

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

PROVISIONAL WASTEWATER SYSTEM APPROVAL

PROVISIONAL NO: PWS-2016-01-R1

Issued To: Fuji Clean USA, LLC
41-2 Greenwood Road
Brunswick, ME 04011
207-406-2927
207-406-2929
www.fujicleanusa.com

For: Fuji Clean USA Models CEN5, CEN7, CEN10, and CEN14
(Fuji Clean CEN5, CEN7, CEN10, and CEN14)

Approval Date: September 2, 2016
March 2, 2020
Addition of two models and re-rating of the two models in the approval

In accordance with G.S. 130A-343, 15A NCAC 18A .1969 and .1970, a proposal by Fuji Clean USA, LLC, for approval of their wastewater system has been reviewed and found to meet the standards of a Provisional system when all of the following conditions are met.

I. General

- A. Scope of this Provisional Approval includes all of the following:**
1. Design, installation, and operation and maintenance guidelines for CEN5, CEN7, CEN10, and CEN14 systems to meet NSF-40 and TS-I effluent standards in accordance with Rule 15A NCAC 18A .1970 (a) Table VII.
 2. Obtain field performance data from CEN5, CEN7, CEN10, and CEN14 systems intended to meet TS-II effluent quality standards in accordance with Rule .1970(a) Table VII.
 3. Operation, maintenance, and monitoring activities for CEN5, CEN7, CEN10, and CEN14 systems to ensure the effluent standards are met.
 4. Proposal for evaluation of this Provisional system.
- B. This Provisional Approval is only applicable to systems receiving domestic strength influent, not exceeding the influent quality standards in Rule.1970(b) Table VIII, utilizing CEN5, CEN7, CEN10, and CEN14 systems with a design daily flow less than or equal to 3,000 gallons per day.**
- C. Use of CEN5, CEN7, CEN10, and CEN14 systems for facilities with an influent waste strength that exceeds the parameters in Rule .1970(b) Table VIII may be proposed by Fuji Clean USA and a Professional Engineer (PE) to the Department for review and approval on a case-by-case basis, prior to permitting by the local health department (LHD). The system design must include the proposed raw wastewater strength (e.g., BOD₅, COD, TN, TSS, fats, oils and grease, etc.), expected organic loading rate (in pounds of BOD per day) and hydraulic loading rate (in gallons**

per day) on the advanced pretreatment system, calculations, references, and any other information needed to support the proposed design.

- D. Any site utilizing these systems shall have wastewater with sufficient alkalinity to facilitate biological treatment processes. The influent shall not have a pH level or toxins that significantly inhibit microbial growth.
- E. This Provisional Approval is limited to 200 systems. The intent of this Provisional Approval is to gain field experience sufficient to qualify this system for Innovative Approval as a TS-I system, pursuant to Rule .1969(g).
- F. Data from CEN5, CEN7, CEN10, and CEN14 systems designed for TS-II effluent quality standards may also be used to support these systems for Provisional or Innovative Approval as a TS-II system if sampled for all TS-II parameters.
- G. Use of CEN5, CEN7, CEN10, and CEN14 systems that have a design flow exceeding 3,000 gallons per day may be permitted after approval by the State on a case-by-case basis in accordance with the Large Systems State Review/Approval Process and Rule .1938.

II. System Description

CEN5, CEN7, CEN10 and CEN14 advanced pretreatment wastewater systems are each self-contained fiberglass reinforced plastic (FRP) vessels baffled into three chambers. The first chamber serves as a settling or septic tank storing sludge, greases etc. The second compartment is an anaerobic chamber that includes fixed film plastic media, which occupies about one-third ($\frac{1}{3}$) of the compartment, and serves as a mechanical filter as well as an environment in which anaerobic bacteria can grow, consume organic substances, and strip molecular oxygen from nitrogen oxide (as part of the denitrification process). There is also space in the second compartment for additional sludge storage. The third compartment is the aerobic chamber that serves as a mechanical filter and includes two additional types of plastic fixed film media on which aerobic microbial colonies live and digest organic substances within the mixed liquor. This third compartment also contains two air lines, which introduce oxygen into the chamber, in addition to two airlift pumps that serve to continuously recycle mixed liquor and sludge to the first chamber as well lift treated effluent to a final settling compartment before discharge. Hand operated mechanical control valves used to set and adjust air and water flows are also included in the aerobic chamber. The entire treatment process is powered by one linear diaphragm blower manufactured by Fuji Clean.

