

**15A NCAC 18A .1970
ADVANCED WASTEWATER
PRETREATMENT SYSTEMS**

Steven Berkowitz and Bob Uebler
NC On-Site Wastewater Section

Major Headings

- (a) Advanced pre-treatment system performance standards
- (b) Design influent quality
- (c) The site shall be initially evaluated and classified in accordance with the rules
- (d) NSF-40 systems siting and sizing requirements
- (e) TS-I systems siting and sizing requirements
- (f) TS-II system siting and sizing requirements
- (g) Artificial drainage systems
- (h) Saproliite systems

Major Headings Continued

- (i) Bed ground absorption systems <1000gpd
- (j) Bed ground absorption systems 1000 to 3000 gpd
- (k) Design
- (l) Installation
- (m) Operation and Maintenance
- (n) System performance
- (o) Site and system compliance
- (p) Responsibilities and permitting procedures

(a) Advanced pre-treatment system performance standards

- Table VII formally adopts the NSF-40, TS-1 and TS-2 treatment standards in the body of our Rules
- Previously found only in system approvals

Table VII

Effluent Quality Standards for Approved Pretreatment Systems

Parameter	NSF-40	TS-I	TS-II
CBOD	<25 (mg/l)	<15 (mg/l)	<10 (mg/l)
TSS	<30 (mg/l)	<15 (mg/l)	<10 (mg/l)
NH ₄ -N		<10 (mg/l)	<10 (mg/l)
TN			<20 mg/l or >60% removal
Fecal Coliform		<10,000 (colonies/100 ml)	<1,000 (colonies/100 ml)

(b) Design influent quality

- Influent standards are given in Table VIII
- Standards dominantly apply to fixed media filters receiving septic tank effluent
- Standards for systems that can handle higher strength waste are still found in individual system approvals for those systems

Table VIII

Influent Quality Standards for Advanced Pretreatment Systems

Parameter	Influent Not to Exceed (mg/l)
BOD	350
TSS	200
TKN	100
FOG	30

(c) The site shall be initially evaluated and classified in accordance with the rules

- The site shall be initially evaluated and classified in accordance with the rules of this Section or as otherwise specified in a system-specific approval issued pursuant to 15A NCAC 18A .1969.
- A ground absorption system receiving effluent from an advanced wastewater pretreatment system may be used on sites classified as SUITABLE or PROVISIONALLY SUITABLE for conventional, modified, alternative, or E & I or accepted systems in accordance with this Section.
- Modifications to siting and system design criteria pursuant to Paragraphs (d), (e), (f), (g), (h), (i), and (j) of this Rule shall be acceptable, as applicable.

(d)(1) NSF-40 systems siting and sizing requirements

- For systems approved to achieve at least NSF-40 standards and designed for no more than 1500 gallons per day
- Trench or bed bottom separation distances are as specified in Table IX
- “SWC” means “Soil Wetness Condition”
- "USC" means an "UNSUITABLE Soil/Fill Condition," other than a SWC.
- Separated into initial siting requirement and vertical trench bottom separation requirement

Table IX

Part 1

Minimum depth of soil/fill required at site
to permit system NSF-40 system \leq
1500gpd.

Soil/Sys Criteria	Rule Reference	Gravity Dist	Pressure Dispersal
Soil Group I	Rules .1955, .1956 & .1957(a)	24 inches	24 inches
Soil Groups II-IV	Rules .1955, .1956 & .1957(a)	24 inches	24 inches
New Fill	Rule .1957(b)(1)	18 in to USC & 12 in to SWC	18 in to USC & 12 in to SWC
Existing Fill (\leq 480 gpd only)	Rule .1957(b)(2)	36 in of Group I Fill/Soil	24 in Group I Fill/Soil

Table IX

Vertical Trench/Bed Bottom Separation Requirements for NSF-40 Systems ≤ 1500 GPD

Soil/Sys Criteria	Gravity Dist (Depth of USC)	Gravity Dist (Depth of SWC)	Pressure Disp (Depth of USC)	Pressure Disp (Depth of SWC)
Soil Group I	12 inches	12 inches	12 inches	12 inches
Soil Groups II-IV	12 inches	12 inches	12 inches	12 inches
New Fill	18 inches	18 inches	18 inches	12 inches
Existing Fill (≤ 480 gpd only)	36 inches	36 inches	18 inches	18 inches

