TITLE 15A - DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

CHAPTER 18 - ENVIRONMENTAL HEALTH

SUBCHAPTER 18A - SANITATION

SECTION .1900 - SEWAGE TREATMENT AND DISPOSAL SYSTEMS

Rules .1901 - .1968 of Title 15A Subchapter 18A of the North Carolina Administrative Code (T15A.18A .1901 - .1968); has been transferred and recodified from Rules .1901 - .1968 of Title 10 Subchapter 10A of the North Carolina Administrative Code (T10.10A .1901 - .1968), effective April 4, 1990.

History Note: *Authority G.S. 130-160; 166.23 through 166.28;*
Eff. July 1, 1977;
Readopted Eff. December 5, 1977;
Amended Eff. July 1, 1982; March 31, 1981; June 30, 1980;
Repealed Eff. July 1, 1982.

15A NCAC 18A .1934 SCOPE

The rules contained in this Section shall govern the treatment and disposal of domestic type sewage from septic tank systems, privies, incinerating toilets, mechanical toilets, composting toilets, recycling toilets, or other such systems serving single or

multiple-family residences, places of business, or places of public assembly, the effluent from which is designed not to discharge to the land surface or surface waters.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. December 1, 1990.

15A NCAC 18A .1935 DEFINITIONS

The following definitions shall apply throughout this Section:

(1) "Alluvial Soils" means stratified soils without distinct horizons, deposited by flood waters.

(2) "Alternative System" means any approved ground absorption sewage treatment and disposal system other than an approved privy or an approved septic tank system.

(3) "Approved" means that which has been considered acceptable to the State or local health department.

(4) "Approved Privy" means a fly-tight structure consisting of a pit, floor slab, and seat riser constructed in accordance with Rule .1959 of this Section.

(5) "Approved Public or Community Sewage System" means a single system of sewage collection, treatment, and disposal owned and operated by a sanitary district, a metropolitan sewage district, a water and sewer authority, a county or municipality, or a public utility, constructed and operated in compliance with applicable requirements of the Division of Environmental Management.

(6) "Areas subject to frequent flooding" means those areas inundated at a 10-year or less frequency and includes alluvial soils and areas subject to tidal or storm overwash.

(7) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, and appliances appurtenant thereto, used for conducting wastes from building drains to a treatment system or to a ground absorption sewage treatment and disposal system.

(8) "Designated wetland" means an area on the land surface established under the provisions of the Coastal Area Management Act or the Federal Clean Water Act.

(9) "Design unit" means one or more dwelling units, places of business, or places of public assembly on:
   (a) a single lot or tract of land;
   (b) multiple lots or tracts of land served by a common ground absorption sewage treatment and disposal system; or
   (c) a single lot or tract of land or multiple lots or tracts of land where the dwelling units, places of business or places of public assembly are under multiple ownership (e.g. condominiums) and are served by a ground absorption system or multiple ground absorption systems which are under common or joint ownership or control.

(10) "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.

(11) "Effluent" means the liquid discharge of a septic tank or other sewage treatment device.

(12) "Estimated saturated hydraulic conductivity" - means a saturated hydraulic conductivity value based upon the soil profile evaluation and description of the soil texture, soil structure, soil consistency, soil pores, and roots following the procedures in Field Book for Describing and Sampling of Soils, NRCS, USDA and comparison to soil profile saturated hydraulic conductivity data for soil input files for similar soils. The Field Book is hereby incorporated by reference, including any subsequent amendments and editions, in accordance with G.S. 150B-21.6. Copies of the Field Book may be inspected at the Division of Environmental Health Raleigh Office, 2728 Capital Boulevard, Raleigh, 27604, and copies may be downloaded at no cost from the internet at http://soils.usda.gov/procedures/field_bk/main.htm#intro, or obtained from the National Soil Survey Center, MS 34, Room 152,100 Centennial Mall North, Lincoln, NE 68508-3866.

(13) "Ground absorption sewage treatment and disposal system" means a system that utilizes the soil for the subsurface disposal of partially treated or treated sewage effluent.

(14) "Horizon" means a layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil forming processes.

(15) "Horizon subdivision" - means a portion of a horizon, approximately parallel to the surface that has distinct characteristics produced by soil forming processes.

(16) "Lateral water movement" - means the movement of water down slope on sites of at least a four percent slope and above a less permeable horizon, and as observed periodically in bore holes, excavations, or monitoring wells.

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

(18) "Matrix" - means a volume equivalent to 50 percent or greater of the total volume of a horizon or horizon subdivision.

(19) "Mean high water mark" means, for coastal waters having six inches or more lunar tidal influence, the average height of the high water over a 19 year period as may be ascertained from National Ocean Survey or U.S. Army Corps of Engineers tide stations data or as otherwise determined under the provisions of the Coastal Area Management Act.

(20) "Mottle" - means a feature(s) which occupies less than 50 percent of the total volume of a horizon or horizon subdivision.

(21) "Naturally occurring soil" means soil formed in place due to natural weathering processes and being unaltered by filling, removal, or other man-induced changes other than tillage.

(22) "Nitrification field" means the area in which the nitrification lines are located.

(23) "Nitrification lines" means approved pipe, specially designed porous blocks, or other approved materials which receive partially treated sewage effluent for distribution and absorption into the soil beneath the ground surface.

(24) "Nitrification trench", also referred to as a sewage absorption trench, means a ditch into which a single nitrification line is laid and covered by soil.

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

(26) "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.

(27) "Parent material" means the mineral matter that is in its present position through deposition by water, wind, gravity or by decomposition of rock and exposed at the land surface or overlain by soil or saprolite.

(28) "Ped" means a unit of soil structure, such as an aggregate, crumb, prism, block, or granule formed by natural processes.

(29) "Perched water table" means a saturated soil horizon or horizon subdivision, with a free water surface periodically observed in a bore hole or shallow monitoring well, but generally above the normal water table, or may be as identified by drainage mottles or redoximorphic features, and caused by a less permeable lower horizon.

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

(31) "Place of business" means any store, warehouse, manufacturing establishment, place of amusement or recreation, service station, foodhandling establishment, or any other place where people work or are served.

(32) "Place of public assembly" means any fairground, auditorium, stadium, church, campground, theater, school, or any other place where people gather or congregate.

(33) "Privy building" means and includes any and all buildings which are used for privacy in the acts of urination and defecation which are constructed over pit privies and are not connected to a ground absorption sewage treatment and disposal system or a public or community sewage system.

(34) "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-461 -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 on-site sewage systems.

(35) "Redoximorphic features" - means a color pattern of a horizon or horizon subdivision due to a loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation/reduction of Fe and/or Mn coupled with their removal, translocation, or accrual; or a soil matrix color controlled by the presence of Fe+2 (see Field Book for Describing and Sampling of Soils, NRCS, USDA which is hereby incorporated by reference, including any subsequent amendments and editions, in accordance with G.S. 150B-21.6.

(36) "Relocation" means the displacement of a residence, place of business, or place of public assembly from one location to another.

(37) "Repair area" means an area, either in its natural state or which is capable of being modified, consistent with these Rules, which is reserved for the installation of additional nitrification fields and is not covered with structures or impervious materials.

(38) "Residence" means any home, hotel, motel, summer camp, labor work camp, mobile home, dwelling unit in a multiple-family structure, or any other place where people reside.

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

(40) "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 relatively hard and cannot be dug with hand tools. The upper boundary of rock is "saprolite", "soil", or the land surface.

(41) "Sanitary system of sewage treatment and disposal" means a complete system of sewage collection, treatment and disposal, including approved privies, septic tank systems, connection to public or community sewage systems, incinerators, mechanical toilets, composting toilets, recycling toilets, mechanical aeration systems, or other such systems.

(42) "Saprolite" means the body of porous material formed in place by weathering of igneous or metamorphic rocks. Saprolite has a massive, rock-controlled structure, and retains the fabric (arrangement of minerals) of its parent rock in at least 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. The term "saprolite" does not include sedimentary parent materials.

(43) "Saturated soils" - means a horizon or horizon subdivision with a free water surface at the corresponding depth and observed in a bore hole or monitoring well.

(44) "Septic tank" means a water-tight, covered receptacle designed for primary treatment of sewage and constructed to:

(a) receive the discharge of sewage 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 clarified liquids to discharge for additional treatment and final disposal.

(45) "Septic tank system" means a subsurface sanitary sewage system consisting of a septic tank and a subsurface disposal field.

(46) "Sewage" means the liquid and solid human waste and liquid waste generated by water-using fixtures and appliances, including those associated with food handling. The term does not include industrial process wastewater or sewage that is combined with industrial process wastewater.

(47) "Site" means the area in which the sewage treatment and disposal system is to be located and the area required to accommodate repairs and replacement of nitrification field and permit proper functioning of the system.

(48) "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.

(49) "Soil series" - means an official series name established by NRCS, USDA and confirmed to be present on the site by detailed on-site soil profile descriptions and taxonomic classification, and not necessarily the soil series mapped on the county soil survey.

(50) "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.

(51) "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 - 0.002 mm or greater in size), and clay (less than 0.002 mm in size) particles. The specific textural classes are defined as follows and as shown in Soil Taxonomy, Appendix I, which is hereby adopted by reference in accordance with G.S. 150B-14(c):

(a) "Sand" means soil material that contains 85 percent or more of sand; the percentage of silt plus 1.5 times the percentage of clay shall not exceed 15.

(b) "Loamy sand" means soil material that contains at the upper limit 85 to 90 percent sand, and the percentage silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit it contains not less than 70 to 85 percent sand, and the percentage of silt plus twice the percentage of clay does not exceed 30.

(c) "Sandy loam" means soil material that contains either 20 percent clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30, and contains 52 percent or more sand; or less than seven percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

(d) "Loam" means soil material that contains seven to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

(e) "Silt loam" means soil material that contains 50 percent or more silt and 12 to 27 percent clay; or contains 50 to 80 percent silt and less than 12 percent clay.

(f) "Silt" means soil material that contains 80 percent or more silt and less than 12 percent clay.

(g) "Sandy clay loam" means soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more sand.

(h) "Clay loam" means soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.

(i) "Silty clay loam" means soil material that contains 27 to 40 percent clay and less than 20 percent sand.

(j) "Sandy clay" means soil material that contains 35 percent or more clay and 45 percent or more sand.

(k) "Silty clay" means soil material that contains 40 percent or more clay and 40 percent or more silt.

(l) "Clay" means soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

(52) "State" means the Department of Environment and Natural Resources, Division of Environmental Health.

(53) "Stream" means a natural or manmade channel, including groundwater lowering ditches and devices, in which water flows or stands most of the year.

(54) "Subsurface disposal" means the application of sewage effluent beneath the surface of the ground by distribution through approved nitrification lines.

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. July 1, 1995; January 1, 1990; August 1, 1988; April 1, 1985;
Temporary Amendment Eff. June 24, 2003;
Amended Eff. May 1, 2004.

15A NCAC 18A .1936 REQUIREMENTS FOR SEWAGE TREATMENT AND DISPOSAL

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Repealed Eff. January 1, 1990.

15A NCAC 18A .1937 PERMITS

(a) Any person owning or controlling a residence, place of business, or place of public assembly 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 Improvement Permit, Authorization for Wastewater System Construction (Construction Authorization) and Operation Permit, shall be required in accordance with G.S. 130A-336, G.S. 130A-337 and G.S. 130A-338. Rule .1949 of this Section shall be used to determine whether subsequent additions, modifications, or change in the type of facility increase wastewater flow or alter wastewater characteristics.

(c) An application for an Improvement Permit or Construction Authorization, as applicable, shall be submitted to the local health department for each site prior to the construction, location, or relocation of a residence, place of business, or place of public assembly. Applications for systems required to be designed by a professional engineer and applications for industrial process wastewater systems shall meet the provisions of Rule .1938 of this Section.

(d) The application for an Improvement Permit shall contain at least the following information: owner's name, mailing address, and phone number, location of property, plat of property or site plan, description of existing and proposed facilities or structures, number of bedrooms, or number of persons served, or other factors required to determine wastewater system design flow or wastewater characteristics, type of water supply including the location of proposed or existing well(s), and signature of owner or owner's legal representative. The applicant shall identify property lines and fixed reference points in the field. The applicant shall make the site accessible for an evaluation as required in Rule .1939 of this Section. The applicant shall notify the local health department on the application of the following:

(1) the property contains previously identified jurisdictional wetlands:

(2) wastewater other than sewage will be generated; or

(3) the site is subject to approval by other public agencies.

(e) The application for a Construction Authorization shall contain:

(1) the information required in Paragraph (d) of this Rule; however, a plat or site plan shall not be required with the application for a Construction Authorization to repair a previously permitted system when the repairs will be accomplished on property owned and controlled by the applicant and for which the property lines are readily identifiable in the field;

(2) the locations of the proposed facility, appurtenances, and the site for the system showing setbacks to property line(s) or other fixed reference point(s); and

(3) the proposed system type as specified by the owner or owner's legal representative and that meets the conditions of the Improvement Permit, the provisions of these Rules, and G.S. 130A, Article 11.

(f) An authorized agent of DENR shall issue an Improvement Permit after determining that the site is suitable or provisionally suitable and that a system can be installed so as to meet the provisions of these Rules. The Improvement Permit shall include those items required in G.S. 130A-336(a). An Improvement Permit for which a plat is provided shall be valid without expiration and an Improvement Permit for which a site plan is provided shall be valid for 60 months from the date of issue as provided in G.S. 130A-335(f) and G.S. 130A-336(a). The Improvement Permit is transferable to subsequent owners except as provided in G.S. 130A-335(f) and G.S. 130A-336(a).

(g) The Construction Authorization as provided in G.S. 130A-335(f) and G.S. 130A-336(b) shall be valid for a period equal to the period of validity of the Improvement Permit, not to exceed 60 months. Site modifications required as conditions of an Improvement Permit shall be completed prior to the issuance of a Construction Authorization. The Construction Authorization shall be issued by an authorized agent for the installation of a wastewater system when it is found that the Improvement Permit conditions and rules of this Section are met. The Construction Authorization shall contain conditions regarding system type, system layout, location, and installation requirements. The property owner shall ensure that a Construction Authorization is obtained and is valid prior to the construction or repair of a system. The property owner shall obtain a Construction Authorization prior to the construction, location, or relocation of a residence, place of business, or place of public assembly. If the installation has not been completed during the period of validity of the Construction Authorization, the information submitted in the application for a Permit or Construction Authorization is found to have been incorrect, falsified or changed, or the site is altered, the Permit or Construction Authorization shall become invalid, and may be suspended or revoked. When a Permit or Construction Authorization has become invalid, expired, suspended, or revoked, the installation shall not be commenced or completed until a new Permit or Construction Authorization has been obtained. Revised Construction Authorizations shall be issued for sites where Improvement Permits are valid without expiration in compliance with G.S. 130A-335(f1).

(h) Prior to the issuance of a Construction Authorization for a wastewater system to serve a condominium or other multiple-ownership development where the system will be under common or joint control, a draft agreement (tri-party) among the local health department, developer, and a proposed non-profit, incorporated owners association shall be submitted to the local health department for approval. Prior to the issuance of an Operation Permit for a system requiring a tri-party agreement, the agreement shall be executed among the local health department, developer, and a non-profit, incorporated owners association and filed with the local register of deeds. The tri-party agreement shall address ownership transfer of ownership, maintenance, repairs, operation, and the necessary funds for the continued satisfactory performance of the wastewater system, including collection, treatment, disposal, and other appurtenances.

(i) No residence, place of business, or place of public assembly shall be occupied nor shall any wastewater system be covered or placed into use until an authorized agent issues an Operation Permit. The Operation Permit shall not be issued or reissued until the authorized agent finds that the system is in compliance with Article 11 of G.S. Chapter 130A, these Rules, and all conditions prescribed by the Improvement Permit, and Construction Authorization. The Operation Permit shall specify the system type in

accordance with Table V(a) of Rule .1961 of this Section, and shall include conditions for system performance, operation, maintenance, monitoring and reporting. At the review frequency specified in Rule .1961, Table V(a) of this Section, an authorized agent shall determine whether a system in compliance with the conditions of the Operation Permit, these Rules, and Article 11 of G.S. Chapter 130A. An authorized agent may modify, suspend or revoke the Operation Permit or seek other remedies under Article 2, Chapter 130A, if the system is not in compliance with Article 11 of G.S. Chapter 130A, these Rules, and all conditions imposed by the Operation Permit.

(j) For a Type V or VI system as specified in Rule .1961, Table V(a) of Paragraph (b)(9) of this Section, the Operation Permit shall expire either;

(1) 60 months after the Operation Permit is issued for any system installed on or after the effective date of these Rules, or

(2) 60 months after the effective date of these Rules for any system with a valid Operation Permit issued prior to the effective date of these Rules.

(k) Upon determining that an existing wastewater system including all subsystems and system components in a manufactured home park has a valid Operation Permit and is in compliance with Article 11 of G.S. Chapter 130A, these Rules, and permit conditions, an authorized agent shall issue a written authorization for a manufactured home to be connected to the existing system.

(l) Any person other than the owner or controller of a residence, place of business, or place of public assembly, who engages in the business of constructing, installing, or repairing wastewater systems shall register with the local health department in each county where he operates before constructing, installing, or repairing wastewater systems.

(m) An authorized agent shall prepare a written report with reference to the site and soil conditions required to be evaluated pursuant to this Section. When a permit is denied, the report shall be provided to the applicant. If modifications or alternatives are available, information shall be provided to the applicant. The report shall be signed and dated by an authorized agent of the State.

History Note: *Authority G.S. 130A-335(e),(f);*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990; January 1, 1984;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. August 1, 1998.

15A NCAC 18A .1938 RESPONSIBILITIES

(a) The permitting of a wastewater system shall be the responsibility of agents authorized by the State in accordance with G.S. 130A-40, 130A-50, and registered with the State of North Carolina Board of Sanitarian Examiners if required in G.S. 90A Article 4.

(b) The person owning or controlling the system shall be responsible for assuring compliance with the laws, rules, and permit conditions regarding system location, installation, operation, maintenance, monitoring, reporting, and repair.

(c) Prior to the issuance of an Improvement Permit or Construction Authorization, plans and specifications may be required by the local health department where there is an unsuitable soil or unsuitable characteristic and shall be required for drainage systems serving two or more lots. These plans and specifications shall be required to 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, ground water hydrology, or drainage systems if required in G.S. 89C, 89E, 89F, and 90A Article 4.

(d) Any wastewater system which meets one or more of the following conditions shall be designed by a registered professional engineer if required by G.S. 89C:

(1) The system is designed to handle over 3,000 gallons per day, as determined in Rule .1949(a) or (b) of this Section, except where the system is limited to an individual septic tank system serving an individual dwelling unit or several individual septic tank systems, each serving an individual dwelling unit.

(2) The system requires pretreatment before disposal, other than by a conventional septic or other system approved under Rule .1957 or .1969 of this Section.

(3) The system requires use of sewage pumps prior to the septic tank or other pretreatment 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 the National Sanitation Foundation.