III. Siting Criteria

- A. A Provisional System may be installed at sites that meet the requirements of this Section and the soil and siting criteria for a conventional, modified, alternative, innovative, or accepted wastewater system. The site shall have sufficient area to install a replacement advanced pretreatment system and 100 percent dispersal field repair area. The manufacturer agrees to provide another approved system if the Provisional System fails to perform properly. Exceptions to the repair area requirement are as set forth in Rule .1969(f)(3) and (4).
- B. CEN5, CEN7, CEN10, and CEN14 systems and associated dispersal fields shall be sited and sized in accordance with Rule .1970 for NSF-40 and TS-I systems. Drip irrigation systems used with CEN5, CEN7, CEN10, and CEN14 systems shall be sited and sized in accordance with the

manufacturer specific drip approval.

IV. System Sizing

The dispersal field sizing criteria shall be based upon the long-term acceptance rate (LTAR) specified in the rules or the specific dispersal system approval.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed dispersal field in accordance with Rule .1970(p) or a manufacturer specific drip approval.

VI. Design Criteria

A. CEN5, CEN7, CEN10, and CEN14 systems shall be designed by a Fuji Clean USA authorized designer or PE (if required).

B. The CEN5, CEN7, CEN10, and CEN14 systems shall be designed in accordance with the following criteria.

1. Units sizing in North Carolina shall be as stipulated in the following table:

Fuji Clean Model #	Number of Bedrooms	Design Flow Limit
CEN5	Up to 4	500 gpd
CEN7	Up to 5	700 gpd
CEN10	Up to 8	1,000 gpd
CEN14	Up to 11	1,350 gpd

2. Buoyancy calculations shall be completed by a PE on sites where a soil wetness condition is present within five feet of the top of the ground surface. The PE shall make appropriate design modifications as needed.
3. For systems proposed to meet TS-II effluent quality standards including a fecal coliform effluent level of less than 1,000 colonies per 100 milliliters, Salcor 3-G UV systems shall be provided for disinfection.
4. An example of the pretreatment layout is provided in the Fuji Clean Installation and O&M Manuals.
5. Effluent samples shall be collected from the outlet end of the disinfection unit or a tap on the dispersal field force main. The tap should be located before the spin filter for drip systems. The preferred location of the tap is in the pump tank discharge/riser assembly. Sample collection shall not commence until at least 30 seconds of continuous discharge through the sampling tap has been completed.
6. Influent samples shall be taken from the sampling port located on the outside of the inlet baffle in the first compartment.
7. Flow monitoring shall include a determination of the 7-day and 30-day flow for the corresponding time period preceding each ORC inspection/sample collection. Each pressurized effluent dispersal system shall incorporate a North Carolina-approved SJE-Rhombus IFS Series controller. Each pressurized effluent distribution system will contain provisions for calculating and data-logging pump dose cycles and run times. Each gravity effluent dispersal system shall include a Premier Plastics pre-packaged Flout system that includes a dose counter and data logger or Fuji Clean USA and State-approved equivalent for flow monitoring.

8. The dispersal field dosing tank shall be a state-approved tank sized in accordance with Rule .1952(c).
9. Effluent from CEN5, CEN7, CEN10, and CEN14 systems may be conveyed to a gravity dispersal field, or to a dispersal field pump tank.
10. The CEN5, CEN7, CEN10, and CEN14 systems shall not be placed in driveways, parking areas, or other areas subject to vehicular traffic.

