



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
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**RENEWAL OF PILOTING APPROVAL**  
Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

North Coast Technologies, LLC  
362 Gifford Street  
Falmouth, MA 02540

Trade name of technology and model: RUCK CFT System (hereinafter called the "System"). Schematic drawings of a typical unit and a technology inspection checklist are attached and are part of this Approval

Transmittal Number: W117130  
Date of Issuance: June 28, 2007  
Date of Expiration: June 28, 2012

**Authority for Issuance**

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Approval to: North Coast Technologies, LLC, 362 Gifford Street, Falmouth, MA 02540 (hereinafter "the Company"), to Pilot in the Commonwealth of Massachusetts the System described herein. Sale and use of the System are conditioned on and subject to compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

Glenn Haas, Acting Assistant Commissioner  
Bureau of Resource Protection  
Department of Environmental Protection

June 28, 2007  
Date

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD Service - 1-800-298-2207.

MassDEP on the World Wide Web: <http://www.mass.gov/dep>

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## I. Purpose

1. The purpose of this Approval is to provide field testing and technical demonstration of the System in Massachusetts, on a Pilot Approval basis, to evaluate if the System can function effectively.
2. With the necessary permits and approvals required by 310 CMR 15.000, this Pilot Approval authorizes the use and installation of the System in Massachusetts and requires testing so that the Department can determine if the System consistently can or cannot function to effectively reduce total nitrogen (TN) to less than 10 mg/L. TN is equal to TKN (total Kjeldahl Nitrogen) plus NO<sub>2</sub> (Nitrite) plus NO<sub>3</sub> (Nitrate).
3. The System may only be installed on facilities that meet the criteria of 310 CMR 15.285(2).
4. Department Piloting Approval authorizes the use of the System, with the approval of the local approving authority, for upgrades of existing failed, failing or substandard systems and for new construction of systems with design flows less than 10,000 gallons per day (GPD), subject to the limitations of this approval.

## II. Design Standards

1. The System is an aerobic treatment system. The System consists of a septic tank designed and constructed in conformance with 310 CMR 15.223 through 15.226 and a pump chamber, sized to operate a minimum of four times a day based on the design flow, which discharges through a pressure distribution system to the System filter. The System filter is constructed of alternating layers of sand and stone with plastic inserts within the sand layers. The filter is constructed within an impermeable liner and is vented to a location to be determined in the field. Filtrate collected at the bottom of the filter in an underdrain is conveyed to a mixing chamber which utilizes a pump or other suitable device to provide mixing. Carbon from with a suitable carbon source (such as a detergent solution) is added in the mixing chamber. Denitrification takes place in the mixing chamber. Treated effluent from the mixing chamber is discharged to a detention tank, then to a soil absorption system (SAS). The minimum size of the mixing chamber and the detention tank shall be based on the total nitrogen concentration estimated in the effluent leaving the System filter.
2. The System shall be installed in series between the septic tank and pump chamber, and the (SAS), of a standard Title 5 system constructed in accordance with 310 CMR 15.100 - 15.279, subject to the provisions of this Approval.
3. Access shall be provided to all System tanks and to the septic tank in accordance with 310 CMR 15.228 (2). The septic tank shall have at least three manholes with impermeable covers of durable material. Two manholes, over the inlet and outlet, shall have a minimum opening of 20 inches. All access ports and manhole covers shall be secure removable impermeable covers of durable material installed and maintained at grade to allow for maintenance of the System..
4. The alarms and controls shall be housed within an enclosure, mounted in a location readily accessible to the operator.
5. New Construction: When the System is used in areas subject to the nitrogen loading limitations of 310 CMR 15.214, an increase in calculated allowable nitrogen loading per acre is allowed for facilities *with a design flow of less than 2,000 gallons per day (gpd)* as provided in 310 CMR 15.217(2). When used in such areas:
  - i. for residential facilities, the design flow shall not exceed 660 gallons per day per acre (gpda), and the System shall not exceed 19 mg/L total nitrogen (TN)

concentration in the effluent measured as the sum of the total TKN (total Kjeldhal Nitrogen), NO<sub>3</sub>-N (Nitrate nitrogen) and NO<sub>2</sub>-N (Nitrite nitrogen).

- ii. for non-residential facilities, the design flow shall not exceed 550 gpd, and the System shall not exceed 25 mg/L TN concentration in the effluent.
- iii. these limitations are based on the maximum nitrogen loading rate credit of a technology with Certification for General Use. If a System(s) needs replacement there will be an approved technology available.

### III. General Conditions

1. No more than 15 Systems may be installed under this Approval. A representative of the Company shall be on-site to inspect and approve each system installation.
2. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.
3. Any required operation and maintenance, monitoring and testing shall be performed in accordance with a Department approved plan. Any required sample analysis shall be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory, unless otherwise is provided in the Department's written Approval. It shall be a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.
4. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.
5. In accordance with applicable law, the Department and/or the local approving authority may require the System owner to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.
6. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. Accordingly, no System shall be upgraded or expanded, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004.
7. Design and installation of the System shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.
8. The following table lists the monitoring requirements for Systems installed under this Approval. The following parameters shall be monitored and reported at each inspection: pH, influent biochemical oxygen demand (BOD<sub>5</sub>), effluent carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), total suspended solids (TSS), alkalinity, total nitrogen (TN). For all Systems, each time the System is monitored the water meter, if a water meter is installed, shall be read and the water use recorded. All monitoring data shall be submitted to the Department and local approving authority within 45 days of the sampling date.