(4) The individual system is required by Rule .1952 of this Section to use more than one pump or siphon in a single pump tank.

(5) The system includes a collection sewer, prior to the septic tank or other pretreatment system, which serves two or more buildings, except for systems subject to the North Carolina Plumbing Code.

(6) The system includes structures which have not been pre-engineered.

(7) The system is designed for the collection, treatment and disposal of industrial process wastewater, 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 sewage, and does not require specialized pretreatment or management, or

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

(8) Any other system serving a business or multi-family dwelling so specified by the local health department.

(e) The State shall review and approve the system layout on a site plan or plat, plans and specifications for all systems serving a design unit with a design flow greater than 3,000 gallons per day, as determined in Rule .1949(a) or (b) of this Section, except:

(1) where the system is limited to an individual septic tank system serving an individual dwelling unit or several individual septic tank systems, each serving an individual dwelling unit, or

(2) where the system consists of individual septic tank systems, each serving an individual facility, and which meets all of the following criteria;

(A) each individual system's design flow does not exceed 1500 gallons per day, as determined in Rule .1949(a) or (b) of this Section,

(B) the site for the nitrification field and repair area for each individual system is at least 20 feet from any other individual system site, and

(C) the design wastewater loading on the lot or tract of land containing the design unit is less than 1,500 gallons per day per acre for new or expanded systems and 3,000 gallons per day/acre for malfunctioning systems.

(f) The state shall also review and approve plans and specifications for any industrial process wastewater system required by this Section to be designed by a registered professional engineer and any other system so specified by the local health department.

(g) For systems that require State review and approval, an improvement permit shall not be issued unless the site plan or plat and system layout, including details for any proposed site modifications, are approved. A Construction Authorization shall not be issued unless plans and specifications, including methods of operation and maintenance, are approved.

(h) Prior to issuance of the operation permit for a system required to be designed by a registered professional engineer, the owner shall submit to the local health department a statement signed by a registered professional engineer stating that construction is complete and in accordance with approved plans and specifications and approved modifications. Periodic observations of construction and a final inspection for design compliance by the certifying registered professional engineer or his representative shall be required for this statement. The statement shall be affixed with the registered professional engineer's seal.

(i) Plans and specifications required to be prepared by a registered professional engineer shall contain the information necessary for construction of the system in accordance with applicable rules and laws and shall include any of the following, determined to be applicable by the local health department or the State:

(1) the seal, signature, and the date on all plans and the first sheet of specifications; specifications and reports prepared by the design engineer and licensed or registered professionals who contributed to the plans, specifications, or reports;

(2) a description of the facilities served and the calculations and basis for the design flow proposed;

(3) a site plan based on a surveyed plat showing all system components, public water supply sources within 500 feet, private water supplies and surface water supplies within 200 feet, water lines serving the project and within 10 feet of all components, building foundations, basements, property lines, embankments or cuts of two feet or more in vertical height, swimming pools, storm sewers, interceptor drains, surface drainage ditches, and adjacent nitrification fields;

(4) specifications describing all materials to be used, methods of construction, means for assuring the quality and integrity of the finished product, and operation and maintenance procedures addressing requirements for the system operator, inspection schedules, residuals management provisions, process and performance monitoring schedules, and provisions for maintaining mechanical components and nitrification field vegetative cover;

(5) plan and profile drawings for collection sewers, force mains and supply lines, showing pipe diameter, depth of cover, cleanout and manhole locations, invert and ground surface elevations, valves and other appurtenances, lateral connections, proximity to utilities and pertinent features such as wells, water lines, storm drains, surface waters, structures, roads, and other trafficked areas;

(6) plans for all tanks, showing capacity, invert and ground elevations, access manholes, inlet and outlet details, and plans for built-in-place or nonstate-approved, precast tanks, also showing dimensions, reinforcement details, liquid depth, and other pertinent construction features;

(7) calculations for pump or siphon sizing, pump curves, and plan and profile drawings for lift stations and effluent dosing tanks, showing anti-buoyancy provisions, pump or siphon locations, discharge piping, valves, vents, pump controls, pump removal system, electrical connection details, and activation levels for pumps or siphons and high-water alarms;

(8) plan and profile drawings for wastewater treatment plants and other pretreatment systems, including cross-section views of all relevant system components, and data and contact lists from comparable facilities for any non-standard systems;

(9) plans for nitrification field and repair area, based on an evaluation and report prepared by a person licensed or registered to practice soil science, if required in G.S. 89F showing the following:

(A) field locations with existing and final relative contour lines based on field measurements at intervals not exceeding two feet or spot elevations if field areas are essentially flat or of uniform grade;

(B) field layout, pipe sizes, length, spacing, connection and clean out details, invert elevations of flow distribution devices and laterals, valves, and appurtenances;

(C) trench plan and profile drawings and flow distribution device details; and

(D) location and design of associated surface and groundwater drainage systems; and

(10) any other information required by the local health department or the State.

(j) The entire wastewater sewage system shall be on property owned or controlled by the person owning or controlling the system. Necessary easements, right of ways, or encroachment agreements, as applicable, shall be obtained prior to the issuance of a Construction Authorization for the system installation or repair. Terms of the easement, right-of-way or encroachment agreement shall provide that the easement, right-of-way, or encroachment agreement:

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

(2) is 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 and egress, system installation, operation, maintenance, monitoring, and repairs:

(4) specifies by metes and bounds description or attached plat, the area or site required for the wastewater system and appurtenances including a site for any required system replacement; and

(5) shall be recorded with the register of deeds in the county where the system and facility is located.

History Note: *Authority G.S. 89C; 89E; 89F; 90A; 130A-335(e),(f);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; April 1, 1985;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. November 1, 1999; August 1, 1998.

15A NCAC 18A .1939 SITE EVALUATION

(a) The local health department shall investigate each proposed site. The investigation shall include the evaluation of the following factors:

(1) topography and landscape position;

(2) soil characteristics (morphology);

(3) soil wetness;

(4) soil depth;

(5) restrictive horizons; and

(6) available space.

(b) Soil profiles shall be evaluated at the site by borings or other means of excavation to at least 48 inches or to an UNSUITABLE characteristic and a determination shall be made as to the suitability of the soil to treat and absorb septic tank effluent. Applicants may be required to dig pits when necessary for proper evaluation of the soil at the site.

(c) Site evaluations shall be made in accordance with Rules .1940 through .1948 of this Section. Based on this evaluation, each of the factors listed in Paragraph (a) of this Rule shall be classified as SUITABLE (S), PROVISIONALLY SUITABLE (PS), or UNSUITABLE (U).

(d) The local health department shall determine the long-term acceptance rate to be used for sites classified SUITABLE OR PROVISIONALLY SUITABLE in accordance with these rules.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1940 TOPOGRAPHY AND LANDSCAPE POSITION

(a) Uniform slopes under 15 percent shall be considered SUITABLE with respect to topography.

(b) Uniform slopes between 15 percent and 30 percent shall be considered PROVISIONALLY SUITABLE with respect to topography.

(c) Slopes greater than 30 percent shall be considered UNSUITABLE as to topography. Slopes greater than 30 percent may be reclassified as PROVISIONALLY SUITABLE after an investigation indicates that a modified system may be installed in accordance with Rule .1956 of this Section; however, slopes greater than 65 percent shall not be reclassified as PROVISIONALLY SUITABLE.

(d) Complex slope patterns and slopes dissected by gullies and ravines shall be considered UNSUITABLE with respect to topography.

(e) Depressions shall be considered UNSUITABLE with respect to landscape position except when the site complies essentially with the requirements of this Section and is specifically approved by the local health department.

(f) The surface area on or around a ground absorption sewage treatment and disposal system shall be landscaped to provide adequate drainage if directed by the local health department. The interception of perched or lateral ground-water movement shall be provided where necessary to prevent soil saturation on or around the ground absorption sewage treatment and disposal system.

(g) A designated wetland shall be considered UNSUITABLE with respect to landscape position, unless the proposed use is specifically approved in writing by the U.S. Army Corps of Engineers or the North Carolina Division of Coastal Management.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1941 SOIL CHARACTERISTICS (MORPHOLOGY)

(a) The soil characteristics which shall be evaluated by the local health department are as follows:

(1) Texture - The relative proportions of sand, silt, and clay sized mineral particles in the fine-earth fraction of the soil are referred to as soil texture. The texture of the different horizons of soils 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.

(A) SOIL GROUP I - SANDY TEXTURE SOILS. The sandy group includes the sand and loamy sand soil textural classes and shall be considered SUITABLE with respect to texture.

(B) SOIL GROUP II - COARSE LOAMY TEXTURE SOILS. The coarse loamy group includes sandy loam and loam soil textural classes and shall be considered SUITABLE with respect to texture.

(C) SOIL GROUP III - FINE LOAMY TEXTURE SOILS. The fine loamy group includes silt, silt loam, sandy clay loam, clay loam, and silty clay loam textural classes and shall be considered PROVISIONALLY SUITABLE with respect to texture.

(D) SOIL GROUP IV - CLAYEY TEXTURE SOILS. The clayey group includes sandy clay, silty clay, and clay textural classes and shall be considered PROVISIONALLY SUITABLE with respect to texture.

(E) The soil textural class shall be determined in the field by hand texturing samples of each soil horizon in the soil profile using the following criteria:

(i) Sand: Sand has a gritty feel, does not stain the fingers, and does not form a ribbon or ball when wet or moist.

(ii) Loamy Sand: Loamy sand has a gritty feel, stains the fingers (silt and clay), forms a weak ball, and cannot be handled without breaking.

(iii) Sandy Loam: Sandy loam has a gritty feel and forms a ball that can be picked up with the fingers and handled with care without breaking.

(iv) Loam: Loam may have a slightly gritty feel but does not show a fingerprint and forms only short ribbons of from 0.25 inch to 0.50 inch in length. Loam will form a ball that can be handled without breaking.

(v) Silt Loam: Silt loam has a floury feel when moist and will show a fingerprint but will not ribbon and forms only a weak ball.

(vi) Silt: Silt has a floury feel when moist and sticky when wet but will not ribbon and forms a ball that will tolerate some handling.

(vii) Sandy Clay Loam: Sandy clay loam has a gritty feel but contains enough clay to form a firm ball and may ribbon to form 0.75-inch to one-inch long pieces.

(viii) Silty Clay Loam: Silty clay loam is sticky when moist and will ribbon from one to two inches. Rubbing silty clay loam with the thumbnail produces a moderate sheen. Silty clay loam produces a distinct fingerprint.

(ix) Clay Loam: Clay loam is sticky when moist. Clay loam forms a thin ribbon of one to two inches in length and produces a slight sheen when rubbed with the thumbnail. Clay loam produces a nondistinct fingerprint.

(x) Sandy Clay: Sandy clay is plastic, gritty, and sticky when moist and forms a firm ball and produces a thin ribbon to over two inches in length.

(xi) Silty Clay: Silty clay is both plastic and sticky when moist and lacks any gritty feeling. Silty clay forms a firm ball and readily ribbons to over two inches in length.

(xii) Clay: Clay is both sticky and plastic when moist, produces a thin ribbon over two inches in length, produces a high sheen when rubbed with the thumbnail, and forms a strong ball resistant to breaking.

(F) The Department may substitute laboratory determination of the soil textural class as defined in these Rules by particle-size analysis of the fine-earth fraction (less than 2.0 mm in size) using the sand, silt, and clay particle sizes as defined in these Rules for field testing when conducted in accordance with ASTM (American Society for Testing and Materials) D-422 procedures for sieve and hydrometer analyses which are hereby adopted by reference in accordance with G.S. 150B-14(c). For fine loamy and clayey soils (Groups III and IV), the dispersion time shall be increased to 12 hours. Copies may be inspected in and copies obtained from the Department of Environment, Health, and Natural Resources, Division of Environmental Health, P.O. Box 27687, Raleigh, North Carolina 27611-7687.

(2) Soil Structure - The following types of soil structure shall be evaluated:

(A) CRUMB AND GRANULAR SOIL STRUCTURE - Soils which have crumb or granular structure shall be considered SUITABLE as to structure.

(B) BLOCK-LIKE SOIL STRUCTURE - Block-Like Soil Structure with peds 2.5 cm (1 inch) or less in size shall be considered PROVISIONALLY SUITABLE as to structure. Block-like soil structure with peds greater than 2.5 cm (1 inch) in size within 36 inches of the naturally occurring soil surface shall be considered UNSUITABLE as to structure.

(C) PLATY SOIL STRUCTURE - soils which have platy soil structure within 36 inches of the naturally occurring soil surface shall be considered UNSUITABLE as to structure.

(D) PRISMATIC SOIL STRUCTURE - Soils which have prismatic soil structure within 36 inches of the naturally occurring soil surface shall be considered UNSUITABLE as to structure.

(E) ABSENCE OF SOIL STRUCTURE - Soils which are single grained and exhibit no structural aggregates shall be considered SUITABLE as to structure. Soils which are massive and exhibit no structural peds within 36 inches of the naturally occurring soil surface shall be considered UNSUITABLE as to structure.

(F) Structure shall be evaluated using Soil Taxonomy, Appendix I, which is hereby adopted by reference in accordance with G.S. 150B-14(c). Copies may be inspected in, and copies obtained from, the Department of Environment, Health, and Natural Resources, Division of Environmental Health, P.O. Box 27687, Raleigh, NC 27611-7687.

(3) Clay Mineralogy - Along with soil texture, the mineralogy of the clay-sized fraction determines the degree to which some soils swell when wetted and thereby affects the size and number of pores available for movement of sewage effluent through the soil. There are two major types of clays, including the 1:1 clays, such as

Kaolinite, which do not shrink or swell extensively when dried or wetted; and the 2:1 clays, including mixed mineralogy clays, such as clays containing both Kaolinite and Montmorillonite that will shrink and swell when dried and wetted. The type of clay minerals in the clay-sized fraction shall be determined by a field evaluation of moist soil consistence or of wet soil consistence using Soil Taxonomy, Appendix I, which is hereby adopted by reference in accordance with G.S. 150B-14(c). The Department may substitute laboratory determination of the expansive clay mineralogy as defined in these Rules for field testing when conducted in accordance with ASTM D-4318, procedures A and B, for the determination of liquid limit, plastic limit, and plasticity index of soils. These procedures are hereby adopted by reference in accordance with G.S. 150B-14(c). If the liquid limit exceeds 50 percent and the plasticity index exceeds 30, the soil shall be considered as having an expansive clay mineralogy. Copies may be inspected in, and copies obtained from, the Department of Environment, Health, and Natural Resources, Division of Environmental Health, P.O. Box 27687, Raleigh, NC 27611-7687.

(A) SLIGHTLY EXPANSIVE CLAY MINERALOGY - Soils which have loose, very friable, friable or firm moist soil consistence, or have slightly sticky to sticky or nonplastic, slightly plastic to plastic wet soil consistence, are considered to have predominantly 1:1 clay minerals and shall be considered SUITABLE as to clay mineralogy.

(B) EXPANSIVE CLAY MINERALOGY - Soils which have either very firm or extremely firm moist soil consistence, or have either very sticky or very plastic wet soil consistence, are considered to have predominantly 2:1 clay minerals (including mixed mineralogy clays) and shall be considered UNSUITABLE as to clay mineralogy.

(4) Organic Soils - Organic soils shall be considered UNSUITABLE.

(b) Where the site is UNSUITABLE with respect to structure or clay mineralogy, it may be reclassified PROVISIONALLY SUITABLE after an investigation indicates that a modified or alternative system may be installed in accordance with Rule .1956 or Rule .1957 of this Section.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1942 SOIL WETNESS CONDITIONS

(a) Soil wetness conditions caused by seasonal high-water table, perched water table, tidal water, seasonally saturated soil or by lateral water movement shall be determined by field evaluation for soil wetness colors and field observations, and may be assessed 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 of the Department using Basic Field Evaluation Procedures pursuant to 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 Charts) at =2% of soil volume in mottles or matrix of a horizon or horizon subdivision. However, colors of chroma 2 or less which are relic from minerals of the parent material shall not be considered indicative of a soil wetness condition.

(2) A Soil wetness condition shall also be determined by the periodic 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 or horizon subdivision, that may occur without the presence of colors of chroma 2 or less. A soil wetness condition caused by saturated soils or a perched water table shall be confirmed to extend for at least three consecutive days. 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 pursuant to Paragraph (b) of this Rule. Sites where soil wetness conditions are greater than 48 inches below the naturally occurring soil surface shall be considered SUITABLE with respect to soil wetness. Sites where soil wetness conditions are between 36 and 48 inches below the naturally occurring soil surface shall be considered PROVISIONALLY SUITABLE with respect to soil wetness. Sites where soil wetness conditions are less than 36 inches below the naturally occurring soil surface shall be considered UNSUITABLE with respect to soil wetness. Sites where a soil wetness condition is determined based upon the observation or indication of lateral water movement within 48 inches of the naturally

occurring soil surface shall be considered UNSUITABLE, except when such water can be intercepted in accordance with 15A NCAC 18A .1956(4).

(d) Alternative Procedures for Soil Wetness Determination: The Owner or the Owner's Legal Representative (Applicant) shall have the opportunity to submit documentation that the soil wetness condition and resultant site classification be alternately determined and reclassified by direct monitoring, computer modeling, or a combination of monitoring and modeling, in accordance with a Direct Monitoring Procedure, Monitoring and Modeling Procedure, or Modeling Procedure made pursuant to Paragraphs (e), (f), or (g) of this Rule. This determination shall take precedence over the determination made pursuant to the Basic Field Evaluation Procedures [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 pursuant to Paragraph (b) of this Rule; or

(2) the Owner proposes to use sites with Group III or IV soil within 36 inches of the surface and where drainage modifications are proposed to be made, including the installation of subsurface drain tile, open drainage ditches, or surface landscape modifications, or on such sites when fill is proposed to be used in conjunction with existing or proposed drainage modifications. Final determination of soil wetness condition for these sites shall be made pursuant to the Modeling Procedure in Paragraph (g) of this Rule

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

(1) The applicant shall notify the local health department 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 monitoring period. An applicant other than the property owner shall have written authorization from the owner to be the owner's legal representative. Soil wetness and rainfall monitoring shall be conducted under the responsible charge of a third-party consultant or by the property owner or the owner's agent. A third party consultant is qualified when licensed or registered in accordance with G.S. 89C (Engineers), G.S. 89E (Geologists), G.S. 89F (Soil Scientists), or G.S. 90A Article 4 (Registered Sanitarians), if required. The Owner shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the local health department.

(2) The applicant shall submit a site plan showing proposed sites for wastewater system, 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 applicant 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. Additional wells shall be required for sites handling systems with a design flow greater than 600 gallons per day (minimum of one additional well per 600 gallons per day increment).

