

***NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND  
NATURAL RESOURCES***

***DIVISION OF ENVIRONMENTAL HEALTH***

***ON-SITE WASTEWATER SECTION***

***EXPERIMENTAL WASTEWATER SYSTEM APPROVAL***

Experimental Wastewater System No: EWWS-96-3

ISSUED TO: Dr. A. R. Rubin, Department of Biological and Agricultural Engineering, North Carolina State University, Box 7625, Raleigh, NC 27695-7625

FOR: Evaluation of the Nibbler , Jr. Pretreatment System for High Strength Wastewater

DATE: December 4, 1996

In accordance with 15A NCAC 18A .1969, an application by Dr. A.R. Rubin, North Carolina State University for approval of an experimental system monitoring and research program for the evaluation of the Nibbler , Jr. Pretreatment System has been found to meet standards to warrant approval. The following shall be met for the system(s) installed in accordance with this experimental system protocol.

I. System description

A. The Nibbler Jr. is designed to provide additional pretreatment of higher strength (organic) wastewater beyond that provided by a septic tank or grease trap, prior to subsurface treatment and disposal. The system includes a containment structure with submerged and exposed media and replaces the sanitary tee typically located at the tank or trap outlet. The system also includes

an airlift pump which circulates effluent up through the submerged media and releases effluent to fall over and through a layer non-submerged media. A portion of the effluent is recirculated back into the first compartment of the tank or trap.

Experimental Wastewater Approval

Page 2

December 4, 1996

B. Specific system to be tested initially:

1. Facility served: Archibald's Deli, 2991 Holden Beach Road, Holden Beach, Brunswick County, NC (Project No. 95-38). Existing 24 seat restaurant, with proposed addition of up to 16 seats located on outside deck area.

2. System components: Existing grease trap (1250 gallons), septic tank (1500 gallons, to be modified to be Nibbler , Jr. system), distribution box, and 4 conventional nitrification trenches (332 linear feet, total).

Modifications to existing system to accommodate proposed experimental system shall include increasing the size of the opening over the existing septic tank sanitary tee to enable the Nibbler , Jr. to be installed, serviced and for this compartment to be capable of being pumped out with the unit in operation. Modifications shall also be provided as needed to enable septic tank effluent to be sampled and trench ponding depths measured.

C. Additional systems may be added to this experimental system protocol, once plans and specifications have been reviewed and approved by the On-Site Wastewater Section.

## **II. Permitting and Installation**

A. A local health department may issue an Improvement Permit, Authorization to Construct, and an Experimental System Operation Permit (ESOP) for an experimental system installed in accordance with this approval and the applicable provisions of Rule .1969 (4)(c).

B. At this time, specific approval only applies to the proposed Archibald's Deli expansion in Brunswick County. Specific permit conditions shall include:

1. Owner shall agree in writing to install alternate approved backup pretreatment system or to remove added seats if performance standards are not met, which shall be:

a. System shall operate properly in accordance with manufacturer's specifications

Experimental Wastewater Approval

Page 3

December 4, 1996

b. Effluent quality shall not exceed:

BOD-200 mg/

COD-500 mg/

Oil and Grease - 30 mg/

Total suspended solids- 100 mg/

c. Flow (to be measured daily from April to November and weekly from December to March) shall not exceed 1000 gallons per day.

2. There shall be no substantial changes to the menu or overall operation that will affect the wastewater flow or characteristics.

3. All other requirements of local zoning and planning departments and the Health Department's Food and Lodging Program shall be met.

4. The owner shall execute a written agreement with North Carolina State University to allow

access to the site for the proposed research.

5. The owner shall agree to contract with a certified operator to operate the system if it is to remain in service after the research project is completed.

C. The installation shall be under the direct field supervision of the research organization (e.g.: NC State University). The installation shall include modifications to existing system components, described above, and shall also be in accordance with all manufacturer's requirements including the attached plans and specifications.

D. Prior to the system being brought into operation, the installation shall be certified by the manufacturer to have been properly installed, approved by the health department, and an ESOP issued. Prior to ESOP issuance, executed agreements shall be provided to the health department between the funding source (Flo Tronix), landowner and research organization (NC State University) authorizing the proposed research to be carried out.

E. All other applicable requirements of Rule .1969 shall be met.

### **III. Operation, maintenance and monitoring**

Effluent from each system to be approved under this experimental system protocol is proposed to be monitored for its effectiveness in the treatment of Total Organic Carbon (TOC), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Fats, Oil and Grease (FOG), Total Kjeldahl Nitrogen (TKN),

Experimental Wastewater Approval

Page 4

December 4, 1996

Ammonium Nitrogen (NH<sub>3</sub>-N), Nitrate Nitrogen (NO<sub>3</sub>-N), Total Dissolved Solids (TDS), Chlorides (Cl), pH, and Dissolved Oxygen (DO). Sampling protocol shall be in accordance with EPA standards, and analyses made by an approved laboratory.

Liquid level in the nitrification trenches will be analyzed to determine any changes in ponding depths.

Groundwater flow direction will be determined, up gradient and down gradient monitoring wells installed, and samples from the wells analyzed for comparable parameters as the effluent.

Wastewater and groundwater monitoring shall be carried out in accordance with the approved research protocol over a two year period of study.

Interim/summary reports are to be provided semi annually upon completion of research and evaluation at each test site. A written report is to be provided to the Division of Environmental Health summarizing the results of this research and making recommendations on the future use of the system.

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Approved By Date