REQUIREMENTS FOR SUBMITTALS of SOIL REPORTS and PRETREATMENT AND/OR DISPERSAL SYSTEM DESIGNS

The purpose of this document is to specify minimum design and report content requirements for the design of subsurface wastewater treatment systems, including those using advanced pretreatment, drip or other dispersal systems. This document is directed for single-family home systems but may also be used for systems with an unreduced design flow of up to 3,000 gallons per day. For systems with an unreduced design flow over 3,000 gallons per day, the On-site Water Protection Section's Large Systems Procedures are applicable.

I. Applicant and General Information

Submittals shall include the following:

1. Property owner's name, mailing address and daytime phone number;
2. All consultants' contact information (address, license number, phone, FAX and e-mail address);
3. Designated use of the property, facility type and proposed design daily flow;
4. The basis for the design flow if other than a single-family residence, include plumbing plans, specifications/cut sheets for all water using fixtures and any other additional information as required to support the proposed design daily flow;
5. Any plumbing or collection system appurtenances (grinder pumps, etc.) that may affect the operation and performance of the system;
6. Written documentation from the system manufacturer on company letterhead specifying that the named designer is currently authorized for systems that require authorized designers; and
7. Locator map for the property.

II. Soil and Site Evaluation

The soil and site evaluation shall be conducted by a person licensed or registered to perform the work when required in accordance with N.C.G.S. 89E (Geologists) or 89F (Soil Scientists). Please refer to 15A NCAC 18A .1970(p) when a special site evaluation is required when using advanced pretreatment or if required based on the proposed dispersal system type.

An overall site plan drawn to scale of no less than 1 inch = 60 feet showing the dimensions of the property, a North arrow, the location of the house or facility, pretreatment components, property lines, utilities, other pertinent site features, and all of the following information shall be submitted.

The information to be shown on the site plan includes the following.

1. Property lines with dimensions, fixed visible reference points, and vertical and horizontal benchmarks.
2. Contour lines on at least two-foot intervals or spot elevations when there is less than a two-foot elevation difference across the site. Alternatively, lines shall be field located on contour map with locations and relative elevations shown on the detailed site plan.
3. Proposed structures, vehicle accesses and appurtenances with setbacks to fixed reference points.
4. Any existing or proposed storm water management features within 50 feet of any part of the proposed system and repair area.
5. All proposed pretreatment system components, collection lines, supply lines, initial drainfield and repair areas shall be shown with dimensions and setbacks to fixed reference points.
6. The location of the soil/saprolite/fill profiles for the system and repair areas, including labeling of the profiles to match the individual profile descriptions.

7. The location of water table monitoring wells, location of hydraulic conductivity measurements (in drainfields and at what depths measurements were conducted), etc. Water table monitoring well elevations (top of casing and ground surface) shall be referenced to established horizontal and vertical benchmarks.
8. Number and location of pits, auger borings, water table monitoring wells and hydraulic conductivity measurements is site specific, but all items must be individually labeled and identified on the plans.
9. Proposed or existing private or public water supply components, (wells, water lines, etc.) relative to the proposed pretreatment system, sewer lines, initial subsurface system and repair areas.
10. The location of all non-potable wells on the property (including UST groundwater monitoring wells, sampling wells, groundwater monitoring wells, irrigation wells, etc.) shall be shown on the plans.
11. Drainage modifications and modifiers, where applicable, including:
    a. Location of existing and proposed drainage features and modifiers;
    b. Depth of drains, slope and elevations relative to a vertical benchmark;
    c. Width of drains, including open ditches;
    d. Outfalls and elevations relative to a vertical benchmark;
    e. Foundation drains;
    f. Existing and proposed drainage system design and construction specifications; and
    g. Other nearby features that may affect the drainage on the site (quarries, surface waters, areas of cut or fill, etc.).
12. New, proposed and existing easements, encroachment agreements, right of ways, access to off-site areas and utilities.
13. Location of any areas to be modified by cutting, filling or covering.
14. Existing or proposed site modifications or improvements.
15. All other features that would have a setback which would impact the on-site subsurface wastewater system and repair area.

Additional required information for the soil and site evaluation:

1. Soil/saprolite/fill profile descriptions (not in paragraph format) labeled to match field designation in a comparable format to the site evaluation form in use by the On-Site Water Protection Section. Copies are available online at: http://www.deh.enr.state.nc.us/osww_new/new1//images/Forms/SiteEvalForm.pdf.
2. Proposed long term acceptance rate shall be indicated for each profile described, the initial system, and the repair area.
3. List of any special equipment and methodology used to perform the evaluation (Ksat equipment – specific manufacturer of equipment and a copy of the Users Manual, pits, etc.).
4. Results of in-situ hydraulic conductivity analyses, groundwater mounding analysis, lateral flow analysis, and monitoring or modeling of existing or projected depth to a soil wetness condition based upon the procedures of Rule .1942. Field measurement log sheets and calculations shall be included in or appended to the report. Information must be supplied to support length of time that the hydraulic conductivities were run, showing compliance with user's manual for steady state determination.
5. A detailed description of any existing or proposed site modifications or improvements. The plans shall include specifications for each modification.

The following items shall be clearly marked and identified in the field for the site visit. When an instrument is required for elevation determination, an engineer's level or equivalent shall be used.