(4) The local health department 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 replacement drainfield site(s) containing the most limiting soil/site conditions. Prior to installation of the wells the local health department shall approve the plan. If the plan is disapproved, the local health department shall include specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend at least five feet below the natural 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 of G.S. 130A-341 and the rules adopted pursuant thereto. 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 at least 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 surface in the monitoring wells shall be recorded at least 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. At least 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

P_J = Total January rainfall

P_F = Total February rainfall

P_M = Total March rainfall

P_A = Total April rainfall

The Department 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, at least 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 at least the most recent three decades of historic data, in accordance with procedures outlined in Chapter 18 of the National Engineering Handbook, NRCS, USDA. From this fitted distribution, the 60-day weighted rainfall index for January through April rainfall with a 30%, 50%, 70% and 80% 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 the following table:

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), (2), (3), (4), (5), and (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 local health department (devices shall record rainfall at least hourly and well water level at least daily).

(2) The ground water simulation model DRAINMOD shall be used to predict daily water levels over at least 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 at least 9 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, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the Department shall be made available upon request to the applicant or applicant's consultants. Daily

maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for at least 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, estimated saturated hydraulic conductivity 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 Carolinas Water Resources Research Institute. DRAINMOD soils data files on file with the Department shall be made available upon request to the applicant or applicant'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 a best fit 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 1500 gallons per day, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(E) The ground water simulation analysis shall be prepared and submitted to the local health department by individuals qualified to use DRAINMOD by training and experience and who are licensed or registered in North Carolina if required in G.S. 89C (Engineers), G.S. 89E (Geologists), and G.S. 89F (Soil Scientists). The local health department or Owner may request a technical review by the Department 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 at least 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 ground water 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 drainage modifications are proposed or when fill is proposed to be used in conjunction with existing or proposed drainage modifications. 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 at least 9 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 at least a 30-year period from the closest available National Weather Service, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the Department shall be made available upon request to the applicant or applicant's consultants.

(2) Soil and Site inputs for DRAINMOD, including a soils data file closest to the soil series identified, depths of soil horizons, hydraulic conductivity 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 Department shall be made available upon request to the applicant or applicant'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 saturated hydraulic conductivity measurements for at least three representative locations on the site and at each location for at least three most representative soil horizons within five feet of the surface. Conductivity 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:

(i) Soil input files for at least two other most closely related soil profiles;

(ii) Saturated hydraulic conductivity of each of horizons measured on-site;

(iii) Drain depth and spacing; and

(iv) 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, hydraulic conductivity input values based upon the range of hydraulic conductivity 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 gallons per day, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(4) The ground water simulation analysis shall be prepared and submitted to the local health department by individuals qualified to use DRAINMOD by training and experience and who are licensed or registered in North Carolina if required in G.S. 89C (Engineers), G.S. 89E (Geologists), and G.S. 89F (Soil Scientists). The local health department shall submit the ground water simulation analysis to the Department 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 pursuant to 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 or registered professional shall bear the professional seal of the person(s) whom conducted the investigation (Engineer, Geologist, Soil Scientist or Registered Sanitarian). A request for technical review of the report by the Department shall include digital copies of monitoring data and digital copies of model inputs, output data, and graphic results, as applicable.

(j) Where the site is UNSUITABLE with respect to soil wetness conditions, it may be reclassified PROVISIONALLY SUITABLE if a modified, alternative or innovative system can be installed in accordance with 15A NCAC 18A .1956, .1957, or .1969.

History Note: *Authority G.S. 130A-335(e):*
Eff. July 1, 1982;
Amended Eff. January 1, 1990;
Temporary Amendment Eff. June 24, 2003; April 17, 2002;
Amended Eff. May 1, 2004.

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15A NCAC 18A .1943 SOIL DEPTH

(a) Soil depths to saprolite, rock, or parent material greater than 48 inches shall be considered SUITABLE as to soil depth. Soil depths to saprolite, rock, or parent material between 36 inches and 48 inches shall be considered PROVISIONALLY SUITABLE as to soil depth. Soil depths to saprolite, rock, or parent material less than 36 inches shall be classified UNSUITABLE as to soil depth.

(b) Where the site is UNSUITABLE with respect to depth, it may be reclassified PROVISIONALLY SUITABLE after a special investigation indicates that a modified or alternative system can be installed in accordance with Rule .1956 or Rule .1957 of this Section.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. August 1, 1988.

15A NCAC 18A .1944 RESTRICTIVE HORIZONS

(a) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 48 inches below the naturally occurring soil surface shall be considered SUITABLE as to depth to restrictive horizons. Soils in which restrictive horizons are three inches or more in thickness and at depths between 36 inches and 48 inches shall be considered

PROVISIONALLY SUITABLE as to depth to restrictive horizons. Soils in which restrictive horizons are three inches or more in thickness and at depths less than 36 inches shall be considered UNSUITABLE as to depth to restrictive horizons.
(b) Where the site is UNSUITABLE with respect to restrictive horizons, it may be reclassified PROVISIONALLY SUITABLE after an investigation indicates that a modified or alternative system can be installed in accordance with Rules .1956 or .1957 of this Section.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; October 1, 1983.

15A NCAC 18A .1945 AVAILABLE SPACE

(a) Sites shall have sufficient available space to permit the installation and proper functioning of ground absorption sewage treatment and disposal systems, based upon the square footage of nitrification field required for the long-term acceptance rate determined in accordance with these Rules.
(b) Sites shall have sufficient available space for a repair area separate from the area determined in Paragraph (a) of this Rule. The repair area shall be based upon the area of the nitrification field required to accommodate the installation of a replacement system as specified in Rule .1955, .1956, or .1957 of this Section. Prior to issuance of the initial Improvement Permit for a site, the local health department shall designate on the permit the original system layout, the repair area, and the type of replacement system.
(c) The repair area requirement of Paragraph (b) of this Rule shall not apply to a lot or tract of land:

(1) which is specifically described in a document on file with the local health department on July 1, 1982, or which is specifically described in a recorded deed or a recorded plat on January 1, 1983; and
(2) which is of insufficient size to satisfy the repair area requirement of Paragraph (b) of this Rule, as determined by the local health department; and
(3) on which a ground absorption sewage treatment and disposal system with a design daily flow of:
    (A) no more than 480 gallons is to be installed; or
    (B) more than 480 gallons is to be installed if application for an improvement permit which meets the requirements of Rule .1937(c) of this Subchapter is received by the local health department on or before April 1, 1983.

(d) Although a lot or tract of land is exempted under Paragraph (c) from the repair area requirement of Paragraph (b), the maximum feasible area, as determined by the local health department, shall be allocated for a repair area.

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. February 1, 1992; July 1, 1983; January 1, 1983.

15A NCAC 18A .1946 OTHER APPLICABLE FACTORS

The site evaluation shall include consideration of any other applicable factors involving accepted public health principles, such as, but need not be limited to:

(1) The proximity of a large-capacity water-supply well, the cone of influence of which would dictate a larger separation distance than the minimum distance specified in Rule .1950 of this Section;
(2) The potential public health hazard due to possible failures of soil absorption systems when specifically identified, would dictate larger separation distances than the minimums specified in Rule .1950 and Rule .1955(m) of this Section;
(3) The potential public health hazard of possible massive failures of soil absorption systems proposed to serve large numbers of residences, as in residential subdivisions or mobile home parks;
(4) For sites serving systems designed to handle over 3,000 gallons per day, as determined in Rule .1949 (a) or (b) of this Section, which include one or more nitrification fields with a design flow of greater than 1500 gallons per day, the applicant shall submit 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

nitrification trenches (sloping sites). The data submitted may include soil borings to depths greater than 48 inches, permeability and hydraulic conductivity measurements, water level readings, and other information determined to be necessary by the local health department or the State. The site shall be considered UNSUITABLE if the data indicate that the groundwater mound which will develop beneath the site cannot be maintained two feet or more below the bottom of the nitrification trenches or it is determined that effluent is likely to become exposed on the ground surface within, or adjacent to, the nitrification field.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1947 DETERMINATION OF OVERALL SITE SUITABILITY

All of the criteria in Rules .1940 through .1946 of this Section shall be determined to be SUITABLE, PROVISIONALLY SUITABLE, or UNSUITABLE, as indicated. If all criteria are classified the same, that classification will prevail. Where there is a variation in classification of the several criteria, the most limiting uncorrectable characteristics shall be used to determine the overall site classification.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1948 SITE CLASSIFICATION

(a) Sites classified as SUITABLE may be utilized for a ground absorption sewage treatment and disposal system consistent with these Rules. A suitable classification generally indicates soil and site conditions favorable for the operation of a ground absorption sewage treatment and disposal system or have slight limitations that are readily overcome by proper design and installation.

(b) Sites classified as PROVISIONALLY SUITABLE may be utilized for a ground absorption sewage treatment and disposal system consistent with these Rules but have moderate limitations. Sites classified Provisionally Suitable require some modifications and careful planning, design, and installation in order for a ground absorption sewage treatment and disposal system to function satisfactorily.

(c) Sites classified UNSUITABLE have severe limitations for the installation and use of a properly functioning ground absorption sewage treatment and disposal system. An improvement permit shall not be issued for a site which is classified as UNSUITABLE. However, where a site is UNSUITABLE, it may be reclassified PROVISIONALLY SUITABLE if a special investigation indicates that a modified or alternative system can be installed in accordance with Rules .1956 or .1957 of this Section.

(d) A site classified as UNSUITABLE may be used for a ground absorption sewage treatment and disposal system specifically identified in Rules .1955, .1956, or .1957 of this Section or a system approved under Rule .1969 if written documentation, including engineering, hydrogeologic, geologic or soil studies, indicates to the local health department that the proposed system can be expected to function satisfactorily. Such sites shall be reclassified as PROVISIONALLY SUITABLE if the local health department determines that the substantiating data indicate that:

(1) a ground absorption system can be installed so that the effluent will be non-pathogenic, non-infectious, non-toxic, and non-hazardous;
(2) the effluent will not contaminate groundwater or surface water; and
(3) the effluent will not be exposed on the ground surface or be discharged to surface waters where it could come in contact with people, animals, or vectors.

The State shall review the substantiating data if requested by the local health department.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. April 1, 1993; January 1, 1990.

15A NCAC 18A .1949 SEWAGE FLOW RATES FOR DESIGN UNITS

(a) In determining the volume of sewage from dwelling units, the flow rate shall be 120 gallons per day per bedroom. The minimum volume of sewage from each dwelling unit shall be 240 gallons per day and each additional bedroom above two bedrooms shall increase the volume of sewage by 120 gallons per day. In determining the number of bedrooms in a dwelling unit, each bedroom and any other room or addition that can reasonably be expected to function as a bedroom shall be considered a bedroom for design purposes. When the occupancy of a dwelling unit exceeds two persons per bedroom, the volume of sewage shall be determined by the maximum occupancy at a rate of 60 gallons per person per day.

(b) Table No. I shall be used to determine the minimum design daily flow of sewage required in calculating the design volume of sanitary sewage systems to serve selected types of establishments. The minimum design volume of sewage from any establishment shall be 100 gallons per day. Design of sewage treatment and disposal systems for establishments not identified in this Rule shall be determined using available flow data, water-using fixtures, occupancy or operation patterns, and other measured data.

TABLE NO. I

TYPE OF ESTABLISHMENT	DAILY FLOW FOR DESIGN
Airports (Also R.R. stations, bus terminals --not including food service facilities)	5 gal/passenger
Barber Shops	50 gal/chair
Bars, Cocktail Lounges (Not including food service)	20 gal/seat
Beauty Shops (Style Shops)	125 gal/chair
Bowling Lanes	50 gal/lane
Businesses (other than those listed elsewhere in this table)	25 gal/employee
Camps	
Construction or Work Camps	60 gal/person 40 gal/person (with chemical toilets)
Summer Camps	60 gal/person
Campgrounds -- With Comfort Station (Without water and sewer hookups)	100 gal/campsite
Travel Trailer/Recreational Vehicle Park (With water and sewer hookups)	120 gal/space
Churches (Not including a Kitchen, Food Service Facility, Day Care or Camp)	3 gal/seat
Churches (With a Kitchen but, not including a Food Service Facility, Day Care, or Camp)	5 gal/seat
Country Clubs	20 gal/member
Day Care Facilities	15 gal/person
Factories (Exclusive of industrial waste)	25 gal/person/shift
Add for showers	10 gal/person/shift
Food Service Facilities	
Restaurants	40 gal/seat or 40 gal/15 ft2 of dining area, whichever is greater
24-hour Restaurant	75 gal/seat
Food Stands	
(1) Per 100 square feet of food stand floor space	50 gal
(2) Add per food employee	25 gal
Other Food Service Facilities	5 gal/meal
Hospitals	300 gal/bed

Marinas	10 gal/boat slip
With bathhouse	30 gal/boat slip
Meat Markets	
(1) Per 100 square feet of market floor space	50 gal
(2) Add per market employee	25 gal
Motels/Hotels	120 gal/room
With cooking facilities	175 gal/room
Offices (per shift)	25 gal/person
Residential Care Facilities	60 gal/person
Rest Homes and Nursing Homes	
With laundry	120 gal/bed
Without laundry	60 gal/bed
Schools	
Day Schools	
With cafeteria, gym, and showers	15 gal/student
With cafeteria only	12 gal/student
With neither cafeteria nor showers	10 gal/student
Boarding Schools	60 gal/person
Service Stations	250 gal/water closet or urinal
24-hour Service Stations	325 gal/water closet
Stores, Shopping Centers, and Malls (Exclusive of food service and meat markets)	120 gal/1000 ft2 of retail sales area
Stadium, Auditorium, Theater, Drive-in	5 gal/seat or space
Swimming Pools, Spas, and Bathhouses	10 gal/person

(c) An adjusted design daily sewage flow may be granted by the local health department upon a showing as specified in Subparagraphs (c)(1) through (c)(2) that a sewage system is adequate to meet actual daily water consumption from a facility included in Paragraph (b) of this Rule.

(1) Documented data from that facility or a comparable facility justifying a flow rate reduction shall be submitted to the local health department and the State. The submitted data shall consist of at least 12 previous consecutive monthly total water consumption readings and at least 30 consecutive daily water consumption readings. The daily readings shall be taken during a projected normal or above normal sewage flow month. A peaking factor shall be derived by dividing the highest monthly flow as indicated from the 12 monthly readings by the sum of the 30 consecutive daily water consumption readings. The adjusted design daily sewage flow shall be determined by taking the numerical average of the greatest ten percent of the daily readings and multiplying by the peaking factor. Further adjustments shall be made in design sewage flow rate used for sizing nitrification fields and pretreatment systems when the sampled or projected wastewater characteristics exceed those of domestic sewage, such as wastewater from restaurants or meat markets.

(2) An adjusted daily sewage flow rate may be granted contingent upon use of extreme water-conserving fixtures, such as toilets which use 1.6 gallons per flush or less, spring-loaded faucets with flow rates of one gallon per minute or less, and showerheads with flow rates of two gallons per minute or less. The amount of sewage flow rate reduction shall be determined by the local health department and the State based upon the type of fixtures and documentation of the amount of flow reduction to be expected from the proposed facility. Adjusted daily flow rates based upon use of water-conserving fixtures shall apply only to design capacity requirements of dosing and distribution systems and nitrification fields. Minimum pretreatment capacities shall be determined by the design flow rate of Table I of this Rule.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; January 1, 1984.

15A NCAC 18A .1950 LOCATION OF SANITARY SEWAGE SYSTEMS

(a) Every sanitary sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

(1)	Any private water supply source, including any well or spring	100 feet;
(2)	Any public water supply source	100 feet;
(3)	Streams classified as WS-I	100 feet;
(4)	Waters classified as S.A.	100 feet, from mean high water mark;
(5)	Other coastal waters	50 feet, from mean high water mark;
(6)	Any other stream, canal, marsh, or other surface waters	50 feet;
(7)	Any Class I or Class II reservoir	100 feet, from normal pool elevation;
(8)	Any permanent storm water retention pond	50 feet, from flood pool elevation;
(9)	Any other lake or pond	50 feet, from normal pool elevation;
(10)	Any building foundation	5 feet;
(11)	Any basement	15 feet;
(12)	Any property line	10 feet;
(13)	Top of slope of embankments or cuts of 2 feet or more vertical height	15 feet;
(14)	Any water line	10 feet;
(15)	Drainage Systems:	
	(A) Interceptor drains, foundation drains, and storm water diversions	
	(i) upslope	10 feet,
	(ii) sideslope	15 feet, and
	(iii) downslope	25 feet;
	(B) Groundwater lowering ditches and devices	25 feet;
(16)	Any swimming pool	15 feet;
(17)	Any other nitrification field (except repair area)	20 feet;

(b) Ground absorption sewage treatment and disposal systems may be located closer than 100 feet from a private water supply, except springs and uncased wells located downslope and used as a source of drinking water, for repairs, space limitations, and other site-planning considerations but shall be located the maximum feasible distance and in no case less than 50 feet.

(c) Nitrification fields and repair areas shall not be located under paved areas or areas subject to vehicular traffic. If effluent is to be conveyed under areas subject to vehicular traffic, ductile iron or its equivalent pipe shall be used. However, pipe specified in Rule .1955 (e) may be used if a minimum of 30 inches of compacted cover is provided over the pipe.

(d) In addition to the requirements of Paragraph (a) of this Rule, sites to be used for subsurface disposal for design units with flows over 3,000 gallons per day, as determined in Rule .1949 (a) or (b) of this Section, which include one or more nitrification fields with individual capacities of greater than 1,500 gallons per day, shall be located at least the minimum horizontal distance from the following:

(1)	Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer	500 feet;
(2)	Any other public water supply source, unless determined to utilize a confined aquifer	200 feet;
(3)	Any private water supply source, unless determined to utilize a confined aquifer	100 feet;
(4)	Waters classified as SA	200 feet, from mean high water mark;
(5)	Any waters classified as WS-I	200 feet;
(6)	Any surface waters classified as WS-II, WS-III, B, or SB	100 feet; and
(7)	Any property line	25 feet.

(e) Collection sewers, force mains, and supply lines shall be located at least the minimum horizontal distance from the following:

(1)	Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100 feet, unless

		constructed of leakproof pipe, such as ductile iron pipe with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 feet;
(2)	Any private water supply source, including wells and springs	50 feet, unless constructed of similar leakproof pipe, such as ductile iron pipe with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 feet;
(3)	Any waters classified as WS-I, WS-II, WS-III, B, SA, or SB	50 feet, unless constructed of similar leakproof pipe, such as ductile iron pipe with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 feet;
(4)	Any other stream, canal, marsh, coastal waters, lakes and other impoundments, or other surface waters	10 feet;
(5)	Any basement	10 feet;
(6)	Any property line	5 feet;
(7)	Top of slope of embankments or cuts of two feet or more vertical height	10 feet;
(8)	Drainage Systems:	
	(A) Interceptor drains, storm drains, and storm water diversions	5 feet;
	(B) Ground-water lowering ditches and devices	10 feet;
(9)	Any swimming pool	10 feet;
(10)	Any other nitrification field	5 feet.

(f) Sewer lines may cross a water line if 18 inches clear separation distance is maintained, with the sewer line passing under the water line. When conditions prevent an 18-inch clear separation from being maintained or whenever it is necessary for the water line to cross under the sewer, the sewer line shall be constructed of ductile iron pipe or its equivalent and the water line shall be constructed of ferrous materials equivalent to water main standards for a distance of at least ten feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(g) Sewer lines may cross a storm drain if:

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

(2) the sewer is of ductile iron pipe or encased in concrete or ductile iron pipe for at least five feet on either side of the crossing.

