed not located directly 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 meet the vertical separation distance requirements from the bed bottom to an unsuitable limiting condition, when all of the following conditions are met: a groundwater lowering system shall not be used to meet the vertical separation distance requirements; new fill material shall be sand or loamy sand, containing not more than 10 percent by volume fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments by volume; and the requirements of Rule.0909(c)(9) of this Subchapter, for the projected side slope of the fill shall be met, as determined beginning at a point six inches above the top edge of the gravel bed.

(d) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow greater than 1,500 gpd and less than or equal to 3,000 gpd may be permitted on the following sites:

(1) The soil and site shall meet the following minimum criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no soil wetness condition exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation distance of 24 inches to any soil wetness condition shall be 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 XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the ~~hydraulic conductivity of the~~ most limiting, naturally occurring soil horizon within 36 inches of the ground 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 determined by dividing the design daily flow by the LTAR;

(B) the minimum bed size may be reduced by up to 25 percent when the system is designed and approved to meet TS-I or TS-II effluent quality 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 meet TS-II effluent quality standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation distance to a soil wetness condition shall be maintained after accounting for projected groundwater mounding; and there shall be 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 XXVII of Rule .1202(e) 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 concentration at the property line will not exceed 10 milligrams per liter (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(d) of this Subchapter and the following criteria:

(A) two or more equally sized beds shall be used and the beds shall not be located directly beneath the advanced pretreatment components; and

(B) effluent shall be distributed to the beds by a pressure dispersal system. A timer control 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 soil wetness condition exists within 18 inches of the existing fill surface;

(2) 18 inches of vertical separation distance exists to the soil wetness condition;

(3) the design daily flow shall 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 issued in accordance with Section .1700 of this Subchapter allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, to be uniformly laid out over the bed area.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

15A NCAC 18E .1207 is proposed for adoption as follows:

15A NCAC 18E .1207 SITE AND SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

Compliance with the effluent quality standards of Rule .1201 of this Section shall be determined as follows:

(1) an individual advanced pretreatment system at a single site shall be in compliance when all the criteria of Rule .1302(d) of this Subchapter have been met; and

(2) an approved system shall be considered in compliance when all the criteria of Rule .1710 of this Subchapter have been met.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 is proposed for adoption as follows:

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems ~~and non-ground absorption systems~~ shall be operated and maintained in accordance with the conditions of the OP, PIA approval, and 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.

Commented [BS62]: Not sure why needed. Non GAS is also a wastewater system

(b) System management in accordance with Table XXXI shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXI shall also be required for all Type V and VI systems existing or installed on or before July 1, 1992.

(c) Wastewater systems with multiple components shall be classified by their highest or most complex system classification type in accordance with Table XXXI to determine LHD and Management Entity responsibilities.

(d) The State shall classify wastewater systems not identified in Table XXXI after consultation with the appropriate commission governing operators of pollution control facilities.

(e) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.

(f) The system shall be maintained to meet the effluent quality standards as specified in Table XXIV of Rule .1201(a) 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 applicant may submit a written request to the LHD and State to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency.

(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 a certified operator, this activity shall be reported to the owner and LHD within 30 days.

(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 et seq.

TABLE XXXI. 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 (single family or 480 gpd or less)	N/A	Owner	N/A
IIb – Conventional system with ~~less~~ no more than 750 linear feet of trench	N/A	Owner	N/A
IIc – Conventional system with shallow placement	N/A	Owner	N/A
IId – 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	Owner	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 – Sand lined trench gravity distribution no artificial drainage	NA	Owner	NA
IIIi – Gravity groundwater lowering system	5 years	Owner	5 years
IVa – LPP distribution	3 years	Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Certified Operator	2/year
IVc –Off-site system	5 years	Certified Operator	1/year
IVg –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Certified operator	1/year
Va – Fixed media advanced pretreatment	1 year	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
Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	1 year	Certified Operator	3,000 – 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS	1 year	Certified Operator	4/year
Vd – Other mechanical, biological, or chemical treatment plants < 3,000 gpd	1 year	Certified Operator	monthly
Ve – Drip dispersal systems	1 year	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
Vf – IPWW designed by a PE and reviewed by the State and determined to be IPWW	1 year	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
Vh - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	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
Vi – Wastewater system with pump groundwater lowering systems	~~Yearly~~1 year75	Certified operator	2/year with one visit during the wet season
VIa – Any system > 3,000 gpd with mechanical, biological, or chemical treatment plant	6 months	Certified Operator	> 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Wastewater reuse or recycle	6 months	Certified Operator	≤ 3,000 gpd – 12/year > 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week

*Toilet systems serving public facilities or more than 10 users per day shall be required to have a Management Entity other than the Owner as well as annual LHD compliance inspections.

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

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS

(a) This Rule applies to all advanced pretreatment systems approved in accordance with Sections .1500 and .1700 of this Subchapter.

(b) System management in accordance with Table XXXI of Rule .1301 of this Section shall be required for advanced pretreatment systems. The following provisions apply to the operation and maintenance contracts for advanced pretreatment systems:

(1) for systems installed after July 1, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this Section. The contract shall be renewable and the contract term shall be for a minimum of one year;

(2) for systems installed prior to July 1, 2006, the manufacturer shall provide an optional renewable yearly operation and maintenance contract with the owner that fulfills the requirements for the system in accordance with this Section;

(3) prior to the issuance or re-issuance of an OP for a proprietary advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place. 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; and

(4) the manufacturer shall notify the LHD and the State when the owner chooses to not renew an operation and maintenance contract executed in accordance with this Paragraph.

(c) 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, Rule .1709 of this Subchapter, the RWTS or PIA approval, and conditions of the OP;

(3) the Management Entity shall inspect each system ~~twice a year~~at least annually 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 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) 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 seven-day and 30-day influent wastewater flow from the facility to the system shall be measured by the Management Entity prior to the visual inspection of the system in accordance with Subparagraph (c)(3) of this Rule and prior to any effluent sampling event required in accordance with Rule .1709 of this Subchapter; and

Commented [BS63]: The VIP is intended to occur only once a year, not during each ME inspection, unless twice/year assessment of field parameters is to be allowed to substitute for annual effluent sampling. This started with peat systems, requiring ORC to remove the tops to observe the peat layer once per year, when previously it wasn't being done at all.

(5) sampling and resampling for an approved RWTS, Provisional, and Innovative System shall be undertaken as required in accordance with Rule .1709 of the 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 State certified laboratory for analyzing;

(C) complete chain of custody from sample collection to analysis for each sample collected shall be maintained; and

(D) repeat 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 State 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 and substitute out of compliance samples with compliant samples. All samples results collected shall be reported.

(d) An individual advanced pretreatment system at a single site shall be considered compliant ~~with the effluent quality standards of Table XXIV of Rule .1201(a) of this Subchapter~~ when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA approval indicates compliant conditions;

(2) seven-day average daily inflow shall not exceed 1.3 times the design daily flow and the 30-day average daily inflow shall not exceed the design daily flow;

(3) influent wastewater to the system does not exceed domestic strength in accordance with Table III, Rule .0402 of this Subchapter; and

(~~3~~4) arithmetic mean (geometric mean for Fecal Coliform) of each sampled effluent constituent across three or more consecutive sampling dates does not exceed the designated effluent quality standard in Table XXIV in Rule .1201(a) of this Subchapter. Non-compliant data may be substituted with a new data set found to meet the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results for purposes of meeting the effluent quality standard.

(~~4~~5) The mass loading of the system, based on site-specific water use records and effluent sampling results may be used to document system compliance with the performance criteria in Subparagraph (d)(~~3~~4) of this Rule. When used to determine compliance, flow used in mass loading calculation shall be the average daily flow during the peak flow month or consecutive 30 day period when effluent samples are collected.

(e) The Management Entity may sample influent sample to the advanced pretreatment system as needed to determine compliance with this Rule.

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 directly 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 it fails to meet one or more of the conditions of Subparagraph (a)(1) of this Rule, either continuously or intermittently, or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to satisfy these conditions. The owner shall contact the LHD when the wastewater system is malfunctioning. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued an NOV;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed to ensure proper operation of the system. The contents shall be pumped whenever the solids level (scum and sludge) is found to be more than 1/3 of the liquid depth in any compartment. The effluent filter shall be cleaned 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 et seq;

(5) grease traps and tanks shall be pumped as needed, but no less than yearly. The owner shall maintain a contract with a certified pumper. All pumping records shall be maintained onsite;

(6) appropriate 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 shall be executed between the system owner and a Management Entity prior to the issuance of an OP for a system required to be maintained by a ~~Management Entity~~certified operator, as specified in Table XXXI of Rule .1301 of the Section, 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 system Management Entity;

(4) provisions that the contract shall be in effect for as long as the system is in use; and

(5) other requirements for the continued performance of the system.

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) ~~(a)~~ The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system operated from the appropriate commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

~~(a)~~(b) When the Management Entity is required to be or to employ a certified operator as specified in Talbe XXXI in Rule .1301 of this Section, the operator shall hold a valid and current certificate or certification as required for the system operated from the appropriate commission, in accordance with G.S. 90A, Article 3. Minimum classification shall be as a Subsurface Operator in accordance with Rule _____. Operators of systems designed for greater than 1500 gallons per day and designed to achieve TS-II or higher effluent quality standards shall additionally have Grade II wastewater certification, unless another category of certification for the system has been established by the appropriate commission.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule .1301 of this Section, or more frequently if required by the RWTS or PIA approval, or the OP, as applicable.

(c) The Management Entity shall provide a copy of the inspection report to the owner and LHD 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 for the owner to obtain a CA for the repairs.

(e) The Management Entity shall be responsible for assuring 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 when the owner or the Management Entity chooses not to renew an operation and maintenance contract executed in accordance with this Rule.

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 XXXI in Rule .1301 of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system.

(b) A LHD may be the Management Entity only for systems classified Type IV, Va, and Vb and only when authorized by resolution of the local board of health.

(c) An authorized agent shall review the performance and operation reports submitted in accordance with Rule .1304(c) of this Section.

(d) An authorized agent shall perform an on-site compliance inspection of the systems as required in Table XXXI in Rule .1301 of this Section. More frequent inspections may be performed by an authorized agent if requested by the system owner or the Management Entity, or identified in the PIA approval or OP.

(e) The authorized agent may provide the owner with the option for a private Management Entity (not the owner) to perform the on-site compliance inspection for Type IIIb and IIIh systems in accordance with Table XXXI in Rule .1301 of this Section instead of the LHD. The Management Entity (not the owner) shall provide to the owner and LHD a written compliance inspection report.

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) The LHD or State shall issue a written NOV to the wastewater system owner for the following:

(1) malfunctioning wastewater system determined in accordance with Rule .1303(a)(1) and (2) of this Section;

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

(3) wastewater system that is partially or totally destroyed.

(b) The wastewater system shall be repaired within 30 days of notification by the State or LHD unless the NOV specifies a different time frame for the repair.

(c) After investigating the malfunction, the State or LHD shall use its best professional judgement in requiring repairs that will enable the system to function.

(d) When necessary to protect the public health, the State 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.

(e) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system. Prior to issuing the CA, the LHD shall receive the following information from the owner:

(1) confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 will be pumping and hauling the sewage from the pump and haul tanks;

(2) identification of the approved wastewater system that will be accepting the sewage. The wastewater system shall be approved under this Subchapter or approved by the Environmental Management Commission in accordance with 15A NCAC 02H or 02T; and

(3) approval shall be obtained from the facility receiving the sewage in addition to confirmation that the additional sewage will not result in an exceedance of the treatment capacity of the receiving wastewater system.

(f) A non-transferrable OP, valid for a period not to exceed five years, shall be issued to the pump and haul system owner.

(g) A malfunctioning wastewater system that has been disconnected from the facility for any reason shall be repaired prior to reuse.

(h) If a malfunctioning wastewater system is found to be nonrepairable, or is no longer required, the 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.

History Note: Authority G.S. 130A-335(e) and (f); 130A-291.1; 130A-291.2;

15A NCAC 18E .1307 is proposed for adoption as follows:

15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is found to be non-repairable or is no longer required, the system shall have the contents removed, and the components collapsed, backfilled, or otherwise secured as directed by the authorized agent to protect public health and safety.

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

SECTION .1400 – APPROVAL OF TANKS AND APPURTENANCES

15A NCAC 18E .1401 is proposed for adoption as follows:

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be constructed in accordance with the approved plans and shall comply with all rules of this Section.

(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.

(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and a temporary identification number issued, the tank manufacturer shall conduct the structural loading requirements of Paragraph (f) of this Rule. Once third-party documentation in accordance with Paragraph (f) of this Rule has been submitted to the State, a tank approval letter will be issued to the tank manufacturer with a permanent identification number. Tanks may not be sold without a permanent identification number. The temporary identification number is for tracking purposes only.

(d) Plans and specifications for tanks with a total liquid capacity of 3,~~500~~ 000 gallons or less shall show the design in detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) wall and slab thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall 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) liquid depth and operating capacity in gallons;

(4) pipe penetration locations and State approved pipe penetration boot;

(5) methods and material for sealing sections and forming water tight joints in tanks with multiple sections;

(6) detailed drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank; and

(7) tank manufacturer and PE requirements for installation, including bedding and recommend methods for additional sealing, as applicable.

(e) Plans and specifications for tanks with a total liquid capacity greater than 3,~~500~~ 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 in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

(2) after completion of the vacuum test requirement in Subparagraph (f)(1) of this Rule, the tank shall be subject to a water test. The water test shall be conducted in accordance with Rule .0805(c)(1); and

(3) written documentation of the testing shall be provided to the State. The written documentation shall include:

(A) drawing of the tank model tested, showing dimensions and type of reinforcement used;

(B) results of the vacuum and water tests, including if there was any vacuum or water drop, surface cracking, deformation, or cracking of the tank during the test; and

(C) third-party person(s) present who witnessed the testing and their written statement of agreement with the results submitted to the State.

(g) Plans for prefabricated tanks other than those pre-approved under this Section shall be considered for tank approval on an individual basis based on the information provided by the tank manufacturer or designer to the State. The information shall indicate the tank shall perform in the same manner and to the same standard as those designed in accordance with the rules of this Section.

(h) The State 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. Tanks found to be out of compliance shall be brought back into compliance by the manufacturer or installer as directed by the State of LHD. Tanks that are not brought into compliance cannot be used in a wastewater system and the imprint detailed in Rule .1402 permanently marked over by the authorized agent.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1402 is proposed for adoption as follows:

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight and not subject to excessive corrosion or decay.

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.

(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate 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 visibly marked at finished grade.