NSF-40 Section (d)(2)

- The total drainfield trench length or bed system bottom area, as required for a ground absorption system receiving septic tank effluent, is reduced by 25 percent in soils which are Groups I or II with SUITABLE structure and clay mineralogy.
- No other reductions in linear footage of nitrification trench, square footage of trench bottom area or system area shall be applied when a PPBPS or innovative trenches or accepted systems are used for the absorption field, except where based on an adjusted design daily flow rate granted in accordance with 15A NCAC 18A .1949(c).
- Bed systems remain restricted to a design flow of 600 gallons per day or less; **and**

NSF-40 Section (d)(3)

- The minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956(6)(g), as applicable, shall be met, except as specified in Table X

Table X

Minimum horizontal setbacks for ground absorption systems where NSF-40 Pretreatment System are used for ≤ 1500 gpd

Land Feature or Component	NSF-40 (feet)
Streams classified as WS-1, except for saprolite	70
Waters classified as S.A., from mean high water mark	70
Other coastal waters from mean high water mark	35
Any other stream, canal, marsh or other surface waters, from normal pool elevation (NPE)	35
Any Class I or Class II reservoir from NPE	70
Any permanent storm water retention pond from FPE	35
Any other lake or pond from NP or MHWE	35

(e) TS-I systems siting and sizing requirements

- Except as allowed in Parts (3)(A) and (3)(B) of this Paragraph, when trenches are used for the drainfield in conjunction with an advanced pretreatment system meeting TS-I standards, **one and only one** of the following siting, sizing or system factors pursuant to Subparagraphs (1), (2) or (3) of this Paragraph apply when designing the ground absorption component of the system.
- When a system is permitted pursuant to this Paragraph, the provisions of Paragraph (d) of this Rule do not apply.

(e)(1) Initial Siting and Trench Bottom separation requirements for a TS-I System

- (1) Trench bottom separation distances for a system with a design flow no greater than 1000 gallons per day are as specified in Table XI

Table XI

Part 1

Minimum depth of soil/fill required at site to permit TS-1 system.

Soil/Sys Criteria	Rule Reference	Gravity Distribution	Pressure Dispersal
Soil Group I	Rules .1955, .1956 & .1957(a)	24 inches	18 inches
Soil Groups II-IV	Rules .1955, .1956 & .1957(a)	21 inches	18 inches
New Fill	Rule .1957(b)(1)	14 in to USC & 12 in to SWC	12 inches
Existing Fill (≤ 480 gpd only)	Rule .1957(b)(2)	36 in of Group I Fill/Soil	24 in of Group I Fill/Soil

Table XI Minimum Vertical Trench Bottom Separation Requirement for TS-1 System \leq 1000gpd

Soil/Sys Criteria	Gravity Dist (Depth of USC)	Gravity Dist (Depth of SWC)	Pressure Disp (Depth of USC)	Pressure Disp (Depth of SWC)
Soil Group I	12 inches	12 inches	9 inches	9 inches
Soil Groups II-IV	9 inches	9 inches	9 inches	9 inches
New Fill	18 inches	14 inches	12 inches	9 inches
Existing Fill (\leq 480 gpd only)	36 inches	36 inches	12 inches	12 inches

Further

- (A) The trench bottom vertical separation distance shall not be reduced to less than 12 inches to rock or tidal water;
- (B) With the exception of the reduced setbacks to drainage devices pursuant to Table XII of this Rule, the minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956(6)(g), as applicable, shall be met;
- (C) A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule;

Or (d)(2)

- The long term acceptance rate (LTAR) that would be assigned by the local health department for a ground absorption system using septic tank effluent may be increased by up to a factor of two when all of the following conditions are met:

- (A) A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule, when Group III or IV soils or saprolite occur within three feet of the trench bottom or the site requires drainage of Group II or III soils or whenever the design flow exceeds 1000 gallons per day;
- (B) No further reductions in linear footage of nitrification trench or system area shall be applied when a PPBPS or innovative trenches or accepted systems are used for the absorption field;
- (C) For systems to be installed in fill, pressure dispersal (LPP or Drip distribution) shall be utilized;

(D) With the exception of the reduced setbacks to drainage devices pursuant to Table XII of this Rule or as allowed pursuant to Part (3)(B) of this Paragraph, the minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951, and .1956(6)(g), as applicable, shall be met. For systems with a design flow in excess of 1000 gallons per day, a 25-foot horizontal separation shall be maintained to the property line, unless a site-specific nitrogen migration analysis indicates that a nitrate concentration at the property line will not exceed 10 milligrams per liter (mg/l);

Or (d)(3)

- (3) The minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956(6)(g), as applicable, shall be met, except as follows for a system with a design flow not to exceed 1000 gallons

Table XII

Minimum

horizontal setbacks for ground systems where TS-I Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-I (feet)
Any public water supply	100
Streams classified as WS-I, except for saprolite	70
Waters classified as S-A, from mean high water mark	70
Other coastal waters, from mean high water mark	35
Any other stream, canal, marsh or other surface waters, from normal pool elevation	35

Table XII

Minimum

horizontal setbacks for ground systems where TS-I Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-I (feet)
Any Class I or Class II reservoir, from normal pool elevation	70
Any permanent storm water retention pond, from flood pool elevation	35
Any other lake or pond, from normal pool or mean high water elevation	35
Any building foundation	5
Any basement	15

Table XII

Minimum

horizontal setbacks for ground systems where TS-I Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-I (feet)
Any property line	10
Top of slope of embankments or cuts of 2 feet or more vertical height	15
Any water line	10
Upslope interceptor / foundation drains / diversions	7
Sideslope interceptor / foundation drains / diversions	10

Table XII

Minimum

horizontal setbacks for ground systems where TS-I Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-I (feet)
Downslope interceptor / foundation drains / diversions	20
Groundwater lowering ditches or devices	20
Any swimming pool	15
Any other nitrification field (except the system repair area)	10

Further

(B) When an accepted system is used which allows for a 25 percent reduction in trench length, compared with a conventional trench system, for systems designed for 1000 gallons per day or less, the horizontal setbacks for a TS-I system allowed for in Table XII and the 25 percent reduction in drainfield trench length may be concurrently applied, when the site has space for an equivalently sized repair system.

(B) continued

A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule when Group III or IV soils or saprolite occur within three feet of the trench bottom.

(f) TS-II systems siting and sizing requirements

- Except as allowed in Parts (3)(A) and (3)(B) of this Paragraph, when trenches are used for the drainfield in conjunction with an advanced pretreatment system meeting TS-II standards, **one and only one** of the following siting, sizing or system factors pursuant to Subparagraphs (1), (2) or (3) of this Paragraph apply when designing the ground absorption component of the system.
- When a system is permitted pursuant to this Paragraph, the provisions of Paragraph (d) of this Rule do not apply.

TS-II (f)(1)

- (1) Trench bottom separation distances for systems with a design flow no greater than 1000 gallons per day are as specified Table XIII.

Table XIII: Minimum depth of soil/fill required at site to permit TS-II system \leq 1000 GPD.

Soil/Sys Criteria	Rule Reference	Gravity Distribution	Pressure Dispersal
Soil Group I	Rules .1955, .1956 & .1957(a)	24 inches	15 inches
Soil Groups II-IV	Rules .1955, .1956 & .1957(a)	21 inches	15 inches
New Fill	Rule .1957(b)(1)	14 in to USC & 12 in to SWC	12 inches
Existing Fill (\leq 480 gpd only)	Rule .1957(b)(2)	36 in of Group I F/S	24 in of Group I F/S

Table XIII: Minimum Vertical Trench Bottom Separation Requirement for TS-II Systems ≤ 1000 GPD

