

**NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH**

INNOVATIVE WASTEWATER SYSTEM APPROVAL
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Innovative Wastewater Approval Number: IWWS 2016-01

For: Off-Site Systems

Approval Date: September 2, 2016

In accordance with G.S. 130A-343 and 15A NCAC 18A .1969, an off-site system has been reviewed and found to meet the standards of an innovative system:

I. General

A. Scope of this Innovative Approval

1. Use, design and installation requirements for off-site systems
2. Operation, maintenance and monitoring requirements for off-site systems

B. This Innovative System Approval applies in a development whenever any components of two or more wastewater systems serving independently owned properties are located on a commonly owned or controlled lot or tract of land, easement or encroachment.

II. System Description

An Off-site system is a wastewater system as defined in G.S. 130A-334(15) where any components of the systems serving two or more facilities are located on property other than the building lot that is under common ownership or control. This approval does not apply to a wastewater system entirely contained on multiple adjoining lots or tracts of land under common ownership or control which are considered a single system per G.S. 130A-334(15) and subject to permitting pursuant to Rule .1938(j). Off-site system terms used throughout this Innovative approval are defined below.

III. Definitions

- A. Alternating valve – a manual or automatic device that diverts flow of effluent from one dispersal field to another
- B. Building lot – the lot or parcel of land on which the design unit served by an off-site system is located
- C. Common area – property that is jointly owned and/or controlled by an Property Owners Association or a corporation for the use and benefit of multiple parties specifically for the purpose of wastewater system(s) components and access

- D. Contact person(s) – the person or agent responsible for representing his/her company (developer, engineer, installer/contractor, licensed soil scientist, system designer, etc.) in activities related to the offsite system.
- E. "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater design daily flow rates are based.
- F. Easement – a property interest that allows the holder of the easement to use the property that he or she does not own or possess. The easement is a legally binding written instrument of title (a deed) which contains all applicable provisions of Rule .1938(j), and includes the following elements:

- 1. a competent grantor,
- 2. an existing grantee capable of taking title,
- 3. a granting or conveyance clause,
- 4. a legal description of the property,
- 5. the requisite execution and “seal” of the grantor,
- 6. satisfactory acknowledgement by a notary or authorized officer, and
- 7. delivery to and acceptance by the grantee.

Instrument(s) shall be recorded in the office of the Register of Deeds (County Registry) where the land lies. If the land is located in more than one county, then the instrument shall be recorded in each county where any portion of the land lies to be effective as to the land in that county.

- G. Encroachment agreement – a legal agreement for one or more supply lines to cross an existing easement or right-of-way owned or controlled by another utility or governmental entity (e.g., NCDOT, power company, gas company, railroad, etc.). The instrument shall contain the following elements:
 - 1. name of the entity that owns or controls the easement or right-of-way,
 - 2. name of the party requesting the encroachment,
 - 3. description of the requested encroachment,
 - 4. an identifiable description of the easement or right-of-way being encroached upon, including necessary plans or drawings,
 - 5. specific conditions of the agreement per grantee’s encroachment policies, and
 - 6. agreement date and signatures of authorized parties (attested, notarized, and/or witnessed per grantee’s encroachment policies).

Instrument(s) shall be recorded in the office of the Register of Deeds (County Registry) where the land lies. If the land is located in more than one county, then the instrument shall be recorded in each county where any portion of the land lies to be effective as to the land in that county.

- H. Property Owners Association (POA) – a perpetual and non-profit entity established through Articles of Incorporation filed with the NC Secretary of State’s Office in accordance with the provision of NCGS 55A, that owns or jointly controls the common areas of a development.
- I. Off-site System Agreement - an agreement executed between the developer and the Property Owners Association (POA), which addresses ownership, transfer of ownership, responsibility for and funding of operation, maintenance and repairs. This agreement is required when any components of an off-site system , including associated easement, encroachment or drainage feature, is located on jointly owned or controlled common areas of a development.

- J. Operation & Maintenance (O&M) Agreement(s) – agreement(s) executed among each owner of an off-site system and the POA and between the POA and the ME (or MEs), as applicable. The agreement specifies responsibilities of all parties, including frequency of visits, duties to be performed, reporting requirements, emergency response requirements, and financial responsibilities for specified operation, maintenance and repairs. One ME is required to operate and maintain all system components located in easements or common areas and all associated subsequent components. This agreement does not apply to components that are located within the building lot and are outside of any easements on the building lot.
- K. Management Entity (ME) - person, as defined by Rule .1935(35), responsible for system management pursuant to this Approval and Rule .1961.
- L. Supply line – a watertight pipe used to convey effluent from the septic tank or pump tank to the distribution device or dispersal field
- M. Supply line network – two or more supply lines located wholly or in part within an easement or encroachment in a single phase or section.