(d) Septic tanks shall meet the following minimum design standards:

(1) minimum liquid depth of 36 inches;

(2) 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) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) length of the tank shall be at least twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) one outlet and one to three inlet openings in the tank. The outlet opening shall be centered on the outlet end of the tank. The inlet openings may be located in the center of the inlet end of the tank, and on one or both sidewalls at the inlet end of the tank~~, one on the tank end and one on each sidewall of the inlet end of the tank~~;

(6) inlet and outlet openings shall have cast or manufactured penetration points and include resilient, watertight, sealed, non-corrodible, flexible connective sleeves for inlet and outlet pipe penetration.~~;~~

~~(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve.~~ The connective sleeve shall meet ASTM C1644 and be approved by the State.;

(8) 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;

(9) no pipe penetration points or openings shall be permitted below the septic tank operating liquid level;

(10) the outlet shall be through an approved effluent filter 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;

(11) invert of the outlet shall be at least two inches lower in elevation than the invert of the inlet;

(12) other methods of supporting the effluent filter case and for making pipe penetrations shall meet all the requirements of this Rule and shall be reviewed on a case by case basis by the State;

(13) 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 to remain in position when subjected to a liquid capacity in one compartment;

(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 leave a water passage slot four inches high for the full interior width of the tank;

(E) a minimum of two four-inch openings, or one four-inch opening per 30 linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;

(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;

(G) there shall be no other openings in the partition wall below the water passage slot or openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal 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;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh at least 40 pounds, but no more than 80 pounds; and

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks.

Commented [BS64]: No location of imprint specification?

(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 six inches above finished grade;

(2) the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening;

(3) larger or multiple access risers shall be provided when two or more pumps are required;

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain at least two four-inch diameter circular openings, or equivalent, 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 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 more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

Commented [BS65]: Location?

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be approved septic tanks with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using ~~a~~ sanitary tee~~s~~ extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, 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;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The

grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less;

(4) 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. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when ~~a~~ sanitary tee~~s is~~ are used as the liquid passage through an interior compartment partition, an access opening(s) and riser(s) to grade over the tee~~(s)s~~ shall be provided for servicing and routine ~~g~~maintenance.

(g) Alternative grease tank designs may be proposed by a manufacturer for approval by the State on an individual basis when documentation has been provided of equivalent or better performance as those designed in accordance with Paragraph (f) of this Rule. Generic approval may also be issued pursuant to an application made for component approval under Section .1700 of this Subchapter.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and

(4) tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1403 is proposed for adoption as follows:

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks designed to hold sewage shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls. Tanks and tank lids shall be able to withstand a uniform live loading of 300 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 cover, active soil pressure on tank walls, and the uplifting force of groundwater.

(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 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;

(A) the reinforcing wire shall be lapped six inches;

(B) concrete cover shall be required for all reinforcement; and

(C) reinforcement shall be placed to maximize the structural integrity of the tank;

Commented [BS66]: No coverage or allowance for fibermesh?

(3) 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;

(4) 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 State for review and tank approval;

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Testing shall be performed using a properly calibrated Schmidt Rebound Hammer or approved equal;

(6) 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 State approved equivalent that is waterproof, corrosion-resistant, and approved for use with concrete tanks; and

(7) tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

(c) ~~Unless otherwise required, thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified.~~Manufacturers of thermoplastic tanks shall provide third-party documentation of certification to IAPMO/ANSI Z1000 or CSA B66. Tanks shall be modified to comply with the requirements of this Section, as applicable.

(d) Glass-fiber-reinforced tanks shall meet the following material and construction requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 0.2 inches. The baffle wall shall be a minimum of 3/16-inch thick; and

(2) material and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks.

(e) Cast in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

History Note: *Authority G.S. 130A-335(e), (f), (f1);*

15A NCAC 18E .1404 is proposed for adoption as follows:

15A NCAC 18E .1404 PLANS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

(a) Risers and riser lids shall be able to withstand a uniform live loading of 300 pounds per square foot 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.

(b) Riser plans and specifications submitted for review and riser approval shall show the design of the riser in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

Commented [BS67]: Not sure we shouldn't treat this like we currently do, though requiring a 4000 psi mix and 3500 psi achieved prior to removal from the tank yard.

(2) physical dimensions of the riser and riser cover, such as wall thickness, internal diameter, proposed casting or installation details and methods, pipe penetrations, and all other dimensions as appropriate;

(3) material type and strength including reinforcement material and location as required;

(4) documentation by a third-party of structural testing to four inches of mercury for five minutes without deformation or failure. Testing shall be done on each diameter of riser and shall be done on the greatest height of a single section that the owner is seeking approval for;

(5) for septic tank risers, a secondary lid, concrete plug, or other State approved safety device to be provided inside the riser for additional security and to prevent accidental entry;

(6) for pump tank risers, State approved primary and secondary safety mechanism shall be provided; and

(7) installation instructions, for both new and retrofit applications, for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and effluent filter approval shall show the design of the effluent filter in detail, including:

(1) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(2) sizing as to capacity and wastewater strength for all models of proposed filters to be approved; and

(3) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and pipe penetration approval shall show the design of the pipe penetration in detail, including:

(1) manufacturer's name, address, phone and fax numbers;

(2) design specifications and materials used in the manufacture of pipe penetration components;

(3) applicable testing results from third-party verification showing pull and flexibility testing;

(4) testing for watertight seal around piping including any component or device included to assure the seal, such as non-corrodible adjustable bands;

(5) documentation that the pipe penetration meets the requirements of ASTM C1644; and

(6) specifications for application, installation, operation, and maintenance.

(e) Plans for risers, effluent filters, and pipe penetrations shall be reviewed and approved by the State and assigned an Identification Number when the design is found to comply with this Section.

(f) Plans for prefabricated risers, effluent filters, and pipe penetrations other than those pre-approved under this Rule shall be considered for approval on an individual basis based on the information provided by the manufacturer or designer to the State. The information shall indicate the riser, effluent filter, or pipe penetration shall perform to the same standard as those designed in accordance with the provisions of this Section.

History Note: *Authority G.S. 130A-335(e), (f), (f1); 130A-335.1;*

15A NCAC 18E .1405 is proposed for adoption as follows:

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL

(a) All riser, effluent filter, and pipe penetration approvals will expire five years after the date the approval is signed. Approvals shall be re-issued when the provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued compliance with the criteria listed in Rule .1404 of this Section.

(c) The State may re-issue a riser, effluent filter, or pipe penetration approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product compliance.

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 State shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, pipe penetrations, distribution devices or other components, upon a finding that:

(1) approval is determined to be based on false, incomplete, or misleading information or the tank or tank components have been subsequently altered;

(2) experience with the product or component results in altered conclusions about system performance, reliability, or design;

(3) product or component fails to perform in compliance with performance standards established for the product or component; or

(4) product, component, or the applicant fails to comply with G.S. 130A, Article 11, this Subchapter, or conditions of the approval.

Commented [BS68]: Not sure why this was removed? (“”}

History Note: Authority G.S. 130A-335(e), (f), (f1);

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1501 is proposed for adoption as follows:

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 design daily flow less than or equal to 1,500 gpd.

(b) RWTS shall only be used with domestic strength wastewater.

(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 Provisional or Innovative 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 State and shall include the following:

(1) manufacturer's name, address, phone number, 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 legible copies of plans and specifications, including information required to evaluate any tanks as required in accordance with Rules .1401 and .1503(3) 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 State.

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.

Commented [BS69]: Can't remove this in order to comply with GS 130A-342

Commented [BS70]: Why was the following removed: "" Don't think is should be

Commented [BS71]: 1503(3) only refers to 1400, so this additional reference not needed here.

(2) RWTS shall be watertight, corrosion resistant structures, with all components needing to be maintained 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 any system components or maintaining system components requiring repair or maintenance.

(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 State, 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.

Commented [BS72]: Require a location here but not for other tanks?

(5) The design, construction, and operation of RWTS shall prevent bypass of wastewater.

(6) The manufacturer shall demonstrate 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, including tracking the last seven days and 30 days, 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 half of the design daily flow 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, an approved prefabricated septic tank, or another tank specially designed for a specific individual system and approved by the State 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 composite sampled annually for all effluent quality standards listed in Table XXIV of Rule .1201(a) of this Subchapter for NSF-40 systems, unless adjusted sampling requirements have been requested and granted in accordance with Rules .1302 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 will expire five years after the date the approval is issued. Approvals shall be re-issued when the requirements of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued certification and listing by a nationally recognized certification body, such as NSF International, as compliant with NSF Standard 40 and authorized by ~~NSF~~ the certification body to distribute and service products in North Carolina.

(c) The State shall re-issue a RWTS approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product certification.

(d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

History Note: Authority G.S. 130A-342;

SECTION .1600 – APPROVAL AND USE OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 is proposed for adoption as follows:

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for design daily flows less than or equal to 3,000 gpd shall be configured as a package and approved as a Provisional, Innovative, or Accepted 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 operating data logging.

(c) All components shall be integrated and designed to work together for the operation of the drip dispersal system. 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) installation specifications;

(4) operation and maintenance manuals; and

(5) design plans and specifications for all components.

(d) The system manufacturer shall provide ongoing 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, and this Section.

(f) Drip dispersal systems that are not pre-engineered packages approved in accordance with Section ~~.1600~~ .1700 of this Subchapter shall be designed on a project specific basis by a PE. The drip dispersal system design shall comply with Rules .0908, .1204, Section .1300, and this Section, as applicable.

(g) Drip dispersal systems for design daily flows 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 State 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 meet one of the following effluent standards: DSE, NSF-40, TS-I, or TS-II as specified in Table III of Rule .0402(a) and Table XXIV of Rule .1201(a) of this Subchapter.

(b) The drip dispersal system pump tank shall meet 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) sufficient capacity to accommodate projected flow and total dynamic head conditions;

(2) delivery of 10 to 60 psi of pressure during dosing events;

(3) minimum flow and pressure as required to backwash or forward flush headworks filter;

(4) manufacturer requirements shall be followed to protect the pump intake from solids materials that may accumulate in the pump tank and for pump cooling during operation;

(5) maintenance of velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(6) maintenance of 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.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, mechanism 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 design daily flow, typically during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a 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 pretreatment unit or to a separate settling tank to allow for primary settling prior to the pump tank;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also monitor 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 0.05 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 on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be uniformly spaced 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 assure 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 may be used where unfavorable site conditions are encountered along a drip run. Blanking tubing shall be differently colored or marked tubing of the same material, specifications and diameter as the connecting dripline, or flexible PVC;

(6) manufacturer shall specify methods for dealing with drainback; 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 to manage the multifunction processes of drip dispersal systems and meet the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at regular intervals throughout the day, at a projected average flow or design daily flow (peak enable float) dose regime. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to meet system design and varying operating conditions;

(3) minimum dose volume per zone shall be set as needed so that 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) at designer and manufacturer-specified frequency and duration;

(5) provide for routine automatic forward flushing of the drip laterals (field flushing) with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) monitor pump cycles and run times;

(7) systems with a design daily flow greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system shall include telemetry in accordance with Rule .1103(c) of this Subchapter;

(8) for systems with a design daily flow 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 include an automatically rechargeable battery back-up power supply or be otherwise designed to be functional during power outages;

(9) in 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 the zones that have been taken out of service and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats in the pump tank shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field or zone.

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 the following items and any other requirements included by the system designer:

(1) all leaks in the pipe network or from emitters exhibiting excessive emission rates, as evidenced by wet spots during dosing cycles comparable to normal operating conditions, shall be repaired; and

(2) dosing and flushing flow rates shall be measured and confirmed to be in accordance with the drip system design parameters as follows:

(A) dosing pressure shall be measured at the lowest point in the supply manifold;

(B) maximum emitter pressure shall be verified to be within emitter design parameters; and

(C) flushing pressures at the ends of each zone supply and return manifold shall be measured and recorded to document system start-up conditions.

(b) All mechanical components, pumps, pump cycling, filters, valves, vents, flushing, high-water alarm, and telemetry systems shall be demonstrated to be operable and in accordance with their design.

History Note: *Authority G.S. 130A-343;*

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

15A NCAC 18E .1701 is proposed for adoption as follows:

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, or that are required by other Sections of this Subchapter to be approved pursuant to this Section. This includes systems for which any of the following are proposed:

(1) minimum setbacks reductions;

(2) depth to limiting condition reductions;

(3) vertical separation distance requirements reductions; or

(4) LTAR increases.

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) detailed system design/drawings;

Commented [BS73]: Removal of "a minimum of" or "at least" is problematic at least in some instances, and I'm not sure why its being consistently done. I've tried to "add back" at least where I think it would be potentially problematic (when it implies that it must by exactly that number, and no more). May not have caught all of them.

(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, including tracking the last seven days and 30 days of wastewater flow for advanced pretreatment systems; and

(J) start-up requirements and information;

(3) summary of the following information:

(A) pertinent 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: established by a nationally recognized certification body; a listed protocol that has been approved by the Department in accordance with G.S. 130A-343(d); a comparable evaluation protocol used for system approval in other states; or in accordance with an alternative performance evaluation protocol proposed for approval by the manufacturer;

(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 accurately monitors system compliance with effluent quality 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, 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, system classification, frequency of system inspection and monitoring in accordance with Table XXXI of Rule .1301 of this Subchapter,

minimum certification/licensing requirements 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 State. Fees received are non-refundable.

(b) Provisional System applications shall include the information listed in Paragraph (a) of this Rule and the following evaluation proposal 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 proposal 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 successful completion of the Provisional System evaluation proposal.

(c) 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).

(d) Accepted Wastewater Dispersal 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).

(e) The Department may initiate review of a nonproprietary PIA system in accordance with G.S. 130A-343(i) without having received an application from a manufacturer. The system may be approved as Provisional or Innovative or the Department may recommend approval to the Commission as an Accepted system. The system shall have been shown to meet all applicable approval criteria of this Section.

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.

(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 Wastewater Dispersal 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 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 may hold technical advisory meetings to discuss PIA applications with stakeholders.

(i) 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 and specify appeal rights. The Department shall assign a unique code to the approved products for tracking purposes.

(j) 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 system shall be approved for use as a Provisional System when all of the following criteria have been met:

(1) For trench and dispersal systems documentation of one of the following:

(A) 50 installations operational and in use for 12 months, with available information indicating comparable hydraulic performance and rate of malfunction to a conventional trench system;

(B) the system's design and functional similarity to another approved system described elsewhere in this Subchapter, or to a Provisional, Innovative or Accepted System approved

in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for the following:

(i) material physical properties and chemical durability;

(ii) field installed permeable sidewall area and bottom infiltrative area;

(iii) method and manner of function for conveyance and application of effluent;

(iv) structural integrity; and

(v) 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.

