

**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-93-1R1

ISSUED TO: Claude Halford House, Department of Forestry, North Carolina State University,  
Box 8008, Raleigh, NC 27695-8008

FOR: Evaluation of On-Site Wastewater Treatment Designs Integrating Constructed Wetlands

DATE: August 3, 1995

In accordance with 15A NCAC 18A .1969 an application by Claude Halford House, North Carolina State University, for revised approval of the experimental system research and testing program for the evaluation of on-site wastewater treatment system designs integrating constructed wetlands has been found to meet standards to warrant approval. This is considered supplementary to the prior approval for EWWS-93-1 issued by this office December 9, 1993. The following shall be met for system(s) installed in accordance with this experimental system protocol.

I. System descriptions: (applies to supplementary approval only)

C. Specific for supplementary approval EWWS-93-1R1:

i. Gates County Site:

Horizontal flow gravel marsh (960 sq. ft.)

Horizontal flow sand marsh (450 sq. ft.), in series, graveless pipe drainfield system (480 LF, 10-inch large diameter pipe)

ii. Chatham County Site:

Sand berms (150 sq. ft. per two bedroom), in parallel, followed by horizontal subsurface flow wetland (sand marsh) (900 sq. ft.), one modified LPP field per two bedrooms).

## II. Site location/selection:

Specific to Gates County site: System shall serve existing homes of Olivia Johnson and Oleywise Brown (3 bedrooms and two bedroom, respectively).

Specific to Chatham County site: System will serve two homes under construction at the Blue Heron Farm Community (one bedroom and four bedroom, respectively) and include capability of expanding to serve a third, three bedroom residence.

## III. Detailed design criteria: (See attached proposals with specifications)

Gates County Site: 1000 gallon septic tank (1 for each home), 12' x 18' x 2' gravel filled marsh, 15' x 30' x 1.5' sand filled marsh, tipping distribution box with speed levelers, 480 linear feet of 10" large diameter pipe (4, 120-foot lines center fed out of individual distribution boxes on 7.5 foot centers)

Chatham County Site: Initially 1500 gallon septic tank for two houses (in future to have 1000 gallon septic tank for each house), 3000 gallon pump tank, (initially to be additional settling tank), 3 sand berms (120 sq. ft. each, 4 in future) with specially designed tipping box distribution system, 900 sq. ft. horizontal subsurface flow wetland (sand marsh) 2000 gallon pump tank, 4 modified LPP drainfields using 10" large diameter pipe (1920 linear feet, total).

## IV. Permitting and Installation:

The affected local health departments may issue improvement permits for the experimental systems installed in accordance with this supplementary approval and the applicable provisions for .1969(4)(c). The specific approval herein only applies to the above referenced Gates County and Chatham County sites.

Note that the installations shall be under the direct field supervision of the research organization (eg: North Carolina State University representatives).

These systems must not be brought into service until the installations have been completed and approved by the health departments, and experimental system operation permits (ESOPs) have

been issued. Prior to ESOP issuance, executed agreements shall be provided to the health departments between the proposed funding sources, land owners, and research organization (North Carolina State University), authorizing the proposed research to be carried out.

The health departments must also be provided with assurances on how system operation and maintenance is to be performed, including designation of the management entity/certified subsurface operators prior to ESOP issuance.

#### V. Operation and Maintenance and Monitoring:

Each system to be approved under this supplementary experimental system protocol is proposed to be monitored for its effectiveness in the treatment of nitrate, ammonium, total Kjeldahl nitrogen, total phosphorus, phosphate phosphorus, suspended solids, biochemical oxygen demand, pH and fecal coliform bacteria.

Monitoring is proposed to be carried out for a two-year period for each system to be installed.

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 the monitoring and making recommendations upon the future use of the system.