Soil/Sys Criteria	Gravity Dist (Depth of USC)	Gravity Dist (Depth of SWC)	Pressure Disp (Depth of USC)	Pressure Disp (Depth of SWC)
Soil Group I	12 inches	12 inches	6 inches	6 inches
Soil Groups II-IV	9 inches	9 inches	6 inches	6 inches
New Fill	18 inches	14 inches	12 inches	9 inches
Existing Fill (≤ 480 gpd only)	36 inches	36 inches	12 inches	12 inches

Further

- (A) The trench bottom vertical separation distance shall not be reduced to less than 12 inches to rock or tidal water;
- (B) With the exception of the reduced setbacks to drainage devices pursuant to Table XIV of this Rule, the minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956 (6)(g), as applicable, shall be met;
- (C) A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule;

Or (f)(2)

(2) The long term acceptance rate (LTAR) that would be assigned by the local health department for a ground absorption system using septic tank effluent may be increased by up to a factor of 2.0 in Group II, III and IV Soils and by up to a factor of 2.5 in Group I Soils when all of the following conditions are met:

- (A) A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule, when Group III or IV Soils or saprolite occur within three feet of the trench bottom or the site requires drainage of Group II or III soils, or whenever the design flow exceeds 1000 gallons per day;
- (B) No further reductions in linear footage of nitrification trench or system area shall be applied when a PPBPS or innovative trenches or accepted systems are used for the absorption field;
- (C) For systems to be installed in fill, a pressure dispersal system (LPP or Drip distribution) shall be utilized;

(D) With the exception of the reduced setbacks to drainage devices pursuant to Table XIV of this Rule or as allowed pursuant to Part (3)(B) of this Paragraph, the minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956 (6)(g), as applicable, shall be met;

(E) For the LTAR to be increased by a factor above 2.0 (up to 2.5) for a system designed for 1000 gallons per day, or less, there must be at least 36 inches of Group I Soils from the naturally occurring soil surface, the depth to a soil wetness condition below the naturally occurring soil surface must be at least 24 inches, a pressure dispersal system (LPP or Drip) shall be utilized, and there must be a 100 percent repair area:

(F) For the LTAR to be increased by a factor above 2.0 (up to 2.5) for a system designed for greater than 1000 gallons per day, there must be at least 48 inches of Group I Soils from the naturally occurring soil surface, the depth to a soil wetness condition below the naturally

Or (f)(3)

(3) The minimum horizontal setback requirements of 15A NCAC 18A .1950, .1951 and .1956(6)(g), as applicable, shall be met, except as specified in Table XIV for a system with a design flow not to exceed 1000 gallons per day:

Table XIV: Minimum horizontal setbacks for ground absorption systems where TS-II Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-II (feet)
Any public water supply	100
Streams classified as WS-I, except for saprolite	50
Waters classified as S-A, from mean high water mark	50
Other coastal waters, from mean high water mark	25
Any other stream, canal, marsh or other surface waters, from normal pool elevation	25

Table XIV: Minimum horizontal setbacks for ground absorption systems where TS-II Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-II (feet)
Any Class I or Class II reservoir, from normal pool elevation	50
Any permanent storm water retention pond, from flood pool elevation	25
Any other lake or pond, from normal pool or mean high water elevation	25
Any building foundation	5
Any basement	15

**Table XIV: Minimum horizontal setbacks for
ground absorption systems where TS-II
Pretreatment Systems are used for ≤ 1000 gpd**

Land Feature or Component	TS-II (feet)
Any property line	10
Top of slope of embankments or cuts of 2 feet or more vertical height	15
Any water line	10
Upslope interceptor / foundation drains / diversions	7
Sideslope interceptor / foundation drains / diversions	10

Table XIV: Minimum horizontal setbacks for ground absorption systems where TS-II Pretreatment Systems are used for ≤ 1000 gpd

Land Feature or Component	TS-II (feet)
Downslope interceptor / foundation drains / diversions	15
Groundwater lowering ditches or devices	15
Any swimming pool	15
Any other nitrification field (except the system repair area)	10

Further

(A) With the exception of the reduced setbacks to drainage devices or as allowed pursuant to Part (B) of this Subparagraph, when any horizontal setbacks are proposed to be reduced pursuant to Table XIV, the vertical separation modifications or LTAR increases shall not be concurrently applied pursuant to Subparagraphs (1) and (2) of this Paragraph, respectively.