(2) Documentation shall be provided that all trench and dispersal systems have been subject to and complied with AASHTO Standard H-5 and H-10 load testing that demonstrates the structural integrity to be comparable to a conventional trench system.

(3) For advanced pretreatment systems requesting Provisional approval for designs complying with TS-I or TS-II effluent quality standards, documentation of one of the following:

(A) 50 complete third-party field verification data sets from a minimum of 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected at least three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section;

Commented [BS74]: Note its OK if it takes more than 15 sites to get the 50 data sets

(B) the system's design and functional similarity 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:

(i) material physical properties and chemical durability;

(ii) structural integrity;

(iii) biological, chemical, or physical treatment processes;

(iv) method and manner of function for conveyance and transformation of wastewater and effluent through the system; and

(v) 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.

(4) Submittal of a proposed evaluation protocol to be overseen by a third-party evaluator. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative approval under G.S. 130A-343(f) and Rule .1705 of this Section is collected.

(A) For trench and dispersal systems:

(i) ~~a total of~~ 100 installations operational and in use for 12 months; and

(ii) sufficient information collected to evaluate the systems hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system;

(B) For advanced pretreatment systems, one of the following:

(i) 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, 50 complete third-party field verification data sets from a minimum of 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected at least three months apart, with no data excluded from the field sampling sites. The data sets shall show compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable; or

(ii) 150 complete third-party field verification data sets from a minimum of 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected at least three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable.

(5) Manufacturers requesting Provisional approval as both an advanced pretreatment and dispersal system must 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 system shall be approved for use as an Innovative System when all of 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 shall be 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 which 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, the results of which support the proposed use of the system; or

(C) the system has been evaluated in accordance with G.S. 130A-343(g)(3).

(5) The following documentation is provided for trench and dispersal systems:

(A) the results of AASHTO Standard H-5 and H-10 load testing that demonstrate structural integrity comparable to a conventional trench system;

(B) 100 installations operational and in use for 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.

(6) For advanced pretreatment systems requesting Innovative approval for designs complying with TS-I or TS-II effluent quality standards, documentation is provided 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, 50 complete third-party field verification data sets from a minimum of 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected at least three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards, as applicable; or

(B) 150 complete third-party field verification data sets from a minimum of 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected at least 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 or TS-II effluent quality standards, as applicable.

(7) 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 clear, convincing, and cogent evidence 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 300 systems installed statewide and in use as an approved Innovative System for more than five years;

(2) data and findings of all prior evaluations of the system performance as provided by the manufacturer;

(3) results of prior performance surveys of Innovative Systems in use in North Carolina for 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 .1712 of this Section. Upon request of the manufacturer, the Department and manufacturer shall meet to discuss the accuracy and validity of performance data and surveys to be considered for inclusion in the review. LHDs shall be invited to participate in the discussion;

(5) a statistically valid survey of system performance shall be performed, as follows:

(A) the manufacturer shall provide a proposed survey plan for Department concurrence prior to carrying out the survey. This plan shall specify the number of systems to be evaluated, period of evaluation, method to randomly select systems to be evaluated, methods of field and data evaluation, and proposed survey team members, including proposed cooperative arrangements to be made with Department and LHD staff. The Department shall facilitate

LHD participation with any performance review or survey. The Department shall utilize the Division of Public Health's State Center for Health Statistics for assistance in evaluating the statistical validity of proposed evaluation protocols; and

(B) the survey shall include the field evaluation of a least 250 randomly selected Innovative Systems compared with 250 comparably aged randomly selected conventional systems, with at least 100 of each type of surveyed system currently in use and in operation for at least five years. Systems surveyed shall be distributed throughout the three physiographic regions of the state (Mountain, Piedmont and Coastal Plain) in approximate proportion to the relative usage in the three regions. The survey shall determine comparative system failure rates, with field evaluations completed during a typical wet-weather season (February through early April), with matched Innovative and conventional Systems sampled during similar time periods in each region. The petitioner shall provide a statistical analysis of the survey results showing a one-sided test where, if the failure rate in the sample of ~~250~~ Innovative Systems is at least five percentage points higher than the failure rate in the sample of ~~250~~ conventional systems, there is only a five percent chance that a difference this large would occur by chance (95 percent confidence level). If a statistically significant higher failure rate in the Innovative System is not detected, the Commission shall find that the Innovative System performs the same as or better than the conventional system;

(6) Other criteria for determining whether the proposed system has been in general use, and other surveys, including evaluations of different numbers of Innovative and conventional systems, designed to verify equal or superior performance of the Innovative System compared to the conventional system under actual field conditions in North Carolina shall be approved by the Department when they are demonstrated to have comparable statistical validity as described in Subparagraph (b)(5) of this Rule. The Department's review and approval of proposed alternate criteria for determining whether the system has been in general use, or of other proposed surveys are subject to review and concurrence by the Commission.

(c) The Commission shall impose any use, design, installation, operation, maintenance, monitoring, and management conditions in accordance with G.S. 130A-343.

(d) Accepted system applications for products that are approved to both treat and disperse wastewater must meet the requirements for treatment and dispersal as described in this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

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

The Department may modify, suspend, or revoke the PIA approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) The PIA approval shall be modified as necessary to comply with subsequent changes in laws or rules which affect their approval.

(2) 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, shall submit to the Department a written application. 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.

(3) The manufacturer of an approved Provisional or Innovative System shall notify the Department within 30 days if they lose their approval from any nationally recognized certification body or choose to drop their listing, as applicable.

(4) The manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria, shall submit to the Department a written application. 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 the manufacturer's demonstration provides clear, convincing, and cogent supporting evidence.

(5) The Department may modify, suspend, or revoke a PIA approval upon a finding that:

(a) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;

(b) the system fails to perform in compliance with established effluent quality standards;

(c) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

(d) the system or the system petitioner fails to comply with wastewater system laws, rules, or conditions of the PIA approval; or

(e) the manufacturer lost their approval or chooses to drop their listing by any nationally recognized certification body, if applicable.

(6) The Commission may 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. The Commission may require the manufacturer or the Department to complete a follow-up survey of a proprietary trench system such as described in this Rule if the Commission determines further information is necessary prior to rendering a final decision on modification of the status of an Accepted System.

(7) 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 EFFLUENT SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS

(a) Wastewater sampling requirements shall vary in accordance with system classification, designated effluent quality standard, system design daily flow, and system performance history.

(b) Effluent from Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent quality constituents until the system receives Innovative Approval.

(c) Effluent from an approved Innovative System shall be grab or composite sampled annually for all applicable influent and effluent quality constituents when the design daily flow is less than or equal to 1,500 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(d) Effluent from an approved Innovative System shall be grab or composite sampled twice a year for all applicable influent and effluent quality constituents when the design daily flow is greater than 1,500 gpd and less than or equal to 3,000 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(e) 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.

(f) The manufacturer of an approved Innovative System may request an adjustment in sampling requirements (constituents or frequency) based on a written application submitted to the Department that includes the following information:

(1) data from 50 separate North Carolina sites in operation for six months;

(2) written reports summarizing results of the VIPs for all North Carolina sites submitted as part of this Rule;

(3) 80 complete data sets, including all data sets that do not meet the limits. Data sets may be from the same site if collected three months apart;

(4) analysis indicating compliant system performance in accordance with Rule .1710 of this Section; and

(5) identification of the constituents for which the manufacturer requests a reduced sampling frequency.

(g) Manufacturers of proprietary advanced pretreatment systems with Innovative approval that are also certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), and are in compliance with the ongoing verification program of such body, may submit a written application with a sampling protocol that reduces the data set requirements by up to 50 percent.

(h) Manufacturers of proprietary advanced pretreatment systems that comply with Paragraphs (f) and (g) of this Rule may apply to the Department to replace the requirement for routine effluent sampling of all individual sites with routine field constituent testing that is included as part of the VIP.

(i) While routine sampling of individual sites may no longer be required in accordance with Paragraphs (b), (c), or (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(b) of this Subchapter or if required as part of an enforcement action by the LHD or the Department.

(j) Effluent may be re-sampled within 30 days from receiving laboratory results indicating non-compliance with Table XXIV of Rule .1201 of this Subchapter. Complete data sets from resampling may be substituted to meet 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 (f) of this Rule.

(k) 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 quality 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 SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent quality standards of Table XXIV of Rule .1201 of this Subchapter when all the following conditions are met:

(1) the arithmetic mean (geometric mean for Fecal Coliform) of all data collected from all sites does not exceed the designated effluent quality standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent quality standard for any applicable constituent. Non-compliant data may be substituted with a new data set meeting the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results;

(3) fifty percent of all complete data sets from all sites shall comply with the designated effluent quality standard for all applicable constituents;

(4) when determining compliance with system effluent quality standards in Items (1), (2), and (3), 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(d)(2 or 3) of this Subchapter and sites that have been otherwise documented to have been subjected to significant abuse; and

(5) results of influent samples from all sites shall be provided to demonstrate compliance with percent reduction effluent criteria in accordance with Table XXIV 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 Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals shall be re-issued when the applicable provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request to the Department that includes the following:

(1) summary of the current status of systems permitted and installed under their approval;

(2) number of malfunctioning systems, including location, reason for malfunction, and how the system was repaired;

(3) documentation of system compliance with effluent quality standards in accordance with Rule .1710 of this Section, including analysis of all effluent data collected subsequent to the most recent system approval;

(4) documentation of compliance with all requirements in current Provisional or Innovative approval;

(5) documentation that 80 percent of the individual advanced pretreatment system~~s at a single~~ site~~s~~ are in compliance with Rule .1302(d) of this Subchapter, excluding single sites found to be out of compliance in accordance with Rule .1302(d)(2 or 3) of this Subchapter and sites that have been otherwise documented to have been subjected to significant abuse;

(6) current status of certification and listing by a nationally recognized certification body; and

(7) any other information the manufacturer deems necessary to support re-issuance of their PIA Approval.

(c) The Department shall re-issue a Provisional Approval for a specified additional period, not to exceed five years, when the manufacturer has demonstrated progress in completing the approved evaluation protocol; compliance with applicable effluent quality standards; and that there is the likelihood that re-issuance of the approval will enable the evaluation protocol to be completed. A Provisional Approval may be re-issued only one time.

(d) The Department shall re-issue an Innovative Approval for a five-year period when the manufacturer's report provided in accordance with Paragraph (b) of this Rule shows system compliance with effluent quality standards and this Subchapter.

(e) The Department shall suspend or revoke a PIA approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

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) All designers, installers, and Management Entities shall be authorized in writing by the manufacturer and as defined in the PIA approval.

(b) Manufacturers of proprietary systems approved under this Section shall provide a list of manufacturer's authorized designers, installers, and Management Entities, as identified in the PIA approval, to the Department and LHDs, and update this list annually.

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; or

(b) when the Provisional System is used as a repair to an existing malfunctioning system when there are no other approved 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) Permit systems designated as approved Accepted Systems in an equivalent manner to a conventional system at the owner's request, provided the location of each trench, trench depth, or effluent distribution method remains unchanged. The type of Accepted System installed shall be indicated on the OP.

(4) 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.

(5) Grant facilities generating high strength effluent the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to assure effluent strength equal to or better than DSE.

(6) 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.

(7) Inform the Department as well as the manufacturer or their authorized representative of any system determined to be malfunctioning.

(8) 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(d) 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 set forth further enforcement possibilities if compliance is not achieved.

(9) 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;*

15A NCAC 18E .0904 is proposed for adoption as follows: [CPP 10/22/2017]

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch or 10-inch (inside diameter) corrugated, polyethylene tubing installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 1.0 gpd/ft^2. To calculate trench length in accordance with Rule .0901(c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe, an equivalent trench width of two and one-half feet shall be used for 10-inch pipe and an equivalent of three feet shall be used for 12-inch pipe.

(d) LDP tubing shall be backfilled with concrete sand to the spring line or horizontal midpoint or enclosed in filter wrap, corrugated tubing, perforations, and fittings meeting the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated tubing 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 (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) when the LDP is not installed in concrete sand the corrugated tubing shall be

covered with filter wrap at the factory;

(5) filter wrap, when used, shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the minimum requirements in Table XVIII; and

(6) the large diameter pipe with filter wrap, when used, shall be encased in a black polyethylene sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

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 0.5 inches of water

(e) LDP system installed in Soil Group I Soils shall be backfilled with concrete sand in compliance with ASTM C-33 to the midpoint or spring line of the LDP system and in other soils where the LDP System is not fabric wrapped,

(f) LDP system installations shall be in accordance with Rule .0901(d) of this Section, the manufacturer's specifications and the following:

(1) trenches shall shall be excavated to a minimum width of the outside diameter of the LDP system;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet) and the trench bottom shaped to match the circumference of the LDP system;

(3) the LDP system shall be backfilled with native soil that is free of trash or debris;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for the LDP shall be six feet except when dispersal trenches are excavated by hand and without mechanical equipment when the minimum spacing shall be 5 feet on centers.

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

From: Hoke, Chris
Sent: Monday, September 25, 2017 10:22 AM
To: Michael, Larry; Deal, Nancy; Angoli, Trish
Subject: Rule Comments
Attachments: DOC092517-09252017100654.pdf

See attached. This appears to be a form comment - this is the second one we have received.