1. Property lines, fixed reference points, horizontal and vertical benchmarks;
2. Location of soil/saprolite/fill profiles;
3. Location of water table monitoring wells, hydraulic conductivity measurements, etc.;

4. Collection, treatment and disposal components for the proposed initial system and the repair system;
5. Primary structures and appurtenance (pools, garages, driveways, etc.);
6. Location of water supply components;
7. Location of storm water management components;
8. Any existing or proposed drainage modifications; and
9. Location of easements, encroachment agreements, right of ways, access to off-site areas and utilities.

III. Pretreatment Components

A site plan detailing the proposed system shall be submitted. The site plan for the pretreatment area must be at a scale no smaller than 1 inch = 20 feet, and include a North arrow and all of the following information.

The following information must be included:

1. Tanks
   a. Plan and profile drawings;
   b. Tank dimensions, location and relevant elevations (e.g. inlet and outlet inverts, ground surface elevations and other elevations as needed to show that the system design works as proposed);
   c. Other pertinent elevations in recirculation and pump tanks (i.e. float activation levels);
   d. Identification number of state approved tanks;
   e. Access riser, manhole, effluent filter and discharge pipe details; and
   f. Provisions for anti-flotation including calculations and drawings, if applicable.
2. Advanced Pretreatment components
   a. Plan and profile drawings;
   b. Drawings showing all treatment units and appurtenances, piping (size and type), disinfection unit, blowers if needed, location of control panels, height of control panels, etc.;
   c. Details on all appurtenances supplied with the advanced pretreatment unit (pump curves, cut sheets, control panels, valves, etc.);
   d. Documentation from the manufacturer supporting the proposed design and use of the advanced pretreatment system, if needed; and
   e. Reference the specific accepted, innovative, controlled demonstration or experimental approval.
3. Pump Systems
   a. Calculations for system total dynamic head including friction loss, elevation head, pressure head, etc.;
   b. Cut sheet for pump with pump curve;
   c. Description of float sequencing, control panel function under normal and other than normal conditions, and appropriate settings;
   d. Control panel must meet the requirements of 15A NCAC 18A .1952(c)(6) and (7) and most recent version of the I&E approval, as applicable;
   e. Emergency storage capacity calculations and provisions for auto-dialer and stand-by power, where applicable;
   f. For pressure dispersal, dosing and flushing conditions for pumping and filter backwash requirements as applicable; and
   g. Single or multiple control panels, who will be providing the panel(s) and what each panel will be controlling.

4. Location and identification of all gravity and pressure lines, including calculations, size and type of piping from building to tanks, among tanks and pretreatment units, and from tanks to nitrification field.
5. Testing and start-up procedures.

IV. Nitrification Field

A detailed site plan showing the location, layout and design of the initial system and repair areas, at a scale no smaller than 1-inch=30-feet, must be provided. Field contour lines must be shown on the plans. A Minimum of two-foot intervals or spot elevations shall be provided if there is less than two-foot elevation variation across site. Alternately, lines shall be field-located on the contour map with locations and relative elevations shown on the detailed site plan.

The following information must be included in the submittal:

1. Trench and lateral distribution system plan and cross sectional details (e.g. trench width and length, trench depth, hole spacing, pipe size and type);
2. Specific trench media to be used, including model number if applicable;
3. Manifolds, supply lines, return lines, cleanouts, interconnection details and appurtenances;
4. Flow distribution device design and construction details;
5. Drainage system locations, discharge points and design details;
6. Fill modifications referencing both depth and location to establish horizontal and vertical benchmarks;
7. Documentation that the drainfield layout has been field staked and verified by the local health department; and
8. Reference the specific accepted, innovative, controlled demonstration or experimental approval.

V. Site Preparation, Installation and Other Items

1. Proposed installation procedures, including site preparation, method of trench/tubing installation, provisions and procedures for blanking, where applicable;
2. An operation and maintenance plan for the proposed system and proposed maintenance of pretreatment and drainage if applicable;
3. Details of cleanouts, aerial crossings, road crossings, water line crossings, storm sewer crossings, etc. as needed;
4. Proof that all necessary legal documents, including easements, association documents, Tri-Party Agreements, etc. have been submitted;
5. Flow reduction information as needed for projects other than single- or multi-family home systems;
6. Additional information based on the soil and site evaluation;
7. Fill installation procedures, including selection and incorporation of fill material;
8. Methods for removal of vegetation, including trees;
9. Slope stabilization plan and maintenance provisions for slopes greater than 30 percent;
10. Final landscaping and vegetation establishment provisions for the nitrification field area, including maintenance of vegetation or landscaping over system;
11. Identification of any well(s) to be abandoned, including a statement that well abandonment shall be per the Division of Water Quality in the Department of Environment and Natural Resources or local health department regulations, as applicable;
12. Identification of old roads, buildings, etc., to be removed and removal procedures;
13. Locations of any debris to be buried on site shall be specified; and
14. Any other site-specific installation procedures recommended by the consultant.

Review of Submittal

The Department or its authorized agent shall provide a written response after receipt of a complete proposal. Before a definitive regulatory decision may be made, additional information may be required based on site-specific conditions. Furthermore, the state may request review assistance on a case-by-case basis, which will have an impact on the final regulatory decision timeframe. State review should only be requested after the health department has received and reviewed the consultant's submittal for completeness in accordance with these requirements.