

F. OFF-SITE SYSTEM (S)

1) Definitions:

- a. “Wastewater system” as defined by NCGS 130A-334(15); means a system of wastewater collection, treatment, and disposal in single or multiple components, including a ground absorption system, privy, septic tank system, public or community wastewater system, wastewater reuse or recycle system, mechanical or biological wastewater treatment system, any other similar system, and any chemical toilet used only for human waste. A wastewater system located on multiple adjoining lots or tracts of land under common ownership or control shall be a single system for purposes of permitting under these Regulations.
- b. “Supply line” means a watertight pipe used to convey effluent from the septic tank or pump tank to the distribution device or dispersal field.
- c. “Off-site supply line” means only the portion(s) of supply line not located in the Building lot itself.
- d. “Off-site supply line easement” for the purposes of this provision means the portion of the off-site easement used exclusively for the conveyance of effluent, through the supply line, from the exit point of the property it serves to the entry point of the off-site drainfield easement.
- e. “Individual supply line easement” means the portions of an off-site supply line easement which is for the sole purpose of installation and housing of the supply line for the lot in which the easement serves.
- f. “Off-site supply line network” means an offsite supply line as defined in IWWS-2016-01; and two or more individual off-site supply lines located wholly or in part within a “common” easement or encroachment in a single phase or section of development.
- g. “Off-site drainfield easement” for the purposes of this provision means the portion of the off-site easement used exclusively for the installation and operation of the off-site drainfield.
- h. “Off-site wastewater system” means a “Wastewater system” any portion of which (initial and/or repair system) is in a separate non-contiguous area/easement than the building-lot itself. This also includes individual off-site supply line or in network, when a dedicated access is required for the purposes of installation of initial/repair, operation, and maintenance of the system. For Off-site system(s) located in common area and/or a common easement, provisions of Innovative Wastewater System Approval 2016-01 (IWWS 2016-01) shall also be met in addition to these provisions.
- i. “Management Entity” means the person, entity, company, or firm designated by the owner of the wastewater system who has primary responsibility for the operation of the wastewater system in accordance with this Section .1900, these Regulations , G.S. 90A, Article 3, and applicable rules of the Water Pollution Control System Operators Certification Commission. The Management Entity can be the owner, a public entity managing wastewater systems, a certified operator, a management company, or an entity that employs certified operators. When the wastewater system has a flow greater than 3,000 gallons per day, then the Management Entity shall be a company or firm that is incorporated.

2) Permitting:

a) The application procedure for all off-site wastewater system(s) shall be as follows:

i) Improvement Permit ("IP"):

An application for an off-site wastewater treatment and dispersal system shall be submitted to the Wake County Department of Environmental Services pursuant to 15A NCAC 18A .1937(c) and the following conditions shall be met:

1. The proposed use of an off-site wastewater system shall be identified in each IP or Construction Authorization ("CA") application, as applicable. (IP for off-site supply line and dispersal field, CA only for off-site supply line).
2. The NC Licensed Soil Scientist working with the project must submit a statement of necessity for use of the off-site system with the application, if applicable.
3. Applications shall be submitted for all proposed off-site wastewater systems for a single phase or section of the development.
4. All applicable provisions of the Wake County Unified Development Ordinance must be met.

ii) Construction Authorization ("CA"):

A separate CA application must be submitted by the Applicant or Property Owners Association ("POA") for each off-site supply line.