Facility Type	Design Flow (gpd)	Sampling Location	Frequency	Sample Type
Residential	< 2,000	Effluent	Monthly for at least the first three months, quarterly thereafter	Grab
Residential	≥ 2,000	Influent & Effluent	Biweekly for three months, monthly thereafter	Composite*
Non-residential	All	Influent & Effluent	Biweekly for three months, monthly thereafter	Composite*

\*Unless otherwise specified by the Department, composite shall be determined based on facility operation.

#### IV. Conditions Applicable to the System Owner

1. The System is approved in connection with the discharge of sanitary wastewater only. Any non-sanitary wastewater generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed of.
2. All effluent samples shall be taken at a flowing discharge point, i.e.- distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent or process samples shall be taken at a point that will provide a representative sample of the required parameter. Sampling locations for collecting influent shall be determined by the system designer subject to written approval by the Department.
3. Operation and Maintenance agreement:
  - i. Throughout its life, the System shall be under an operation and maintenance (O&M) agreement. The initial O&M agreement shall be for at least 18 months as described in Section V, items 7 through 9, with the Company or its licensed agents. Each subsequent O&M agreement shall be for at least one year.
  - ii. No System shall begin operation until an O&M agreement is submitted to the Department and the local approving authority which:
    - a. provides for the contracting of a person or firm competent in providing services consistent with the System's specifications and the operation and maintenance requirements specified by the designer and any specified by the Department;
    - b. contains routine O&M activities specified by the Company necessary for proper operation of the System;
    - c. contains procedures for notification to the Department and the local approving authority within five days of a System failure or alarm event and for corrective measures to be taken immediately;
    - d. provides the name of an operator, which must be a Massachusetts certified operator if one is required by 257 CMR 2.00, that will operate and monitor the System (hereinafter the "System operator"). The System operator must inspect, operate and maintain the System,

- (1) for residential installations with a design flow less than 2,000 gpd, conduct inspections at least every three months and anytime there is an alarm event, and,
  - (2) for all non-residential facilities and facilities with a design flow 2,000 gpd or greater, unless otherwise approved in writing by the Department, conduct biweekly inspections for the first three months of operation then at least monthly.
4. After the first 18 months of System operation, if the System is approved as acceptable by the Department in accordance with section V, item 11, additional O & M and sampling agreements shall be for periods of least one year with a Massachusetts certified operator of the appropriate grade. After the first 18 months of System operation the System owner may request in writing a reduction in inspection and sampling requirements from the Department.
5. The effluent pH shall not be less than 6.0 or more than 9.0 standard units. In nitrogen sensitive areas, the TN concentration in the effluent discharged from the System shall not exceed 19 mg/L for single family residential facilities, and, 25 mg/L for non-residential facilities and residential facilities of 2000 gpd or greater.
6. During the first 18 months of System operation, if on two consecutive sampling events the effluent exceeds the TN limit, then the System owner shall have the person or firm contracted to operate and maintain the System submit a report to the Department, within 60 days of the second exceedance, on the reasons for the exceedances and containing recommendations to be followed to prevent further violations..
4. During the first 18 months of System operation, the System owner in cooperation with the Company shall submit monitoring data and inspection results to the Department and the Board of Health within 45 days of each sampling date and each inspection date. All inspection results must be recorded on a DEP approved inspection form and the System technology checklist, copies of which are attached to this Approval. Forms shall be completed by the System operator.
5. For year round residential facilities with design flows less than 2,000 gpd, effluent from the System shall be monitored at least once per calendar quarter. Any sample collected within 60 days or more than 90 days of a previous sample shall not be considered a required quarterly sample. For all non-residential facilities and residential facilities with design flows of 2,000 gpd or greater, both influent and effluent shall be sampled and analyzed biweekly for the first three months, unless otherwise approved by the Department, and monthly thereafter. Following the three months of startup only effluent sampling will be required. Should the System not meet effluent limits for two consecutive sampling periods the System shall be sampled for both influent and effluent until the System meets the required effluent quality. The following parameters shall be monitored: pH, influent BOD5, effluent CBOD5, TSS, alkalinity and TN. Each time the System is monitored, the water meter, if a water meter is installed, shall be read and the water use recorded. For residential Systems less than 2,000 gpd .
6. For seasonal residential facilities where the residence is occupied fewer than six months per year, effluent from the System shall be monitored twice per season; initially 45 days after occupancy and if the residence is occupied during an additional calendar quarter, once during that following quarter prior to System shut down. The following parameters shall be monitored: pH, CBOD5, TSS, TN and alkalinity. Each time the System is monitored, the water meter, if a water meter is installed, shall be read and the water use recorded.