Chris Hoke, J.D.
Director of Regulatory and Legal Affairs Division of Public Health North Carolina Department of Health and Human Services

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-----Original Message-----
From: Murray, Holly A
Sent: Monday, September 25, 2017 10:12 AM
To: Hoke, Chris <chris.hoke@dhhs.nc.gov>
Subject: FW: Send data from MFP11503427 09/25/2017 10:07

-----Original Message-----
From: DPH-HR TOSHIBA e-STUDIO457 [mailto:NoReply@dhhs.nc.gov]
Sent: Monday, September 25, 2017 1:07 PM
To: Murray, Holly A <Holly.Murray@dhhs.nc.gov>
Subject: Send data from MFP11503427 09/25/2017 10:07

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Rule Review conducted by: Doug Lassiter - NORTH CAROLINA SEPTIC TANK ASSOCIATION

(Name)

Rule Number	Page Number	Line Number	Comment	Suggested changes based on comment *(Alternate language, suggested definition, etc.)*	Suggest Terminology *(ADD, CHANGE, or REPLACE)*
GENERAL			THIS EFFORT IS A LONG TIME COMING. AND WHILE THE LAST EFFORT INCLUDED THE STAKEHOLDERS FROM THE ONSET, THE ON-SITE WATER PROTECTION STAFF, ESPECIALLY TRICIA ANGOLI, SHOULD BE RECOGNIZED AS A CAPABLE ADMINISTRATOR FOR THIS DOCUMENT.		
GENERAL			DUE TO THE VOLUME OF WORK AND THE FACT THAT THE DRAFT IS PRESENTED IN A NEW FORMAT (18E), THE INSPECTION OF THE CURRENT RULES VERSUS THE PROPOSED RULES CANNOT BE EXAMINED "SIDE-BY-SIDE." THE CURRENT RULES ARE STRUCK-THROUGH IN ENTIRETY, AND THE PROPOSED RULES ARE ALL UNDERLINED.	**BECAUSE OF THE INABILITY TO COMPARE CURRENT VERSUS DRAFT RULES, AND BECAUSE OF THE NUMBER OF COMMENTS ENTERED DURING THE COMMENT PERIOD AND THE MEETINGS, THE NCSTA IS REQUESTING A COPY OF THE COMPILED COMMENTS COMING TO MR. HOKE AND THE ONSITE WATER PROTECTION BRANCH, ENDING OCT. 31, 2017. THE COMPILED COMMENTS SHOULD ALSO INCLUDE THE NAME OR GROUP OF THE SPONSOR OF THE COMMENT, INCLUDING MEMBERS OF THE ONSITE STAFF. THIS COPY SHOULD BE PRESENTED AT A TIME PRIOR TO THE MEETING OF THE COMMISSION FOR PUBLIC HEALTH. WE ARE CONFIDENT THAT THE REVISED COPY OF THE DRAFT 18E RULES WILL BE AVAILABLE TO THE PUBLIC AT THE TIME OF THE MEETING. THIS REQUEST IS ONLY FOR THE COMMENTS THEMSELVES AND THEIR SPONSOR. THIS COPY CAN BE SENT TO www.douglassiter@gmail.com.**	

0.0103	1		INCORPORATION BY REFERENCE	**WHILE IT IS UNDERSTANDABLE TO LIST A PORTION OF THE RULES AS REFERENCED TO RECOGNIZED STANDARDS, THE CONTINUED USE CAUSES A LACK OF TRANSPARENCY DUE TO THE COST OF THE MATERIAL. RULES OF THE STATE OF NORTH CAROLINA SHOULD ATTEMPT TO BE AS TRANSPARENT AND PUBLICALLY AVAILABLE AS POSSIBLE. SUGGEST THAT THE STATE ATTEMPT TO HAVE AVAILABLE AT NO CHARGE ANY REFERENCED DOCUMENT OR STANDARD FOR MEMBERS OF THE INDUSTRY.**	
0.0105	12	20	"SEPTIC TANK" MEANS A WATERTIGHT, COVERED RECEPTACLE… . THIS DEFINITION IS INCOMPLETE.	"SEPTIC TANK" MEANS A WATERTIGHT RECEPTACLE CONSTRUCTED OR MANUFACTURED TO WITHSTAND A MINIMUM OF 300 PSF IN ADDITION TO ALL LOADS THAT MAY BE PRESENT IN AN UNDRGROUND STRUCTURE, AND USED FOR THE COLLECTION AND TREATMENT OF WASTEWATER. **OMIT "COVERED" SINCE WATERTIGHT STRUCTURES IMPLY COVERED.**	
0.0105	13	32	"THIRD PARTY" REVIEW SHOULD NOT BE LEFT SOLELY AS A REPORT FROM AN OUTSIDE PARTY.	ADD TO THE END OF THE DEFINITION: **THE DEPARTMENT SHALL BE NOTIFIED OF ALL SAMPLING AND TEST DATA WITHIN 30 DAYS OF THE TESTING BY THE THIRD PARTY AND SHALL REVIEW THE ANNUAL REPORT FOR COMPLIANCE WITH EXISTING RULES. THE DEPARTMENT MAY SUSPEND AN APPROVAL IF TESTING OR EVALUATION FAILS TO MEET MINIMUM STANDARDS WITHIN THESE RULES UNTIL SUCH TIME AS SUBSEQUENT REPORTS ARE REVIEWED.**	
0.0202	15	3	A "COMPLETE" APPLICATION FOR AN IP CA OR EXISTING SYSTEM AUTHORIZATION SHOULD NOT EXPIRE 12 MONTHS AFTER DATE OF APPLICATION.	**OMIT THIS SENTENCE. ACCORDING TO THE CURRENT RULES, UPON RECEIPT OF A "COMPLETE" APPLICATION, THE LHD SHALL ACT ON THE APPLICATION.**	
0.0202	15	37	INTRODUCTION OF A CHECK-OFF FOR A GARBAGE DISPOSAL IS UNWARRANTED. WHILE GARBAGE DISPOSALS ARE RECOGNIZED FOR INTRODUCTION OF UNDIGESTED SOLIDS INTO THE SEPTIC TANK, IT CANNOT BE DETERMINED AS TO HOW MUCH THE DEVICE IS USED OR IF THE GARBAGE DISPOSAL WILL BE INCLUDED OR NOT INCLUDED.	OMIT THE CHECK-OFF FOR GARBAGE DISPOSALS. THIS IS A MATTER OF INCREASED MAINTENANCED, NOT TANK CAPACITY.	

0.0204	18	28	THE REVIEW OF PERMITS > 5 YEARS OLD SHOULD BE AT THE REQUEST OF THE OWNER AND AFTER CONSULTATION WITH THE LHD, THE REVISED CA (WHICH MUST BE AT A PLAT SITE SINCE IT IS > 5 YEARS OLF) MAY BE ACCEPTED IN WRITING OF THE OWNER	**THIS REVIEW FOR APPLICATIONS > 5 YEARS OLD IS STATED AS BEING WHERE "CURRENT TECHNOLOGY CAN BE EXPECTED TO IMPROVE THE WASTEWATER SYSTEM PERFORMANCE." SUGGEST IT IS MADE CLEAR THAT THE OWNER MAY CHOOSE TO RETAIN THE CONDITIONS AND DETAILS OF THE PERMIT.**	
0.0205	19	26	WHEN COMPARED WITH THE LANGUAGE ON PAGE 14, LINE 26-28, THIS PROPOSED RULE ALLOWS A SECONDARY OPINION OF ANOTHER MEMBER OF THE LHD THAT NEGATES THE CONDITIONS SET FORTH IN THE PERMIT. THIS ABILITY TO DENY THE OP UNTIL CHANGES ARE MADE PLACES THE COST OF ALL CHANGES ON THE OWNER. AND THERE IS NO WAY TO DETERMINE IF THE FIRST INTERPRETATION OR THE SECOND INTERPRETATION IS CORRECT, UNLESS MORE COST AND DELAYS ARE PLACED ON THE OWNER.	**CHANGE THE WORDING TO REFLECT THE INSTALLATION SHALL FOLLOW THE CONDITIONS SET OUT BY THE IP AND CA. OMIT THE ABILITY OF THE LHD TO PLACE CHANGES ON THE PERMIT INSTALLATION UNLESS DOCUMENTED PER CITATION WITH RULE AND UNLESS THE COST IS ASSUMED BY THE LHD. OTHERWISE, PLACE IN THE RULES THAT CHANGES BROUGHT BY A SECONDARY REVIEW WILL RESULT IN A WRITTEN ENTRY IN THE INITIAL LHD STAFFERS FILE.**	
0.0205	20	2	ELIMINATE THE EXPIRATION OF TYPE V OR VI SYSTEMS AS A RESULT OF A FINITE DATE (5 YEARS AFTER BEING ISSUED)	**TYPE V AND VI SYSTEMS ARE PERMITTED WITH A HIGH DEGREE OF OPERATION AND MAINTENANCE REQUIREMENTS. THESE SYSTEMS SHOULD BE REVIEWED BASED ON COMPLIANCE AND PERFORMANCE, NOT A SPECIFIED DATE.**	
0.0205	20	10	ELIMINATE (k) AND LET THE OPs BE REVOKED BASED ON PERFORMANCE, NOT A FINITE DATE.	**ELIMINATE**	
0.0207	22	30	THIS SUBSECTION CONCERNS THE EOP. THE RESPONSIBILITIES OF THE LHD DOES NOT INCLUDE THE ATTENDANCE AT THE POST-CONSTRUCTION MEETING	**ADD THE ATTENDANCE OF THE LHD AT THE POST-CONSTRUCTION MEETING**	
0.0301	23		ADD THE RESPONSIBILITY OF THE OWNER TO ESTABLISH APPROPRIATE SITE SPECIFIC VEGETATION OVER THE WASTEWATER SYSTEM AND REPLACEMENT AREA	**THIS RESPONSIBILITY IS WITH THE OWNER NOT THE INSTALLER.**	
0.0401	31	24	THE MODIFICATION IN THE PROPOSED RULES TO REQUEST IF THERE WILL BE MORE THAN TWO PERSONS IN A BEDROOM THAT THERE WILL BE AN ADDITIONAL 60 GPD PER PERSON IS NOT A BAD IDEA, BUT IMPLEMENTATION MAY BE IMPOSSIBLE	**KEEP THE CURRENT FORMULA FOR DESIGN DAILY FLOW BASED ON TWO PERSONS PER BEDROOM.**	

0.0401	32	3	THE BIGGEST CULPRIT FOR ADDING FLOWS OUTSIDE THE FORMULA FOR PER BEDROOM IS THE DISCHARGE FROM THE WATER SOFTENER. THIS SHOULD BE DIRECTLY MENTIONED.	**ADD "WATER TREATEMENT SYSTEM BACKFLUSH"**	
0.0401	36	3	TABLE III HAS DETAILED A GREATER NUMBER OF FACILITIES WITH DESIGN DAILY FLOWS, BUT THERE SHOULD BE A BETTER WAY OF NOTIFICATION FOR HIGH-STRENGTH FACILITIES INSTEAD OF A DOUBLE ASTRISK.	**GIVE SOME CITATION OF >RESIDENTIAL STRENGTH WASTEWATER AND GIVE MORE DETAIL INTO THE MASS LOADING FORMULAS THAT MAY BE USED.**	
0.0402	36	19	MENTION OF A "LICENSED CONSULTANT" IS NOT FOUND IN THE DEFINITIONS AND THE QUALIFICATIONS ARE NOT MENTIONED IN THE PROPOSED RULES.	**ELIMINATE "LICENSED CONSULTANT" OR DEFINE WITH STATE-APPROVED QUALIFICATIONS IN DEFINITIONS.**	
0.0601	54	1	SETBACKS FOUND IN TABLE SHOULD BE FURTHER MODIFIED TO ADJUST TO CLOSED PIPES (SCH. 40 OR GREATER) USED FOR TRANSMITTING WASTEWATER. WITH THE COST OF PROPERTY AND SMALLER LOTS, THE STATE SHOULD REVIEW THESE SETBACKS FOR ACTUAL RISK-BASED FEATURES.	**MODIFY THE SETBACKS FOR CLOSED PIPE VERSUS DISCHARGE AREAS.**	
0.0801	63	8	ON TABLE XIII, ELIMINATE THE ADDED COLUMN FOR GARBAGE DISPOSAL. AS STATED EARLIER, THE USE OF A GARBAGE DISPOSAL DOES ADD UNDIGESTED MATERIALS TO THE SEPTIC TANK, BUT THE INCREASE IN CAPACITY OF THE SEPTIC TANK CANNOT BE FACTUALLY DETERMINED. THE DIFFERENCE IS IN THE ADDED MAINTENANCE AND SERVICE, WHICH IS AN OWNER RESPONSIBILITY	**ELIMINATE THE COLUMN FOR SEPTIC TANK MINIMUM CAPACITY WITH A GARBAGE DISPOSAL.**	
0.0802	64	21	WHILE THIS PUMP TANK SIZING IS CURRENTLY IN RULE, THE USE OF A PUMP TANK IS IN ITS CAPACITY. IT IS UNKNOWN IF 2/3 OF THE PUMP TANK SIZE IS ADEQUATE, BUT APPEARS THAT IT REDUCES EMERGENCY HOLDING CAPACITY, AND THIS DRAFT, IF INCLUDED, SHOULD INCLUDE ALL SOIL GROUPS, NOT JUST I, II, OR III SOILS.	**KEEP PUMP TANK SIZE BASED ON IDENTICAL SIZE TO THE SEPTIC TANK OR BASED ON DISCHARGE REQUIREMENTS TO FULLY UTILIZED THE DISCHARGE EVENT. OR ALLOW ALL SOILS GROUPS TO USE 2/3RDS CAPACITY.**	

0.0805	67	14	THIS ATTEMPT OF IMPROVING TANK QUALITY IS FLAWED IN BOTH EQUITY ACROSS ALL MATERIALS AND IN ITS ABILITY TO BE IMPLEMENTED BY LHDs EQUALLY TO ALL TANK MANUFACTURERS. THE STRUCTURE OF "10% OF ALL TANKS IN EACH COUNTY" DOES NOT ADDRESS TANKS OF VARIOUS SIZES IN THE WHOLE POPULATION (For example, can 10% be met with all manufacturers, with all sizes from all forms, etc.)	**ELIMINATE THE PROPOSED QA PROGRAM. THE LHDs HAVE CONSISTENTLY STATED THEY HAVEN'T THE TIME OR MANPOWER FOR SUCH A TESTING PROTOCOL. IT APPEARS ONLY THE FULLY FUNDED LHDs SUCH AS WAKE AND ORANGE HAVE COMMITTED TO THIS, AND THESE ARE TWO OF THE COUNTIES THAT HAVE CHOSEN TO ABANDON THE STATE RULES FOR LOCAL RULES. CONSIDER A PROPOSAL THAT WOULD PROVIDE AN EQUAL REQUIREMENT THAT LHDs AND STATE PERSONNEL WOULD TEST TANKS AT MANUFACTURING SITES OR WHOLESALE DEALERS.**	
0.0805	67	34	THIS TESTING PROCEDURE OF A 24 HR. DEMONSTRATION IS FOUND IN STANDARDS FOR TANKS, BUT THE LHDs HAVE FOUND THIS RETURN TRIP COSTLY AND BURDENSOME. MOREOVER, THIS IS A HYBRID TEST SINCE IT ONLY PLACES THE 24 HR. FEATURE ON "POROUS" MATERIALS AND NOT ALL TANKS, WITHOUT MENTION OF NON-POROUS MATERIALS. SINCE LEAKAGE CAN RESULT IN OTHER AREAS OTHER THAN AS A RESULT OF POROUS (THROUGH THE WALL) ACTIVITY, IF THE HYDROSTATIC TEST IS APPLIED, IT SHOULD APPLY TO ANY TANK STRUCTURE	**KEEP THE OPTION OF HYDROSTATIC TESTING, BUT ELIMINATE TESTING PROTOCOL DIFFERENCES. WHILE THE CONCRETE MATERIAL MAY BE CONSIDERED POROUS, THIS IS NOT AN INDICATION THAT NON-POROUS MATERIAL WOULD REMAIN WATERTIGHT AFTER 24 HOURS.**	
0.0805	68	8	THIS PROPOSAL ALLOWS FOR A VACUUM TEST IN THE FIELD, BUT THE LIMIT FOR TESTING IS ONLY 2.5 INCHES OF MERCURY. IF THE STATE OF NORTH CAROLINA IS TRULY INTENT ON QUALITY ASSURANCE FOR ALL TANKS, THIS STANDARD IS A POOR ATTEMPT. KEEP THE VACUUM TEST AT THE SAME LEVEL FOR DETERMINING 300 PSF IN ADDITION TO ALL OTHER LOADS (AS STATED IN 15A NCAC 18E .1403). THIS WAY, THE MANUFACTURER WOULD BE MORE LIKELY TO CONTINUE QUALITY PROGRAM.	**VACUUM PRESSURE TESTING SHALL BE TESTED TO 5 INCHES OF MERCURY FOR TWO MINUTES FOR ALL TANKS OF ALL MATERIALS.**	

