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Amendments to the Regulation Governing Wastewater Treatment and Dispersal Systems in Wake County adopted November 18, 2021

Regulation II.C – Requirement for Maintenance Agreement Recordation at Register of Deeds

Current Regulation:

C) When a property is to be served by an accepted, alternative, conventional, experimental, innovative, pretreatment, or controlled demonstration wastewater treatment and dispersal system, which is required to be maintained by a Certified Operator on a routine basis pursuant to state regulations, the owner, must record a description of the system and a general maintenance schedule at the Wake County Register of Deeds prior to issuance of the Operation Permit for such system

Proposed Change –

Proposed language change

Proposed Revision –

When a property is to be served by ~~an accepted, alternative, conventional, experimental, innovative, pretreatment, or controlled demonstration~~ any wastewater ~~treatment and dispersal~~ system, which is required to be maintained by a Certified Operator on a routine basis pursuant to state regulations, the owner, must record a description of the wastewater system and a general maintenance schedule at the Wake County Register of Deeds prior to issuance of the Operation Permit for ~~such~~ the system.

Effect of Change:

Updating wording to be consistent with State regulation wording.

The Stakeholders requested an increase in education concerning these documents to the real estate community, homeowners associations, and individual homeowners to increase the effectiveness of them during points of sale.

Historical Evidence:

Historical evidence was provided by Wake County staff (current and retired). In the past, systems more complex in nature, especially those requiring operators, were not properly maintained after a real estate transaction due to the new owners not understanding what type of wastewater system their new home/business was served by. The requirement to record a maintenance agreement at the Wake County Register of Deeds allowed for the information associated with the higher maintenance requirement to be locatable during a title search which is standard for any real estate transaction. This allowed for the new owner of the system to have the documents that indicated/instructed the additional requirements for maintenance for their new system. This requirement has been supported by a developer and Wake County HBA as important to their clients and a needed requirement to help ensure that people purchasing properties with these type wastewater systems have notification of such. The County is also working on increasing the education of these documents to the real estate community to make sure the buyers are provided and explained these documents prior to the closing to make them more informed about their purchase.

Regulation II.D – Requirement for Owner Letter Requesting Use of a Product with Size Reduction

Current Regulation:

- D) When it is proposed that a property is to be served by a wastewater treatment and dispersal system, other than an accepted wastewater treatment and dispersal system entailing no modification to system design as specified in 15 A NCAC 18A .1969 (i)(2), that receives a reduction in total nitrification trench length or trench bottom area, as compared to the total nitrification trench length or trench bottom area calculated for a 36 inch wide conventional wastewater treatment and dispersal system, the owner, or owner's legal representative must submit a letter to the office of the director of Environmental Services requesting the specific system and the reduction.

Proposed Change –

Proposed language change

Proposed Revision –

- D) When it is proposed that a property is to be served by a an innovative wastewater ~~treatment and dispersal~~ system, other than an accepted wastewater ~~treatment and dispersal~~ system entailing no modification to system design as specified in 15 A NCAC 18A .1969 (i)(2), that receives a reduction in total nitrification trench length or trench bottom area, as compared to the total nitrification trench length or trench bottom area calculated for a 36 inch wide conventional wastewater ~~treatment and dispersal~~ system, the owner, or owner's legal representative must submit a letter to the office of the director of Environmental Services requesting the specific system and the reduction.

Effect of Change:

This change is from the Public Comment period and is a minor change in the regulations.

Updating wording to be consistent with new language.

Update language to clarify this regulation is specifically enforced on Innovative systems only.

Historical Evidence:

Historical evidence was provided by Wake County staff (current and retired). In the past, this regulation has only been enforced on Innovative Product systems, despite the wording reflecting all systems with reduction. Because of this the county felt it appropriate to clarify this language to specify the actual historical enforcement of the regulation by the county.

Regulation IV.B.1 – Requirement limiting the use of serial distribution

Current Regulation:

Where more than one nitrification line is used, an effluent distribution device as specified in 15A NCAC 18A .1955 shall be installed and all lines shall contain equivalent square footage of trench bottom area unless approved by the Authorized Agent.