7. Anytime the operator is changed, within seven days of such change, the System owner shall notify the Department and the local approving authority in writing and submit a copy of the new agreement to operate and monitor the System.
8. The System owner shall at all times have the System properly operated and maintained in accordance with the Company's and the designer's operation and maintenance requirements and this Approval.
9. The System owner shall furnish the Department any information, which the Department may request regarding the System, within 21 days of the date of receipt of that request.
10. The System owner shall provide a copy of this Approval, prior to the signing of a purchase and sale agreement for the facility served by the System or any portion thereof, to the proposed new owner.
11. Prior to installation of the System, the proposed System owner shall submit to the Department the written approval of the local approving authority, together with a copy of the complete application submitted to the local approving authority, and a complete BRP WP 64b application in order to obtain DEP written approval.
12. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property, and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.
13. Within fourteen days of the local approving authority's issuance of the Certificate of Compliance, the System owner shall submit a copy of the Certificate of Compliance to the Department.
14. With all Systems 2000 gpd or greater, the System owner shall conduct and document an education program at the facility within 60 days of startup based on the information provided by the Company in Section V item 3 regarding information on substances that should not be discharged to the System

**V. Conditions Applicable to the Company**

1. By January 31 of each year, the Company shall submit to the Department a report, signed by a corporate officer, general partner or Company owner, that contains information on the System for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts during the previous calendar year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, school, institutional) and the design flow; and for all Systems installed since the date of issuance of this Approval, all known failures, malfunctions, and corrective actions taken and the address of each such event.

2. The Company shall notify the Department's Director of Wastewater Management Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval is issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.
3. The Company shall make available to owners, operators, and installers of the System, in printed and electronic format: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System; a protocol for collecting samples; a maintenance checklist; and a recommended schedule for maintenance of the System. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.
4. The Company shall institute and maintain a program of operator training and continuing education. The Company shall maintain and annually update, and make the list of qualified System operators available by March 1<sup>st</sup> of each year. The Company shall also make the list known to the local approving authorities, the Department and users of the technology.
5. Prior to its sale of the System, the Company shall provide the purchaser with a copy of this Approval. In any contract for distribution or sale of the System, the Company shall require the distributor or seller to provide the purchaser of the System, prior to any sale of the System, with a copy of this Approval.
6. The Company shall furnish the Department any information that the Department requests regarding the System, within 21 days of the date of receipt of that request.
7. For at least the first 18 months of operation, the Company shall be responsible for operating, maintaining and monitoring the Systems in accordance with Section III, item 8 of this Approval. The Company shall submit monitoring data and O&M inspection results to the Department and the local approving authority within 45 days of each sampling date and each inspection date. Results of each inspection must be recorded on a DEP approved inspection form and a technology checklist. Accurate completion of the forms shall be the responsibility of the Company.
8. The TN concentration in the effluent discharged from the System shall not exceed the values specified in Section II item 5. The effluent pH shall not be less than 6.0 or more than 9.0 standard units.
9. During the first 18 months of operation, excluding startup, should the effluent concentration from the System exceed the applicable TN limit on two consecutive sampling events, the Company shall initiate monthly sampling and within 60 days submit a report to the Department explaining the reasons for the exceedances with recommendations for operational or design changes to prevent future violations. Quarterly sampling can be restarted once the system has met its effluent limits for two consecutive monthly samples.

10. Within 30 days of the end of the first 18 months of operation the Company shall submit a summary report on each system describing the operations of the system, any changes in operation or design that were made during the Piloting period, the final results of the Piloting program for that system and whether the system met the effluent limits for the previous 12 months of operation. That report shall also include either recommendations for approving and ending the Piloting program for that system or recommendations for continuing Piloting for any system that has not performed as planned.
11. The Department will review the report(s) in item 10 above and determine if additional Piloting of the system is required. The Company shall either continue the Piloting program for that system as required by the Department or remove the system and replace it with a fully complying Title 5 system. If the Department determines that the system has performed at the relevant level for at least the final 12 months of the Piloting program, the Company can turn the responsibility for operation and monitoring of the system over to the system owner in accordance with Section IV, item 4 of this Approval.
12. If the Company wishes to continue this Piloting Use Approval after its expiration date; the Company shall apply for and obtain a renewal of this Approval. The Company shall submit a renewal application at least 180 days before the expiration date of this Approval, unless permission for a later date has been granted in writing by the Department.

#### **VI. Reporting**

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director  
Wastewater Management Program  
Department of Environmental Protection  
One Winter Street - 5th floor  
Boston, Massachusetts 02108

#### **VII. Rights of the Department**

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.

#### **VIII. Expiration date**

1. Notwithstanding the expiration date of this Approval, any System sold and installed prior to the expiration date of this Approval, and approved, installed and maintained in compliance with this Approval (as it may be modified) and 310 CMR 15.000, may remain in use unless the Department, the local approving authority, or a court requires the System to be modified or removed, or requires discharges to the System to cease.