0.0902	72	6	THIS PROPOSAL IS UNNECESSARY, BURDENSOME, AND PROVIDES NO REAL EVIDENCE OF NON-COMPLIANCE. AGGREGATES PURCHASED BY WEIGHT MAY NOT BE DESTINED FOR A SINGLE JOBSITE, AND AGGREGATES FROM DIFFERENT QUARRIES MAY BE OF DIFFERENT SPACIFIC GRAVITIES.	**ELIMINATE THIS PARAGRAPH.**	
0.0903	93	36	THE PROPOSAL TO INCREASE THE HEIGHT OF THE CONTROL PANEL TO 36 INCHES MAY BE EASIER FOR THE OPERATOR, BUT IT WOULD BE BURDENSOME AND UNNECESSARY AND NOT WELL RECEIVED BY THE OWNER.	**CONTINUE TO REQUIRE A MINIMUM HEIGHT OF 12 INCHES ADJACENT TO THE PUMP TANK.**	
0.1103	94	14	REQUIREMENT OF 18 INCHES OF EFFLUENT TO REMAIN IN THE PUMP TANK IS NOT NECESSARY AS A SET DEPTH. THE DECISION SHOULD BE A RESULT OF THE NECESSARY REQUIREMENTS OF THE PUMP MANUFACTURER.	**ELIMINATE THE REQUIREMENT OF 18 INCHES.**	
0.1106	96	17	WHAT IS THE DEFINITION OF A "DISSIPATOR BOX" AND THE PROPOSED DIMENSIONS. THE PROPOSED RULE SAYS "MAY" BE USED, AND IT STATES THAT AN "AUTHORIZED AGENT" MAY APPROVE THE USE. WHO IS THE AUTHORIZED AGENT, THE LHD OR THE DESIGNER OR ENGINEER?	**FURTHER EXPLAIN THE SIZE AND FEATURES OF A COMPONENT, OR INCLUDE A STANDARD DISTRIBUTION BOX AS FULFILLING THE PERFORMANCE OF DISSIPATION.**	
0.1301	113	TABLE XXXI	REQUIREMENTS OF OPERATORS OF Va SYSTEMS (FIXED MEDIA ADVANCED PRETREATMENT VERSUS Vc RWTS SYSTEMS SHOULD BE THE SAME. THIS IS AN APPARENT ATTEMPPT TO ADD COST AND BURDEN TO A TECHNOLOGY THAT IS PROVEN IN THE INDUSTRY	**KEEP BOTH THE FIXED MEDIA AND RWTS SYSTEMS OF < 1500 GPD AT TWO TIMES/YEAR.**	
0.1401	121	21	THIS CHANGE IN THE TESTING FOR TANK STRUCTURE IS A 20% DECREASE IN THE PRIOR TESTING REQUIREMENTS PLACED ON TANK MANUFACTURERS AND DOES NOT MEET THE ENGINEERING SET IN RULES OF 300 PSF IN ADDITION TO ALL OTHER LOADS ANTICIPATED IN AN UNDERGROUND STRUCTURE.	**THIS DECREASE IN REQUIRED STRUCTURAL INTEGRITY SHOULD BE REMOVED. KEEP THE 5 INCHES OF MERCURY FOR 2 MINUTES WITHOUT DEFORMATION OR LOSS OF VACUUM THAT IS NOT RECOVERABLE UPON RELEASE OF VACUUM. THIS IS FOR ALL TANKS OF ALL MATERIALS. THIS STANDARD SHOULD BE FOR INITIAL APPROVAL OF TANK DESIGN, AND SHOULD APPLY TO TANKS SOLD IN NC NOW AND IN THE FUTURE (NO GRANDFATHERING). SUBSEQUENT TESTING TO THE APPROVAL LEVEL (5 INCHES FOR 2 MINUTES) SHOULD BE DONE WITHIN NC AND WITNESSED BY LHD AND STATE.**	

0.1401	121	24	THIS SECONDARY TESTING FOR WATERTIGHTNESS AFTER THE STRUCTURE HAS SUCCESSFULLY PASSED A VACUUM TEST OF 5 INCHES OF MERCURY IS UNNECESSARY AND BURDENSOME. A STRUCTURE THAT LEAKS WATER WOULD NOT BE ABLE TO PULL 5 INCHES OF MERCURY IN A VACUUM TEST.	**ELIMINATE (2), THE ADDED HYDROSTATIC TEST.**	
0.1402	122	9	REMAIN CONSISTENT WITH THE DEFINITION OF SEPTIC TANK, ADD STRUCTURAL STANDARD OF 300 PSF	**ELIMINATE PROPOSED SENTENCE STRUCTURE AND REMAIN CONSISTENT WITH SEPTIC TANK DEFINITIONS FOR ALL TANKS**	
0.1402	122	23	CURRENT RULE HAS THREE POSSIBLE INLET PORTS AND ONE OUTLET PORT	**REVIEW IN CONJUNCTION WITH (7) BELOW**	
0.1402	122	26	INLET PIPE PENETRATIONS ARE NOT AS NECESSARY TO REQUIRE A FLEXIBLE SLEEVE AS WITH OUTLET PIPE PENETRATION. THE INTRODUCTION OF THREE FLEXIBLE INLET SLEEVES WILL BE COSTLY AND BURDENSOME. WHILE THE STATE HAS REPORTED INCIDENTS OF LEAKING AROUND INLET PORTS, THIS IS A MATTER OF IMPROPER INSTALLATION OF THE BEDDING AROUND THE SEWAGE PIPE.	**ELIMINATE THE PROPOSED REQUIRED INLET FLEXIBLE SLEEVES. AS AN ALTERNATIVE, CHANGE ITEM (5) ON LINE 23 TO STATE THAT THERE WILL BE ONE INLET OPPOSITE THE OUTLET.**	
0.1402	122	30	THE REQUIREMENT THAT NO PIPE PENETRATION POINT OR OPENING SHALL BE ALLOWED BELOW THE OPERATING WATER LINE IS CURRENT. IN THE PAST, CONCRETE TANK MANUFACTURERS HAVE BEEN REQUIRED TO REMOVE ANY PIPE PENETRATION KNOCKOUT FROM A BOTTOM OF THE TANK, EVEN WHEN CAPABLE OF WITHSTANDING A PRESSURE OF 5 INCHES OF MERCURY. WITH THE INTRODUCTION OF PLASTIC TANKS, THIS IS A PROBLEM. THE BOTTOMS OF THE MID-SEAM TANK HAS THE IDENTICAL INTERUPTION OF THE RIBBING THAT REPORTEDLY PROVIDES THE STRENGTH.	**ALLOW THE MANUFACTURER TO DEMONSTRATE THAT THE INTRODUCTION IN THE REINFORCEMENT DOES NOT PREVENT THE TANK IN ITS STRUCTURAL INTEGRITY.**	
0.1402	123	5	THE REQUIREMENTS OF A PARTITION NEED TO MAINTAIN THE INTENT OF THE PARTITION FOR THE LIFE OF THE SEPTIC TANK. JUST A DESIGN FEATURE DOES NOT IMPLY SUSTAINED USE	**CONSIDER "THE PARTITION SHALL BE DESIGNED, MANUFACTURED, AND INSTALLED TO REMAIN IN POSITION AND SHALL BE CONSTRUCTED TO WITHSTAND A PRESSURE OF 300 PSF." In this instance, there would be no additional loading pressures anticipated.**	

0.1403	125	2	IN (a) THE DEFINITION OF SEPTIC TANK NEEDS TO BE CHANGED TO BE CONSISTENT WITH THE OTHER PARTS OF THE RULES.	**CHANGE THE DEFINITION TO READ "TANKS DESIGNED FOR USE IN THESE RULES SHALL BE WATERTIGHT AND CAPABLE OF WITHSTANDING A UNIFORM LIVE LOAD OF 300 PSF IN ADDITION TO ALL LOADS TO WHICH AN UNDERGROUND STRUCTURE IS NORMALLY SUBJECTED.**	
0.1403	125		TANK MATERIAL REQUIREMENTS NEED TO HAVE PROTOCOL FOR FIBER-REINFORCED CONCRETE USE IN LIEU OF 6X6 10 GAGE WWF.	**KEEP THE LANGUAGE SIMPLE, NOT TOO PRESCRIPTIVE. REFER TO CURRENT POSITION PAPER, REQUIRE DEMONSTRATION OF 300 PSF +**	
0.1403	125	27	SENTENCE STRUCTURE NEEDS CLARIFICATION. TANK LIDS AND RISER COVERS IN THIS SUBSECTION APPEAR TO BE JUST FOR LIDS AND COVERS MADE OF CONCRETE, BUT IS NOT FOUND IN LIDS AND RISER COVERS OF OTHER MATERIALS. SHOULD ALSO BE "A HANDLING DEVICE EQUIVALENT IN STRENGTH TO A #3 REBAR." SAYING A "HANDLE OF STEEL" IS CONFUSING.		
0.1405	127	12	RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVALS SHOULD REMAIN IN EFFECT UNTIL THE MANUFACTURER SEEKS TO AMEND THEIR APPROVAL. THIS PROPOSAL WOULD DRAW MANPOWER FROM THE STATE THAT COULD BE USED BETTER ELSEWHERE	ELIMINATE .1405	
0.1505	130	18	RWTS APPROVALS SHOULD NOT HAVE A FINITE EXPIRATION. THIS IS UNNECESSARY AND BURDENSOME TO THE MANUFACTURER, MANY OF THEM SPENT OVER 5 YEARS TRYING TO GET THE FIRST APPROVAL. THE REQUIRED O & M OF THE SYSTEM SHOULD GIVE A PERFORMANCE BASE TO SUSPEND OR REMOVE THE APPROVAL. STATE MANPOWER CAN BE USED MORE EFFECTIVELY ELSEWHERE	ELIMINATE .1505	
0.1704	139	20	BASED ON THIS LANGUAGE, **WHICH IS GOOD AND PROPER,** THE USE OF THE EZ FLOW PRODUCT WOULD CONTINUE BY LAW NOT TO HAVE TO MEET THIS REQUIREMENT. HAS THIS LEGISLATION BEEN REMOVED?	**CONSIDER REWORDING THIS LANGUAGE TO MAKE THE MARKET EQUAL.**	

0.1711	147	18	PROVISIONAL AND INNOVATIVE APPROVALS SHOULD NOT EXPIRE WITH A FINITE DATE OF 5 YEARS. MOST SPENT OVER 5 YEARS JUST GETTING APPROVED. AND THE REQUIREMENT WOULD BE COSTLY AND OTHERWISE BURDENSOME. THE STATE MANPOWER CAN BE USED ELSEWHERE. CONTINUE TO REQUIRE O & M DATA SETS AND SUSPEND OR REVOKE BASED ON PERFORMANCE OR NON-COMPLIANCE	**ELIMINATE .1711**	
0.1713	148	14	THIS ONLY REQUIRES THE LHD TO NOTIFY THE STATE OF PROVISIONAL SYSTEMS. INNOVATIVE SYSTEMS SHOULD ALSO BE TRACKED AND REPORTED	**ADD "INNOVATIVE SYSTEMS"**	
GENERAL			**THE NCSTA WISHES TO COMMEND THE EFFORTS TO UPDATE THE RULES FOR ONSITE WASTEWATER SYSTEMS. OBVIOUSLY, THERE WILL BE DIFFERENT OPINIONS AND NO PERSON OR SECTOR SHOULD EXPECT TO HAVE EVERY WISH RESOLVED. THAT BEING SAID, NCSTA WILL CONTINUE ON CERTAIN PROPOSALS TO INSIST ON MODIFICATIONS DUE TO OUR BASIC FORMAT OF PROVIDING RULES THAT (1) CAN BE UNDERSTOOD, (2) ARE ENFORCEABLE AND ENFORCED, AND (3) EQUAL FOR ALL PARTIES. RULES THAT CANNOT MEET THESE STANDARDS SHOULD NEVER BE ACCEPTED. THANKS FOR THE SUPPORT AND CONSIDERATION. AND PLEASE REMEMBER TO SEND A COMPLETE SET OF COMMENTS WITH THEIR SPONSOR TO:**		
			www.douglassiter@gmail.com		
ADDED COMMENTS					

