CONSTRUCTED WETLANDS FOR FAILED SEPTIC SYSTEMS

DONALD SURRENCY

INTRODUCTION:

Inadequate treatment of domestic wastewater in rural areas of the Tennessee Valley contributes to non-point source pollution of surface waters and contaminates groundwater supplies. Water quality of streams is impaired, public health is threatened, and the problems are growing. For example, in Alabama, 47% of the homes are on septic tanks systems for household waste disposal, with 78% of these in rural areas. An estimated 50% of the households depend on groundwater for drinking supplies; in 1989, 50% of the private well samples had high bacteria counts, an increase
from the 35% in 1973.

Alternatives to conventional on-site wastewater treatment systems are needed to help provide solutions to this serious pollution problem. A small constructed wetlands (CW) system is believed to be one treatment alternative where conventional septic tank systems are ineffective due to poor or shallow soils, high groundwater table, Karst topography, or too small a lot size.

Riches Bar BQ

Riches Bar BQ located approximately 25 miles from Birmingham, Alabama, on Highway 280 along Coosa River. The family owned business has been in operation for about 14 years. The Bar BQ business has been served by a septic tank-absorption field system. Wastewater was surfacing routinely from the absorption field due to poor percolating soils and a seasonal high waster table. The public health department was in the process of closing the business. The constructed wetland was constructed and planted with emergent wetland plants in 1997. The system is operating and providing wastewater treatment for the Bar BQ business.

In a conventional septic tank system microbial colonies act to biodegrade many wastewater contaminants. In many cases, this creates subsurface disposal problems.

This biomass development in tight soils often clogs pores and retards wastewater infiltration. In extreme cases, the wastewater will actually surface, causing polluted runoff and a public health risk. One method to alleviate this problem is to treat the wastewater prior to in-ground disposal. This is where constructed wetlands can play a major role eliminating failed septic system problems.

Here is how constructed wetland work. Two cells are constructed with each being 14 feet wide, 28 feet long, and 1 to 2 feet deep. Wastewater flows through a pipe from a septic tank into the constructed wetlands. Wastewater is distributed evenly across the width of the wetland cell and flows through a gravel medium. A waterproof liner is used in the first cell to contain the wastewater and assure adequate water levels for the wetland plants. The first cell is planted with wetland plants such as canna lilies, blue flag iris, and other native aquatic plant. From the first cell, wastewater enters a second cell that acts as a disposal area.

As wastewater flows through the system, suspended solids and trace metals settle and are filtered. Plants and organic materials also absorb nutrients and trace metals. Microbes or organisms form on the gravel surfaces, stems, and roots of the wetland plants and use the organic materials and nutrients from the wastewater as food. Plants provide much of the oxygen needed by the organisms to live and grow.

The USDA-NRCS plant materials center (Jimmy Carter) located in Americus, Georgia has developed the latest plant technology for selecting suitable wetland plants for constructed wetlands. Two native wetland plants have been tested and evaluated and selected as new plant varieties for wetlands. They are available commercially at most wetland plant nurseries located in Alabama, Georgia, Florida and South Carolina. In addition a brochure is available on Guidelines for Establishing Aquatic Plants in Constructed Wetlands.