Proposed Change –

Revise to allow for gravity serial distribution utilizing unequal line lengths.

Proposed Revision:

Where more than one nitrification line is used, an effluent distribution device as specified in 15A NCAC 18A .1955 shall be installed and all lines shall contain equivalent square footage of trench bottom area, except when the conditions of IV:B)1)a) are met. unless approved by the Authorized Agent. Trenches have equivalent square footage of trench bottom area when the LTARs for all trenches are within five percent of the permitted LTAR.

a) Trenches do not need to contain equivalent square footage of trench bottom area when the following conditions are met:



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- (i) the proposed design is approved by the Authorized Agent or permitted with an alternative wastewater system permitting option;
- (ii) for gravity systems, stepdowns are constructed of Schedule 40 PVC, or other equivalent strength pipe, at a minimum and constructed to a height which fully utilizes the upstream trench; and
- (iii) for pump systems, serial distribution may be used to connect no more than two individual line segments. If the two individual lines are of equivalent trench bottom square footage, the flow shall be split uniformly between the two lines.

Effect of Change:

Remove the limitation disallowing serial distribution with stipulations on the use and minimum requirements of some system components while still requiring parallel distribution on systems with individual lines of equivalent size (Ex. 4 – 100 foot lines). This will allow certain design situations to provide for a better overall product to the system owners.

Historical Evidence:

Wake County staff (current and retired) provided a historical account, which was supported by septic installers, of the issue within the county that led to the adoption of this regulation. At the time the county was experiencing a large number of malfunctions due to damage incurred by homeowners and landscapers while doing final landscaping work on newly developed properties. This damage was fairly isolated to the physical stepdowns used in serial distribution systems. At the time these stepdowns would be crushed, and occasionally removed from the system during practices such as grading and leveling of the properties. Another issue that was identified was the piping used for the stepdowns was not of sufficient quality to prevent crushing, even at the time of backfilling. Since the original regulation prevented stepdowns entirely, there was not need to address the piping quality issue. The revisions to the original regulation are to accommodate the piping quality issue now that we are going to allow serial distribution again. The rest of the revisions are to address the research that shows the quality advantage of parallel distribution when it can be achieved, but allow for serial when needed to maximize the efficiency of the development of properties. An example of this it when a full size system and repair is designed for a gravity system, however the entirety of the design cannot accommodate parallel distribution. With the current regulation the design would have to either be 2 pump to pressure manifold systems, or to use the middle lines as gravity parallel, and the outside lines as pump to manifold repair (known as split repair). Split repairs have been identified as difficult to impossible to install in the future as repair, and allowing for gravity serial initial and repair systems will allow for better preservation of the repair area, and better utilization of space.

Regulation IV.B.4 & IV.B.5 – 50 foot minimum line length

Current Regulation:

- 4) Any conventional, accepted, innovative, control demonstration, or experimental trench as described in 15A NCAC 18A .1955, .1956 and .1969 shall have a minimum length of fifty (50) feet, except as designed using Section IV. B), 5) of these regulations. If low-pressure pipe distribution is utilized, the minimum trench length shall conform to Section IV. D), 7) of these regulations.
- 5) As an alternative to the minimum line length requirements to Section IV B) 4), the applicant may submit site-specific data to predict lateral and vertical flow away from the nitrification trenches. The data submitted shall include soil borings to depths greater than 48 inches, permeability and hydraulic conductivity measurements, and other information as determined

necessary by the Authorized Agent. The site-specific data must show that the effluent will not become exposed on the ground surface within, or adjacent to, the nitrification field.

Proposed Change – To revise this regulation to allow for lines less than 50 feet as long as there is no hydraulic interaction between the different line segments.