VII. Installation and Testing

- A. Prior to beginning construction of CEN5, CEN7, CEN10, and CEN14 systems, a preconstruction conference shall be required to be attended by the system authorized designer, PE (if required), Fuji Clean USA licensed distributor, Fuji Clean USA authorized installer, and LHD.
- B. The CEN5, CEN7, CEN10, and CEN14 systems shall be located in compliance with the horizontal setback requirements of Rule .1950(a) and Rule .1970 and shall be located to prevent surface/subsurface water inflow/infiltration.
- C. All CEN5, CEN7, CEN10, and CEN14 systems shall be installed according to directions provided by Fuji Clean USA. Additionally, all CEN5, CEN7, CEN10, and CEN14 systems and components used with, but not manufactured by Fuji Clean USA, shall be installed in accordance with all applicable regulations and manufacturer instructions.
- D. All individuals/companies installing CEN5, CEN7, CEN10, and CEN14 systems shall be in possession of all necessary permits and licenses before attempting any portion of a new or repair installation. The company/individual must be a Level IV installer and Fuji Clean USA authorized.
- E. Watertightness of the tanks and any dosing tanks shall be demonstrated by a 24-hour water leakage test conducted at the installation site. A water level change of one-half inch or more over 24 hours, or visual observation of leakage shall be cause for failure of the watertightness test.
- F. Prior to Operation Permit (OP) issuance, the Fuji Clean USA authorized system installer and system authorized designer or NC PE of record shall conduct an inspection/start-up of the Fuji Clean Models CEN5, CEN7, CEN10 and CEN14 systems and all associated system components. The LHD personnel and the operator in responsible charge (ORC) will attend and observe the inspection/start-up. An acceptance letter from the authorized installer and system authorized designer or NC PE shall be provided to the LHD prior to issuance of the OP.
- G. All specified site preparation steps and construction specifications for the dispersal field shall be strictly adhered to including, but not limited to, specified depth of trenches in relation to site limiting conditions, cover material specifications (if needed), and trench installation method.

VIII. Operation, Maintenance, Monitoring, and Reporting

- A. CEN5, CEN7, CEN10, and CEN14 systems shall be classified, at a minimum, as a Type Vc system in accordance with Table V(a) of Rule .1961(b). Management and inspection shall be in accordance with Rules .1961 and .1970.
- B. All CEN5, CEN7, CEN10, and CEN14 systems require an operation and maintenance agreement

between the system owner and an authorized subsurface system operator designated as the ORC to inspect and maintain the system. The ORC shall meet one of the following criteria: a Fuji Clean USA, employee, a Fuji Clean USA authorized representative, or an authorized subsurface operator authorized in writing by Fuji Clean USA in accordance with Rule .1970. The operator must have proper equipment and training to access and program the control panels on site.

- C. All CEN5, CEN7, CEN10, and CEN14 systems shall be operated and maintained according to the latest version of Fuji Clean USA O&M manual.
- D. At each CEN5, CEN7, CEN10, and CEN14 system inspection, the ORC shall follow service procedure steps identified in the Fuji Clean USA O&M Manual and, at a minimum, observe, monitor, record, and/or collect the following:
 - 1. Conductivity, pH, DO, and temperature of system effluent;
 - 2. Clarity of system effluent;
 - 3. Wastewater, sludge, and scum levels in all tanks;
 - 4. Proper operation of system aerator, noting any unusual sounds or physical appearance;
 - 5. Air flowrate for the system aerator;
 - 6. Solids level in the aeration chamber;
 - 7. Watertightness of all tanks, risers, and pipe connections at the tanks;
 - 8. Operation of pumps, floats, valves, electrical controls, and alarms, including record of alarms since last visit and troubleshooting actions;
 - 9. Dispersal field pump delivery rate (drawdown test), determination of the average pump run time, and dispersal field dosing volume;
 - 10. Average and maximum 7-day and 30-day flowrates in gallons per day;
 - 11. Any structural damage, accessibility issues, adequate ventilation, excess odors, ponding of effluent, insect infestations, vegetative growth over the dispersal field, or surfacing of effluent on the dispersal field; and
 - 12. Samples and laboratory analyses of CEN5, CEN7, CEN10, and CEN14 systems influent and effluent as required.
- E. The ORC shall also conduct other or additional observations, measurements, monitoring, and maintenances activities as specified in the OP and as recommended by the manufacturer.
- F. Sampling
 - 1. All sampling shall be done in accordance with Rule .1970(n)(3) and (5).
 - 2. All systems shall be tested for effluent CBOD₅, TSS, NH₄-N, and fecal coliforms. Influent shall be tested for BOD₅ and TKN. The manufacturer may choose for TS-I system effluent to be additionally tested for TN.
 - 3. Influent samples shall be taken from the sampling port located on the outside of the inlet baffle in the first compartment of the advanced pretreatment system.
 - 4. Effluent samples shall be collected from the outlet end of the disinfection unit or a tap on the dispersal field force main.
- G. Notification and Performance of Maintenance and Repairs
 - 1. The ORC shall alert Fuji Clean USA, the LHD, and the system owner within 48hours of needed maintenance or repair activities including but not limited to landscaping, tank sealing, tank pumping, pipe or control system repairs, media or aerator replacement, and/or adjustments to any other system component.
 - 2. The ORC shall notify the system owner, Fuji Clean USA, and the LHD whenever the pump