(h) Sewer lines may cross a stream if at least three feet of stable cover can be maintained or the sewer line is of ductile iron pipe or encased in concrete or ductile iron pipe for at least ten feet on either side of the crossing and protected against the normal range of high and low water conditions, including the 100-year flood/wave action. Aerial crossings shall be by ductile iron pipe with mechanical joints or steel pipe. Pipe shall be anchored for at least ten feet on either side of the crossing.

(i) Septic tanks, lift stations, wastewater treatment plants, sand filters, and other pretreatment systems shall not be located in areas subject to frequent flooding (areas inundated at a ten-year or less frequency) unless designed and installed to be watertight and to remain operable during a ten-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-335(e) and (f);*

Eff. July 1, 1982;
Amended Eff. January 1, 1990; October 1, 1982.

15A NCAC 18A .1951 APPLICABILITY OF RULES

(a) Except as required in Paragraph (b) of this Rule, the minimum horizontal distance requirements in Rule .1950(a)(4), (11), (12), or (13) shall not apply to the installation of a single septic tank system serving a single-family residence not to exceed four bedrooms on a lot or tract of land:

(1) which, on July 1, 1977, is specifically described in a deed, contract, or other instrument conveying fee title or which is specifically described in a recorded plat; and

(2) which, on July 1, 1977, is of insufficient size to satisfy the minimum horizontal distance requirements in Rule .1950(a)(4), (11), (12), or (13) of this Section; and

(3) which, on the date system construction is proposed to begin, is not capable of being served by a community or public sewerage system.

(b) For those lots or tracts of land described in Rule .1951(a) of this Section, where any of the minimum horizontal distance requirements prescribed in Rule .1950(a)(4), (11), (12), or (13) of this Section can be met, such minimum horizontal distances shall be required.

(c) For those lots or tracts of land described in Rule .1951(a) of this Section, where a specific minimum horizontal distance requirement prescribed in Rule .1950(a)(4), (11), (12), or (13) of this Section cannot be met, the maximum feasible horizontal distance, as determined by the local agency, shall be required. Provided, however, that at least the following minimum horizontal distances shall be required in all cases:

(1) Rule .1950(a)(4) of this Section, the minimum horizontal distance shall be not less than 50 feet;

(2) Rule .1950(a)(11) of this Section, the minimum horizontal distance shall be not less than 8 feet;

(3) Rule .1950(a)(12) and (13) of this Section, the minimum horizontal distance shall be not less than 5 feet.

(d) All other provisions of this Section except as exempted by this Rule shall apply to the lots or tracts of land described in Rule .1951(a) of this Section. Any rules and regulations of the Commission for Health Services 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 Rule .1950(a)(4), (11), (12), or (13) of this Section do not apply.

(e) It shall be the responsibility of any owner of a lot or tract of land, who applies for a permit required by Rule .1937 of this Section, and who seeks, under the provisions of Rule .1951(a) of this Section, to exempt his lot or tract of land from any of the minimum horizontal distance requirements of Rule .1950(a)(4), (11), (12), or (13) of this Section to provide to the local health department necessary records of title to the lot or tract of land for which the exemption is sought in order that the local agency may determine whether the applicant is entitled to any such exemption.

(f) For those lots or tracts of land which, on the effective date of this Section, are specifically described in a deed or recorded plat, and the minimum horizontal distance requirements prescribed in Rule .1950(a)(15)(B) cannot be met, the maximum feasible horizontal distance, as determined by the local health department, shall be required, but shall not be less than ten feet.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1952 SEPTIC TANK, EFFLUENT FILTER, DOSING TANK AND LIFT STATION DESIGN

(a) A septic tank or dosing tank shall be watertight, structurally sound, and not subject to excessive corrosion or decay. Septic tanks shall be of two-compartment design. The inlet compartment of a two-compartment tank shall hold between two-thirds and three-fourths of the total tank capacity. Septic tanks shall have an approved effluent filter and access devices. The effluent filter shall function without a bypass of unfiltered wastewater, sludge or scum. The effluent filter case shall be designed to function as a sanitary tee with the inlet extending down to between 25 and 40 percent of the liquid depth. The requirement(s) for an effluent filter and access devices shall apply to septic tanks for which a Construction Authorization is issued on or after January 1, 1999. A properly designed dosing siphon or pump shall be used for discharging sewage effluent into nitrification lines when the total length of such lines exceeds 750 linear feet in a single system and as required for any pressure-dosed system. When the design daily flow from a single system exceeds 3,000 gallons per day or when the total length of nitrification lines exceeds 2,000 linear feet in a single system, alternating siphons or pumps shall be used which shall discharge to separate nitrification fields. The dose volume from pump or siphon systems shall be of such design so as to fill the nitrification lines from 66 percent to 75 percent of their capacity at each discharge except as required for low-pressure distribution systems. The discharge rate from dosing systems

shall be designed to maximize the distribution of the effluent throughout the nitrification field. Septic tanks installed where the top will be deeper than six inches below the finished grade shall have an access manhole over each compartment with cover, extending to within six inches of the finished grade, having a minimum opening adequate to accommodate the installation or removal of the septic tank lid, septage removal, and maintenance of the effluent filter. When the top of the septic tank or access manhole is below the finished grade, the location of each manhole shall be visibly marked at finished grade. Any system serving a design unit with a design sewage flow greater than 3,000 gallons per day shall have access manholes that extend at least to finished grade and be designed and maintained to prevent surface water inflow. The manholes shall be sized to allow proper inspection and maintenance. All dosing tanks shall have a properly functioning high-water alarm. The alarm shall be audible and visible by system users and weatherproof if installed outdoors. The alarm circuit shall be provided with a manual disconnect in a watertight, corrosion-resistant outside enclosure (NEMA 4X or equivalent) adjacent to the dosing tank.

(b) Minimum liquid capacities for septic tanks shall be in accordance with the following:

(1) Residential Septic Tanks (for each individual residence or dwelling unit):

Number of Bedrooms	Minimum Liquid Capacity	Equivalent Capacity Per Bedroom
3 or less	900 gallons	300 gallons
4	1,000 gallons	250 gallons
5	1,250 gallons	250 gallons

(2) Septic tanks for large residences, multiple dwelling units, or places of business or public assembly shall be in accordance with the following:

(A) The liquid capacity of septic tanks for places of business or places of public assembly with a design sewage flow of 600 gallons per day or less shall be determined in accordance with the following: $V = 2Q$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow. However, the minimum capacity of any septic tanks shall be 750 gallons.

(B) Individual residences with more than five bedrooms, multiple-family residences, individual septic tank systems serving two or more residences, or any place of business or public assembly where the design sewage flow is greater than 600 gallons per day, but less than 1,500 gallons per day, the liquid capacity of the septic tank shall be designed in accordance with the following: $V = 1.17Q + 500$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow. The minimum liquid capacity of a septic tank serving two or more residences shall be 1,500 gallons.

(C) Where the design sewage flow is between 1,500 gallons per day and 4,500 gallons per day, the liquid capacity of the septic tank shall be designed in accordance with the following: $V = 0.75Q + 1,125$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow.

(D) Where the design sewage flow exceeds 4,500 gallons per day, the septic tank shall be designed in accordance with the following: $V = Q$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow.

(E) The minimum liquid capacity requirements of Subparagraph (b)(2) of this Rule shall be met by use of a single two-compartment septic tank or by two tanks installed in series, provided the first tank is constructed without a baffle wall and contains at least two-thirds of the total required liquid capacity.

(c) The following are minimum standards of design and construction of pump tanks and pump dosing systems:

(1) The liquid capacity of a pump tank shall be considered as the entire internal volume with no additional requirement for freeboard. Pump tanks shall have a minimum liquid capacity in accordance with the following:

(A) Pump tanks for systems with nitrification fields installed in Soil Group I, II, or III soils, as defined in these Rules, shall have a minimum liquid capacity equal to two-thirds of the required septic tank liquid capacity.

(B) Pump tanks for systems installed in Group IV soils shall have a minimum liquid capacity equal to the required septic tank liquid capacity.

(C) The minimum liquid capacity of any pump tank shall be 750 gallons.

(D) An alternate method to determine minimum liquid capacity of a pump tank shall be to provide for the minimum pump submergence requirement (Subparagraph (c)(5) of this Rule), the minimum dose volume requirement (Paragraph (a) of this Rule), and the minimum emergency storage capacity requirement. The emergency storage capacity requirement is determined based on the type of facility served, the classification of surface waters which would be impacted by a pump tank failure, and the availability of standby power devices and emergency maintenance personnel. The emergency storage capacity shall be the freeboard space in the pump tank above the high-water alarm activation

level plus the available freeboard space in previous tankage and in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert. The minimum emergency storage capacity for residential systems and other systems in full-time use on sites draining into WS-I, WS-II, WS-III, SA, SB, and B waters shall be 24 hours, without standby power, or 12 hours with standby power manually activated, or four hours with standby power automatically activated or with a high-water alarm automatically contacting a 24-hour maintenance service. The minimum emergency storage capacity for systems not in full-time use and for all systems at sites draining into all other surface waters shall be 12 hours without standby power, or eight hours with standby power manually activated, or four hours with standby power automatically activated or with a high-water alarm automatically contacting a 24-hour maintenance service.

(E) Notwithstanding Paragraphs (c)(1)(A)-(D), other criteria for pump tank capacity may be approved by the local health department and the State for raw sewage lift stations, pressure sewer systems, and systems with design flows exceeding 3,000 gallons per day.

(2) The effluent pump shall be capable of handling at least one-half inch solids and designed to meet the discharge rate and total dynamic head requirements of the effluent distribution system. The pump shall be listed by Underwriter's Laboratory or an equivalent third party electrical testing and listing agency, unless the proposed pump model is specified by a registered professional engineer.

(3) Pump discharge piping shall be of Schedule 40 PVC or stronger material and adequately secured. Fittings and valves shall be of compatible corrosion-resistant material. A threaded union, flange, or similar disconnect device shall be provided in each pump discharge line. All submersible pumps shall be provided with a corrosion-resistant rope or chain attached to each pump enabling pump removal from the ground surface without requiring dewatering or entrance into the tank. Valves shall also be readily accessible from the ground surface.

(4) Antisiphon holes (three-sixteenth inch) shall be provided when the discharge or invert elevation of the distribution system is below the high-water alarm elevation in the pump tank, or in accordance with pump manufacturer's specifications. Check valves shall be provided when the volume of the supply line is greater than 25 percent of the dosing volume, or in accordance with pump manufacturer's specifications. When provided, the antisiphon hole shall be located between the pump and the check valve.

(5) Sealed mercury control floats or similar devices designed for detecting liquid levels in septic tank effluent shall be provided to control pump cycles. A separate level sensing device shall be provided to activate the high-water alarm. Pump-off level shall be set to keep the pump submerged at all times or in accordance with the manufacturer's specifications. A minimum of 12 inches of effluent shall be maintained in the bottom of the pump tank. The high-water alarm float shall be set to activate within six inches of the pump-on level. The lag pump float switch, where provided, shall be located at or above the high-water alarm activation level.

(6) Pump and control circuits shall be provided with manual circuit disconnects within a watertight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the pump tank, securely mounted at least 12 inches above the finished grade. The pump(s) shall be manually operable without requiring the use of special tools or entrance into the tank for testing purposes. Conductors shall be conveyed to the disconnect enclosure through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes provided inside the tank. Wire grips, duct seal, or other suitable material shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.

(7) For systems requiring duplex and multiplex pumps, a control panel shall be provided which shall include short-circuit protection for each pump and for the control system, independent disconnects, automatic pump sequencer, hand-off-automatic (H-O-A) switches, run lights, and elapsed time counters for each pump. Alarm circuits shall be supplied ahead of any pump overload or short circuit protective devices. The control panel must be in a watertight, corrosion-resistant enclosure (NEMA 4X or equivalent) unless installed within a weathertight building. The panel shall be protected from intense solar heating.

(8) Dual and multiple fields shall be independently dosed by separate pumps which shall automatically alternate. The supply lines shall be "H" connected to permit manual alternation between fields dosed by each pump. "H" connection valving shall be readily accessible from the ground surface, either from the pump tank access manhole or in a separate valve chamber outside the pump tank. Other equivalent methods of dosing dual or multiple fields may be approved by the State.

(9) The pump tank shall have a properly functioning high-water alarm. The alarm circuit shall be supplied ahead of any pump overload and short circuit protective devices. The alarm shall be audible and visible by system users and weatherproof if installed outdoors in an enclosure (NEMA 4X or equivalent).

(d) Siphons and siphon dosing tanks may be used when at least two feet of elevation drop can be maintained between the siphon outlet invert and the inlet invert in the nitrification field distribution system.

(1) Siphon dosing tanks shall be designed in accordance with the minimum dose requirements in this Rule and shall meet the construction requirements of this Section. The siphon dose tank shall provide at least 12 inches of freeboard, and the inlet pipe shall be at least three inches above the siphon trip level. The high-water alarm shall be set to activate within two inches of the siphon trip level.

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

(3) The 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 dosing tank or otherwise designed to not serve as an overflow for the tank.

(4) All siphon parts shall be installed in accordance with the manufacturer's specifications. All materials must be corrosion-resistant, of cast iron, high density plastic, fiberglass, stainless steel, or equal.

(5) Siphon dosing tanks shall have a properly functioning high-water alarm that is audible and visible by system users and weatherproof if installed outdoors in an enclosure (NEMA 4X or equivalent).

(e) Raw sewage lift stations shall meet the construction standards of this Section and all horizontal setback requirements for sewage treatment and disposal systems in accordance with Rule .1950(a) of this Section unless the station is a sealed, watertight chamber, in which case the setback requirements for collection sewers in Rule .1950(e) of this Section shall apply. Sealed, watertight chambers shall be of a single, prefabricated unit, such as fiberglass, with sealed top cover, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent. Dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets. Pumps shall be listed by Underwriter's Laboratories or an equivalent third party electrical testing and listing agency, and shall be grinder pumps or solids-handling pumps capable of handling at least three-inch spheres unless the station serves no more than a single water closet, lavatory, and shower, in which case two-inch solids handling pumps shall be acceptable. Minimum pump capacity shall be 2.5 times the average daily flow rate. The dosing volume shall be set so that the pump-off time does not exceed 30 minutes, except for stations serving single buildings, and pump run-time shall be from three to ten minutes at average flow. Pump station emergency storage capacity and total liquid capacity shall be determined in accordance with Paragraph (c)(1)(D) of this Rule except for a sealed, watertight chamber serving an individual building, in which case a minimum storage capacity of eight hours shall be required. All other applicable requirements for pump tanks and pump dosing systems in accordance with Paragraph (c) of this Rule shall also apply to raw sewage lift stations.

History Note: *Authority G.S. 130A-335 (e)(f)(f1)[2nd];*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1953 PREFABRICATED SEPTIC TANKS AND PUMP TANKS

When prefabricated concrete tanks or tanks of other material are used, they shall be constructed in accordance with the plans which have been approved by the State and shall comply with all requirements of this Section. At least three complete sets of plans and specifications for the initial design of the prefabricated septic tank or subsequent changes and modifications shall be submitted to the Department of Environment, and Natural Resources, On-Site Wastewater Section, PO Box 29594, Raleigh, North Carolina 27626-0594. Separate plans and specifications for the design of each septic tank or pump tank to be produced shall be submitted to the On-Site Wastewater Section for approval. These plans and specifications shall show the design of the septic tank in detail, including:

(1) All pertinent dimensions;
(2) Reinforcement material and location;
(3) Material strength;
(4) Liquid depth;
(5) Pipe penetration, joint material and method of sealing;
(6) Access manhole riser, lid, and other proposed appurtenances to the septic tank;
(7) Approved effluent filter(s), filter support detail and filter access detail; and
(8) Other design features.

History Note: *Authority G.S. 130A-335 (e)(f)f1)[2nd];*
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Amended Eff. January 1, 1990;
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Amended Eff. August 1, 2000.

15A NCAC 18A .1954 MINIMUM STANDARDS FOR PRECAST REINFORCED CONCRETE TANKS

(a) The following are minimum standards of design and construction of precast reinforced concrete septic tanks:

(1) The minimum requirement for the liquid depth is 36 inches.

(2) A minimum of nine inches freeboard is required, the freeboard being the air space between the top of the liquid and the bottom side of the lid or cap of the tank.

(3) The length of the septic tank shall be at least twice as long as the width.

(4) There shall be three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank. The blockouts for these openings shall leave a concrete thickness of not less than one inch in the tank wall. The blockouts shall be made for a minimum of four-inch pipe or a maximum of six-inch pipe. The outlet pipe penetration of the tank shall be through a resilient, watertight, sealed, non-corrosive and flexible connective sleeve. The outlet pipe penetration shall be precast to be compatible with the connective sleeve. No pipe penetration points or openings shall be permitted below the tank liquid level.

(5) The inlet pipe in the tank shall be a straight pipe.

(6) The outlet shall be through an approved effluent filter secured in place in an effluent filter support case. The effluent filter support case shall serve as a functioning sanitary tee with the bottom inlet extending down between 25 and 40 percent of the liquid depth. The approved effluent filter and support case shall be furnished by the septic tank manufacturer. The invert of the outlet shall be at least two inches lower in elevation than the invert of the inlet.

(7) Other equivalent methods of supporting the effluent filter and for making the pipe penetrations shall be approved by the On-Site Wastewater Section.

(8) In order to obtain approval of an effluent filter, the filter manufacturer shall submit to the State the following information with supporting documentation:

(A) For each septic tank system that is designed to treat 3,000 gallons per day or less of sewage, a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a)(1)(2)(3), and (4);

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

(C) Specifications for application, installation, operation, and maintenance.

(9) All tanks shall be manufactured with a cast-in-place partition so that the tank contains two compartments. The partition shall be located at a point not less than two-thirds nor more than three-fourths the length of the tank from the inlet end. The top of the partition shall terminate two inches below the bottom side of the tank top in order to leave space for air or gas passage between compartments. The top and bottom halves of the partition shall be cast in such manner as to leave a water passage slot four inches high for the full width of the tank. The partition (both halves) shall be reinforced by the placing of six-inch by six-inch No. 10 gage welded reinforcing wire. The reinforcing wire shall be bent to form an angle of 90 degrees on the ends in order to form a leg not less than four inches long. When the wire is placed in the mold the four-inch legs should lay parallel with the sidewall wire and adjacent to it. It is recognized that there are other methods of constructing a partition or two-compartment tank. Any method other than the one described will be considered on an individual basis for approval by the On-Site Wastewater Section. However, the tank wall thickness must remain not less than two and one-half inches thick throughout the tank except for the pipe penetrations.