Proposed Revision –

4) ~~Any conventional, accepted, innovative, control demonstration, or experimental trench as described in 15A NCAC 18A .1955, .1956 and .1969 shall have a minimum length of fifty (50) feet, except as designed using Section IV. B) 5) of these regulations. If low-pressure pipe distribution is utilized, the minimum trench length shall conform to Section IV. D) 7) of these regulations. System design shall accommodate for reduction of hydraulic interaction among the trenches when the following conditions are present. LPP systems shall follow requirements in section IV.D of these regulations. Surface Drip systems shall follow the requirements set forth in their individual state innovative approval and 15A NCAC .1900 where applicable:~~

- ~~a. the slope from the top edge of the uppermost trench to the bottom edge of the lowermost trench is greater than 30 percent;~~
- ~~b. a restrictive layer, or a less permeable soil horizon, is present within 24 inches of the trench bottom (if criteria a and c are met, soil evaluation to 24 inches below the proposed trench bottom is required); and~~
- ~~c. One or more of the following drainfield criteria are present~~
 - ~~i. More than 5 consecutive trenches aligned from upslope to downslope less than 50 feet in length as the lowermost part of the design, or~~
 - ~~ii. more than 10 consecutive trenches of any length aligned from upslope to downslope.~~

~~System design modification options for systems up to 720 gallons per day flow rate include:~~

- ~~a. Alternating parallel or serial distribution; or~~
- ~~b. increasing trench spacing to minimum ten feet on center; or~~
- ~~c. loading of every other trench in the design for the initial system with the remaining trenches used for the repair system (utilization of this method may require the installation of all trenches during initial system installation), or~~
- ~~d. utilization of the loading rate of the least permeable layer within 24 inches of the trench bottom~~
- ~~e. an alternative design approved by the authorized agent or permitted with an alternative wastewater system permitting option.~~

~~Systems over 720 gallons per day flow rate shall require a special site assessment pursuant to 15A NCAC 18A .1970(p).~~

~~5) As an alternative to the minimum line length requirements to Section IV. B) 4), the applicant may submit site-specific data to predict lateral and vertical flow away from the nitrification trenches. The data submitted shall include soil borings to depths greater than 48 inches, permeability and hydraulic conductivity measurements, and other information as determined necessary by the Authorized Agent. The site-specific data must show that the effluent will not become exposed on the ground surface within, or adjacent to, the nitrification field.~~

Effect of Change:

Allowing lines less than 50 feet in length allows for greater utilization of space under certain situation that are currently requiring design of highly specialized and expensive systems when the only thing preventing the use of a normal system is this 50 foot line length restriction. The limitations concerning slope and trench spacing reduce the possibility of malfunctions due to hydraulic interaction between individual trenches. This also removes a hardship of burden of proof for a potential situation that is only reserved to steep slope topography, with a requirement that will serve the same purpose as the original burden of proof, without the hardship.



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Historical Evidence:

Wake County staff (current and retired) provided the historical evidence that led to this regulation, which have been supported by product manufacturers. The issue at the time was that there was no minimum line size requirement and due to the increasing complexity of lots, line sizes began to lessen to the point that they were ineffective as part of the design and under certain conditions led to hydraulic interaction between the lines which caused malfunctions. To remedy this issue, a minimum line length of 50 feet was adopted. This effectively resulted in reducing the amount of designs that created issues where these conditions could cause malfunctions. The issue today is that there are technologies and practices that can be utilized to allow for lines less than 50 feet in length to be utilized as part of a viable design, however there is still the need to protect against the conditions that would lead to hydraulic interaction, resulting in a malfunction. These conditions were discussed with specialists in academia and regulatory agencies who assisted in defining the conditions that can lead to malfunctions. The solutions for utilizing a combination of parallel and serial distribution came from a product manufacturer. The solution for increasing spacing as you move down the design came from the stakeholder group itself from an example solution recommendation from Wake County staff.