0.0301	23	30	(7) THIS SENTENCE SHOULD REALLY BE EMPHASIZED. THE OWNER IS ULTIMATELY RESPONSIBLE FOR THEIR SEPTIC TANK SYSTEM, AND THERE SHOULD BE NO EXCUSE FOR A LAPSE IN CONTRACT WITH A CERTIFIED OPERATOR, WHEN NOTED IN 15A NCAC 18E .1301	**THE ONLY WAY TO SUSTAIN COMPLIANCE IS TO APPLY SOME SORT OF OVERSIGHT ON THESE SYSTEMS. THIS STARTS WITH OWNER AWARENESS AND ACCOUNTABILITY, EXTENDS TO LHD RECEIVING AND ACTING ON THE REPORTS, AND THE STATE COMPILING THE ACTIVITY REPORTS. CONSIDER WORKING WITH DEQ ON STRENGTHENING THE OPERATOR PROGRAM**	
0.0401	31	21	THIS EXPANSION OF THE DESIGN DAILY FLOW CHART MAY MAKE IT EASIER FOR THE APPLICANT AND THE LHD TO APPLY CORRECT FLOWS. ALSO IMPRESSIVE IS THE INTRODUCTION OF MASS LOADING, WHICH HAS BEEN PROVEN TO IMPACT THE ACTUAL PERFORMANCE		
0.0402	36	19	THIS SUBSECTION ALLOWS THE LICENSED CONSULTANT THE ABILITY TO JUSTIFY NOT USING ADVANCED PRETREATMENT AND IS AN EXCELLENT EXAMPLE OF PERFORMANCE OPTIONS.	**KEEP ALLOWING OPTIONS FOR OBTAINING DESIRED PERFORMANCE. IT'S THE END OF PIPE RESULT THAT'S IMPORTANT. DOES "LICENSED CONSULTANT" DESIGNATION COME WITH LISTED QUALIFICATIONS.**	
0.0506	48	30	MORE CONSIDERATION SHOULD BE GIVEN TO SYSTEMS PLACED IN SAPROLITE AREAS. THE MAJORITY OF LICENSED SOIL SCIENTISTS IN THE FIELD FIND SAPROLITE TO BE MORE SUITABLE THAN THE CURRENT OR PROPOSED RULES ALLOW. ALSO IN AREAS OF SAPROLITE, THE SETBACKS TO WELLS IS REQUIRED AT 100 FT., WHERE SITE IDENTIFIED IN SOILS MAY BE ALLOWED TO A MINIMUM SETBACK OF 50 FT. THIS SHOULD BE EXAMINED AND EQUITY BE GIVEN IN THESE RULES	**EXPAND THE RULES FOR SAPROLITE AREAS.**	
0.0601	54	TABLEIX	THERE IS LISTED IN THIS TABLE, A MINIMUM SETBACK FOR GEOTHERMAL CLOSED LOOP SYSTEMS. WHILE THE OTHER SETBACK MAY BE A NATURAL OCCURANCE FOR SITE LOCATION, THE LOCATION OF THE ONSITE SYSTEM AND REPAIR AREA SHOULD BE GIVEN PREFERENCE INSTEAD OF A GEOTHERMAL CLOSED LOOP SYSTEM.	**PLACE SETBACKS OF AN ONSITE WASTEWATER SYSTEM IN THE APPLICATION AND CONSTRUCTION OF A GEOTHERMAL SYSTEM. CLOSED LOOP GEOTHERMAL SYSTEMS SHOULD BE MARKED FOR LOCATION.**	

0.0801	63	21	THE ADDITIONAL LANGUAGE FOR SYSTEMS USING GRINDER PUMPS IS VERY ACCEPTABLE. DISCUSSIONS WITH PUMP MANUFACTURERS HAVE SPOKE FAVORABLY, AND THERE IS STILL THE OPTION FOR OTHER DESIGNS THAT DEMONSTRATE EQUAL PERFORMANCE.	**LANGUAGE SOLVES A PROBLEM WITH SOLIDS THAT GO THROUGH A GRINDER PUMP, AND THE PERFORMANCE OPTION SHOWS FLEXIBILITY FOR SITE SPECIFIC APPLICATIONS**	
0.0803	66	7	THIS SUBSECTION EXPANDS THE DESIGNS NEEDING GREASE TANKS. HISTORICAL EVIDENCE SHOWS THAT FOG EFFLUENT ACTS DIFFERENTLY FROM DSE, AND THE PROPOSED RULES RECOGNIZE A COMPROMISE WITH SYSTEMS <1500 GPD AND THOSE MORE COMMERCIAL SYSTEMS OF >1500 GPD.	**GOOD EXPANSION OF REQUIREMENTS FOR SYSTEMS THAT INCLUDE A RECOGNIZED FOG INCREASE.**	
0.0901	72	16	THE ESTABLISHMENT OF VEGETATION AT A SITE SHOULD BE THE RESPONSIBILITY OF THE OWNER, NOT THE INSTALLER.		
0.0904	74	28	THE TRENCH SPACING FOR LDP IS SET HERE AT A MINIMUM OF 6 FEET. THIS WOULD ASSUME THAT THE TRENCH IS EXCAVATED IS A MECHANICAL DEVICE AND NEEDS MORE SPACING FOR DIGGING AND MATERIAL. THE USE OF LDP, ESPECIALLY IN THE MOUNTAINS, IS MANY TIMES DUG BY HAND AND WITHOUT THE COMPACTION AND NEED FOR THE ADDED SPACE, SHOULD BE ABLE TO REDUCE THE SPACING TO 5 FEET WHEN HAND DUG. ADDITIONAL MODIFICATIONS COULD BE APPLIED FOR SITES WITH STEEP SLOPES.	**CONSIDER ADJUSTING TRENCH SPACING TO ALLOW FOR NON-MECHANICAL EXCAVATION.**	
0.0907	81	LPP SYSTEMS	THE LANGUAGE IS FAIRLY PRESCRIPTIVE AND SHOULD BE EXPANDED TO ALLOW FOR OTHER TECHNOLOGIES AND COMPONENT CONFIGURATIONS (LIKE ORIFICE SHIELDING DEVICES).	**CONSIDER ALLOWING "OTHER DESIGNS SHALL BE CONSIDERED UPON DEMONSTRATION."**	
0.1302	115	4	THIS SUBSECTION APPEARS TO GIVE THE RESPONSIBILITY OF OPERATION AND MAINTENANCE TO THE MANUAFCTURER INSTEAD OF THE OWNER. THIS REALLY IS AN INCORRECT APPROACH. YOU DON'T BUY A CAR AND THINK YOU CAN FAIL TO MAINTAIN IT BECAUSE THE MANUFACTURER IS GOING TO "PROVIDE FOR THE ONGOING OPERATION AND MAINTENANCE."	**APPLY RESPONSIBILITY WHERE IT BELONGS. THE O & M REPSONSIBILITY BELONGS TO THE OWNER OF THE SYSTEM.**	

0.1307	120	10	THE PROPOSAL FOR ABANDONMENT OF A SEPTIC TANK SYSTEM NEEDS CLARIFICATION. THE PROPOSAL SAYS THE CONTENTS SHALL BE REMOVED AND THE COMPONENTS COLLAPSED AND BACKFILLED. SINCE THE "SYSTEM" ALSO INCLUDES THE DISPERSAL FIELD, IS IT THE INTENT THAT, FOR THE CHAMBER SYSTEM AS AN EXAMPLE, THE CHAMBERS WOULD BE REMOVED AND THE EXCAVATION CLEANED OF THE REMAINING CONTENTS? THIS SUBSECTION MAY NEED REWORKING	**CONSIDER: "IF A WASTEWATER SYSTEM IS FOUND TO BE NON-REPAIRABLE OR NO LONGER REQUIRED, THE TANKS SHALL HAVE THE CONTENTS REMOVED BY A PERSON CERTIFIED AS A SEPTAGE FIRM, THE TANKS COLLAPSED OR OTHERWISE SECURED PER LOCAL HEALTH DEPARTMENT, AND THE ABOVEGROUND COMPONENTS DE-ENERGIZED AND REMOVED."**	

September 20, 2017

Chris Hoke

1931 Mail Service Center

Raleigh, NC 27699-2961

RE: Concerns and Objections to proposed 15A NCAC 18E

Mr. Hoke,

We are a manufacturer of an approved TS-I and TS-II wastewater system in North Carolina. We have serious concerns over the current proposed Rules being considered for Permanent Rule. We have listed the most questionable ones below.

.0202 Page 3, Line 3 (c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

A complete Application should be without expiration.

.0205 Page 20, Line 2 (h) For a Type V or VI system as specified in Table XXXI of Rule .1301 of this Subchapter, the OP shall expire five years after being issued.

Type V and VI systems have requirements of inspections, sampling, and reporting and the systems should be subject to suspension or revocation based on inability to meet compliance, not a specified date.

.1201 Page 97 Table XXIV

For TS-II systems, the current rules state the Advanced Treatment System shall meet a Total Nitrogen (TN) of less than or equal to 20 mg/l or a reduction of > 60 percent. The proposed Rules eliminate the 60% reduction. Enforcement of the current rule is not being exercised consistently. The Advantex Innovative approval has not met the standard since July of 2007, leaving subjective enforce by the section.

.1202 Page 98 Table XXV and Table XXVI

The Tables appear to remain consistent with each other, even with the added treatment to the effluent of TS-I and TS-II standards, especially with New Fill minimum vertical separation.

.1302 Page 115 Line 4 (1) for systems installed after July 1, 2006, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this Section. The contract shall be renewable and the contract term shall be for one year.

This should NOT be a responsibility of the manufacturer. Once a system, any system, is installed the responsibility of operation and maintenance that corresponds with the conditions of the permit should be the Owner. If the Owner is offered an O & M contract by the manufacturer, they can choose to contract with the manufacturer or with another Management Entity approved and listed by the manufacturer. ***Delete the mandatory requirement of manufacturer responsibility for advanced pretreatment systems and make it similar to the other systems permitted by the State, with the inspection and reporting frequency as per rules.***

.1305 Page 118, Line 13 (c) The Management Entity shall provide a copy of the inspection report to the owner and LHD within 30 days of the system inspection.

Since the ongoing compliance is valuable information for the manufacturer of the advance pretreatment system, it would be proper to add the issuance of the inspection report to the manufacturer. ***Amend: (c) The Management Entity shall provide a copy of the inspection report to the owner, the LHD, and where applicable the manufacturer of the proprietary advanced pretreatment system.***

In the current 1970 rules, there is a rule that has not been enforced since day one, July 1 1970.

(5) All samples shall be collected, preserved, transported and analyzed in compliance with 40 CFR 136. The manufacturer shall demonstrate that the system can be sampled in compliance with 40 CFR 136 and that the method for system sampling accurately monitors system performance. Samples shall be analyzed by a state certified laboratory. Samples

shall be analyzed for the applicable parameters. The sample collector shall maintain a complete chain of custody from sample collection to analysis for each sample collected. The results of all analyses for each sample shall be reported by the certified wastewater laboratory directly to the ORC and simultaneously to the health department and the state. Repeat sampling at any site shall be performed as required in the system approval, approved performance audit, this Rule, or as otherwise directed by the health department or state as part of an enforcement action. The owner or manufacturer or manufacturer's representative may also re-sample a system to verify or refute sample results, as long as the results of all samples collected are similarly reported

.1711 Page 147, Line 19 (a) All Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals shall be re-issued when the applicable provisions of this Rule have been met.

This is a very subjective and not objective proposed rule. What are the parameters for re-evaluation? It only took 8 ½ years to move from TS2 control demonstration for EZ TREAT and countless dollars due to subjective evaluation by the Department. Personal opinions and biases were the absolute determination of the company's ability to do business in the State of NC. There needs to be an objective and definite process with time constraints in order to even contemplate this procedure. Lack of Enforcement of the current rule has been the norm.

Page 147, Line 21 (b) six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request to the Department…

Both (a) and (b) are unnecessary and burdensome. The requirements of ongoing operation and maintenance should provide compliance history found in (b), and the idea of an expiration of an Approval based solely on a definitive date is useless. If the mandatory reports by a certified Operator and the inspection of the LHD are created and compiled as they should with the Department, the expiration deadlines are needless.

.1713 Page 148, Line 34 (2) Notify the Department of all IPs, CAs, and Ops issued for Provisional Systems.

Amend this to require that LHDs shall notify the Department of all IPs, CAs, and Ops issued for Provisional and Innovative systems. This was probably an oversight, but the information should be gathered and compiled for both.

.1204 Page 101-106 LTAR in Soil Groups/Treatment Levels

This Section (.1204) appears to allow little adjustment to justify the cost to the consumer to use an advanced treatment system. There is no allotment for a TS 2 system for vertical separation. There is no advantage for a TS 2 system.

Table XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality

Table XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality 4 **Minimum dept**

from naturally occurring soil surface to LC

Type of Fill	**Distribution Method**		**Effluent Quality Standard**	
DSE*	**NSF-40**	**TS-I**	**TS-II**	
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	18 to LC 12 to SWC	18 to LC 12 to SWC	14 to LC 12 to SWC	14 to L 12 to S
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 (≤480 gpd)	Gravity		36 of Group I Fill/Soils	
LPP		24 of Group I Fill/Soils		
Drip		24 of Group I Fill/Soils		

Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC

Type of Fill	**Distribution Method**		**Effluent Quality Standard**	
DSE*	**NSF-40**	**TS-I**	**TS-II**	
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	24 to LC 18 to SWC	18	18 to LC 14 to SWC	18 to L 14 to S
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

There is no consideration for the minimum vertical separation between NSF 40, TS 1and TS2. TS1 and TS2 has no advantage to the to LC and SWC, if it is 12 for TS 1 then it is 12 for TS 2. IF it is 9 for TS1 it is 9 for TS 2. TS 2 should be 6''.

It is apparent that certain technologies are being written into the rules. Prefabricated permeable block and panel systems, Drip systems, and underground sand filters are being written into the rules. Drip manufacturers are Geoflow and Netafin. Approvals by American, EZ TREAT, Delta etc. are by system integrators. We purchase pieces and parts from the Manufacturers and assemble proprietary system products under current approvals. These approvals are approved by the Department for continuity and function. The rule relieves

accountability for any system integrator and creates a "finger pointing contest". Each system integrator should be evaluated and approved upon a system and not a piece and part conglomeration. Furthermore, no technology should have a rule application and should be stand alone approvals. IE. Presby, Elgen, and T and J Panel.

The proposed rules for Drip are way extensive and the LPP systems are very broad. The hydraulics should be similarly evaluated.

15A NCAC 18E .1502 APPLICATION 23
An application shall be submitted for RWTS approval in writing to the State and shall include the following: 24
(1) manufacturer's name, address, phone number, plant location(s), and contact information for 25 distributors; 26
(2) verification of NSF Standard 40 Class I system approval and listing by NSF International or other 27 ANSI-accredited third-party certification program;

In the definitions, a RWTS is defined as a residential wastewater treatment system. This sentence occurs more than once. If you will be using NSF standards, it needs to be recognized that the ANSI accredited labs need to be 'arms length apart". IE. Norweco has owner affiliation with an ANSI lab and should not be considered "THIRD PARTY".