Following provision for CA must be addressed for Off-site system(s) in network:

1. Whenever any portion(s) of two or more off-site systems are in a shared easement, encroachment, or commonly owned area, provisions shall be established for all such portions to be owned or controlled by a non-profit, incorporated POA or by a Management Entity. This POA or Management Entity shall be jointly named on any Construction Authorization and Operation Permit to be issued for any such shared system.
2. Maps and/or detailed drawings of all locations of easements for all components which are not located on the Building Lot shall be provided.

b) Prior to the issuance of an Improvement Permit for any off-site wastewater system, the following items shall be completed:

- i) Dispersal field lines shall be field flagged by use of an engineer's level or laser level to assure conformity with natural contours by the owner or owner's representative.
- ii) The proposed dispersal field lines shall be measured, as needed, to verify design requirements for sizing, location and separation distances. Allowances shall be made for additional area, as needed, to accommodate staging of materials and maneuvering of construction equipment without encroaching on other properties or system areas.

iii) A site plan shall be prepared that includes:

1. Initial and repair areas depicting
  - i) Line lengths
  - ii) Flag colors
  - iii) Line elevations
2. All proposed easement and/or property lines, along with the lot and facility served, shall be clearly staked and labeled in the field.
3. All tankage, setbacks, important monuments, supply line, and any other appurtenances.

99 iv) The Authorized Agent (“AA”) shall conduct:

- 100 1. A visual evaluation of the supply line path to determine feasibility of installation.
- 101 2. A review of field staked lines, facility, easement area/encroachment area.
- 102 3. A review to ensure that the total daily design flow to combined off-site dispersal
- 103 field(s) is consistent with the provisions of these Rules, the Wake County Unified
- 104 Development Ordinance, and 15A NCAC 18A .1970(p)(2).
- 105 4. A review of stormwater plans and assessment of effects of upslope and internal
- 106 stormwater runoff, proposed stormwater management systems, and impacts of any
- 107 other potentially hydraulically-interacting active dispersal field or repair area.
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109 c) Prior to the issuance of a Construction Authorization for any off-site wastewater system, the

110 following requirements shall be met:

- 111 i) All easements and property lines shall be surveyed and permanently marked in the field.
- 112 ii) Any encroachment agreements shall be obtained, where required, and recorded with Wake
- 113 County Register of Deeds.
- 114 iii) A complete wastewater treatment and dispersal system design shall be submitted for review
- 115 and approval.
- 116 iv) Plans, specifications and system design shall be required to be prepared by a person or
- 117 persons who are licensed or registered to consult, investigate, evaluate, plan or design
- 118 wastewater systems, soil and rock characteristics, ground water hydrology, or drainage
- 119 systems if required by G.S. 89C, 89E, 89F, and/or 90A Article 4.
- 120 v) Plans shall incorporate best management practices and accepted design standards such as:
- 121 1. Minimizing supply line crossings and lengths
- 122 2. Accessibility of dispersal lines and other system components
- 123 3. Facilitation of the installation, operation, repair, and maintenance of the system
- 124 4. Pump calculations including flow rate, total dynamic head, and velocity in supply
- 125 lines, hydraulic profile (if needed), and calculations specifying the amount of drain-
- 126 back to either the pump tank or dispersal field.
- 127 5. The designer of the supply line network may be required to submit substantiating
- 128 data, as specified by the EHS, Wake County.
- 129 6. Plans and specifications shall be prepared by a registered professional engineer if
- 130 required by G.S. 89C or when one or more of the following conditions are met:
- 131 i) Utilization of pretreatment components that have not received prior state
- 132 approval or as required by a pretreatment approval,
- 133 ii) Daily design flow exceeds 720 gallons per day.
- 134 iii) Supply lines are longer than 500 feet.
- 135 iv) When elevation variations in the supply line or lines require(s) use of
- 136 appurtenances, such as air release valves. An air release valve is usually
- 137 required when the variation of elevation difference between conjugative high
- 138 and low points is greater than 5 feet.
- 139 v) Alternate materials or design specifications are proposed to be used for
- 140 supply lines, or trenches
- 141 vi) One or more off-site systems utilize pressure dispersal (Drip irrigation and
- 142 Low Pressure Pipe (“LPP”) fields) and its supply line is on a net downhill
- 143 grade or includes a portion that will drain more than 25-percent of the field
- 144 dose volume to the dispersal fields between doses.
- 145 vii) A common pressure sewer or supply line is used to convey wastewater or
- 146 effluent from two or more pump tanks to a common off-site area.
- 147 viii) Duplex alternating pumps are required (duplex pumps are required if linear