Regulation IV.B.9 – 25% Reduction Maximum

Current Regulation:

When it is proposed that a property be served by a wastewater treatment and dispersal system that receives a reduction in total nitrification trench length or trench bottom area that exceeds twenty-five percent (25%) as compared to the total nitrification trench length or trench bottom area calculated for a 36-inch-wide conventional (gravel aggregate) system, the following shall be required:

- a. The wastewater treatment and dispersal system footprint area shall be equal to or greater than 75% of the area required for installation of a 36-inch-wide conventional system designed to receive untreated septic tank effluent. The minimum system footprint area shall be calculated by multiplying 75% of the trench length (in feet) required for a 36-inch-wide conventional system by 9 feet. Minimum trench spacing for the system with proposed reduction shall be determined by dividing the footprint area by the actual proposed trench length. A larger spacing shall be required if field conditions require portions of trenches to be installed further apart in order for lines to be on contour. The repair system footprint area shall likewise be sized to be equal to or greater than 75% of the area required for a 36-inch-wide conventional system designed to receive untreated septic tank effluent, with minimum footprint area and spacing as calculated above. The system footprint and replacement system areas shall be suitable or provisionally suitable areas as defined in these Regulations.

Example: Three bedroom home: design flow 360 GPD and 0.3 GPD/ft² LTAR

$$\begin{aligned}\text{Required linear footage of gravel trench} &= \frac{(360 \text{ GPD})}{(0.3 \text{ GPD/ft}^2)} \\ &= 3 \text{ ft}^2 / \text{lin. ft} \\ &= 400 \text{ ft}\end{aligned}$$

$$\begin{aligned}\text{System footprint for conventional system} &= \text{trench length} \times \text{trench spacing} \\ &= 400 \text{ ft} \times 9 \text{ ft} = 3,600 \text{ ft}^2\end{aligned}$$

$$\text{Required minimum footprint for any innovative product} = 3,600 \text{ ft}^2 \times 0.75$$

$$= 2,700 \text{ ft}^2$$

Required minimum trench spacing, assuming reduction in trench length

$$\text{by } 35\% = (2700 \text{ ft}^2)/(400 \times .65) = 10.4 \text{ ft}$$

- b. The site shall be evaluated by a Licensed Soil Scientist. The Licensed Soil Scientist shall conduct a detailed assessment of site conditions and provide a written, signed and sealed report to the Department that includes:
 - i. Detailed descriptions of landscape position and soil morphological conditions to a depth of at least three (3) feet below the trench bottom in the drainfield and repair area.
 - ii. Field estimates of the depth and thickness of the least permeable horizons,
 - iii. Recommended depth for placement of the trench bottoms and the recommended LTAR,
 - iv. A hydraulic assessment, based on site-specific information, substantiating the projected effectiveness of the system performance. This shall include documentation that indicates the wastewater at the proposed LTAR will not discharge to the surface of the ground within or adjacent to the drainfield when the system is installed and operated within design parameters, and justification for any proposed drainage system.
 - v. Other site-specific requirements for system design, installation, site preparation, modifications and final landscaping.
- c. The system daily design flow shall not exceed 1,500 gallons, and the wastewater characteristics shall not exceed those of domestic wastewater.
- d. System installation shall be only by Certified Contractors trained and certified by the manufacturer of the specific product utilized. The manufacturer shall provide a current list of certified contractors to this Department as often as necessary. Installation of systems by persons not on the current installers list shall not be approved and the Operation Permit shall be denied.
- e. The manufacturer of the product utilized shall provide a performance warranty, as set forth in G.S 130A-343, to the owner or purchaser of the wastewater treatment and dispersal system which shall require:
 - i. Certification by the manufacturer or certified contractor that the wastewater system is installed in accordance with the manufacturer's specifications, any conditions of regulatory approval and all conditions of the Authorization to Construct the wastewater system.
 - ii. Copies of the certified warranty shall be returned to the manufacturer, the system owner or purchaser, and the Department, a copy of which shall be attached to the Operation Permit. A copy of the certified warranty shall also be recorded at the Wake County Register of Deeds prior to issuance of the Operation Permit.

Proposed Change – Repeal regulation.

Effect of Change:

Repealing this regulation will allow for additional technologies that have historical evidence of functionality throughout the state to be utilized in the county where they were previously restricted. This regulation was prescriptive to prevent possible public health issues from an unknown and unproven technology. These technologies now have a positive track record in the rest of the state such that we should anticipate that they will not be a potential of public health concern in Wake County.