Page #	Line #'s	Current Language or Issue	Proposed Language	Justification
1	10,11	"...waters, or directly to groundwater."	"...waters, or directly to groundwater except as allowed when used in conjunction with a reclaimed water system."	Do we want to be a proactive and progressive State and allow and encourage reclaimed water useage or not? North Carolina has been leaders in the allowance and oversight of advanced treatment systems. While we haven't been the most lenient, by and large systems approved and installed in this state WORK. Well technology has passed by our old prescriptive .1900 Rules. We now have the technology and institutional and undustrywide knowledge in this State to be leaders in the field of reclaimed water systems. This benefits potential property owners and the environment alike when done properly. By including this "reclaimed water" language in page 1, we set the tone right away.
7	5	...material (crushed rock or gravel) screened...	...material (crushed rock, gravel, or approved alternative media) screened...	Tire chips still in use in areas of the State, additionally by including this language it allows for future approved materials to be used without modification to the rules.
17	37	"(F) trench widths, length, and depth on the downslope side of the trench."	"(F) trench widths, length, and depth on the downslope side of the trench. Trench depths shall be sited and subsequently verified by means of a engineer's transit or laser level from a mark placed by the LHD or PE or LSS on a fixed benchmark at the time of the IP or CA". Fixed Benchmark will need to be defined. However examples include a nail in tree, mark on crown of road, mark on edge of foundation.	If you aren't designing the drainfield elevations from a fixed point, how is one supposed to determine if it's actually been installed at the proper level? Some soils have wonderful perfect identifiers that make it simple to determine if it has been placed at the proper level, however many do not. Without setting a fixed benchmark, no guarantee can be made that the drainfield has been set at the proper depth meaning that no assurances of public health protection can be reliably made. Think beach sand with how much soil movement and fill work is done on those sites.
20	2,3	"(h) For a Type V or VI system as specified in Table XXXI of Rule .1301 of this Subchapter, the OP shall expire five years after being issued."	"All Operation Permits shall expire five years from date of issue. For a Type I or II system as specified, in Table XXXI of Rule .1301 of this Subchapter, the OP shall be renewed by the LHD after presenting documentation of a pump out by an Authorized Septage Hauler, or an inspection by the LHD, the contracted Certified Operator of the system, or a Certified Inspector which states the system to be a functioning subsurface treatment system as defined by <needs definition>.For a Type III, IV, V or VI system as specified, in Table XXXI of Rule .1301 of this Subchapter, the OP shall be renewed after presenting documentation of an inspection by the LHD, the contracted Certified Operator of the system, or a Certified Inspector which states the system to be a functioning subsurface treatment system as defined by <needs definition>."	An expiring OP is a powerful tool to encourage proper operation and sustainable infrastructure. While we realize that requiring expiring OP's on ALL onsite systems may seem like a bridge too far, only requiring it for systems that have an Certified Operator and County Inspection requirement is redundant and turning a blind eye to many sites with concerns and problems. A system with a pump (Type III) and a Low Pressure Pipe or Off Site system (type IV) are at much greater risk of premature failure than a conventional gravity system and yet they have no required Certified Operator or County oversight. These two especially are glaring examples of the absolute perfect scenario in which an expiring OP can help preserve the environment, or a save a life (falling in tank), or prolong the life of the system at a minimum.
23	19-37	List of owners responsibilities.	...or what?	What legal recourse does the Branch and/or LHD have if the owner does not comply with this list of requirements. We believe this should be spelled out clearly (in approximately this location) as it will help installers, pumpers, operators, and LHD's get compliance from owners in violation.
32	3,4	"Shall not" removes any flexibility for the designers.	"...unless specified by a P.E. or approved by the State."	at times it is nice to put ice machine drainage into the grease trap or septic tank to lower the temperature for restaurant system.
36	Table III	"Effluent quality standards"	"Septic tank effluent quality..."	There is no good or efficient way to take a sample of influent into a septic tank. Certainly not from a gravity line...strength depends on who's in the bathroom if you get my drift. A sample near the outlet filter or preferably a falling sample after the filter is most accurate and practical.
49	30	"shell meet all required setbacks..."	"shall be equal to, or larger than, the initial wastewater system and meet all required setbacks..."	We are putting the citizens of North Carolina at a risk by allowing for an advanced system or reduced footprint system for a repair when a primary may be a conventional system. Imagine you are a low income family with a home on a marginal piece of land. Your primary conventional system costs $4,000. Your repair however, includes drive over tanks, a TSII treatment system and drip irrigation...adding up to $30,000. When you bought the home, you didn't even know that time bomb was waiting for you. If this language was in place, the builder would have had to install a treatment system to start with so that you would know the price, alternately he could have added more land to the lot and thereby reducing density but saving some cost by having a conventional primary and a conventional repair.
50	28	"shall be 18 inches"	"shall be 24 inches"	Why are we reducing this when it has provided good protection all these years? On what evidence or scientific justification are the department lowering this separation?
61	27-28	"shall be three-inch nominal size..."	"shall be three-inch nominal or greater size..."	Some stub outs for systems are 4"+.
62	6-32	Pipe materials	Recommend removing the requirement for HDPE to be designed by a PE. This material is superior in almost all ways to PVC and is becoming more and more prevalent on job sites. To require it to be pressure tested and engineer designed, when solvent welded PVC is not, flies in the face of standard practice in the sewer industry. HDPE has better welds at much longer intervals than PVC...it's simply a better practice, why add cost to it by putting hurdles in the way?	Recommend removing much of this language. it is far too prescriptive.
77	2	"...soil surface..."	"...soil surface unless receiving effluent from an approved TS-II treatment system..."	Added protection for the underlying aquifer is offered by nutrient and fecal reduction.
85	32	"the fill pad shall be constructed when the wastewater system..."	"the fill pad shall be constructed 3 months before the wastewater system..."	Allows for settling
91	33-37	Reuse and Recycle Systems	Flesh this out. Build on it.	Please form a working group to build on this. The technology and institutional knowledge is there to do these systems and do them well.
92	34	"removable without requiring entrance into the tank."	"within 18" of the lid."	entrance of what? Breaking the plane of the tank? bodily entrance? an arm? what? Just make it 18"
92	23,24	"The pump operating flow rate..."	Strike	If this was true, everything would be pressure dispersal. What does it mean?
93	36-37	36" panel height	no change	hallelujah
93	25	"latching"	strike	Spring loaded hoa switches can be safer to user and pump at times and are UL approved.
93	27	"a pump run light"	strike	Pump run lights can lead to a false sense of security ie a false negative. "I can open the union because the pump run light is off." Additionally they are costly and expensive. Lose lose lose proposition.
93	6	"...These backflow prevention..."	strike	Why? There are times it is nice to have it on the field side of the disconnect. Talked to several good operators and no one knows why this would be mandated by rule. Too prescriptive.
95	17	"cast iron"	Strike	No. Just no.
95	19	"...functioning high water alarm..."	"functioning trip counter and high water alarm..."	We use ETM's and cT's on control panels for troubleshooting and control. Why not have the same control on dosing siphons? Don't you want to know how many times it has dosed since your last inspection??
96	17-19	Dissipator box	I have no idea what is intended ...	What exactly is a dissipator box? Is plywood a viable construction material? See what i mean? Needs a definition.
96	Table XXIV	Effluent Nitrogen is too low	A decade+ of experience and data shows that influent total nitrogen concentrations are in reality higher than many textbook values. The attached curve shows that the median TKN for influent is approx. 64 mg/l and an 80% confidence point is 92 mg/l. These technologies were approved and can generally only meet 60% nitrogen reduction without additional technology, chemicals, and possibly tanks.	Recommend changing the effluent total nitrogen limits to <30 mg/l for flows <3000 GPD and <20 for flows greater than 3,000 GPD.
96	Table XXIV	Fecal Coliform limit on a subsurface system makes very little sense and is costly and time consuming and mandated without any significant allowances granted.	Simply strike all fecal coliform standards from Table XXIV	Recent research shows that conventional soil systems with a unsaturated soil depth of only 12" struggle to remove fecal coliforms reliably. Therefore, unless the depth to soil wetness is increased for conventional systems there is no justification to impose additional disinfection on treatment systems. We are increasing the cost of equipment as well as the cost of laboratory fees for no justifiable reason. Unless we begin applying wastewater to the land surface, I see no reason to continue disinfecting the effluent UNLESS additional vertical setback or sizing allowances are offered. (see below)
98	Table XXVI - TOP	The right hand column for TSII effluent should be 12,9,9,9 for depth from soil surface	We grant horizontal setback reductions for TS-II systems as compared to TS-I systems, why are we not granting reduced vertical separation?	As compared to TSI systems, TSII systems provide for an additional log removal of fecal coliforms, significant nitrogen removal, and 33% additional organic load onto the infiltrative surface area. Not only is it not right to grant these technologies more lenient vertical allowance, due to the nutrient and fecal reduction we should want to encourage their use. Time dosing provides an added layer of protection as well. In summary, we are granting a 25% decrease in vertical separation to TSII systems over TSI systems in exchange for 60% less nitrogen load, 33% less organic load, a 10 fold decrease in fecal coliform, and gaining time dosing of the drainfield. It's protective, and it's fair.
98	Table XXVI - Bottom	The right hand column for TSII effluent should be 15,12,9,6,9,6	We grant horizontal setback reductions for TS-II systems as compared to TS-I systems, why are we not granting reduced vertical separation?	As compared to TSI systems, TSII systems provide for an additional log removal of fecal coliforms, significant nitrogen removal, and 33% additional organic load onto the infiltrative surface area. Not only is it not right to grant these technologies more lenient vertical allowance, due to the nutrient and fecal reduction we should want to encourage their use. Time dosing provides an added layer of protection as well. In summary, we are granting a 25% decrease in vertical separation to TSII systems over TSI systems in exchange for 60% less nitrogen load, 33% less organic load, a 10 fold decrease in fecal coliform, and gaining time dosing of the drainfield. It's protective, and it's fair.

Page #	Line #'s	Current Language or Issue	Proposed Language	Justification
99	13	"...new system using DSE and all the following conditions are met:"	"...new system using DSE when pressure distribution and time dosing is utilized."	As compared to TSI systems, TSII systems provide for an additional log removal of fecal coliforms, significant nitrogen removal, and 33% additional organic load onto the infiltrative surface area. Not only is it not right to grant these technologies more lenient sizing, due to the nutrient and fecal reduction we should want to encourage their use. Time dosing provides an added layer of protection as well. In summary, we are granting a 25% increase in loading rate to TSII systems over TSI systems in exchange for 60% less nitrogen load, 33% less organic load, a 10 fold decrease in fecal coliform, and gaining time dosing of the drainfield. It's protective, and it's fair.
99	14-17	conditions...	strike them	see above.
112	Table XXXI	ALL systems (including those of Type III and under) should have at least a 5 year LHD inspection interval OR provide an inspection report from a qualified Certified Operator OR provide A point of Sale Inspection OR a pump out receipt from a licensed Septage Hauler	ALL systems (including those of Type III and under) should have at least a 5 year LHD inspection interval OR provide an inspection report from a qualified Certified Operator OR provide A point of Sale Inspection OR a pump out receipt from a licensed Septage Hauler	Are we a permanent part of the infrastructure or not? At this point in time, simply burying wastewater systems and forgetting about them is not sustainable for the long term. ALL systems should be looked at by the LHD at some time interval. Type I-III systems account for what 80-90% of the systems installed in the State? There is WAY too much risk out there to simply turn a blind eye.
114	Table XXXI	"VIa - Any system >3,000 GPD with mechanical ..."	"VIa - Any non fixed media system >3,000 GPD..."	See Va. This is a little confusing. So is VIa activated sludge systems and Va fixed film systems? Is the intent with Va to be packed bed filter systems? Fixed media and packed bed filter are no necessarily synonymous. Fixed media might be submerged for example.
115	6	"2006, the manufacturer of a proprietary advanced..."	"2006, the manufacturer, or its designated entity, of a proprietary advanced..."	Distributors, dealers, etc. may be separate businesses but designated by the manufacturer to do these requirements.
115	6	"2006, the manufacturer of a proprietary advanced..."	for discussion...	What about non-proprietary systems? Who is responsible? The State since it approved it without manufacturer support?
126	20	"State approved primary and secondary..."	arbitrary	What specifications does the State require for these devices.
129	27	"...malfunction or a high water condition..."	"...malfunction, to include a pressure loss on the air supply line, and a high water alarm..."	For almost all RWTS a loss in air flow will reduce treatment efficiency within minutes. The only significant measurable malfunction is a loss in air pressure. This can be caused by the blower going out, clogging of the air line, or breakage of the air line.
130	8,9	"...grab or composite sampled..."	"...grab or 24 hour composite sampled..."	Clarification required. Use something other than 24 hours if you like, but it needs to have a time associated or do it as flow proportional.
132	34	"...to a separate settling..."	"...to the septic tank, a separate settling tank....	Most systems don't have a separate settling tank. All systems have a septic tank. Returning flows here has been standard practice for over a decade.
133	9	"shall be 0.05 percent or less"	"shall be 5% or less"	We aren't asking for 99.995% precision in manufacturing a plastic part are we?
135	5	"measured at the lowest point on the supply manifold;"	"measured at the lowest point on the supply manifold and the highest point on the return"	You need to measure at both points in order to yield the highest and lowest pressures to determine if you are in the 15-60 psi range.
135	3-8	drip startup	add "D. Once the system is pressurized, flows dosing flows to each zone shall be recorded using the flow meter."	The whole #2 just reads a little funny. Pressures and flows should be recorded to all zones.
137	30-34	Non-proprietary PIA systems	Non-proprietary PIA systems	What about the manufacturer required reporting and operation and maintenance oversight for these systems? These requirements are being pushed on to industry. Who is responsible for these requirements in the case of non-proprietary PIA systems? The State?
142	1	"operation for six..."	"operation for eighteen..."	Six months is not NEARLY long enough to determine the effective operation of a system. In fact, nitrogenous bacteria sometimes take months to simply establish themselves. Even a septic tank is barely mature in 6 months.
147	Rule .1711	Provisional and Innovative Approval Renewals	No change	We fully support this rule. The Department has historically successfully protected the citizens of North Carolina with a strict initial review of new innovative technologies. Recent legal efforts have prematurely opened the doors to more technologies. While this can be seen as a positive for both industry and citizens alike, liberalization of the approval process can also jeopardize the citizens and our environment to shoddy manufacturers and snake oil salesman. Requiring a Renewal of the permit is a strong yet fairly inexpensive way to ensure new technologies are allowed in our State, while at the same time our environment stays clean and our property owners aren't cheated.
147	1	"all sites"	"all non HSW sites"	
101 AND 99	Line 25,26 on page 101 and 28,29 on page 99	"Design daily flow shall not..."	Strike it all	If a 3 BR property owner wants to build 2 more bedrooms onto his home, he should absolutely be allowed to install a treatment system in order to increase the LTAR and not have to expand his drainfield. The environment is protected. Organic mass load will be decreased by 95% or more with approved treatment systems. We should not be prohibiting this action by the owner, we should be applauding it.
131-134		arbitrary oversight of drip when compared to LPP	Both drip and LPP are designed to deliver a fairly equal flow rate to the infiltrative surface. Why on earth are there so many requirements being put on drip systems and not LPP systems?	Why not a flow meter on an LPP system? Why not telemetry on an LPP system?
68	33,34	Septic tank riser depths	Please bring risers to grade.	Enough is enough. Burying something that is going to need routine maitenance to conitnue to function is not proactive or sustainable.
67	13-36	Water fitness checks	Make it mandatory for all systems AFTER installation	We test everything else for functionality....why exactly are we not testing tanks for functiionality after we have buried them? We've done it for a decade or more with pre-treatment systems. It is not nearly as troublesome as everyone makes it out to be. Yet it is the single most important part of the system. We support water fitness testing for all tanks post installation.