(10) Adequate access openings must be provided in the tank top. Access shall be provided for cleaning or rodding out of the inlet pipe, for cleaning or clearing the air or gas passage space above the partition, for pumping of each compartment, and for the maintenance of the effluent filter. This shall be accomplished by properly locating two manholes or access openings with each having a minimum opening of 15 inches by 15 inches or 17 inches in diameter as the opening cuts the plane of the bottom side of the top of the tank or other equidimensional opening with at least 225 square inches. The manhole covers shall be beveled on all sides in such manner as to accommodate a uniform load of 150 pounds per square foot without damage to the cover or the top of the tank. If the top of the tank is to be multislab construction, the slabs over the inlet of the tank, partition, and outlet of the tank must not weigh in excess of 150 pounds each. Multislab construction allows

for the elimination of the manholes. Manhole covers, tank lids, access opening covers, or slabs shall have a handle of steel or other rot-resistant material equivalent in strength to a No. 3 reinforcing rod (rebar).

(11) 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 in the top, bottom ends, and sides of the tank. The reinforcing wire shall be lapped at least six inches. Concrete cover shall be required for all reinforcement. Reinforcement shall be placed to maximize the structural integrity of the tank. The tank, tank lid, riser and riser cover shall be able to withstand a uniform live loading of 150 pounds per square foot in addition to all loads to which an underground tanks, riser, or riser cover is normally subjected, such as the dead weight of the concrete and soil cover, active soil pressure on tank walls, and the uplifting force of the ground water. Additional reinforcement shall be required when the loads on a concrete tank, riser, or riser cover are exceeded by subjecting it to vehicular traffic or when the top of the tank is placed deeper than three feet below the finished grade.

(12) The top, bottom, ends, and sides of the tank must have a minimum thickness of two and one-half inches.

(13) A minimum 28-day concrete compressive strength of 3,500 pounds per square inch shall be used in the construction of the septic tank, concrete access riser and riser cover. The concrete shall achieve a minimum compressive strength of 3,000 pounds per square inch 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 septic tank shall be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Recognized devices for testing the strength of concrete include a properly calibrated Schmidt Rebound Hammer or Windsor Probe Test. Accelerated curing in the mold by use of propane gas or other fuels is prohibited, except in accordance with accepted methods and upon prior approval of the State.

(14) After curing, tanks manufactured in two sections and as required, concrete risers shall be joined and sealed at the joint by using a mastic, butyl rubber, or other pliable sealant that is waterproof, corrosion-resistant, and approved for use in septic tanks. The sealant shall have a minimum size of one inch nominal diameter or equivalent. Before sealing, the joint shall be smooth, intact, and free of all deleterious substances. Tank halves shall be properly aligned to ensure a tight seal. The sealant shall be provided by the manufacturer.

(15) All tanks produced shall bear an imprint identifying the manufacturer, the serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks. This imprint shall be located to the right of the blockout made for the outlet pipe on the outlet end of the tank. All tanks shall also be permanently marked with the date of manufacture adjacent to the tank imprint or on the top of the tank directly above the imprint.

(16) Risers and access covers shall have a clear opening sized to allow for maintenance and removal of internal devices of the septic tank and shall not allow accidental entry. The access cover and tank lid shall be designed, constructed, and maintained to prevent unauthorized access. Risers shall be sealed watertight where they join the top of the septic tank, and constructed to prevent water inflow through the lid or cover.

(b) Pump tanks shall meet the construction requirements of Paragraph (a) of this Rule with the following modifications.

(1) Tanks shall be cast with a single compartment, or, if a partition is provided, the partition shall be cast to contain a minimum of two four-inch diameter circular openings, or equivalent, located no more than 12 inches above the tank bottom.

(2) There shall be no requirement as to tank length, width, or shape, provided the tank satisfies all other requirements of this Section.

(3) 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.

(4) After joining, tanks manufactured in two sections shall be plastered along the joint with hydraulic cement, cement mortar, or other waterproofing sealant. Other methods of waterproofing tanks may be used as specifically approved in the plans and specifications for the tank. Prior to backfilling, the local health department shall make a finding that a two section tank is watertight if a soil wetness condition is present within five feet of the elevation of the top of the tank.

(5) Tanks shall be vented and accessible for routine maintenance. A watertight access manhole with removable lid shall be provided over the pump with a minimum diameter of 24 inches. The access manhole shall extend at least to six inches above finished grade and be designed and maintained to prevent surface water inflow. Larger or multiple manholes shall be provided when two or more pumps are required. Pumps shall be removable without requiring entrance into the tank. Manhole lids and electrical controls shall be secured against unauthorized access. Manhole risers shall be joined to the tank top and sealed in accordance with Paragraphs (a)(14) and (b)(4) of this Rule.

(6) All pump tanks shall bear an imprint identifying the manufacturer, pump tank serial number assigned by the Division of Environmental Health, and the liquid or working capacity of the tank. The imprint shall be located to the left of the outlet blockout. All tanks shall also be permanently marked with the date of manufacture adjacent to the tank imprint or on the top of the tank directly above the imprint.

(c) Plans for prefabricated tanks, risers and riser covers, other than those approved under Paragraph (a) or (b) of this Rule shall be approved on an individual basis as determined by the information furnished by the designer which indicates the tank, riser or riser cover will provide equivalent effectiveness as those designed in accordance with the provisions of Paragraphs (a) and (b) of this Rule.

(d) Tanks other than approved prefabricated tanks shall be constructed consistent with the provisions of this Rule except as follows:

(1) Cast-in-place concrete septic and pump tanks shall have a minimum wall thickness of six inches.

(2) Concrete block or brick masonry tanks shall have a minimum wall thickness of at least six inches when the design volume is less than 1,000 gallons and a minimum wall thickness of at least eight inches when the design volume is 1,000 gallons or more. All joints between masonry units shall be mortared using masonry cement mortar or equivalent. The joints shall have a nominal thickness of three-eighths inch. All concrete block masonry tanks shall have a minimum wall reinforcement of number three reinforcing bars on 20-inch centers, or equivalent. The maximum allowable reinforcement spacing in either direction shall be four feet. All block wall cores shall be filled with concrete with a minimum compressive strength of 3,000 pounds per square inch. All tanks constructed of block or brick shall be plastered on the inside with a 1:3 mix (one part cement, three parts sand) of Portland cement at least three-eighths inch thick or the equivalent using other approved waterproofing material.

(3) The bottom of the built-in-place tank shall be poured concrete with a minimum thickness of four inches. All built-in-place tanks shall be reinforced to satisfy the structural strength requirements of Paragraph (a)(9) of this Rule. Reinforcement shall be placed in both directions throughout the entire tank, including top, bottom, walls, and ends.

(e) Manufacturers of septic tanks, effluent filters, pump tanks, risers, and riser locators shall comply with the General Statutes, this Section, and Approval conditions. If the approved products or materials are found to be in non-compliance, the Operation Permit shall not be issued or shall be denied. The State shall suspend or revoke the product approval upon a finding that the information submitted is falsified, the product has been subsequently altered, or subsequent experience with the product results in altered conclusions about its design or performance. Suspension or revocation of the product approval shall not affect systems previously installed pursuant to the approval.

History Note: *Authority G.S. 130A-335 (e)(f)f1)[2nd];*
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Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1955 DESIGN INSTALLATION CRITERIA FOR CONVENTIONAL SEWAGE SYSTEMS

(a) Conventional septic tank systems shall utilize a septic tank of approved construction with an approved effluent filter and support case, access devices, and design volume which provides primary treatment of the sewage in accordance with the provisions of these Rules. The effluent filter support case shall be solvent welded to a PVC Schedule 40 outlet pipe with a minimum diameter of three inches inserted through the outlet connective sleeve creating a watertight and mechanically sound joint and shall extend at least 24 inches beyond the tank outlet. The filter and support case shall be installed and maintained in accordance with the filter manufacturer's specifications. The effluent filter shall be accessible without the operator entering the septic tank and removable by hand. The effluent filter shall be secured in the support case and located under the outlet access opening or manhole. When the top of the septic tank or access manhole is installed below finished grade, the location of each access opening or manhole shall be visibly marked at finished grade. The visible marker(s) shall be located over or within a five foot radius of each access opening or manhole. The marker(s) shall be identified as a septic tank locator. When not placed over each access opening or manhole, the marker(s) shall indicate location of tank access opening(s) or manhole(s). The filtered effluent from the septic tank shall be conveyed to an approved nitrification line where the soil provides for final treatment and disposal of the sewage.

(b) Table II shall be used in determining the maximum long-term acceptance rate for septic tank systems of conventional trench design. The long-term acceptance rate shall be based on the most hydraulically limiting naturally occurring soil horizon within three feet of the ground surface or to a depth of one foot below trench bottom, whichever is deeper.

TABLE II

SOIL GROUP	SOIL TEXTURE CLASSES (USDA CLASSIFICATION)		LONG-TERM ACCEPTANCE RATE gpd/ft2
I	Sands (With S or PS structure and clay mineralogy)	Sand Loamy Sand	1.2 - 0.8
II	Coarse Loams (With S or PS structure and clay mineralogy)	Sandy Loam Loam	0.8 - 0.6
III	Fine Loams (With S or PS structure and clay mineralogy)	Sandy Clay Loam Silt Loam Clay Loam Silty Clay Loam Silt	0.6 - 0.3
IV	Clays (With S or PS structure and clay mineralogy)	Sandy Clay Silty Clay Clay	0.4 - 0.1

The long-term acceptance rate shall not exceed the mean rate for the applicable soil group for food service facilities, meat markets, and other places of business where accumulation of grease can cause premature failure of a soil absorption system. Long-term acceptance rates up to the maximum for the applicable soil group may be permitted for facilities where data from comparable facilities indicates that the grease and oil content of the effluent will be less than 30 mg/l and the chemical oxygen demand (COD) will be less than 500 mg/l.

(c) The design daily sewage flow shall be divided by the long-term acceptance rate to determine the minimum area of nitrification trench bottom. The total length of the nitrification line shall be determined by dividing the required area of nitrification trench bottom by the trench width, not to exceed 36 inches. Trenches shall be located not less than three times the trench width on centers with a minimum spacing of five feet on centers.

(d) The local health department may permit the use of a bed system on sites where the soil texture can be classified into either Soil Groups I, II, or III, meeting the other requirements of this Section, and only on lots which are limited by topography, space, or other site-planning considerations. In such cases, the number of square feet of bottom area needed shall be increased by 50 percent over what would be required for a trench system. Nitrification lines shall be at least 18 inches from the side of the bed and shall have lines on three-foot centers. When the design daily flow exceeds 600 gallons per day, bed systems shall not be used.

(e) The pipe or tubing used between the septic tank and the nitrification line shall be a minimum of three-inch nominal size Schedule 40 polyvinyl chloride (PVC), polyethylene (PE), or acrylonitrile-butadiene-styrene (ABS) or equivalent with a minimum fall of one-eighth inch per foot. However, three-inch or greater nonperforated polyethylene (PE) corrugated tubing may be substituted for Schedule 40 pipe between a distribution device and the nitrification line if the following conditions are met:

(1) the trench has a minimum bottom width of one foot;
(2) the trench bed is compacted, smooth, and at a uniform grade;
(3) the pipe is placed in the middle of the trench with a minimum of three inches of clearance between the pipe and the trench walls;
(4) washed stone or washed gravel envelope is placed in the trench on both sides of the pipe and up to a point at least two inches above the top of the pipe;
(5) a minimum of six inches of soil cover is placed and compacted over the stone or gravel envelope; and
(6) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the trench separating the trench from the distribution device and the nitrification line.

All joints from the septic tank to the nitrification line shall be watertight.

(f) When four or six-inch diameter corrugated plastic tubing is used for nitrification lines, it shall be certified as complying with ASTM F 405, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings, which is hereby adopted by reference in accordance with G.S. 150B-21.6. The corrugated tubing shall have three rows of holes, each hole between one-half inch and three-fourths 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 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 nitrification lines provided the pipe satisfies the requirements of this Section for hole size and spacing and the pipe has a stiffness equivalent to corrugated polyethylene tubing (ASTM F-405) or stronger. The nitrification line shall be located in the center of the nitrification trench.

(g) Nitrification trenches shall be constructed as level as possible but in no case shall the fall in a single trench bottom exceed one-fourth inch in 10 feet as determined by an engineer's level or equivalent. When surface slopes are greater than two percent, the bottom of the nitrification trenches shall follow the contour of the ground. An engineer's level or equivalent shall be used for installation and inspection. The nitrification trench shall not exceed a width of three feet and a depth of three feet, except as approved by the local health department.

(h) Rock used in soil absorption systems shall be clean, washed gravel or crushed stone and graded or sized in accordance with size numbers 3, 4, 5, 57, or 6 of ASTM D-448 (standard sizes of coarse aggregate) which is hereby adopted by reference in accordance with G.S.150B-21.6. Copies may be inspected in, and copies obtained from the Division of Environmental Health, P.O. Box 27687, Raleigh, North Carolina 27611-7687. The rock shall be placed a minimum of one foot deep with at least six inches below the pipe and two inches over the pipe and distributed uniformly across the trench bottom and over the pipe.

(i) The soil cover over the nitrification field shall be to a depth of at least six inches. The finished grade over the nitrification field shall be landscaped to prevent the ponding of surface water and runoff of surface water shall be diverted away from the nitrification field. Soil cover above the original grade shall be placed at a uniform depth over the entire nitrification field, except as required to prevent the ponding of surface water, and shall extend laterally five feet beyond the nitrification trench. The soil cover shall be placed over a nitrification field only after proper preparation of the original ground surface. The type of soil cover and placement shall be approved by the local health department.

(j) Effluent distribution devices, including distribution boxes, flow dividers, and flow diversion devices, shall be of sound construction, watertight, not subject to excessive corrosion, and of adequate design as approved by the local health department. Effluent distribution devices shall be separated from the septic tank and nitrification lines by a minimum of two feet of undisturbed or compacted soil and shall be placed level on a solid foundation of soil or concrete to prevent differential settlement of the device. The installer shall demonstrate that the distribution devices perform as designed.

(k) Grease traps or grease interceptors shall be required at food service facilities, meat markets, and other places of business where the accumulation of grease can cause premature failure of a soil absorption system. The following design criteria shall be met:

(1) The grease trap shall be plumbed to receive all wastes associated with food handling and no toilet wastes;

(2) The grease trap liquid capacity shall be sufficient to provide for at least five gallons of storage per meal served per day, or at least two-thirds of the required septic tank liquid capacity, or a capacity as determined in accordance with the following:

$$LC = D \times GL \times ST \times HR/2 \times LF$$

where LC = grease trap liquid capacity (gallons)
D = number of seats in dining area
GL = gallons of wastewater per meal (1.5 single-service; 2.5 full service)
ST = storage capacity factor = 2.5
HR = number of hours open
LF = loading factor = (1.25 interstate highway
= 1.0 other highways and recreational areas
= 0.8 secondary roads)

(3) Two or more chambers must be provided, with total length-to-width ratio at least 2:1. Chamber opening and outlet sanitary tee must extend down at least 50 percent of the liquid depth.

(4) Access manholes, with a minimum diameter of 24 inches, shall be provided over each chamber and sanitary tee. The access manholes shall extend at least to finished grade and be designed and maintained to prevent

surface water infiltration. The manholes shall also have readily removable covers to facilitate inspection, filter maintenance, and grease removal.

(5) One tank or multiple tanks, in series, shall be constructed in accordance with Rules .1952, .1953, and .1954 of this Section, and the provisions of Paragraphs (k)(3) and (k)(4) of this Rule.

(6) Where it has been demonstrated that specially designed grease interceptors will provide improved performance, the grease trap liquid capacity may be reduced by up to 50 percent.

(l) Stepdowns or drop boxes may be used where it is determined by the local health department that topography prohibits the placement of nitrification trenches on level grade. Stepdowns shall be constructed of two linear feet of undisturbed soil and constructed to a height which fully utilizes the upstream nitrification trench. Effluent shall be conveyed over the stepdown through nonperforated pipe or tubing and backfilled with compacted soil. Drop boxes shall be 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 top of the trench outlet laterals, which allow effluent to move to the nitrification lines, shall be two inches below the invert of the outlet supply line. Area taken up by stepdowns and drop boxes shall not be included as part of the minimum area required for nitrification trench bottoms.

(m) Nitrification trenches shall be installed with at least one foot of naturally occurring soil between the trench bottom and saprolite, rock, or any soil horizon unsuitable as to structure, clay mineralogy or wetness. If the separation between the bottom of the nitrification trench and any soil wetness condition is less than 18 inches, and if more than six inches of this separation consists of Group I soils, a low pressure pipe system shall be required.

(n) If sewage effluent pumps are used, the applicable requirements of Rule .1952 of this Section shall apply.

(o) Collection sewers shall be designed and constructed in accordance with the following minimum criteria:

(1) Building drains and building sewers shall be in accordance with the state plumbing code and approved by the local building inspector.

(2) Pipe material shall be specified to comply with the applicable ASTM standards, with methods of joining and other special installation procedures specified which are appropriate for the pipe to be used.

(3) Gravity sewers shall be designed to maintain scour velocities of at least two feet per second with the pipe half full and a minimum of one foot per second at the peak projected instantaneous flow rate. Force mains shall be sized to obtain at least a two-foot per second scour velocity at the projected pump operating flow rate.

(4) Infiltration and exfiltration shall not exceed 100 gallons per day per inch diameter per mile of gravity sewer pipe or 20 gallons per day per inch diameter per mile of pressure pipe in force mains and supply lines.

(5) Three-foot minimum cover shall be provided for all sewers unless ferrous material pipe is specified. Ferrous material pipe or other pipe with proper bedding to develop design-supporting strength shall be provided where sewers are subject to traffic-bearing loads.

(6) Manholes shall be used for sewers at any bends, junctions, and at least 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.

(7) 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. When used, cleanouts are required at least every 50 feet for four-inch sewers and every 100 feet for six-inch sewers and at all junctions and bends which exceed 45 degrees.

(8) Additional ventilation provisions may be required for collection sewers. Air relief valves shall be provided as needed for force mains.

(p) Alternating dual field nitrification systems may be utilized where soils are limited by high clogging potentials (Soil Groups III and IV) and where the potential for malfunction and need for immediate repair is required. Alternating dual nitrification fields shall be designed with two complete nitrification fields, each sized a minimum of 75 percent of the total area required for a single field and separated by an effluent flow diversion valve. The diversion valve shall be constructed to resist 500 pounds crushing strength, structurally sound, and shall be resistant to corrosion. Valves placed below ground level shall be provided with a valve box and suitable valve stem so that they may be operated from the ground surface.