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Regulation IV.B.12.a – 50 feet setback to a stormwater Retention pond

Current Regulation:

All portions of the wastewater treatment and dispersal system must be at least fifty (50) feet from the flood pool elevation of any permanent stormwater detention pond [Ref. 15A NCAC 18A .1950(a)(8)].

Proposed Change – Change “Detention” to “Retention”.

Proposed Revision:

All portions of the wastewater treatment and dispersal system must be at least fifty (50) feet from the flood pool elevation of any permanent stormwater ~~detention~~ retention pond [Ref. 15A NCAC 18A .1950(a)(8)].

Effect of Change:

Correction of a typographical error.

Historical Evidence:

Typographical error revision only.

Regulation IV.C.1 – Prefabricated Permeable Panel Block System (PPBPS)

Current Regulation:

Nitrification area for Prefabricated, Permeable, Block Panel systems (PPBPS) shall be determined in accordance with 15 A NCAC 18A.1955 (b) and 15 A NCAC 18A.1955 (c), with each linear foot of panel trench considered equivalent to one (1) linear foot of a three-foot wide conventional trench.

Proposed Change – Repeal regulation.

Effect of Change:

Repealing this regulation will allow for additional technologies that have historical evidence of functionality throughout the state to be utilized in the county where they were previously restricted. This regulation was prescriptive to prevent possible public health issues from an unknown and unproven technology. These technologies now have a positive track record in the rest of the state such that we should anticipate that they will not be a potential of public health concern in Wake County.

Regulation IV.C.2 – Serial Distribution Limitation

Current Regulation:

Effluent distribution devices (distribution boxes, flow dividers, pressure manifolds, etc.) shall feed lines of equivalent square footage in accordance with Section IV. B) 1) of these regulations. System designs that do not have equivalent square footage in the separate line segments may be considered for review and permitting if the designer can demonstrate conformance to the following items

Proposed Change – Revise to be specific to Pumping to Unequal Line Length Pressure Manifolds

Proposed Revision:

- 1) ~~Effluent distribution devices (distribution boxes, flow dividers, pressure manifolds, etc.) shall feed lines of equivalent square footage in accordance with Section IV. B) 1) of these regulations.~~ System designs that do not have equivalent square footage in the separate line segments may be considered for review and permitting if the designer can demonstrate conformance to the following items:

Effect of Change:

Remove the limitation disallowing serial distribution. The restriction was in both Section IV.B.1 and this regulation. The stipulation as to the uses allowed is in the revision of IV.B.1

Historical Evidence:

This is a repeal of the portion of this regulation that deals with the limitation of serial distribution use in Wake County. It is tied to regulation revision for IV.B.1. Without the repeal of this portion of this regulation serial distribution would still not be allowed. The rest of the regulation is not changed and deals specifically with design requirements for unequal length pressure manifold design and comes from BEST practices identified and in use by the county and state. It was adopted into the regulation when policies were disallowed for enforcement through general statute.

Wake County staff (current and retired) provided a historical account, which was supported by installer(s), of the issue within the county that led to the adoption of this regulation. At the time the county was experiencing a large number of malfunctions due to damage incurred by homeowners and landscapers while doing final landscaping work on newly developed properties. This damage was fairly isolated to the physical stepdowns used in serial distribution systems. At the time these stepdowns would be crushed, and occasionally removed from the system during practices such as grading and leveling of the properties. Another issue that was identified was the piping used for the stepdowns was not of sufficient quality to prevent crushing, even at the time of backfilling. Since the original regulation prevented stepdowns entirely, there was not need to address the piping quality issue. The revisions to the original regulation are to accommodate the piping quality issue now that we are going to allow serial distribution again. The rest of the revisions are to address the research that shows the quality advantage of parallel distribution when it can be achieved, but allow for serial when needed to maximize the efficiency of the development of properties. An example of this is when a full size system and repair is designed for a gravity system, however the entirety of the design cannot accommodate parallel distribution. With the current regulation the design would have to either be 2 pump to pressure manifold systems, or to use the middle lines as gravity parallel, and the outside lines as pump to manifold repair (known as split repair). Split repairs have been identified as difficult to impossible to install in the future as repair, and allowing for serial initial and repair systems will allow for better preservation of the repair area, and better utilization of space.