Further

(B) If the horizontal setbacks for a TS-II system are only proposed to be reduced to the extent allowed for a TS-I system (Table XII), for a system designed for 1000 gallons per day or less, a 25 percent trench length reduction may be concurrently applied, compared to the length required for any type of trench system receiving septic tank effluent, when the site has space for an equivalently sized repair system.

(B) continued

A special site evaluation shall be provided to
the

local health department on behalf of the owner,
pursuant to Paragraph (p) of this Rule when
Group

III or IV soils or saprolite occur within three feet
of

the trench bottom. No further reductions in
linear

footage of nitrification trench or system area

(g) Artificial Drainage Systems

Applicable Siting and Sizing Factors

- TS-I or TS-II Pretreatment
- Group I, II or III Soils
- TS-I or TS-II LTAR or Horizontal Setback Reductions Apply (one; one only)
- No Vertical Separation Modifications

(h) Saprolite

Design shall not exceed 1000 GPD

- (1) The requirements of Rule .1956(6) of this Section shall be met, except where modifications are specifically allowed in this Paragraph.
- (2) Allowable saprolite textures include sandy clay loam in addition to sand, loamy sand, sandy loam, loam, or silt loam.

Saprolite Continued

- (3) Maximum trench depth is five feet.
- (4) The provisions for LTAR or Horizontal Setback modifications as allowed in Paragraphs (e) or (f) of this Rule for TS-I or TS-II systems, respectively, shall also apply to Saprolite Systems. However, there shall be no vertical separation modifications from as specified elsewhere in the Rules of this Section;

Saprolite Continued

- (5) For systems installed in saprolite with sandy clay loam texture, the maximum LTAR for gravity trenches shall be 0.2 gallons per day per square foot and 0.1 gallons per day per square foot for pressure dispersal (LPP or Drip) systems and
- (6) A special site evaluation shall be provided to the local health department on behalf of the owner, pursuant to Paragraph (p) of this Rule.

TS-I and II Systems, Beds \leq 1000 GPD

Applicable Siting and Sizing Factors

- Group I or II Soils
- Modest Vertical Separation Relaxations; and
- Up to 50% Bed Size Reduction (TS-I) or
Up to 60% Bed Size Reduction (TS-II); and
- TS-I or II Horizontal Setback Reductions

Table XV

Vertical Separation Requirements for TS-I and TS-II Bed Systems
 Designed for ≤ 1000 gpd

Soils / Sys Criteria to Permit Sys	Allowable Adj to Soil Criteria to Permit Sys	DFS to SWC	Bed Bottom Separation Requirement D of USC	Bed Bottom Separation Requirement D of SWC
S or PS Soils, 30 in Group I or II Soils from naturally occurring SS & slope $\leq 2\%$	Can increase allowable slope from $\leq 2\%$ to $\leq 10\%$ based on hydraulic assessment	36 inches	24 inches	12 inches

Table XV

Vertical Separation Requirements for TS-I and TS-II Bed Systems
 Designed for ≤ 1000 gpd

Soils / Sys Criteria to Permit Sys	Allowable Adj to Soil Criteria to Permit Sys	Depth From Surface to SWC	Bed Bottom Separation Requirement Depth of USC	Bed Bottom Separation Requirement D of SWC
36 in of Group I Soils, from naturally occurring soil surface, & slope $\leq 2\%$	Can reduce from 36 to 18 in of Group I Soils, based on hydraulic assessment, &/or b. can increase allowable slope from $\leq 2\%$ to $\leq 10\%$ based on hydraulic assessment	12 inches	12 inches	12 inches

Table XV

Vertical Separation Requirements for TS-I and TS-II Bed Systems
Designed for ≤ 1000 gpd