IV. Siting Criteria

Off-site systems may be permitted on sites classified as Suitable or Provisionally Suitable and for any system that may be approved pursuant to 15A NCAC 18A .1900 *et seq.*

V. System Sizing

The dispersal field shall be sized according to the Long Term Acceptance Rate (LTAR) as determined in Rules .1955, .1956, .1957, .1969, and .1970, as applicable.

VI. Special Site Evaluation

A special site evaluation may be required based on the proposed ground absorption system. Refer to Rule .1970(p), as applicable.

VII. Design Criteria

- A. The septic tanks and pump tanks shall be designed and constructed in accordance with Rules .1952 and .1954 with a specified capacity in accordance with Rule .1952(b).
- B. The design of the supply line and supply line networks shall include specifications for the location, installation, and method of testing.
 - 1. Supply lines serving off-site septic systems, shall be located either individually in dedicated easements or within supply line networks in common areas or easements. Easements and networks shall be dedicated exclusive use and extend completely from the building lot to the dispersal field area.
 - a. Supply line easements shall be a minimum width of 15 feet. Once a supply line crosses into an easement, the supply line shall be located a minimum of 5 feet from any other parallel utility, or a greater distance if required for the specific utility (e.g., 10-feet required from a water line).
 - b. Any utility crossings over or under the supply lines must meet the requirements of Rules .1950(f) and (g) and any necessary encroachment agreements shall be obtained.

- c. Supply lines crossing a stream must meet the requirements of Rule .1950(h).
 - d. Supply lines conveyed under areas subject to vehicular traffic shall meet the requirements of Rule .1950(c).
 - e. Supply line network easements shall be under common ownership or control and include ingress and egress on the easements for the purpose of installation, operation, maintenance and repair.
 - f. Easements shall remain free of structures, landscaping, or any activities that would interfere with the use of the easement for its intended purpose.
 - g. Supply lines shall be designed in a horizontal configuration along the trench bottom. Vertical configuration (stacking) of supply lines is prohibited.
 - h. To prevent pipe movement, thrust restraint (blocking) shall be incorporated into the construction plans as needed.
 - i. Each individual supply line installed in a common trench shall be separated horizontally by a minimum distance equal to one pipe diameter.
 - j. All pipe segments shall be permanently marked every ten feet on the crown of the pipe with the corresponding unique lot number or letter and shall be visible at the time of inspection. The printed lot number or letter shall be at least one inch in height and legible.
 - k. A minimum burial depth of 30 inches, as measured from the crown of the pipe to the ground surface, shall be provided throughout the length of the supply line from the point of exiting the building lot to the point of entering the dispersal field area-
 - l. If the 30 inch minimum burial depth cannot be met, the supply line(s) shall be sleeved in ductile iron or DOT traffic rated road crossing culvert pipe.
 - m. Clean soil or appropriate backfill shall be used to cover supply lines. Appropriate backfill shall be approved by the LHD. Native backfill will be considered appropriate less rock and/or any organics. Proper continuous bedding (undisturbed soil or appropriate compacted backfill) under the supply lines shall be required to prevent bridging of pipes.
 - n. Provisions to stabilize and compact the excavation shall be made during backfilling in order to prevent erosion.
2. Supply line design specifications shall meet the following minimum criteria:
 - a. The discharge piping and supply lines shall be at least one inch in diameter.
 - b. The pump size and supply line size shall be selected to achieve a velocity of at least two feet per second (minimum scour velocity) and no more than five feet per second to minimize water hammer.
 - c. Supply lines and fittings shall be constructed of, at a minimum, Schedule 40 PVC pipe pressure-rated for water service (e.g., labeled NSF-PW) with solvent welded joints. Pressure rated piping other than Schedule 40 PVC may be used when designed by a Professional Engineer and certified by the design engineer to be installed per ASTM D-2774 for Underground Installation of Thermoplastic Pressure Piping. All pipe, fittings, joints, installation and testing methods shall conform to the appropriate ASTM or ANSI/AWWA standards.
 - d. Air/vacuum relief valves shall be specified as needed to release trapped air from the force main and maintain system performance.
 3. Supply Line Network design plans and specifications shall incorporate best management practices and accepted design standards including, but not limited to the following:
 - a. minimizing supply line crossings and lengths,
 - b. ensuring accessibility of the supply line network, dispersal fields and other system components, including all weather access specification,
 - c. facilitating installation, operation, repair, and maintenance of the system,