- delivery rate efficiency and/or average pump run times are not within 25% of initial measurements conducted prior to system start-up.
3. System troubleshooting and needed maintenance shall be provided to maintain the pump delivery rate and average pump run time within 25% of initial measurements conducted during system start-up.
 4. Tank compartments will be pumped as needed upon recommendation of the ORC and in accordance with the Fuji Clean USA system Operation and Maintenance instructions. However, at a minimum, the septic tank will be pumped whenever the solids level exceeds 25% of the tank's total liquid working capacity or the scum layer is more than four inches thick.
 5. The tanks shall be pumped by a properly permitted septage management firm, and the septage handled in accordance with 15A NCAC 13B .0800.
 6. All maintenance activities shall be logged and recorded in the ORC reports provided to the LHD.

H. Reporting

1. The ORC shall provide a completed written report to the system owner, Fuji Clean USA, and the LHD within 30 days of each inspection. At a minimum, this report shall specify:
 - a. The date and time of inspection;
 - b. System operating conditions measured and observed according to VIII.D and VIII.E;
 - c. Results from any laboratory analyses of any influent and effluent samples;
 - d. Maintenance activities performed since the last inspection report;
 - e. An assessment of overall system performance;
 - f. A list of any improvements or maintenance needed;
 - g. A determination of whether the system is malfunctioning, and the specific nature of the malfunction; and
 - h. Any changes made in system settings based on recommendations of the manufacturer.
2. Proposal for Evaluation and Reporting
 - a. The manufacturer shall maintain a contract for evaluation of the performance of the controlled demonstration wastewater system with an independent third-party laboratory, consultant, or other entity that has expertise in the evaluation of wastewater system and that is approved by the Department.
 - b. Semi-Annual Reports are due to the Department by January 31 and July 31 of each year from the third party. The report shall include the following information at a minimum:
 - (1) list of all system currently installed under Provisional Approval;
 - (2) results of all effluent quality samples collected, including a table summarizing all the effluent quality results;
 - (3) flow monitoring information;
 - (4) copies of all ORC inspection reports;
 - (5) assessment of system performance in relation to effluent quality standards and showing compliance with Rule .1970(o);
 - (6) assessment of system performance in relation to flow monitoring and showing compliance with Rule .1970(o);
 - (7) assessment of physical and chemical properties of the materials used to construct the system in terms of strength, durability, and chemical resistance to loads and conditions experienced and showing compliance with Rule .1969(g)(2)(B);
 - (8) recommended areas of applicability for the system; and
 - (9) conditions and limitations related to the use of the system.
 - c. Upon completion of the research and testing protocol, the third party shall submit a final

report to the Department. This report shall be submitted in conjunction with Fuji Clean USA completing an application for Innovative Approval and within five years of the effective date of the first OP issued pursuant to this approval.