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15A NCAC 18A .1956 MODIFICATIONS TO SEPTIC TANK SYSTEMS

The following are modifications to septic tank systems or sites which may be utilized singly or in combination to overcome selected soil and site limitations. Except as required in this Rule, the provisions for design and installation of Rule .1955 of this Section shall apply:

(1) SHALLOW SYSTEMS: Sites classified UNSUITABLE as to soil depth or soil wetness may be reclassified as PROVISIONALLY SUITABLE with respect to soil depth or soil wetness conditions by utilizing shallow placement of nitrification trenches in the naturally occurring soil. Shallow trenches may be used where at least 24 inches of naturally occurring soil are present above saprolite, rock, or soil wetness conditions and all other factors are PROVISIONALLY SUITABLE or SUITABLE. Shallow trenches shall be designed and constructed to meet the vertical separation requirements in Rule .1955(m) of this Section. The long-term acceptance rate shall be based on the most hydraulically limiting naturally occurring soil horizon within 24 inches of the ground surface or to a depth of one foot below the trench bottom, whichever is deeper. Soil cover above the original grade shall be placed at a uniform depth over the entire nitrification field and shall extend laterally five feet beyond the nitrification trench. The soil cover shall be placed over a nitrification field only after proper preparation of the original ground surface. The type and placement of soil cover shall be approved by the local health department.

(2) DRAINAGE AND RESTRICTIVE HORIZONS: Sites classified UNSUITABLE as to soil wetness conditions or restrictive horizons may be reclassified PROVISIONALLY SUITABLE as to soil wetness conditions or restrictive horizons when:

(a) Soils are Soil Groups I or II with SUITABLE structure, and clay mineralogy;

(b) Restrictive horizons, if present, are less than three inches thick or less than 12 inches from the soil surface;

(c) Modifications can be made to meet the requirements in Rule .1955(m) of this Section for the separation between the water table and the bottom of the nitrification trench at all times and when provisions are made for maintenance of the drainage systems;

(d) Easements are recorded and have adequate width for egress and ingress for maintenance of drainage systems serving two or more lots;

(e) Maintenance of the drainage system is made a condition of any permit issued for the use or operation of a sanitary sewage system; and

(f) Drainage may be used in other types of soil when the requirements of Rule .1948(d) in this Section are met.

(3) GRAVELLESS TRENCHES: Modified nitrification trenches or lines, including large diameter pipe (greater than four inches I.D.), and specially designed porous block systems may be permitted by the local health department.

(a) Gravelless nitrification trench systems may be substituted for conventional trench systems on any site found to be suitable or provisionally suitable in accordance with Rules .1940 to .1948 of this Section to eliminate the need for gravel, minimize site disturbance, or for other site planning considerations. Gravelless nitrification trench systems shall not be used, however, where wastes contain high amounts of grease and oil, such as restaurants.

(i) Large diameter pipe systems shall consist of eight-inch or 10-inch (inside diameter), corrugated, polythylene tubing encased in a nylon, polyester, or nylon/polyester blend filter wrap installed in a nitrification trench, 12 or more inches wide and backfilled with soil classified as soil group I, II, or III. Nitrification area requirement shall be determined in accordance with Rules .1955(b) and .1955(c), or in Rule .1956(6)(b), Table III of this Section, when applicable, with eight-inch tubing considered equivalent to a two-foot-wide conventional trench and 10-inch tubing considered equivalent to a two and one-half-foot-wide conventional trench. The long-term acceptance rate shall not exceed 0.8 gallons per day per square foot. Tubing and fittings shall comply with the requirements of ASTM F-667, which is hereby incorporated by reference including any subsequent amendments and editions. Copies of the standards may be inspected in and copies obtained from the Divison of Environmental Health, P.O. Box 27687, Raleigh, NC 27611-7687 at no cost. The corrugated tubing shall have two rows of holes, each hole between three-eighths 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. The tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes. Filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the following minimum requirements:

Unit Weight:	Oz/yd2= 1.0
Sheet Grab Tensile:	MD - 23 lbs.
Trapezoid Tear:	MD - 6.2 lbs.
XD - 5.1 lbs.	
Mullen Burst:	PSI = 40
KPa = 276	

Frazier Air Perm, CFM/ft] 0.5 "H2O: 500"

Corrugated Tubing shall be covered with filter wrap at the factory and each joint shall be immediately encased in a black polyethylene sleeve which shall continue to encase the large diameter pipe and wrap until just prior to installation in the trench. Large diameter pipe systems shall be installed in accordance with this Rule and the manufacturer's guidelines. The trench bottom and pipe shall be level (with a maximum fall of one inch in 100 feet). Filter wrap encasing the tubing shall not be exposed to sunlight (ultraviolet radiation) for extended periods. Rocks and large soil clumps shall be removed from backfill material prior to being used. Clayey soils (soil group IV) shall not be used for backfill. The near end of the large diameter pipe shall have an eight-inch by four-inch offset adaptor (small end opening at top) suitable for receiving the pipe from the septic tank or distribution device and making a mechanical joint in the nitrification trench.

(ii) A Prefabricated, Permeable Block Panel System (PPBPS), untilizing both horizontal and vertical air chambers and special construction to promote downline and horizontal distribution of effluent, may be used under the following conditions:

(A) the soil and site criteria of this Section shall be met;

(B) in calculating the required linear footage for a PPBPS's nitrification field, the linear footage for the nitrification line as determined in Rule .1955 (b) and (c), or in Rule .1956 (6)(b), Table III of this Section when applicable, shall be multiplied by 0.5 for a 16 inch PPBPS;

(C) installation of the PPBPS shall be in accordance with these Rules except:

(I) the PPBPS trench shall be located not less than eight feet on centers;

(II) the installation shall be in accordance with the manufacturer's specifications; and

(III) the sidewalls of nitrification trenches placed in Group IV soils shall be raked to open pores which were damaged or sealed during excavation;

(D) where design sewage flow is more than 480 gallons per day, the system shall be pressure-dosed; and

(E) the long-term acceptance rate shall not exceed 0.8 gallons per day per square foot.

(b) Other types of nitrification trenches or lines may be approved by the local health department on a site-specific basis in accordance with Rule .1969 of this Section.

(4) INTERCEPTOR DRAINS: Sites classified as UNSUITABLE as to soil wetness conditions because of the presence of lateral water movement may be reclassified PROVISIONALLY SUITABLE as to soil wetness conditions when such water is intercepted and diverted to prevent saturation of the soil absorption system.

(5) STEEP SLOPES: Stable slopes greater than 30 percent may be reclassified as PROVISIONALLY SUITABLE when:

(a) The soil characteristics can be classified as SUITABLE or PROVISIONALLY SUITABLE to a depth of at least one foot below the bottom of the nitrification trench at the upslope side of the trench;

(b) Surface water runoff is diverted around the nitrification field if necessary to prevent scouring or erosion of the soil over the field; and

(c) The finished grade over the nitrification field site is returned to the original topography and adequately seeded, unless otherwise specified by the local health department.

(6) SAPROLITE SYSTEM: Sites classified UNSUITABLE as to soil depth, with saprolite present, may be reclassified PROVISIONALLY SUITABLE as to soil depth when the provisions of this Paragraph are met.

(a) An investigation of the site using pits at locations specified by the local health department shall be conducted. The following physical properties and characteristics shall be present in the two feet of saprolite below the proposed trench bottom:

(i) the saprolite texture shall be sand, loamy sand, sandy loam, loam, or silt loam;

(ii) clay mineralogy shall be suitable;

(iii) greater than two-thirds of the material shall have a moist consistence of loose, very friable, friable, or firm;

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

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

(vi) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock to a depth of two feet below the proposed trench bottom.

(b) Table III shall be used in determining the long-term acceptance rate for septic tank systems installed pursuant to Paragraph (6) of this Rule. The long-term acceptance rate shall be based on the most hydraulically limiting, naturally occurring saprolite to a depth of two feet below trench bottom.

TABLE III

SAPROLITE GROUP	SAPROLITE TEXTURAL CLASSES		LONG-TERM ACCEPTANCE RATE gpd/ft^2
I	Sands	Sand	0.8 - 0.6
		Loamy Sand	0.7 - 0.5
II	Loams	Sandy Loam	0.6 - 0.4
		Loam	0.4 - 0.2
		Silt Loam	0.3 - 0.1

If a low pressure pipe system is used, the long term acceptance rate in Table III shall be reduced by one-half and the system shall be designed in accordance with Rule .1957(a) of this Section, except that Rule .1957 (a)(2)(B) and Rule .1957(a)(3) shall not apply. Saprolite textural classifications shall be determined from disturbed materials and determined by Rule .1941(a)(1) of this Section. Low-pressure distribution shall be used when the total length of nitrification lines exceeds 750 feet in a single system.

(c) The design daily flow shall not exceed 1000 gallons.

(d) The nitrification field shall be constructed using nitrification trenches with a maximum width of three feet and a maximum depth of three feet on the downslope side of the nitrification trench. The bottom of a nitrification trench shall be a minimum of two feet above rock or saprolite that does not meet the requirements of Subparagraph (6)(a) of this Rule. However, where SUITABLE or PROVISIONALLY SUITABLE soil underlies the trench bottom, this separation distance may be reduced by subtracting the actual soil depth beneath the trench bottom from 24 inches to establish the minimum separation distance from the trench bottom to rock.

(e) The bottom of any nitrification trench shall be a minimum of two feet above any wetness condition.

(f) Surface and subsurface interceptor drains shall be required on sites with more slowly permeable horizons above the usable saprolite to intercept laterally flowing waters or perched waters.

(g) Exceptions to the provisions of Rule .1950(a) found in Rule .1950 and .1951 of this Section shall not apply to systems installed pursuant to this Paragraph [Rule .1956(6)].

(h) Other saprolite systems may be approved on a site-specific basis in accordance with Rule .1948(d) of this Section.

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

Eff. July 1, 1982;
Amended Eff. November 1, 1999; July 1, 1995; April 1, 1993; January 1, 1990; August 1, 1988.

15A NCAC 18A .1957 DESIGN CRITERIA FOR DESIGN OF ALTERNATIVE SEWAGE SYSTEMS

(a) LOW-PRESSURE PIPE SYSTEMS: Low-pressure pipe (LPP) systems with a two to five-foot pressure head maybe utilized on sites which are SUITABLE or PROVISIONALLY SUITABLE for conventional or modified systems and on sites where soil and site conditions prohibit the installation of a conventional or modified septic tank system if the requirements of this Paragraph are met.

(1) The LPP system shall consist of the following basic components:
   (A) a network of small-diameter (one to two inches) perforated PVC 160 psi pipe or equivalent placed in naturally occurring soil at shallow depths (generally 12 to 18 inches) in narrow trenches not less than eight inches in width and spaced not less than five feet on center. Trenches shall include at least five inches of washed stone or washed gravel below the pipe and two inches above the pipe; and four inches of soil cover.
   (B) a properly designed, two-compartment septic tank or other approved pretreatment system, and a pumping or dosing tank;
   (C) a watertight supply manifold pipe, of Schedule 40 PVC or equivalent, for conveying effluent from the dosing chamber to the low-pressure network.

(2) The soil and site criteria for LPP systems shall meet the following minimum requirements:
   (A) LPP nitrification fields shall not be installed on slopes in excess of ten percent unless special design procedures to assure proper distribution of effluent over the nitrification field are approved. Landscaping of the LPP distribution field shall be constructed to shed rainwater or runoff. All other requirements of Rule .1940 of this Section shall be met.
   (B) Site suitability for an LPP system shall be based on the first 24 inches of soil beneath the naturally occurring soil surface. This 24 inches shall consist of SUITABLE or PROVISIONALLY SUITABLE soil as determined in accordance with Rules .1941 through .1944 and .1956 of this Section.
   (C) Location of the septic tank, other approved pretreatment unit, pumping or dosing chamber, and nitrification field shall be in accordance with Rule .1950 of this Section. Horizontal distances from the nitrification field shall be measured from a margin two and one-half feet beyond the lateral and manifold pipes.
   (D) There shall be no soil disturbance of the site or repair area for an LPP system except the minimum required for installation.
   (E) The available space requirements of Rule .1945 of this Section shall apply.

(3) Table IV shall be used in determining the long-term acceptance rate for LPP systems. The long-term acceptance rate shall be based on the most hydraulically limiting, naturally occurring soil horizon within two feet of the ground surface or to a depth of one foot below the trench bottom, whichever is deeper.

TABLE IV

SOIL GROUP	SOIL TEXTURAL CLASSES (USDA CLASSIFICATION)		LONG-TERM ACCEPTANCE RATE gpd/ft^2
I	Sands (With S or PS structure and clay mineralogy)	Sand Loamy Sand	0.6 - 0.4
II	Coarse Loams (With S or PS structure and clay mineralogy)	Sandy Loam Loam	0.4 - 0.3

III	Fine Loams (With S or PS structure and clay mineralogy)	Sandy Clay Loam Silt Loam Clay Loam Silty Clay Loam Silt	0.3 - 0.15
IV	Clays (with S or PS structure and clay mineralogy)	Sandy Clay Silty Clay Clay	0.2 - 0.05

The long-term acceptance rate shall not exceed the mean rate for the applicable soil group for food service facilities, meat markets, and other places of business where accumulation of grease can cause premature failure of a soil absorption system. Long-term acceptance rates up to the maximum for the applicable soil group may be permitted for facilities where data from comparable facilities indicates that the grease and oil content of the effluent will be less than 30 mg/l and the chemical oxygen demand (COD) will be less than 500 mg/l.

(4) In calculating the number of square feet for the nitrification field, the design sewage flow shall be divided by the long-term acceptance rate from Table IV. In calculating the minimum length of trenches in the LPP system, the total square footage of the nitrification field shall be divided by five feet.

(5) Low-pressure systems shall be designed for uniform distribution of effluent. The trenches shall be level and parallel to the ground elevation contours.

(A) The maximum lateral length shall yield no more than a ten-percent difference in discharge rate between the first and last hole along the lateral.

(B) Minimum hole size shall be 5/32-inch for at least two-thirds of the field lateral lines. Smaller holes (no less than 1/8-inch) may be used in no more than one-third of the lateral lines where necessary to balance flow distribution on sloping sites. However, for systems serving restaurants, foodstands, meat markets and other establishments where effluent is expected to have a high clogging potential, the minimum hole size shall be 5/32-inch.

(C) Maximum hole spacing shall be as follows: Soil Group I, five feet; Soil Group II, six feet; Soil Group III, eight feet; and Soil Group IV, ten feet.

(D) The following design provisions are required for sloping sites:

(i) Separately valved manifolds are required for all subfield segments where the elevation difference between the highest and lowest laterals exceeds three feet.

(ii) The hole spacing, hole size or both shall be adjusted to compensate for relative head 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. The lateral network shall be designed to achieve a ten 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.

(iii) Maximum elevation difference between the highest and lowest laterals in a field shall not exceed ten feet unless the flow is hydraulically split between subfield segments without requiring simultaneous adjustment of multiple valves.

(E) Turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or equivalent, and protected with sleeves of larger diameter pipe (six inches or greater). Turn-ups and sleeves shall be cut off and capped at or above the ground surface, designed to be protected from damage, and easily accessible.

(F) The supply manifold shall be sized large enough relative to the size and number of laterals served so that friction losses and differential entry losses along the manifold do not result in more than a 15 percent variation in discharge rate between the first and last laterals.

(i) 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.

(ii) The reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees.

(iii) Cleanouts to the ground surface shall be installed at the ends of the supply manifold.

(G) Gate valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length. Valves shall be readily accessible from the ground surface and adequately protected in valve boxes.

(6) Septic tanks, pump tanks, pump dosing systems, siphons, and siphon dosing tanks shall be provided in accordance with Rule .1952 of this Section.

(A) Design flow rate shall be based upon delivering two feet to five feet of static pressure head at the distal end of all lateral lines.

(B) Dose volume shall be between five and ten 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.

(b) FILL SYSTEM: A fill system (including new and existing fill) is a system in which all or part of the nitrification trench(es) is installed in fill material. A fill system, including an existing fill site, may be approved where soil and site conditions prohibit the installation of a conventional or modified septic tank system if the requirements of this Paragraph are met.

(1) Fill systems may be installed on sites where at least the first 18 inches below the naturally occurring soil surface consists of soil that is suitable or provisionally suitable with respect to soil structure and clay mineralogy, and where organic soils, restrictive horizons, saprolite or rock are not encountered. Further, no soil wetness condition shall exist within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system shall not be used to meet this requirement. Fill systems shall not be utilized on designated wetlands unless the proposed use is specifically approved in writing by the designating agency. The following requirements shall also be met:

(A) Nitrification trenches shall be installed with at least 24 inches separating the trench bottom and any soil horizon unsuitable as to soil structure, clay mineralogy, organic soil, rock or saprolite. However, if a low pressure pipe system is used, the minimum separation distance shall be 18 inches.

(B) Nitrification trenches shall be installed with at least 18 inches separating the trench bottom and any soil wetness condition. This separation requirement for soil wetness conditions may be met with the use of a groundwater lowering system only in Soil Groups I and II, with suitable structure and clay mineralogy. However, if a low pressure pipe system is used, the minimum separation distance shall be 12 inches.

(C) Systems shall be installed only on sites with uniform slopes less than 15 percent. Storm water diversions and subsurface interceptor drains or swales may be required upslope of the system.

(D) The long-term acceptance rate shall be based on the most hydraulically limiting soil horizon within 18 inches of the naturally occurring soil surface or to a depth one foot below the trench bottom, whichever is deeper. The lowest long-term acceptance rate for the applicable soil group shall be used for systems installed pursuant to this Rule. However, the long-term acceptance rate shall not exceed 1.0 gallons per day per square foot for gravity distribution or 0.5 gallons per day per square foot for low-pressure pipe systems installed on sites with at least 18 inches of Group I soils below the naturally occurring soil surface or to a depth of one foot below the trench bottom, whichever is deeper.

(E) If the fill system uses low-pressure pipe distribution, all the requirements of Paragraph (a) of this Rule, except Paragraph (a)(2)(B), shall apply. Systems with a design daily flow greater than 480 gallons per day shall use low-pressure pipe distribution.

(F) Fill material shall have such soil texture to be classified as sand or loamy sand (Soil Group I) up to the top of the nitrification trenches. The final six inches of fill used to cover the system shall have a finer texture (such as Group II, III) for the establishment of a vegetative cover. Existing fill material shall have no more than ten percent by volume of fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments.

(G) Where fill material is added, the fill material and the existing soil shall be mixed to a depth of six inches below the interface. Heavy vegetative cover or organic litter shall be removed before the additional fill material is incorporated.

(H) The fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope.

(I) The side slope of the fill shall not exceed a rise to run ratio of 1:4. However, 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.

(J) The outside edge of the nitrification trench shall be located at least five feet horizontally from the top of the side slope.

(K) The fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover against erosion.

(L) The setback requirements shall be measured from the projected toe of the slope. However, if this setback cannot be met, the setback requirements shall be measured from a point five feet from the nearest edge of the nitrification trench if the following conditions are met:

(i) Slope of the site shall not exceed two percent;

(ii) The first 18 inches of soil beneath the naturally occurring soil surface shall consist of Group I soils;

(iii) The lot or tract of land was recorded on or before December 31, 1989; and

(iv) A condition is placed upon the Improvement Permit to require connection to a public or community sewage system within 90 days after such system is available for connection and after it is determined that 300 feet or less of sewer line is required for connection.

(M) The available space requirements of Rule .1945 of this Section shall apply.

(2) An existing fill site that does not meet the requirements of Paragraph (b)(1) of this Rule may be utilized for a sanitary sewage system if the following requirements are met:

(A) Substantiating data are provided by the lot owner (if not readily available to the local health department) indicating that the fill material was placed on the site prior to July 1, 1977.