- d. pump calculations including flow rate, total dynamic head, and velocity in supply lines,
 - e. hydraulic profile (if needed), and
 - f. calculations specifying the amount of drain back to either the pump tank or dispersal field.
- C. All Weather Access design plans and specifications shall be submitted by a professional engineer and the construction shall be certified by the designer upon completion and shall include the following as applicable:
1. Minimum width of 10 feet with a minimum inside turning radius of 28 feet (must be accessible/passable by a tandem axle truck including curves).
 2. Minimum vertical clearance of not less than 13 feet 6 inches.
 3. Dead end access roads in excess of 500 feet shall include an area for turnaround.
 4. Graded to prohibit ponding of water.
 5. Sloped from centerline to edge at minimum 2% grade.
 6. The road shall not be constructed at a grade of greater than 15%.
 7. The subgrade of the road shall be compacted to 95% standard proctor.
 8. Minimum of six inches of aggregate (compacted) shall be required consistent with emergency fire access lane (i.e. heavy truck acceptable).
 9. Alternate construction practices may be specified by the system designer.
- D. Dispersal Field design specifications shall include:
1. Accessibility via the dedicated easement.
 2. A minimum 10 foot horizontal setback from easement lines to ensure compliance with Rule .1950.
 3. Surface water runoff diverted away from the field.
 4. Protection from vehicular traffic or other unauthorized access.
 5. At-grade access to components for operation and maintenance
 6. Final soil cover to a depth of six inches after settling.
 7. Stabilization of final cover with appropriate vegetation.

VIII. Installation and Testing Procedures

- A. A pre-construction conference shall be required to be attended by the applicable contact person(s) and the LHD prior to beginning construction of the off-site system.
- B. All supply lines in a supply line network shall be installed concurrently.
- C. The final soil cover over the dispersal field shall be at least six inches deep after settling. Dispersal fields shall be sloped to shed surface water and in a manner which facilitates easy maintenance with standard mowing equipment. Runoff shall be diverted away from the dispersal field. Grass or other suitable vegetative cover shall be established and maintained over the sanitary sewage treatment and dispersal system and reserve area to prevent erosion, stabilize slopes, and allow for effective system inspection.
- D. At the final inspection, the LHD shall observe the operation of alternating valves and other distribution devices to confirm that they function as designed and are accessible from the finished ground surface.

- E. Each supply line shall be demonstrated to be watertight utilizing the test methods prescribed in VII.B.2.(c) above, and able to achieve the specified delivery rate and pressure head prior to the issuance of the Operation Permit.

IX. Operation, Maintenance and Monitoring

- A. The POA shall retain a ME to be responsible on its behalf to operate and maintain all components of an off-site 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 system will also be responsible for separately contracting with an ME if required based on the system type pursuant to Rule .1961.
- B. Off-site systems shall be classified minimally as a Type IV system. The following minimum inspection/maintenance and reporting requirements shall apply unless otherwise specified in the Operation Permit(s). The off-site system shall be inspected by the POA-ME's Operator in Responsible Charge (ORC) a minimum of once a year and by the LHD a minimum of once every five years.
- C. Each Operation Permit shall reference the responsibility of the POA for inspection and maintenance requirements for a supply line network, any other components in common areas under the POA's ownership or control, and any subsequent components of the system.
- D. The ORC shall provide monitoring reports to the LHD within 30 days of each required inspection. The ORC shall maintain a log of all malfunction incidences/notifications, observations and maintenance activities. Minimum maintenance during each required inspection shall include:
 - 1. Observation of the dispersal field,
 - 2. Observation of the pressurized supply line and appurtenant valves for leakage and damage ,
 - 3. Operation of alternating valves and distribution devices as applicable,
 - 4. Measurement of pressure head and flushing of distribution devices as applicable,
 - 5. Confirmation that the ground surface and vegetation over the dispersal field and supply lines are maintained, and
 - 6. Confirmation of accessibility of system components, including maintenance of the all weather access, as applicable.
- E. The owner of the off-site septic system and applicable components or the POA, as prescribed in the Off-Site System agreements, shall be responsible for assurance of operation, maintenance, and repair of the system including, but not limited to, the mowing of grass over the dispersal field, supply line easements, access easements, and repair area as applicable. These areas shall be kept clear of vegetative overgrowth, underbrush and debris.
- F. The Operation Permit shall document the POA's membership in *811 pursuant to G.S. 87-121(g).
- G. The Operation and Maintenance agreements shall specify repair and maintenance responsibilities of the entire septic system.