Regulation IV.C.2.c – 5 minute minimum pump run time

Current Regulation:

The minimum pump, run time, for a pressure manifold serving unequal line lengths is five minutes.

Proposed Change – Revise to allow for a pump run time that meets a standard based on the intent of the regulations being to ensure that the system is fully pressurized during operation to provide for uniform wastewater distribution to the individual trenches



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Proposed Revision –

The minimum pump run time for a pressure manifold service unequal line lengths is five minutes. When a pressure manifold is used to distribute effluent among unequal line lengths, the minimum pump run time shall meet the following requirements:

1. manifold pressurization and pump operating flow rate at the design pressure head; and
2. minimum dose volume.

The pump run time may be field adjusted after installation to optimize system performance based on operating conditions

Effect of Change:

This allows much greater flexibility in system design, while maintaining the enforcement of the intent of the regulation which is to ensure each drainline of the septic system is dosed per the design specifications which only happens under full system pressurization.

Historical Evidence:

Wake County staff (current and retired) provided historical evidence explaining the issues identified with certain designs that did not allow for proper pressurization of a pressure dosed system (especially an unequal line length pressure manifold). This leads to improper flow distribution among the different tap sizes which led to malfunctioning of systems. This is especially problematic with systems where the manifold and drainfield are oriented below the pump tank allowing the supply line to drain. In this scenario the system must fill the entirety of the supply line and manifold, and reach pressurization, then be given enough time to dose under full pressurization to function properly over time. Most systems oriented with the manifold and drainfield oriented above the pump tank are not impacted by this issue. This revision allows for systems to be designed specific to their individual needs concerning proper pressurization.

Regulation IV.C.3 – At Grade Systems maximum slope requirement

Current Regulation:

The slope of sites proposed for “at grade”, shallow placed drainfield systems as described in 15 A NCAC 18A .1956 (1), shall not exceed five (5) percent.

Proposed Change – Revise to allow flexibility on steeper slopes if the intent of this regulation is met. The intent is the stabilization of the material added to the site to meet the minimum burial depth of the trenches. This material is not compacted and susceptible to erosion.

Proposed Revision:

The slope of sites proposed for “at grade”, shallow placed drainfield systems as described in 15 A NCAC 18A .1956 (1), shall not exceed five (5) percent unless the following requirements are met:

- 1) the system design is approved by the Authorized Agent or permitted with an alternative wastewater system permitting option; and
- 2) the cover material used for the system installation can be stabilized to prevent erosion.

Effect of Change:

Allow greater flexibility to design “At Grade” systems where soil is required to be brought in and placed on top of the trenches to meet the required depth of cover (capping material). This change will allow for installation on steeper

slopes if the original intent of the regulation is met. The original intent was to ensure that the capping material did not erode before the cap could be stabilized with vegetation. We are also not limiting the method of stabilization if it is sufficient to prevent erosion of the capping material.

Historical Evidence:

Wake County staff (current and retired) provided the historical evidence that led to the adoption of this regulation. At the time, designers were proposing at grade system designs on systems of greater than 5% slope. At the time there were few viable options for stabilization of the 6-inch cap creating issues of erosion leading to both rule violation for minimum 6 inches of cover above the top of the trench aggregate and leading to malfunctions. This revision allows for design and installation of at-grade systems on slopes higher than 5% if the designer can propose a viable form of stabilization of the capping material using current technologies available to stabilize soil.