- footage of nitrification trenches exceeds 2000 feet).
- ix) When a system is otherwise required to be designed by a registered professional engineer pursuant to 15A NCAC 18A .1938(d) or when required as part of a system approval issued pursuant to 15A NCAC 18A .1969.
  - x) Any system serving more than one facility so specified by the EHS, Wake County.
  - xi) If two or more off-site systems are proposed, all off-site wastewater supply lines shall be designed by a registered professional engineer ("P.E."), and P.E. design shall be required for any supply line or system component so specified by the AA.
  - xii) An all-weather access road is included in the design.
  - xiii) When specified by the AA.
- d) Construction Authorization (CA) approval for any off-site wastewater system shall be issued as follows:
- i) Any CA issued by the AA shall address each component of the off-site wastewater system (e.g. supply lines, dispersal fields, tanks and appurtenances).
  - ii) If the supply lines are to be installed first, with the dispersal field nitrification lines to be installed later, a CA shall be issued for the supply lines installation only.
  - iii) "AS needed "A separate CA be issued for each supply line and each dispersal field to be installed at this time. A separate CA shall be issued for dispersal fields to be installed after easement recordation.
- e) Prior to the issuance of the Operation Permit for an off-site wastewater treatment and dispersal system, all the following criteria shall be met, as applicable:
- i) An as-built drawing must be submitted showing the location of property lines and all off-site system components, including easements and encroachments.
  - ii) The installation and testing of the offsite system must be inspected and approved by the AA.
  - iii) For systems or system components required to be designed by a P.E. or an individual licensed or registered in accordance with G.S. 89E, 89F or 90A, Article 4, the owner shall submit a written certification sealed, signed and dated by the engineer that the system was installed in accordance with the approved plans and specifications.
  - iv) All easement areas (access, supply line and dispersal fields) shall be surveyed and marked with permanent markers or monuments that are described in Section III: F) 3.a) i) 8 of these Regulations.
  - v) All documents that are required to be executed, and recorded at the Register of Deeds, shall be so executed and recorded, including, but not limited to:
    - 1. Encroachment agreements,
    - 2. Maintenance agreements, and
    - 3. Easements.
  - vi) Any subdivision with an off-site supply line shall have provisions for:
    - 1. A Management Entity for wastewater system components.
    - 2. All documents shall be reviewed and approved by the AA and recorded with the Register of Deeds. The documents shall at a minimum, address the following:
      - i. The use and/or limits of use for supply line Access and Maintenance of Easements and Remote Wastewater Treatment and Dispersal System Areas.
      - ii. Outline a course of action in the event that a repair to an off-site wastewater treatment and dispersal system is necessary, including details of ownership and financial responsibility.
  - vii) No other agencies may issue permits for a facility, pursuant to G.S. 130A-338, until all

197 CAs have been issued for the entire wastewater system.  
198 viii) Each Operation Permit for a completed individual off-site wastewater system shall include  
199 as parties to the permit the owner of the individual design unit and system, and the POA as  
200 applicable, and shall delineate the responsibilities of each party for operation and  
201 maintenance of the system.  
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203 3. System Sizing and Design Criteria:

204 a) Supply Lines:

205 i) Supply Lines Locations:

206 Supply lines serving off-site wastewater treatment and dispersal systems shall be located  
207 either individually in dedicated easements/parcels or within supply line networks in common  
208 easement(s). Easements shall extend completely from the building lot to the dispersal field  
209 area.  
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- 211 1. All supply lines in a supply line network shall be installed concurrently.
- 212 2. Individual easements/parcels shall be a minimum width of 15 feet. If there is an  
213 existing utility easement on the property, a total easement width of 20 feet must be  
214 provided, with an exclusive septic easement not less than 12 feet and shall be located  
215 a minimum of 5 feet from any other parallel utility or greater distance (e.g. 10 feet  
216 required from water line.)
- 217 3. No other utilities shall be installed in the same trench as the supply lines
- 218 4. Any utility crossings over or under the supply lines must meet the requirements of  
219 15A NCAC 18A .1950(f) and (g), and any necessary encroachment agreements shall  
220 be obtained and executed.
- 221 5. Supply lines crossing a stream must meet the requirements of 15A NCAC 18A  
222 .1950(h).
- 223 6. Off-site supply line network easements or multiple individual dedicated  
224 easements/parcels installed contiguously shall be under common ownership or control  
225 and provide for accessibility to all wastewater system components for installation,  
226 operation, maintenance and repair.
- 227 7. Both sides of off-site supply line easements shall be permanently marked at the  
228 beginning of the easement where it leaves the building lot, and at the location where it  
229 leaves the road frontage, at least every 300 feet and at every directional change.  
230 Markers shall be visible from the ground surface, permanent in construction, easily  
231 locatable, and shall permanently identify the easement that is being marked. Easement  
232 field marker or monument locations shall be depicted on the as-built survey.
- 233 8. Easements for the off-site supply line and off-site area or lot corners shall be marked  
234 with permanent ground markers or monuments clearly labeled as to the easement area  
235 and the lot it serves. For purposes of these Regulations, "permanent construction" is  
236 defined as a marker which requires the use of mechanical tools to remove; "easily  
237 locatable" means no specialized or mechanical tools are required to locate and  
238 uncover the marker; "visible from the ground surface" means a marker that is located  
239 on the ground surface, or, if located below ground, a marker that is in a box with its  
240 top visible at the ground surface (e.g. valve box or water meter box).
- 241 9. All easements/parcels shall remain free of structures, landscaping, or any activities  
242 that would interfere with the use of the easement for its intended purpose.
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246 ii) Off-site Supply Line Design:

247 Off-site Supply line design specifications shall meet the requirements of Section IV B) 8) c)  
248 of these Regulations, as well as the following conditions specific to off-site supply lines:

- 250 1. All pipe, fittings, joints, installation and testing methods shall conform to the  
251 appropriate ASTM or ANSI/AWWA standards. Alternate materials, proposed by a  
252 professional engineer, may be approved by the AA.
- 253 2. All pipe segments shall be permanently marked every ten feet on the crown of the  
254 pipe with the corresponding unique lot number or letter, which shall be visible at the  
255 time of inspection. The printed lot number or letter shall be at least one inch in height  
256 and legible.
- 257 3. A minimum of five (5) feet of separation is required between the supply line and the  
258 boundary of the supply line parcel or easement.
- 259 4. Supply line trench width and depth shall be constructed in accordance with approved  
260 design specifications:
  - 261 i. The pipe shall be uniformly and continuously supported over its entire length  
262 with clean, firm, and stable backfill material.
    - 263 a) In situ material which does not contain any large objects, rock, or  
264 organics may be used for fill.
    - 265 b) Proper continuous bedding shall be required to prevent bridging of  
266 pipes.
    - 267 c) Any other backfill method will need AA's approval.
  - 268 ii. Where rock, restrictive horizon, or boulders are encountered which cannot be  
269 avoided or removed, a minimum of a four (4) inch bed of compacted washed  
270 gravel or sand shall be placed to form the bottom of that portion of the trench.  
271 Sleeving may also be used. Backfill material along the pipes (in network)  
272 sides and top of the pipe shall be uniformly hand compacted and walked-in  
273 prior to completing the trench backfilling process. Alternatively, spacers may  
274 be used with following requirements:
    - 275 a) Spacers shall be of similar strength as of the pipes during installation  
276 with no sharp edges (wood stakes may be used),
    - 277 b) Spacers shall have a minimum width of one and one-half the  
278 diameter of the supply line pipe used,
    - 279 c) Spacers Shall be placed at a minimum 10 feet apart at the markings,  
280 along the pipe length. Additional spacers may be used.
  - 281 iii. Thrust blocking at the bends and elbows shall be installed where specified by  
282 the designer.
  - 283 iv. Each individual supply line installed in a common trench shall be separated  
284 horizontally by a minimum distance equal to the diameter of one pipe.  
285 Vertical stacking of pipe is prohibited.
  - 286 v. The discharge piping and supply lines shall be a minimum of one and one-half  
287 (1 ½) inches in diameter.
- 288 5. Unless otherwise addressed under 15A NCAC 18A.1955, a minimum burial depth of  
289 30 inches, as measured from the crown of the pipe to the ground surface, shall be  
290 provided throughout the length of the supply line. If the 30-inch minimum burial  
291 depth cannot be met, or a road crossing is required, the supply lines shall be sleeved  
292 in ductile iron, or DOT traffic rated road crossing culvert pipe extending to a  
293 minimum of 5 feet beyond the shallowest area on each side. The minimum burial  
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depth to top of sleeving is per the pipe sleeving manufacturer's recommendation, but in no case less than 6 inches.