- d. The final report shall contain the following information at a minimum:
 - (1) list of all systems currently installed during Provisional Approval period;
 - (2) results of all effluent quality samples collected, including a table summarizing all the effluent quality results;
 - (3) flow monitoring information;
 - (4) copies of all ORC reports;
 - (5) assessment of system performance in relation to effluent quality standards and showing compliance with Rule .1970(o);
 - (6) assessment of system performance in relation to flow monitoring and showing compliance with Rule .1970(o);
 - (7) assessment of physical and chemical properties of the materials used to construct the system in terms of strength, durability, and chemical resistance to loads and conditions experienced and showing compliance with Rule .1969(g)(2)(B);
 - (8) recommended areas of applicability for the system; and
 - (9) conditions and limitations related to the use of the system.
- e. The final report shall be in electronic format and may be published on the On-Site Water Protection Branch's website without confidentiality. The contents of the semi-annual and final reports shall not be altered from the original document without approval from Fuji Clean USA.
- f. The research and testing protocol shall be managed by 3-Engineering, LLC or other approved third-party evaluator and includes the following minimum activities outlined in a detailed protocol provided in the submittal:
 - (1) A minimum of 50 complete data sets shall be collected from a minimum of 15 sites.
 - (2) A complete data set includes the following information: influent BOD and TKN; and effluent CBOD, TSS, NH4-N, TN, and fecal coliforms. If the manufacturer chooses for TS-I system effluent to be additionally tested for TN, that information will be included in the complete data set reporting.
 - (3) There must be at least 30 days between samples collected from any one site.
 - (4) Samples shall be collected from all sites. A site may be excluded if justification is provided that it is unsuitable as a test site. The samples from that site must be provided but will not be used as part of the data evaluation.
 - (5) Each site shall produce a minimum of two sample sets collected over at least a 12-month period.
 - (6) For coastal resort communities, two samples shall take place between June 1 and September 8 of each year. The samples must be taken at least six weeks apart.
 - (7) Other seasonal homes shall be sampled during the projected times of greatest use.
 - (8) The samples will be collected during a scheduled visit by the ORC.
 - (9) A copy of the sample results will be provided to the On-Site Wastewater Branch after the analyses.

IX. Responsibilities and Permitting Procedures

- A. Prior to the installation of a CEN5, CEN7, CEN10, or CEN14 system at a site, the owner or owner's agent shall fill out an application at the LHD for the proposed use of this system. The LHD shall issue an Improvement Permit (IP) or Construction Authorization (CA) or amend a previously issued CA allowing for the use of a CEN5, CEN7, CEN10, or CEN14 system.

- B. The IP and CA shall contain all conditions the site approval is based upon, including the proposed used of the Provisional System. The OP will include all conditions specified in the IP and CA.
- C. When a special site evaluation is required pursuant to Rule .1970(p)(1) or a drip approval, an evaluation and written, sealed report from a Licensed Soil Scientist (LSS) regarding the site shall be provided to the LHD. The report shall contain the information as specified in Rule .1970(p)(2) and “Requirements for Submittals of Soil Reports and Pretreatment and/or Dispersal System Designs”. The LHD may request the assistance of their Regional Soil Scientist in evaluating this report prior to permit issuance.
- D. CEN5, CEN7, CEN10, and CEN14 systems shall be designed by either a authorized designer or a PE (if required).
- E. Prior to issuance of a CA for CEN5, CEN7, CEN10, and CEN14 systems, a design submittal prepared by a authorized designer or a PE shall be submitted for review and approval by the LHD. The design submittal shall include the information required in “Requirements for Submittals of Soil Reports and Pretreatment and/or Dispersal System Designs”.
- F. It is recommended that local authorized environmental health practitioners attend a design training session offered by the manufacturer/authorized representative prior to permitting the system. Also, at the request of the LHD, an OSWP Engineer will review designs otherwise not required to be reviewed by the State.
- G. A Fuji Clean USA authorized installer and authorized designer or PE, as applicable, or shall certify in writing that the CEN 5, CEN7, CEN10, or CEN14 system was installed in accordance with the approved plans and specifications prior to OP issuance.
- H. For sites required to be evaluated by an LSS or Licensed Geologist (LG) (see Section V and IX.C), the LHD may specify as a condition on the IP and CA that a LSS or LG oversee critical phases of the dispersal field installation and certify in writing that the installation was in accordance with their specified site/installation requirements prior to the OP issuance.
- I. The ORC shall be present during the final inspection of the system prior to the issuance of the OP. The ORC shall be certified both as a subsurface operator and an authorized Fuji Clean USA system operator.

X. Repair of Systems

The provisions of 15A NCAC 18A .1961(l) shall govern the use of the CEN5, CEN7, CEN10, and CEN14 systems for repairs to existing malfunctioning wastewater systems.

Approved By: _____ Date: _____