Soils / Sys Criteria to Permit Sys	Allowable Adj to Soil Criteria to Permit Sys	Depth from surface to SWC	Bed Bottom Separation Requirement Depth of USC	Bed Bottom Separation Requirement D of SWC
24 in of Group I Existing Fill meeting Rule .1957(b)(2)(A), (B), & ©, & only when design flow ≤ 480 gpd	No Adjustments Applicable	18 inches	18 inches	18 inches

TS-I and II Systems, Beds > 1000 to ≤ 3000 GPD Applicable Siting and Sizing Factors

- Group I Soils
- Modest Vertical Separation Relaxations; and
- Up to 50% Bed Size Reduction (TS-I) or
Up to 60% Bed Size Reduction (TS-II); and
- No Horizontal Setback Reductions and 25-foot property line setback unless TS-II or nitrogen migration study

Table XVI

Vertical Separation Requirements for TS-I and TS-II Bed Systems
Designed for ≤ 1000 to ≤ 3000 gpd

Soils / Sys Criteria	Depth from Surface to SWC	Bed Bottom Separation Depth to SWC	Bed Bottom Separation Allowable Adj in Depth to SWC
54 in of Group I Soils from naturally occurring soil surface	48 inches	24 inches	Can reduce from 24 in to 12 inches in naturally occurring soil, or to 18 in for fill systems based on groundwater mounding analysis

Design Criteria, NSF-40, TS-I and TS-II Systems

- See RWTS, Experimental, Controlled Demonstration, Innovative or Accepted System Approval
- Provisions to Sample Influent and Effluent While the System is Operational
- Flow Monitoring Method
 - To Measure and and Record Daily Wastewater Flows
 - Means to determine past 30 days of Flow

Installation Criteria, NSF-40, TS-I and TS-II Systems

- See RWTS, Experimental, Controlled Demonstration, Innovative or Accepted System Approval
- Manufacturer-Authorized Installer Required
- See Authorization to Construct

Operation and Maintenance NSF-40, TS-I and TS-II Systems

- Post 7/1/06: Manufacturer Shall Provide for O+M
 - Provide Renewable Contracts, Min. 1-year
- Pre 7/1/06: Optional renewable year contracts
- OPs after 7/1/06: Owner Shall Provide Contract:
 - With Manufacturer/Manufacturer's Representative; or
 - With Manufacturer-Authorized Certified Operator

System Performance

NSF-40, TS-I and TS-II Systems

- Annual Visual Inspection per Manufacture's Procedure
- 7-day and 30-day wastewater flow
- Influent/Effluent Sampling
 - Quarterly for Controlled Demonstration
 - Annually for RWTS/Innovative for all parameters
 - May reduce by 50 percent after 2 years for TS-I and TS-II
 - Semi-annually for systems >1500-3000 gpd
- No Routine Sampling after Accepted Status Granted

Site Compliance

Advanced Pretreatment Systems

- Passes Annual Visual Inspection
- 7-day Flow ≤ 1.3 x design daily wastewater flow and
30-day \leq design daily wastewater flow
- Influent Wastewater \leq Table VIII values
- Effluent Samples
 - No parameter value > 2 x Standard (2.5 x for Fecals)
 - Mean \leq Standard for when 4 or more samples collected annually

System Compliance

Advanced Pretreatment Systems

- Mean of all Data \leq Designated Standard
- Less than 20-percent of Sites Exceed Standard for one or more parameters
- Less than 10-percent of Sites Exceed 2 x Standard for one or more parameters

Non-Compliance Actions Advanced Pretreatment Systems

- ORC informs Owner of Non-Compliance
 - Flow > design daily flow, or
 - Influent exceeds standards, or
 - Maintenance/repairs needed
- LHD issues Owner at Individual Site NOV
 - Visual Inspections Determines Non-Compliance, or
 - Exceeds Wastewater Flow or Effluent Standards
- State issues Manufacturer NOV when system non-compliant
- LHD issues Manufacturer Intent to Suspend CAs
 - 10 percent malfunctioning or violating effluent standards, or when
 - 5 percent haven't had required O+M activities completed

Approved NSF-40 (RWTS) Systems

- Aquarobic International
- Consolidated Treatment Systems (Multi-Flo + Nyadic)
- Delta Fiberglass and Environmental Products, Inc.
- Bio-Microbics, Inc.
- Norweco, Inc.
- Clearstream Wastewater Systems, Inc.
- Hoot Aerobic Systems, Inc.
- Jet, Inc.