6. Provisions must be made to address any supply line drainback volume to either the pump tank or dispersal field.
7. The pump supply line size and pump capacity shall be sized such that a minimum velocity of two (2) feet per second is achieved in the supply line,
8. Air/vacuum relief valves shall be specified at high points as specified by the design engineer to release trapped air from the supply line and maintain system performance.
9. Provisions to stabilize the surface of the excavation shall be made upon backfilling in order to prevent erosion.

b) Pump Tanks:

The minimum total capacity for pump tanks shall meet all requirements of SECTION IV of these Regulations, as well as the following requirements:

- i) The size of the dose volume shall also account for the portion of the supply line that drains back into the pump tank or into the dispersal field between doses.
- ii) Pump tanks that are part of a STEP (septic tank effluent pump) system involving a second pump tank shall meet the minimum sizing requirements of these Regulations.
- iii) Any pump tank or pretreatment device not located on the building property building-lot shall have its alarm designed for auto-dialer hook up to a 24-hour maintenance service.

c) Dispersal Field:

i) Access or Access Road

1. An all-weather access to off-site wastewater system area shall be by a properly maintained, publicly accessed road for the passage of equipment normally used to install, inspect, operate, maintain and repair the wastewater system, or via a dedicated access parcel or easement which shall be maintained to prevent any hindrance of free movement through this area and shall be of following width:
  - a) 20 feet for single off-site supply line if the wastewater drainfield easement is not cleared,
  - b) 15 feet for single off-site supply line if drainfield easement is cleared, but drainfield and appurtenances not installed
  - c) 10 feet for individual off-site supply line, if drainfield and appurtenances in drainfield easement installed up front.
2. The access area provided shall be either owned or controlled by the owner of the off-site area, or commonly owned or controlled by the POA.
3. When an access road is required it shall be designed by a registered professional engineer and per IWWS-2016-01.
4. All weather access may be eliminated if the Engineer or Designer stipulates and the CA for each design unit requires that:
  - a) All the adjacent and contiguous offsite wastewater system components within a phase of construction, including any repair/replacement dispersal fields, are installed at the same time (prior to the Operation Permit), or
  - b) All the offsite wastewater system components are installed by hand (without the use of equipment on the site).
  - c) Notwithstanding the exclusions noted in a) and b) above, the design shall ensure effective access to off-site wastewater system components for the system's continued operation, maintenance, and repair.

- ii) Dispersal fields, supply lines, and all wastewater system components shall be protected from traffic or other unauthorized access.
- iii) All system and repair areas, within an area of off-site systems, shall be located at least twenty (20) feet from all other system and repair areas.
- iv) Any surface water runoff, drains, ditch discharges shall be diverted away from the dispersal field.
- v) Final soil cover shall be provided such that a depth of six inches cover remains after settling.
- vi) Stabilization of final cover with appropriate vegetation shall be provided.