Page #	*Line #'s*	*Current Language or Issue*
1	10,11	"...waters, or directly to groundwater."
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Please bring risers to grade.

Make it mandatory for all systems AFTER installation

Justification

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Are we a permanent part of the infrastructure or not? At this point in time, simply burying wastewater systems and forgetting about them is not sustainable for the long term. ALL systems should be looked at by the LHD at some time interval. Type I-III systems account for what 80-90% of the systems installed in the State? There is WAY too much risk out there to simply turn a blind eye.

See Va. This is a little confusing. So is VIa activated sludge systems and Va fixed film systems? Is the intent with Va to be packed bed filter systems? Fixed media and packed bed filter are no necessarily synonymous. Fixed media might be submerged for example.

Distributors, dealers, etc. may be separate businesses but designated by the manufacturer to do these requirements.

What about non-proprietary systems? Who is responsible? The State since it approved it without manufacturer support?

What specifications does the State require for these devices.

For almost all RWTS a loss in air flow will reduce treatment efficiency within minutes. The only significant measurable malfunction is a loss in air pressure. This can be caused by the blower going out, clogging of the air line, or breakage of the air line.

Clarification required. Use something other than 24 hours if you like, but it needs to have a time associated or do it as flow proportional.

Most systems don't have a separate settling tank. All systems have a septic tank.

Returning flows here has been standard practice for over a decade.

We aren't asking for 99.995% precision in manufacturing a plastic part are we?

You need to measure at both points in order to yield the highest and lowest pressures to determine if you are in the 15-60 psi range.

The whole #2 just reads a little funny. Pressures and flows should be recorded to all zones.

What about the manufacturer required reporting and operation and maintenance oversight for these systems? These requirements are being pushed on to industry. Who is responsible for these requirements in the case of non-proprietary PIA systems? The State?

Six months is not NEARLY long enough to determine the effective operation of a system. In fact, nitrogenous bacteria sometimes take months to simply establish themselves. Even a septic tank is barely mature in 6 months.

We fully support this rule. The Department has historically successfully protected the citizens of North Carolina with a strict initial review of new innovative technologies. Recent legal efforts have prematurely opened the doors to more technologies. While this can be seen as a positive for both industry and citizens alike, liberalization of the approval process can also jeopardize the citizens and our environment to shoddy manufacturers and snake oil salesman. Requiring a Renewal of the permit is a strong yet fairly inexpensive way to ensure new technologies are allowed in our State, while at the same time our environment stays clean and our property owners aren't cheated.

If a 3 BR property owner wants to build 2 more bedrooms onto his home, he should absolutely be allowed to install a treatment system in order to increase the LTAR and not have to expand his drainfield. The environment is protected. Organic mass load will be decreased by 95% or more with approved treatment systems. We should not be prohibiting this action by the owner, we should be applauding it.

Why not a flow meter on an LPP system? Why not telemetry on an LPP system? Enough is enough. Burying something that is going to need routine maitenance to conitnue to function is not proactive or sustainable.

We test everything else for functionality....why exactly are we not testing tanks for functiionality after we have buried them? We've done it for a decade or more with pre-treatment systems. It is not nearly as troublesome as everyone makes it out to be. Yet it is the single most important part of the system. We support water fitness testing for all tanks post installation.

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As compared to TSI systems, TSII systems provide for an additional log removal of fecal coliforms, significant nitrogen removal, and 33% additional organic load onto the infiltrative surface area. Not only is it not right to grant these technologies more lenient sizing, due to the nutrient and fecal reduction we should want to encourage their use. Time dosing provides an added layer of protection as well. In summary, we are granting a 25% increase in loading rate to TSII systems over TSI systems in exchange for 60% less nitrogen load, 33% less organic load, a 10 fold decrease in fecal coliform, and gaining time dosing of the drainfield. It's protective, and it's fair.

see above.

Are we a permanent part of the infrastructure or not? At this point in time, simply burying wastewater systems and forgetting about them is not sustainable for the long term. ALL systems should be looked at by the LHD at some time interval. Type I-III systems account for what 80-90% of the systems installed in the State? There is WAY too much risk out there to simply turn a blind eye.

See Va. This is a little confusing. So is VIa activated sludge systems and Va fixed film systems? Is the intent with Va to be packed bed filter systems? Fixed media and packed bed filter are no necessarily synonymous. Fixed media might be submerged for example.

Distributors, dealers, etc. may be separate businesses but designated by the manufacturer to do these requirements.

What about non-proprietary systems? Who is responsible? The State since it approved it without manufacturer support?

What specifications does the State require for these devices.

For almost all RWTS a loss in air flow will reduce treatment efficiency within minutes. The only significant measurable malfunction is a loss in air pressure. This can be caused by the blower going out, clogging of the air line, or breakage of the air line.

Clarification required. Use something other than 24 hours if you like, but it needs to have a time associated or do it as flow proportional.

Most systems don't have a separate settling tank. All systems have a septic tank.

Returning flows here has been standard practice for over a decade.

We aren't asking for 99.995% precision in manufacturing a plastic part are we?

You need to measure at both points in order to yield the highest and lowest pressures to determine if you are in the 15-60 psi range.

The whole #2 just reads a little funny. Pressures and flows should be recorded to all zones.

What about the manufacturer required reporting and operation and maintenance oversight for these systems? These requirements are being pushed on to industry. Who is responsible for these requirements in the case of non-proprietary PIA systems? The State?

Six months is not NEARLY long enough to determine the effective operation of a system. In fact, nitrogenous bacteria sometimes take months to simply establish themselves. Even a septic tank is barely mature in 6 months.

We fully support this rule. The Department has historically successfully protected the citizens of North Carolina with a strict initial review of new innovative technologies. Recent legal efforts have prematurely opened the doors to more technologies. While this can be seen as a positive for both industry and citizens alike, liberalization of the approval process can also jeopardize the citizens and our environment to shoddy manufacturers and snake oil salesman. Requiring a Renewal of the permit is a strong yet fairly inexpensive way to ensure new technologies are allowed in our State, while at the same time our environment stays clean and our property owners aren't cheated.

If a 3 BR property owner wants to build 2 more bedrooms onto his home, he should absolutely be allowed to install a treatment system in order to increase the LTAR and not have to expand his drainfield. The environment is protected. Organic mass load will be decreased by 95% or more with approved treatment systems. We should not be prohibiting this action by the owner, we should be applauding it.

Why not a flow meter on an LPP system? Why not telemetry on an LPP system?

T&J Panel, Inc. - Comments on proposed 18E rules:

- **Rule:** .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems

Comment: .0901(c)(4) "The total trench length required for products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval." This comment is not necessary under the section of "General Design and Installation Criteria for Subsurface Dispersal Systems." Mentioning "PIA" products solely in the category of "General Design & Installations Criteria", puts products, not specifically mentioned, at a disadvantage when it comes to educating the industry professionals. Modifications to Conventional Septic Systems (as LDP and PPBPS are referred to in the .1900 rules), cannot be omitted from this section, if you are going to include Approved/Innovative products in this section.

Add: If it is necessary for this comment to remain, add line (5) to say "*The total trench length required for trench products approved under Section .0905 and .0904 shall be determined in accordance with rule .0905(c) and rule .0904(c).*" The better option would be *to strike the sentence in .0901(c)(4)*; as to not provide an unfair market advantage to products from the .1700 Section.

- **Rule:** .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems

Comment: .0901(d) states that "Wastewater system installation shall be in accordance with the following criteria:" followed by .0901(d)(12) which states "*trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval.*" Mentioning "PIA" products solely in the category of "General Design & Installations Criteria", puts products not specifically mentioned at a disadvantage when it comes to educating the industry professionals. Modifications to Conventional Septic Systems (as LDP and PPBPS are referred to in the .1900 rules), cannot be omitted from this section, if you are going to include Approved/Innovative products in this section.

Add: If it is necessary for this comment to remain, add line (13) to say "*Trench products approved under Section .0905 shall be installed in accordance with .0905(d).* Add line (14) to say "*Trench products approved under Section .0904 shall be installed in accordance with .0904(e).*" The better option would be *to strike the sentence in .0901(d)*; as to not provide an unfair market advantage to products from the .1700 Section.

- **Rule:** .0902 – Conventional Wastewater Systems

Comment: .0902(b) "Sites classified as suitable to soil depth may utilize shallow placement of dispersal system." Permeable, Porous Block Panel Systems have always been used hand in hand with conventional gravel systems. If you have the space and soil to install a conventional gravel system, you can also adequately install a PPBPS. It is important to remember that PPBPS are considered a "Modification to Conventional Septic Systems," and are able to be used in any way that a conventional septic system can be used.

Add: Add line "(e)" in section .0905, stating "*Sites classified suitable as to soil depth may utilize shallow placement of dispersal system*."

T&J Panel, Inc. - Comments on proposed 18E rules:

- **Rule:** .0903-Bed Systems, .0906-Sand Lined Trench Systems, .0907-Low Pressure Pipe Systems, .0909-Fill Systems

Comment: PPBPS's have been used in conjunction with these subsections for many years, and with much success. PPBPS should be addressed in each of these subsections. It is important to remember that PPBPS are considered a "Modification to Conventional Septic Systems," and are able to be used in any way that a conventional septic system can be used.

Add: Add line in each section (perhaps beneath the line: "*trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval")*, stating "*trench products approved under Section .0905 of this section shall be installed in accordance with manufacturer's specifications*."

- **Rule:** .0902 – Conventional Wastewater Systems

Comment: .0902(f)(7) "*the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter."* There is some confusion around which products are allowed additional reductions in dispersal field area, when installed as dual alternating dispersal fields. The maximum reduction is stated here to be "25 percent", however some 25% reduction products have been given a 35% and 35% reduction when being installed as dual alternating dispersal fields. It would be beneficial to see a consistent formula that results in a fair reduction, equivalent to the reduction already achieved by a system when installed singularly, with a traditional repair area.

Add: Change .0902(f)(7) "*the maximum reduction in dispersal field area is 25 percent for conventional gravel systems, the maximum reduction in dispersal field area is 35 percent for Chamber and Pipe systems, and the maximum reduction in dispersal field area is 60 percent for Panel Block Systems.*

- **Rule:** .0907 – Low Pressure Pipe Systems

Comment: .0907(e)(16) "*trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval."* Again, specifically mentioning the PIA products as a viable LPP solution, while negligently omitting Panel Block Systems, is improper. PPBPS have been used in conjunction with LPP technology since its inception.

Add: .0907(e)(17) "*trench products approved under section .0905 shall be installed in accordance with manufacturer's specifications."*

- **Rule:** ALL

Comment: There are a lot of references in the Subsurface Dispersal System Subchapter to products approved under Section .1700. It is important to remember that "Modifications to Conventional Systems" (Large Diameter Pipe and Permeable, Porous Block Panel Systems), were not required to go through a "PIA" process, but are still viable, and in most cases, better dispersal system solutions. The language used throughout the .0900 Subchapter is very subjective towards products from the .1700 Section, and omits the applicability of LDP and PPBPS in every section outside of .0904 and .0905.

15 NCAC 18E .0105 Definitions
8. “Bedroom” put the NC Building Code wording here. There is no need to make folks look this up. I suggest this not apply to vacational rentals
26. full Kitchen needs to be rewritten to make clear what “equiptment” means such as 3 compartment sink, dishwasher, commercial refrigerator, stove etc.
71. “Sequencial distribution” (explain proximal end(suggest) means the distribution method in which effluent is loaded into one trench and fills it to a predermined level before passing through a device (drop box) to the succeeding trench at a lower elevation.
73. “Serial distribution” (substitute some other wording for single uninterrupted flow path)(suggest) means the distribution method in which effluent is loaded into one trench and fills it to a predermined level before passing through an approved pipe to the succeeding trench at a lower elevation.
90. “Unstable slopes” use definition from geologic survey

15A NCAC 18E DESIGN DAILY FLOW
(a) I suggest adding wording that makes it clear this does not apply to vacation rentals. I think this was covered in an earlier version of this rule. Please review this.
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.0508 AVAILABLE SPACE
(c) state when the dispersal field shall be staked Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on contour when the authorized agent has concerns that the initial and repair dispersal field systems can not be installed in the area delineated.

15A NCAC 18E .0510 SPECIAL SITE EVALUATION
(A) (3) (E) Special site evaluation not need for lateral flow and the installation of interceptor drains
(5)(D) Not needed

15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS
TABLE IX
Building foundation with artifical drainage use current rule 25 feet upslope, 15 feet sideslope and 5 feet downslope
(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source. Does this mean tanks can be located closer and if so how close?

15A NCAC 18E .0703 PIPE MATERIALS
(b) This rule should be struck. There are better, easier and cheaaper alternatives.

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS
(e) (1) Trenches shall be a minimum of 12 inches wide and a maximum of 18 inches wide. On sites with a lot of roots the fabric will be torn during installation, the outside diameter of 10 inch LDP is 12 inches.

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS
(d) (4) same rule as 15A NCAC 18E .0510 SPECIAL SITE EVALUATION
((5)(D) Not needed

15A NCAC 18E .0910 ARTIFICAL DRAINAGE SYSTEMS
This rule needs to specify more clearly what is covered. I think the intention is for it to apply to groundwater lowering but it is not clear. Interceptor drains do not need all of this. I suggest adding the requirements for interceptor drains to (d).

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(d) (6) inlet and outlet openings shall have cast or manufactured penetration points. Please review this as it applies to rule .1404. I might be wrong, but I don't think cast in place openings meet the proposed requirements

(d) (16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds. change to tank lids shall be locked, secured, or weigh between 40 and 80 pounds, and riser covers shall be locked, secured, or weigh between 40 and 80 pounds