(B) The fill material placed on the site prior to July 1, 1977 shall have such soil texture to be classified as sand or loamy sand (Group I) for a depth of at least 24 inches below the existing ground surface. This fill material shall have no more than ten percent by volume of fibrous organics, building rubble, or other debris. This fill shall not have discreet layers containing greater than 35 percent of shell fragments. However, if at least 24 inches of Group I fill material was in place prior to July 1, 1977, additional fill with soil texture classified as Group I may be added to meet the separation requirements of Paragraph (b)(2)(D) of this Rule.

(C) Soil wetness conditions, as determined by Rule .1942(a) in this Section, are 18 inches or greater below the ground surface of the fill placed on the lot prior to July 1, 1977. This requirement shall be met without the use of a groundwater lowering system.

(D) Low-pressure pipe distribution shall be used and shall meet all the requirements of Paragraph (a) of this Rule, except (a)(2)(B). The long-term acceptance rate shall not exceed 0.5 gallons per day per square foot. However, for existing fill sites with 48 inches of Group I soils, conventional nitrification trenches utilizing a maximum long-term acceptance rate of 1.0 gallons per day per square foot may be installed in lieu of low-pressure pipe systems. The minimum separation distance between the trench bottom and any soil wetness condition or any soil horizon unsuitable as to soil structure, clay mineralogy, organic soil, rock, or saprolite shall be 24 inches for low pressure pipe systems and 48 inches for conventional systems. This separation requirement may be met by adding additional Group I soil, but shall not be met with the use of a groundwater lowering system. Where fill is to be added, the requirements of Paragraphs (b)(1)(C), (F), (G), (H), (J), (K), of this Rule and the following requirements shall be met:

(i) The side slope of the fill shall not exceed a side slope ratio of 1:3, and;

(ii) The setback requirements shall be measured from the projected toe of the slope. However, if this setback cannot be met, the setback requirements shall be measured from a point five feet from the nearest edge of the nitrification trench if the following conditions are met:

(I) Slope of the site shall not exceed two percent;

(II) The lot or tract of land was recorded on or before December 31, 1989; and

(III) A condition is placed upon the Improvement Permit to require connection to a public or community sewage system within 90 days after such system is available for connection and after it is determined that 300 feet or less of sewer line is required for connection.

(E) The available space requirements of Rule .1945 of this Section shall apply.

(F) The design flow shall not exceed 480 gallons per day.

(3) Other fill systems may be approved by the local health department on a site-specific basis in accordance with Rule .1948(d) of this Section.

(c) Individual aerobic sewage treatment units (ATUs) shall be sited, designed, constructed and operated in accordance with this Rule to serve a design unit with a design flow rate of up to 1500 gallons per day, as determined in Rule .1949(a) or .1949(b) of this Section. ATUs shall not be used, however, where wastes contain high amounts of grease and oil, including restaurants and

food service facilities. The strength of the influent wastewater shall be similar to domestic sewage with Biological Oxygen Demand (BOD) and suspended solids not to exceed 300 parts per million. ATUs shall comply with the requirements of the National Sanitation Foundation (NSF) Standard 40 for Individual Aerobic Wastewater Treatment Plants and shall be classified as meeting Class I effluent quality. NSF Standard 40 for Individual Aerobic Wastewater Treatment Plants is hereby incorporated by reference including any subsequent amendments and editions. Copies of the standards may be inspected in and copies obtained from the Division of Environmental Health, P.O. Box 27687, Raleigh, N.C. 27611-7687 at no cost. ATUs shall bear the NSF mark and the NSF listed model number or shall bear the certification mark and listed model number of a third party certification program accredited by the American National Standards Institute (ANSI), pursuant to ANSI Policy and Procedures for Accreditation of Certification Programs to certify ATUs in accordance with NSF Standard Number 40. The ANSI Policy and Procedures for Accreditation of Certification Programs is hereby incorporated by reference including any subsequent amendments and editions. Copies of the standard may be inspected in and copies obtained from the Division of Environmental Health, P.O. Box 27687, Raleigh, N.C. 27611-7687 at no cost. ATUs shall only be permitted where the unit is to be operated and maintained by a certified wastewater treatment facility operator employed by or under contract to the county in which the unit is located, and in accordance with this Rule.

(1) ATUs shall be constructed and installed in accordance with the plans which have been approved by the Division of Environmental Health and shall comply with all requirements of this Rule. Procedures for plan review and approval shall be in accordance with Rule .1953 of this Section.

(2) The rated capacity of ATUs listed as complying with NSF Standard 40 shall not be less than the design daily flow as determined by Rule .1949(a) or .1949(b) of this Section.

(3) The following are minimum standards of design and construction of ATUs:

(A) Blockouts in concrete ATU inlet openings shall leave a concrete thickness not less than one inch in the plant wall. Inlet and outlet blockouts shall be made for a minimum of four inch pipe and a maximum of six inch pipe. No blockouts or openings shall be permitted below the liquid level of the ATU.

(B) The inlet into the ATU shall be a straight pipe.

(C) The invert of the outlet shall be at least two inches lower in elevation than the invert of the inlet.

(D) Interior baffle walls in concrete units shall be reinforced by the placing of six-inch by six-inch No. 10 gauge welded reinforcing wire. The reinforcing wire shall be bent to form an angle of 90 degrees on the ends in order to form a leg not less than four inches long. When the wire is placed in the mold, the four inch legs shall lay parallel with the side wall wire and adjacent to it.

(E) Access openings shall be provided in the ATU top. Access shall be provided for cleaning or rodding out the inlet pipe, for cleaning or clearing air or gas passage spaces, as an entrance for inserting the suction hose in compartments that are required to be pumped out, to allow for sampling the effluent, and for access to repair or maintain any system components requiring repair and maintenance. All access openings shall have risers sealed to the top of the ATU and extended at least to six inches above finished grade and designed and maintained to prevent surface water inflow. Rule .1950(i) of this Section shall also be met.

(F) Concrete ATUs shall be constructed in accordance with Rule .1954(a)(9), (10), (11) and (12) and .1954(b)(4) of this Section.

(G) Fiberglass reinforced plastic ATUs shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on the unit walls.

(i) ATUs shall have the following minimum physical properties:

Ultimate tensile strength:	12,000 psi
Flexural strength:	19,000 psi
Flexural modulus of elasticity:	800,000 psi

(ii) A vacuum test shall be performed on at least one ATU of each model number by an independent testing laboratory, in accordance with ASTM D-4021, Standard Specification for Glass-Fiber Reinforced Polyester Underground Petroleum Storage Tanks, which is hereby incorporated by reference including any subsequent amendments and editions. Copies of the standards may be inspected in and copies obtained from the Division of Environmental Health, P.O. Box 27687, Raleigh, N.C. 27611-7687 at no cost. Unit must withstand negative pressure of 2.5 pounds per square inch (69.3 inches of water) without

leakage or failure. Test results shall be included with the specifications that are provided to the state for approval.

(iii) Composition of the finished unit shall be at least 30 percent fiberglass reinforcement by weight. Minimum wall thickness shall be one-fourth inch. However, a wall thickness of not less than three-sixteenth inch may be allowed in small, isolated areas of the ATU.

(iv) Interior and exterior surfaces shall have no exposed fibers or projections, no blisters larger than one-fourth inch in diameter, and no pores or indentations deeper than one-sixteenth inch. The tank shall be watertight.

(H) Prefabricated ATUs other than precast reinforced concrete or fiberglass reinforced plastic units shall be approved on an individual basis based on information furnished by the designer which indicates the unit will provide effectiveness equivalent to reinforced concrete or fiberglass reinforced plastic units.

(I) ATUs shall bear an imprint identifying the manufacturer, serial number assigned to the manufacturer's plans and specifications approved by the Division of Environmental Health, and the liquid or working capacity of the unit. The imprint shall be located to the right of the blockout or opening made for the outlet pipe on the outside of the unit. ATUs shall also be permanently marked with the date of manufacture adjacent to the unit imprint or on the top of the unit directly above the imprint.

(J) The design, construction, and operation of ATUs shall prevent bypass of wastewater.

(K) Electrical circuits to the ATU shall be provided with manual circuit disconnects within a watertight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the ATU securely mounted at least 12 inches above the finished grade. Control panels provided by the manufacturer shall be installed in a watertight, corrosion-resistant enclosure (NEMA 4X or equivalent) adjacent to the unit or on the side of the facility readily visible from the unit and accessible by maintenance personnel. Conductors shall be conveyed to the disconnect enclosure and control panel through waterproof, gasproof, and corrosion-resistant conduits. Splices and wire junctions, if needed, shall be made outside the ATU in a watertight, corrosion-resistant enclosure (NEMA 4X or equivalent) securely mounted adjacent to the unit at least 12 inches above the finished grade. Wire grips, duct seal, or other suitable material shall be used to seal around wire and wire conduit openings inside the ATU and disconnect enclosure. The ATU shall have an alarm device or devices to warn the user or operator of a unit malfunction or a high water condition. The alarm shall be audible and visible by system users and securely mounted adjacent to the ATU, on the side of the facility in clear view of the unit, or inside the finished occupied space of the facility. If mounted outside, the alarm shall meet NEMA 4X standards or equivalent. The alarm circuit or circuits shall be supplied ahead of any ATU electrical control circuit overload and short circuit protective devices.

(4) A settling tank shall be required prior to an ATU serving a design unit with a design daily flow greater than 500 gallons, as determined in Rule .1949(a) or .1949(b) of this Section. The liquid capacity of the settling tank shall be at least equal to the design daily flow as determined in Rule .1949(a) or (b) of this Section. The settling tank may either be an approved prefabricated septic tank or another tank specially designed for a specific individual aerobic sewage treatment plant and approved by the Division of Environmental Health as a part of the plans for the plant.

(5) Ground absorption systems receiving effluent from approved ATUs may be used on sites classified as suitable or provisionally suitable for conventional, modified, or alternative systems in accordance with this Section. The following modifications to siting and design criteria shall be acceptable:

(A) The minimum horizontal setback requirements of Rule .1950(a) of this Section shall be met, except as follows:

(i)	Any private water supply source, except any uncased well or spring	50 feet.
(ii)	Streams classified as WS-I	70 feet.
(iii)	Waters classified as SA	70 feet.
(iv)	Other coastal waters not classified as SA	35 feet.
(v)	Any other stream, canal, marsh, or other surface waters	35 feet.
(vi)	Any Class I or Class II reservoir from normal pool elevation.	70 feet,
(vii)	Any permanent storm water retention pond from flood pool elevation.	35 feet,

(viii) Any other lake or pond 35 feet, from normal pool elevation.

(B) The requirements of Rules .1955(m), .1956(1), .1956(2), .1956(6), .1957(b)(1), and .1957(b)(2) of this Section shall be met, except as follows:

(i) A low-pressure pipe system shall not be required where the separation between the bottom of the nitrification trench and any soil wetness condition is at least 12 inches, but less than 18 inches, and more than six inches of this separation consists of Group I soils.

(ii) The restriction in Rule .1956(6)(a)(v) of this Section that saprolite be overlain by at least one foot of suitable or provisionally suitable naturally occurring soil shall not apply.

(iii) For new fill systems, a low pressure pipe system shall not be required in order for the minimum separation distance between the trench bottom and any unsuitable soil horizon, rock, or saprolite to be reduced to 18 inches.

(iv) For existing fill systems, the minimum separation requirements of Rule .1957(b)(2)(D) of this Section shall be reduced from 48 to 36 inches for conventional systems and from 24 to 18 inches for low-pressure pipe system.

(C) The maximum long-term acceptance rate shall be increased by 25 percent for any ground absorption system in soils which are Groups I or II with suitable structure and clay mineralogy. No other reductions in linear footage of nitrification trench or system area shall be applied, except where based on an adjusted design daily sewage flow rate granted in accordance with Rule .1949(c) of this Section.

(6) Prior to issuance of an Operation Permit for an ATU, the manufacturer or his licensed representative shall certify that the unit has been properly installed and a contract for operation and maintenance shall have been executed between the unit owner and the county in accordance with Rule .1961(b) of this Section. It shall be a condition of the Operation Permit that subsequent owners of an ATU execute such a contract.

The contract shall include the specific requirements for maintenance and operation, responsibilities for maintenance and operation, responsibilities of the owner and system operator, provisions that the contract shall be in effect for as long as the system is in use, and other requirements for the continued proper performance of the ATU.

A condition of the Operation Permit shall be that the unit continue to perform in accordance with Class I effluent quality requirements of the National Sanitation Foundation (NSF) Standard Number 40 effective on the date the improvement permit was issued.

(7) Performance monitoring shall be carried out by the operator.

(A) During each inspection, the operator shall confirm proper mechanical performance, conduct a visual check for unusual color, clogging, oily film, odors, foam, measure settleable aeration chamber solids, and ascertain the need for removing solids, backwash and cleaning of filters, and other maintenance activities. The ground absorption system shall also be inspected and an evaluation of performance shall be made. The operator shall take the necessary steps to assure that needed maintenance is carried out.

(B) Semi-annually, samples shall be collected by the system operator and analyzed by a state-approved wastewater testing laboratory of the effluent for Five-Day Biological Oxygen Demand, Suspended Solids, and pH. The aeration tank shall be sampled for mixed liquor suspended solids.

(C) Performance monitoring results shall be reported to the local health department and the state quarterly.

(D) Remedial action and additional sampling shall be required if monitoring results or inspection indicate that Class I effluent standards are not met.

History Note: *Authority G.S. 130A-335(e),(f); 130A-342;*
Eff. July 1, 1982;
Amended Eff. April 1, 1993; May 1, 1991; December 1, 1990; January 1, 1990.

15A NCAC 18A .1958 NON-GROUND ABSORPTION SEWAGE TREATMENT SYSTEMS

(a) Where an approved privy, an approved septic tank system, or a connection to an approved public or community sewage system is impossible or impractical, this Section shall not prohibit the state or local health department from permitting approved non-ground absorption treatment systems utilizing heat or other approved means for reducing the toilet contents to an inert or stabilized residue or to an otherwise harmless condition, rendering such contents noninfectious or noncontaminating. Alternative systems shall be designed to comply with the purposes and intent of this Section.

(b) Holding tanks shall not be considered as an acceptable sewage treatment and disposal system. An improvement permit shall not be issued for a sewage holding tank for any new construction. However, an Authorization to Construct may be issued for a holding tank for pumping and hauling of wastewater effluent to a wastewater system approved under this Section when the owner has provided a showing that a malfunctioning system cannot otherwise be repaired by connection to a system approved under this Section or to a system approved under the rules of the Environmental Management Commission. Pumping and hauling wastewater effluent shall be performed by a septage management firm permitted in accordance with G.S. 130A-291.1.
(c) Incinerating, composting, vault privies, and mechanical toilets shall be approved by the state agency or local health department only when all of the wastewater is handled by a system approved under this Section.
(d) Sewage recycling systems which discharge treated waste-water meeting the state drinking water standards may be used only for toilet flushing and recycled sewage shall not be used for body contact or human consumption. Such systems must be approved by the state or local health department.
(e) Chemical or portable toilets for human waste may be approved in accordance with G.S. 130A-335. Chemical or portable toilets shall have a watertight waste receptacle constructed of nonabsorbent, acid resistant, noncorrosive material.

History Note: *Authority G.S. 89C; 89E; 89F; 90A; 130A-335;*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. August 1, 1998.

15A NCAC 18A .1959 PRIVY CONSTRUCTION

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.

(1) The pit shall consist of an excavation at least 42 inches square and in no case shall the bottom of an excavation be closer than one foot from the seasonally high water table or rock.
(2) The pit shall be properly curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In tight soils, partial curbing is acceptable if it prevents caving.
(3) The privy floor slab shall be constructed of reinforced concrete. Where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction shall be acceptable provided the floor slab is made of rough sub-flooring and covered with tight tongue-and-groove flooring or other type flooring materials to provide strength and prevent entrance of flies and mosquitoes to the privy pit. Where wood construction is used, floors shall be anchored to at least four-inch by four-inch sills.
(4) Wood used for riser, seat assemblies, and the floor slab shall be tongue-and-groove or plywood (exterior or marine) material.
(5) Privies shall not be used for the disposal of water-carried sewage.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. December 1, 1990.

15A NCAC 18A .1960 MAINTENANCE OF PRIVIES

(a) Any person owning or controlling the property upon which a privy is located shall be responsible for these 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 earth.
(3) If the pit caves in, a new pit shall be provided.

(b) The tenant or person occupying the property shall be responsible for these requirements:
(1) The walls, floors, and seat of the privy and grounds immediately adjacent to the building shall be kept in a clean and decent condition.
(2) Fowl and other animals shall not be harbored in the privy building.

(3) Seat cover shall be hinged and closed at all times when the privy is not in use.
(4) Flies shall be excluded from the pit at all times.
(5) Ashes, garbage, and trash shall be kept out of the pit.

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1961 MAINTENANCE OF SEWAGE SYSTEMS

(a) Any person owning or controlling the property upon which a ground absorption sewage treatment and disposal system is installed shall be responsible for the following items regarding the maintenance of the system:

(1) Ground absorption sewage treatment and disposal systems shall be operated and maintained to prevent the following conditions:
   (A) a discharge of sewage or effluent to the surface of the ground, the surface waters, or directly into groundwater at any time; or
   (B) a back-up of sewage or effluent into the facility, building drains, collection system, or freeboard volume of the tanks; or
   (C) a free liquid surface within three inches of finished grade over the nitrification trench for two or more observations made not less than 24 hours apart. Observations shall be made greater than 24 hours after a rainfall event.

The system shall be considered to be malfunctioning when it fails to meet one or more of these requirements, 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 the conditions of Parts (A), (B), or (C) of this Paragraph. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued a notice of violation.

(2) Ground absorption sewage treatment and disposal systems shall be checked, and the contents of the septic tank removed, periodically from all compartments, to ensure proper operation of the system. The contents shall be pumped whenever the solids level is found to be more than 1/3 of the liquid depth in any compartment.

(b) System management in accordance with Tables V(a) and V(b) of this Rule shall be required for all systems installed or repaired after July 1, 1992. After July 1, 1992, system management in accordance with Tables V(a) and V(b) shall be required for all existing Type V and Type VI systems.

(c) No Improvement Permit or Construction Authorization shall be issued for Type IV, Type V, or Type VI systems, unless a management entity of the type specified in Table V(b) is specifically authorized, funded, and operational to carry out this management program in the service area where the proposed system is to be located.

(d) A local health department may be the public management entity only for systems classified Type IV, V(a) and V(b) and only when specifically authorized by resolution of the local board of health.

(e) A contract shall be executed between the system owner and a management entity prior to the issuance of an Operation Permit for a system required to be maintained by a public or private management entity, unless the system owner and certified operator are the same. The contract shall include the specific requirements for maintenance and operation, responsibilities of the owner and system operator, provisions that the contract shall be in effect for as long as the system is in use, and other requirements for the continued proper performance of the system. It shall also be a condition of the Operation Permit that subsequent owners of the system execute such a contract.