X. Responsibilities and Permitting

- A. An application for an off-site system Improvement Permit (IP) shall be submitted pursuant to Rule .1937.
1. The proposed use of an off-site system shall be identified in each IP application. Applications shall be submitted for all proposed off-site systems for a single phase or section of the development.
 2. When the development includes a supply line network, a separate supply line network application for a Construction Authorization (CA) must be received from the Developer/POA.
- B. Prior to the issuance of an IP for each building lot to be served by an off-site system, the following items shall be completed by the owner, owner's representative, applicant, or contact person for field verification by the LHD:
1. Laterals shall be field-staked by the contact person using an engineer's level or laser level to ensure conformation with natural contours.
 2. The size, location, horizontal separation distances, installation access, and staging areas of the proposed ground absorption system components shall be measured and field-staked.
 3. All proposed easements and/or property lines shall be field-staked and labeled for the LHD's review.
 4. A site diagram (see Appendix I) shall be prepared that includes:
 - a. Lateral length
 - b. Color key to field staking
 - c. Lateral elevations (as applicable), and
 - d. proposed easement, encroachment, right of way and/or property lines.
 5. When the combined field design flow exceeds 3,000 gpd and the combined dispersal field area (including repair areas) has a design flow greater than 1,500 gpd/acre, a hydraulic assessment shall be required with the following information supplied at a minimum:
 - a. mounding analysis (if appropriate)
 - b. lateral and vertical flow analysis (if appropriate)
 - c. deep soil borings (greater than 48 inches)
 - d. hydraulic conductivity measurements
 - e. approved storm water plans
 - f. any other information as specified by the LHD.The hydraulic assessment shall be prepared by a person or persons who are licensed or registered to consult, investigate, or evaluate soil and rock characteristics, hydraulic conductivity, lateral flow, and groundwater hydrology, (if required) pursuant to G.S. 89F or 89E.
 6. When a hydraulic assessment is required, this assessment must include the following:
 - a. verification that all off-site dispersal fields, both individually and collectively, meet the required vertical separation requirements after accounting for groundwater mounding or lateral flow conveyance, as applicable.
 - b. Consideration shall be given to effects of upslope and internal stormwater runoff, proposed stormwater management systems, and impacts of any other potentially hydraulically-interacting active dispersal field or repair area.
- Each IP for a building lot shall specify as a condition that a separate CA shall be issued for the Supply Line Network associated with that design unit.
- C. Prior to the issuance of a CA for the supply line network, plans and system design shall be submitted to the LHD for review and approval. Plans, specifications and system design 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 characteristic, ground water hydrology, or drainage systems if required in G.S. 89C, 89E, 89F, and 90A Article 4. Plans shall incorporate best management practices and accepted design standards, in accordance with Section VII(b) of this Approval.

1. All easements and property lines shall be surveyed and permanently marked in the field.
 2. Any encroachment agreements shall be obtained as needed.
 3. Plans, specifications and design of specified system components shall be prepared by a registered professional engineer if required by G.S. 89C or when one or more of the following conditions are met:
 - a. Supply Lines are longer than 1,000 feet.
 - b. Supply Line Network(s) include more than four supply lines in a single easement.
 - c. Elevation variations require use of appurtenances such as air release valves.
 - d. Alternate materials or design specifications other than as prescribed in this innovative approval are proposed to be used for supply lines, supply line networks or trenches.
 - e. System utilizes pressure dispersal (drip irrigation and LPP fields) and the supply line is on a net downhill grade or includes a section that will drain more than 25-percent of the field dose volume to the drainfield between doses.
 - f. System is required to be designed by an engineer pursuant to Rules .1938(d) or .1969.
 - g. One or more supply lines in an easement or common area that is a part of a Septic Tank Effluent Pump (STEP) system serving two or more facilities connected to a shared dispersal field.
 - h. An all weather access road is included in the design.
 - i. Any other off-site system sharing an easement or common area with another system so specified by the LHD.
 4. All weather access to each dispersal field for vehicles and equipment without encroaching on other system area(s). The design criteria for the road specified in Section VII(C) of this Approval shall be met. The provision for all weather access may be eliminated if the designer stipulates and the CA for each design unit requires that:
 - a. All of the adjacent and contiguous offsite 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 of the offsite 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 system components for continued operation, maintenance, and repair.
 - d. When an all weather access is proposed, any dispersal field that is not adjacent to the all weather access shall be installed in accordance with a or b above.
- D. A separate CA shall be issued to the Developer/POA for each Supply Line Network. All supply lines in a Supply Line Network shall be installed at the same time. The Supply Line Network CA(s) may be issued first, or concurrently with the CAs issued for individually permitted portions of the off-site systems. The CA for the supply line network shall reference the associated IPs for all building lots served. The CA for the Supply Line Network shall not be used to obtain a building permit.
- E. A CA shall be issued by the LHD that specifies construction of components (tanks, appurtenances, supply lines and dispersal fields) of the off-site system serving a design unit on a building lot. Separate CAs may be issued for specific components of the system. A building