Approved Advanced Pretreatment Systems

- Innovative Approvals:
 - Sand Filter Pretreatment
 - Generic (TS-I and TS-II)
 - Orenco Systems, Inc., Kit (TS-I)
 - Peat Filter Pretreatment (TS-I)
 - Puraflo Peat Biofilter System
 - Ecoflo Peat Biofilter System
 - Norweco Singular RWTS/Sand Filter System (TS-I +TS-II?).
 - Bioclere Modified Trickling Filter System (TS-I+II?)
 - AdvanTex Geotextile Filter System (TS-I+TS-II)

Approved Advanced Pretreatment Systems

- Controlled Demonstration Approvals:
 - Bio-Microbics, Inc. FAST RWTS (TS-I and TS-II)
 - E-Z-Treat Polystyrene Media System (TS-I and TS-II?)
 - Septi-Tech Polystyrene Media System (TS-I and TS-II?)
 - Wastewater Innovations Inc. EnviroFilter (formerly EarthTek) Geotextile Filter System (TS-I, II?)

(p) RESPONSIBILITIES AND PERMITTING PROCEDURES:

- (1) Prior to the issuance of the Improvement Permit at a site where the drainfield is to be preceded by an advanced pre-treatment system, an evaluation shall be provided to the local health department on behalf of the owner when any of the following conditions are applicable:

- (A) the initial vertical separation siting criteria or vertical separation distances for trench bottoms are proposed to be reduced in accordance with Subparagraphs (e)(1) or (f)(1) of this Rule,
- (B) drainage is proposed for Group III soils or a groundwater lowering system is proposed to be used in conjunction with a fill system in accordance with Paragraph (g) of this Rule,
- (C) sandy clay loam texture saprolite is proposed to be used in accordance with Paragraph (h) of this Rule,

- (D) the LTAR is proposed to be increased on a site with Group II or IV soils within three feet of the proposed trench bottom or on a site where drainage of Group II or III soils is proposed, or on any site when the design flow exceeds 1000 gallons per day, in accordance with Subparagraphs (e)(2) or (f)(2) of this Rule, or
- (E) for a bed system with flow exceeding 1000 gallons per day in accordance with Paragraph (j) of this Rule, or if required for other bed systems in accordance with Subparagraph (i)(1) of this Rule.

(2) When a special site evaluation is required pursuant to Subparagraph (1) of this Paragraph, it shall contain the following information, as applicable. This evaluation 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, groundwater hydrology and nutrient transport, if required pursuant to G.S. 89F or 89E. This evaluation shall be provided to the local health department in a written report sealed, signed and dated by any licensed or registered professionals who contributed to the report.

- (A) detailed descriptions of soil profiles and soil morphological conditions to a depth of at least three feet below the proposed trench or bed bottom and description of landscape setting in the initial system area and repair area;
- (B) field measurements of the depth and thickness of each of the soil horizons;
- (C) recommended location and depth for placement of the trenches or beds and the recommended LTAR;

(D) hydraulic assessment, based on site-specific information, substantiating the projected effectiveness of system performance. This shall include supporting documentation that indicates the treated effluent applied at the proposed LTAR will not result in the discharge of effluent to the surface of the ground after the system is installed and operated within design parameters; that all required vertical separation distances shall be maintained; and justification for any proposed drainage systems or other site modifications.

Hydraulic Assessment Cont'd

This hydraulic assessment shall require

- in-situ tests of saturated hydraulic conductivity
- groundwater mounding analysis,
- lateral flow analysis, and
- monitoring or modeling of existing or projected depth to a soil wetness condition based upon procedures of Rule .1942 of this Section,
- as needed;

- (E) site-specific nitrogen migration analysis, if needed pursuant to Subparagraphs (e)(2) or (j)(2) of this Rule; and
- (F) proposed site-specific requirements for system design, installation, site preparation, modifications, final landscaping and vegetative cover.