(f) Inspections of the system shall be performed by a management entity at the frequency specified in Table V(b). The management entity shall report the results of their inspections to the local health department at the specified reporting frequency. However, where inspections indicate the need for system repairs, the management entity shall notify the local health department within 48 hours in order to obtain a Construction Authorization for the repairs.

(g) The management entity shall be responsible for assuring routine maintenance procedures and monitoring requirements in accordance with the conditions of the Operation Permit and the contract.

(h) Sewage systems with multiple components shall be classified by their highest or most complex system type in accordance with Table V to determine local health department and management entity responsibilities.

(i) Sewage systems not identified in this Rule shall be classified by the Division of Environmental Health after consultation with the appropriate commission governing operators of pollution control facilities.

(j) The local health department shall routinely review the performance and operation reports submitted in accordance with Table V(b) of this Rule and shall perform an on-site inspection of the systems as required in Table V(a).

(k) The certified operator shall hold a valid and current certificate from the appropriate commission, and nothing in this Section shall preclude any requirements for system operators, in accordance with Article 3 of G.S. 90A.

TABLE V(a)

LOCAL HEALTH DEPARTMENT RESPONSIBILITIES

System Classification	System Description	Permits Required	Minimum System Review Frequency
Type I	a. Privy b. Chemical toilet c. Incinerating toilet d. Other toilet system e. Grease trap	Improvement Permit, Construction Authorization, and Operation Permit	N/A
Type II	a. Conventional septic system (single-family or 480 GPD or less) b. Conventional septic system with 750 linear feet of nitrification line or less c. Conventional system with shallow placement	Improvement Permit, Construction Authorization, and Operation Permit	N/A
Type III	a. Conventional septic system > 480 GPD (excluding single-family residence) b. Septic system with single effluent pump or siphon c. Gravity fill system d. Dual gravity field system e. PPBPS system, gravity dosed f. Large diameter pipe system g. Other non-conventional trench systems	Improvement Permit, Construction Authorization, and Operation Permit	5 yrs. (IIIb only)
Type IV	a. Any system with LPP distribution b. System with more than 1 pump or siphon	Improvement Permit, Construction Authorization, and Operation Permit	3 yrs.
Type V	a. Sand filter pretreatment system b. Any > 3,000-GPD septic tank system with a nitrification field designed for > 1500 GPD c. Aerobic Treatment Unit (ATU) d. Other mechanical, biological, or chemical pretreatment plant (< 3000 GPD)	Improvement Permit, Construction Authorization, and Operation Permit	12 mos.

Type VI	a. Any > 3,000 GPD system with mechanical, biological, or chemical pretreatment system plant b. Wastewater reuse/recycle	Improvement Permit, Construction Authorization, and Operation Permit	6 mos.

TABLE V(b)

MANAGEMENT ENTITY RESPONSIBILITIES

System Classification	Management Entity	Minimum System Inspection/Maintenance Frequency	Reporting Frequency
Type I	Owner	N/A	N/A
Type II	Owner	N/A	N/A
Type III	Owner	N/A	N/A
Type IV	Public Management Entity with a Certified Operator or a private Certified Operator	2/yr.	12 mos.
Type V	Public Management Entity With a Certified Operator or a private Certified Operator	a. 2/yr (0-1500 GPD) 4/yr (1500-3000 GPD) 12/yr (3000-10000 GPD) 1/wk (> 10000 GPD) b. 12/yr (3000-10000 GPD) 1/wk (> 10000 GPD) c. 4/yr. d. 12/yr.	6 mos.
Type VI	Public Management Entity With a Certified Operator	a. 1/wk(3000-10000 GPD) 2/wk(10000-25000 GPD) 3/wk(25000-50000 GPD) 5/wk(> 75000 GPD) b. 12/yr.	3 mos.

(l) A sewage collection, treatment, and disposal system that creates or has created a public health hazard or nuisance by surfacing of effluent or discharge directly into groundwater or surface waters, or that is partially or totally destroyed shall be repaired within 30 days of notification by the state or local health department unless the notification otherwise specifies a repair period in writing. If a system described in the preceding sentence has for any reason been disconnected, the system shall be repaired prior to reuse. The state or local health department shall use its best professional judgement in requiring repairs that will reasonably enable the system to function properly. If, for any reason, a sewage collection, treatment, and disposal system is found to be nonrepairable, or is no longer required, the system shall not be used, and may be required to have any contents removed, collapse any components and backfill, or otherwise secured as directed by the authorized agent to protect the public health and safety.

(m) When necessary to protect the public health, the state or local health department may require the owner or controller of a malfunctioning system to pump and haul sewage to an approved wastewater system during the time needed to repair the system.

History Note: *Filed as a Temporary Amendment Eff. July 3, 1991, for a period of 180 days to expire on December 30, 1991;*
Filed as a Temporary Amendment Eff. June 30, 1990, for a period of 180 days to expire on December 27, 1990;
Authority G.S. 130A-335(e),(f);
Eff. July 1, 1982;
Amended Eff. August 1, 1991; October 1, 1990; January 1, 1990; August 1, 1988;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. August 1, 1998.

15A NCAC 18A .1962 APPLICABILITY

The provisions of this Section shall not apply to properly functioning sewage collection, treatment, and disposal systems in use or for which a valid permit to install a system has been issued prior to July 1, 1977. This provision is applicable only where the sewage flow and sewage characteristics are unchanged. This provision does not affect the requirements for system operation, maintenance, and management in accordance with Rule .1961 of this Section.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; December 1, 1990.

15A NCAC 18A .1963 DISUSE OF SEWAGE SYSTEM

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Repealed Eff. August 1, 1988.

15A NCAC 18A .1964 INTERPRETATION AND TECHNICAL ASSISTANCE

(a) The provisions of this Section shall be interpreted, as applicable, in accordance with the recognized principles and practices of soil science, geology, engineering, and public health.
(b) The State will provide technical assistance. Local health departments may obtain technical information and assistance from appropriate personnel as may be needed for interpretation of this Section.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1965 APPEALS PROCEDURE

Appeals concerning the interpretation and enforcement of the rules in this Section shall be made in accordance with G.S. 150B and 10 NCAC 1B.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. February 1, 1987.

15A NCAC 18A .1966 SEVERABILITY

If any provision of these Rules or the application thereof to any person or circumstance is held invalid, the remainder of the rules or the application of such provisions to other persons or circumstances shall not be affected thereby.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982.

15A NCAC 18A .1967 INJUNCTIONS

A person who violates any rule of this Section is subject to the injunctive relief provisions of G.S. 130A-18.

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1985.

15A NCAC 18A .1968 PENALTIES

A person who violates any rule of this Section is subject to the penalty provisions contained in G.S. 130A-22(c) (Administrative Penalties), 130A-23 (Suspension and Revocation of Permits), and 130A-25 (Criminal Penalties).

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1985.

15A NCAC 18A .1969 APPROVAL AND PERMITTING OF ON-SITE SUBSURFACE WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

Experimental, controlled demonstration, innovative, and accepted wastewater systems (hereinafter referred to as E & I systems) are any wastewater systems, system components, or devices that are not specifically described in Rules .1955, .1956, .1957, or .1958 of this Section, including any system for which reductions are proposed in the minimum horizontal or vertical separation requirements or increases are proposed to the maximum long-term acceptance rates of this Section; or any E & I systems as defined by G.S. 130A-343(a) and approved pursuant to applicable Laws and this Rule. This Rule shall provide for the approval and permitting of E & I systems.

(1) An application shall be submitted in writing to the State for an E & I system. The application shall include the information required by G.S. 130A-343(e), (f), and (g), and the following, as applicable:
    (a) specification of the type of approval requested as either innovative, controlled demonstration, experimental, accepted or a combination;
    (b) description of the system, including materials used in construction, and its proposed use;
    (c) summary of pertinent literature, published research, and previous experience and performance with the system;
    (d) results of any available testing, research or monitoring of pilot systems or full-scale operational systems conducted by a third party research or testing organization;
    (e) identity and qualifications of any proposed research or testing organization and the principal investigators, and an affidavit certifying that the organization and principal investigators have no conflict of interest and do not stand to gain financially from the sale of the E & I system;
    (f) objectives, methodology, and duration of any proposed research or testing;
    (g) specification of the number of systems proposed to be installed, the criteria for site selection, and system monitoring and reporting procedures;
    (h) operation and maintenance procedures, system classification, proposed management entity and system operator;
    (i) procedure to address system malfunction and replacement or premature termination of any proposed research or testing;
    (j) notification of any proprietary or trade secret information, system, component, or device; and

(k) 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 Wastewater System Account or NC OSWW System Account, and mailed to the On-Site Wastewater Section, 1642 Mail Service Center, Raleigh, NC 27699-1642 or hand delivered to Rm. 1A-245, Parker Lincoln Building, 2728 Capital Blvd., Raleigh, NC.

(2) The State shall review all applications submitted and evaluate at least the following:

(a) the completeness of the application, and whether additional information is needed to continue the review;

(b) whether the system meets the standards of an innovative system under G.S. 130A-343(a)(5), G.S. 130A-343, and Item (3) of this Rule, or whether the system meets the standards of an experimental or controlled demonstration system under G.S. 130A-343(e) or (f) and Item (4) of this Rule, as applicable.

(3) INNOVATIVE SYSTEMS: Innovative systems, technologies, components, or devices shall be reviewed and approved by the State, and the local health department shall permit innovative systems in accordance with the following:

(a) The State shall approve the system as an innovative system if the following standards have been met;

(i) The system, shall have been demonstrated to perform equal or superior to a system, which is described in Rules .1955, .1956, .1957, or .1958, of this Section, based upon controlled pilot-scale research studies or statistically-valid monitoring of full-scale operational systems.

(ii) Materials used in construction shall be equal or superior in physical properties and chemical durability, compared to materials used for similar proposed systems, specifically described in Rules .1955, .1956, .1957, or .1958 of this Section.

(b) When a system is approved as innovative by the State, the applicant shall be notified in writing. Such notice shall include any conditions for permitting, siting, installation, use, monitoring, and operation.

(c) A local health department shall issue an Improvement Permit and a Construction Authorization for any innovative system approved by the State upon a finding that the provisions of this Section including any conditions of the approval are met. Use of an innovative system and any conditions shall be described on the Improvement Permit, Construction Authorization, or Operation Permit.

(4) EXPERIMENTAL AND CONTROLLED DEMONSTRATION SYSTEMS: A system may be approved for use as an experimental or controlled demonstration system as part of a research or testing program which has been approved by the State. The research or testing program shall be conducted by a third party research or testing organization which has knowledge and experience relevant to the proposed research or testing and has no conflict of interest and does not stand to gain financially from the sale of the proposed system.

(a) To be approved by the State, the proposed research or testing program shall include the following:

(i) The research program shall be designed such that, if the objectives were met, the system would satisfy the standards for approval as an innovative system under Item (3) of this Rule.

(ii) Research design and testing methodology shall have a reasonable likelihood of meeting the objectives.

(b) The State shall notify the applicant and the applicable local health departments when the proposed research or testing program has been approved for an experimental or controlled demonstration system. Such notice shall include, but not be limited to, conditions for permitting, siting, operation, monitoring and maintenance, and number of systems which can be installed.

(c) A local health department shall issue an Improvement Permit and Construction Authorization for an experimental or controlled demonstration system when the following conditions are met:

(i) There is an application for an Improvement Permit in accordance with Rule .1937(c) of this Section, with the proposed use of an experimental system specified.

(ii) The proposed site is included as part of an approved research or testing program and any conditions specified for use of the system have been met.

(iii) When an experimental or controlled demonstration system is proposed to serve a residence, place of business or place of public assembly, there shall be a repair area using a non-experimental or non-controlled demonstration backup system in accordance with the provisions of Rule .1945(b) or an accepted system of this Rule, except:

(A) When an existing and properly functioning wastewater system is available for immediate use, including connection to a public or community wastewater system; or

(B) When the experimental or controlled demonstration system is used as a repair to an existing malfunctioning system; or

(C) When for a controlled demonstration system sufficient available space shall be reserved for the installation of a replacement system at least equal to the initial controlled demonstration system, or the State or Local Health Department otherwise determines that the manufacturer can provide an acceptable alternative method for collection, treatment, and disposal of the wastewater.

(iv) When an experimental or controlled demonstration system is proposed to serve a residence, place of business or place of public assembly, there shall be a repair system in accordance with the provisions of Rule .1945(b) or an innovative or accepted system of this Rule, except:

(A) When an existing and properly functioning wastewater system is available for immediate use, including connection to a public or community wastewater system; or

(B) When the experimental or controlled demonstration 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 Controlled Demonstration Systems.

(iv) When an experimental or controlled demonstration system is proposed which shall not serve a residence, place of business, or place of public assembly, a repair area or backup system shall not be required.

(v) The application for an experimental system shall include statements that the property owner is aware of its experimental nature, that the local health department and State do not guarantee or warrant that these systems will function in a satisfactory manner for any period of time, and that use of the system may need to be discontinued if the system malfunctions and is found to be non-repairable, or if the proposed research or testing program is prematurely terminated. Such statements shall be signed by the owner.

(vi) The owner of the site on which an experimental system is proposed shall execute a easement granting rights of access to the system at reasonable hours for monitoring and evaluation to the research or testing organization. This easement shall specify that it is granted for the purposes of researching and testing an experimental wastewater system and shall remain valid as long as the system is to be part of the proposed research or testing program. The easement shall be recorded with the county register of deeds.

(vii) Provisions shall be made for operation and maintenance of the system.

(viii) Any special conditions required for the installation of the experimental or controlled demonstration system shall be specified in the Improvement Permit and the Construction Authorization. Use of an experimental or controlled demonstration system and any conditions shall be described on the Improvement Permit, Construction Authorization and any subsequent operation permits, with provisions for a repair area and backup system specified. A condition of the Improvement Permit and Construction Authorization shall be that the installation be under the direct field supervision of the research or testing organization.

(ix) The proposed Improvement Permit, Construction Authorization and any subsequent operation permits for experimental or controlled demonstration systems shall be reviewed by the State and found to be consistent with the approved research or testing program prior to issuance by the local health department.

(d) Upon completion of the installation and prior to use, an Experimental or Controlled Demonstration System Operation Permit (ESOP or CDSOP) shall be issued by the local health department. The ESOP (CDSOP) shall be valid for a specified period of time not to exceed five years. Special maintenance, monitoring and testing requirements shall be specified as permit conditions, in accordance with the approved research or testing program. Failure to carry out these conditions shall be grounds for permit suspension or revocation.

(e) Prior to expiration of the ESOP (CDSOP) and based upon satisfactory system performance as determined during the research or testing program, the local health department shall issue an Operation Permit. Premature termination of the research or testing program shall be grounds for ESOP (CDSOP) suspension or revocation.

(f) Upon completion of monitoring, research and testing, the research or testing organization shall prepare a final report including recommendations on future use of the system. If the State determines that the results indicate that the standards of Item (3) of this Rule are met, the State shall approve the use as an innovative system.

(g) Any proposed changes or modifications in the E & I system shall be submitted for review and approval by the State.

(5) The State may modify, suspend or revoke the approval of an E & I system as provided for in G.S. 130A-343(c).

(a) The E & I system approval shall be modified as necessary to comply with subsequent changes in Laws or Rules which affect their approval.

(b) The approval of an E & I system may be modified, suspended or revoked upon a finding as follows:

(i) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;

(ii) the system or component fails to perform in compliance with performance standards established for the system; or

(iii) the system or component or the E & I system applicant fails to comply with wastewater system Laws, Rules or conditions of the approval.

(6) Modification, suspension or revocation of an E & I System approval shall not affect systems previously installed pursuant to the approval.

(7) Reductions in total nitrification trench length allowed for E & I systems, as compared to the system sizing requirements delineated in Rule .1955 of this Section for conventional systems based upon excavated trench width, apply only to drainfields receiving septic tank effluent of domestic strength or better quality. The system may be used for facilities producing higher strength wastewater with nitrification trench length and trench bottom area determined based upon excavated trench width equal to what is required by Rule .1955 of this Section for a conventional gravel trench system, with no reduction or application of an equivalency factor. However, reductions up to 25 percent when allowed for approved innovative or accepted system models may be applied for facilities producing higher strength wastewater following a specifically approved pretreament system designed to assure effluent strength equal to or better than domestic septic tank effluent, with a BOD less than 150 mg/l, TSS less than 100 mg/l and FOG less than 30 mg/l.

(8) A Performance Warranty shall be provided by the manufacturer of any approved innovative or accepted wastewater system (warranty system) handling untreated septic tank effluent which allows for a reduction in the total nitrification trench length of more than 25% as compared to the total nitrification trench length required for a 36-inch wide conventional wastewater system, pursuant to G.S. 130A-343(j). The Department shall approve the warranty when found in compliance with the applicable Laws and these Rules. When a warranty system is proposed to serve a residence, place of business, or place of public assembly, the site shall include a repair or replacement area in accordance with Rule .1945(b) of this Section or an innovative or accepted system approved under this Rule with no more than a 25 percent reduction in excavated trench bottom area.

(a) The Manufacturer shall provide the approved Performance Warranty in effect on the date of the Operation Permit issuance to the owner or purchaser of the system. The warranty shall be valid for a minimum of five-years from the date the warranty system is placed into operation.

(b) The Manufacturer shall issue the Performance Warranty to the property owner through its authorized installer who shall sign the Performance Warranty indicating the system has been installed in accordance with the manufacturer's specifications, any conditions of the system approval granted by the Department, and all conditions of the Authorization to Construct a Wastewater System by the local health department. The installer or contractor shall promptly return a copy of the signed Performance Warranty to the Manufacturer indicating the physical address or location of the facility served by the warranty system, date the system was installed or placed into use, and type and model of system installed.

(c) The Performance Warranty shall provide that the manufacturer furnishes all materials and labor necessary to repair or replace a malfunctioning warranty system as defined in Rule .1961(a) of this

Section or a warranty system that failed to meet any performance conditions of the approval with a fully functional wastewater system at no cost to the Owner, in accordance with this Section and applicable Laws.

(d) Performance Warranty repairs such as full replacement of the nitrification system, extension of the nitrification system or other repairs shall be completed pursuant to a repair Authorization to Construct that is issued by the local health department in accordance with this Section.

(e) The Performance Warranty shall be attached to the Operation Permit issued by the Health Department for the wastewater system. The Performance Warranty remains in effect, notwithstanding change in ownership, to the end of the five-year warranty period.

(10) Manufacturers of proprietary systems approved under this Rule shall provide a list of manufacturer's authorized installers to the Department and applicable local health departments, and update this list whenever there are additions or deletions. No Operation Permit shall be issued for a proprietary system installed by a person not authorized by the Manufacturer, unless the Manufacturer of the proprietary system specifically approves the installation in writing.

History Note: *Authority G. S. 130A-335(e),(f); 130A-343;*
Eff. April 1, 1993;
Temporary Amendment Eff. June 24, 2003; February 1, 2003;
Amended Eff. May 1, 2004.