permit shall not be issued until CAs for all system components serving the individual design unit on a building lot have been issued.

- F. Prior to issuance of an CA for the system components located on a building lot:
1. CA's shall be issued for the associated Supply Line Network and the off-site drainfield for that building lot.
 2. Plats, easements, declarations, and subordination documents shall be properly executed and recorded at the Register of Deeds,
 3. Where applicable, documentation of creation of a POA and a draft copy of an Off-Site System Agreement (as defined by this document) shall be submitted and approved by the LHD.
- G. All system components shall be installed by a contractor who is a North Carolina Certified Wastewater System Installer (Grade III or higher) or as specified in accordance with G.S. 90A-72. A pre-construction meeting will be required prior to the installation of any supply line network and other components separate from the building lot. The applicable Contact Person(s) along with the representative of the LHD shall meet on the site with the approved off-site system design plan and supply line network plan (see Appendix II).
- H. Prior to the issuance of the Operation Permit (OP) for an off-site system, all the following criteria shall be met, as applicable:
1. An O&M Agreement(s) shall be executed between the POA and a Management Entity which employ(s) or executes a contract with an ORC. Where applicable, an O&M Agreement(s) shall also be executed between and the system owner and a ME. The agreements shall contain all the information as required in accordance with Rule .1961(e) and Section IX of this document. The agreements shall be in effect as long as the system is in use. A signed and executed copy of the agreement(s) shall be submitted to the LHD prior to the issuance of the Operation Permit.
 2. All inspections as required by the LHD shall be completed.
 3. Pump delivery rate and pressure shall be verified by the LHD at the distal end of the supply line(s).
 4. For systems or system components required to be designed by a professional engineer or an authorized design individual, the owner shall submit:
 - a. A written certification signed by the engineer/designer that the system was installed in accordance with the approved plans and specifications, and,
 - b. A record drawing representing the system components as they were installed.
 5. All easement areas (access, individual, and supply line network) shall be surveyed and marked with permanent markers or monuments that are clearly labeled as to the easement area and the Building Lot served.
 6. The Off-Site System Agreement shall be properly executed and recorded at the Register of Deeds in the county where the property is located.
 7. The entire system, supply lines, dispersal fields, tanks, pumps, and appurtenances, must be installed, tested by the designer and approved by the LHD, including as needed for concurrent or prior approval of a Supply Line Network, as applicable, prior to the issuance of the Operation Permit.
 8. The POA/developer shall provide documentation of *811 Membership pursuant to G.S. 87-121 as applicable.

- I. Each Operation Permit for a completed individual Off-Site System shall include as parties to the permit the owner of the individual design unit and system, and the POA, and delineate the responsibilities of each party for Operation and Maintenance of the system.
- J. Any development with a supply line network shall have a Property Owners Association (POA) and the appropriate documents. A draft and final copy of the POA documents shall be provided to the LHD for review prior to being recorded with the Register of Deeds. POA documents shall, at a minimum, address the following:
 - 1. The use and/or limits of use for easements
 - 2. The maintenance of easements
 - 3. Outline a course of action in the event that a repair to an off-site septic system dispersal field or its supply line is necessary including details of ownership and financial responsibilities.
 - 4. Maps and/or detailed drawings of all locations of easements for all components not located on the Building Lot
 - 5. The POA shall provide documentation to the LHD of its membership as an Operator in the North Carolina Notification Center established pursuant to the Underground Utility Safety and Damage Prevention Act (Article 8A, Chapter 87 of the General Statutes), and has provided the location information necessary for the Center to notify prospective excavators.

XI. Repair of Systems

The provisions of 15A NCAC 18A .1961(l) shall apply to the use of off-site systems for repairs to existing malfunctioning septic tank systems.

Appendices

These samples are provided as examples only and are meant for general guidance

- I. Sample Supply Line Network Diagram
- II. Sample Supply Line Network Details

Approved by: _____ Date: _____