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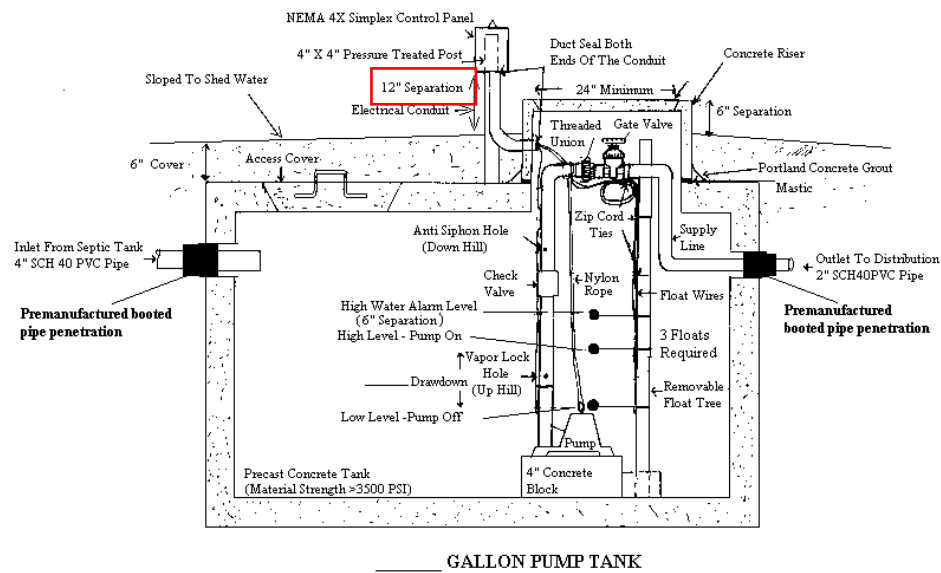
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Appendix A

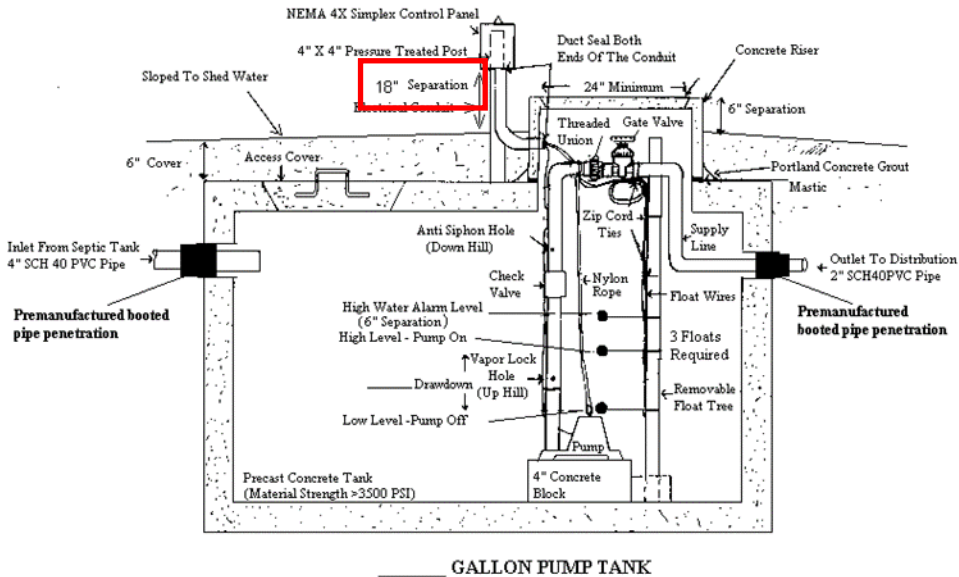
Current Regulation:

Wake County Department Of Environmental Services



Proposed Change – Change 12” to 18” in Appendix A diagram to match regulation IV.B.8.a.ii

Wake County Department Of Environmental Services



Effect of Change:

Correction of a typographical error.

Historical Evidence:

Revision of typographical error only.

DocuSigned by:

Kenneth Murphy

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11/19/2021

Kenneth Murphy, Wake County Attorney

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Ann Rollins

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11/19/2021

Ann Rollins, Chair – Health and Human Services Board

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Nannette Bowler

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11/19/2021

Nannette Bowler, Health and Human Services Director