#### 4. Installation, Inspection, and Testing Procedures:

- a. A pre-construction conference is required prior to the installation of an off-site wastewater system. The owner or owner's representative, the installer and the AA shall meet on the site to review the approved off-site wastewater system design plan and supply line plan as applicable.
- b. All off-site wastewater systems shall be installed by an installer certified in accordance with G.S. 90A-72 (Grade III or higher required).
- c. Leak testing, using water under pressure, shall be performed whenever a supply line exceeds 500 feet in length or two or more supply lines are in common parcels, a dedicated easement or encroachment. Leak testing shall be field-verified by the system designer in the presence of the AA.
- d. All off-site supply lines shall be installed and approved prior to final plat recordation.
- e. At the final inspection, the AA shall observe the dispersal field, alternating device(s), other distribution devices, and all other system components, and shall determine them to be functional and accessible from the finished ground surface.
- f. For individual supply line easements with a minimum width of 30 feet and a maximum length of 100 feet, the supply line shall not be required to be installed prior to the recordation of the easement(s).

#### 5. Operation, Maintenance, and Monitoring:

- a. The Owner/POA shall retain a Management Entity to be responsible on its behalf to operate and maintain all components of an off-site wastewater system within a supply line network, within common areas that are owned or controlled by the POA, and all associated subsequent components of the system. An individual owner of an off-site wastewater system will also be responsible for separately contracting with an ME if required based on the system type pursuant to 15A NCAC 18A .1961.
- b. A tri-party agreement, as required in 15A NCAC 18A .1938, shall be in effect. (A sample tri-party agreement is provided as attachment "A" to these Regulations). Where applicable, verification shall be provided that a non-profit, incorporated property owners association has been duly established, as indicated by articles of incorporation and bylaws registered with the North Carolina Secretary of State's Office, and a draft agreement (tri-party) among the developer/owner and the association has been submitted to the Department. The tri-party agreement shall address:
  - 1. Ownership,
  - 2. Transfer of ownership,
  - 3. Maintenance of system and system sites,
  - 4. Drainage,



- 393 5. Repairs,  
394 6. Operation, and  
395 7. The necessary funds for the continued satisfactory performance of common  
396 wastewater system components, including but not limited to supply lines, access  
397 areas, dispersal fields, and other appurtenances.
- 398 c. Easements, agreements, declarations and subordination documents shall be recorded at the  
399 Wake County Register of Deeds, as required,
- 400 d. System Management shall be required in accordance with 15A NCAC 18A .1961 (b), with the  
401 minimum classification of a Type IV system. The off-site system and its components shall be  
402 inspected by the ORC a minimum of once a year, unless a greater frequency is required for  
403 operation of an individual advanced pretreatment or pressure dispersal system is required in  
404 15A NCAC 18A .1961, .1969, or .1970. Repair and maintenance responsibilities shall be  
405 clearly specified in the ORC contract.
- 406 e. The ORC shall provide monitoring reports to the Wake County Department of Environmental  
407 Services within 30 days of each required inspection. The ORC shall maintain a log of all  
408 malfunction incidences/notifications, observations and maintenance activities. Minimum  
409 maintenance during each required inspection shall include:
- 410 1. Visual observation of the dispersal field,  
411 2. Visual observation of the supply line and appurtenant valves for leakage and damage,  
412 3. Alternation of dispersal field alternating devices as applicable,  
413 4. Measuring of pressure head and flushing of distribution devices as applicable, and  
414 5. Assurance that the ground surface and vegetation over the dispersal field and supply  
415 lines are maintained.
- 416 f. Whenever two or more Supply Line Easements are located along a road right-of-way or  
417 encroachment under the ownership, control or management of an POA, the association shall  
418 maintain updated information with the Register of Deeds office, and, upon notification of  
419 excavation, provide location and marking information pursuant to the requirements of the  
420 Underground Damage Prevention Act, NCGS Chapter 87.
- 421 g. In lieu to membership to locating service such as \*811, An alternate method of locating supply  
422 lines e.g. by tracing by means of Tape or equivalent is acceptable for single off-site supply  
423 lines.