



*“Adequately managed decentralized systems can protect public health and the environment as well as provide long-term solutions for the nation’s wastewater needs.”
(USEPA Response to Congress)*

Charmed, I’m Sure!

When Charm, Ohio was introduced to EPA orders demanding the construction of a central sewer system, the reception was less than cordial. Sampling for Phase II Stormwater compliance had revealed dangerously high fecal coliform levels in the local watershed. The orders required the creation of an entirely new public infrastructure, including a collection system and treatment works, and the abandonment of all existing septic tanks. Much less charming was how this small farming village of 86 people could afford the estimated \$3 million price tag.

Background Information

Located within Holmes County in northeast Ohio, the Village of Charm is home to restaurants, bakeries and quaint gift shops. In the heart of Amish Country, Charm has become a popular tourist attraction. On August 7, 1998, representatives from the Ohio EPA sampled the surface water within, and downstream of, the village. On September 9, 1998, a Notice of Violation was issued to the Holmes County Commissioners citing, “The unnamed tributary of Doughty Creek which runs through the Village was found to contain fecal coliform in excess of the 5,000 per 100 milliliters.” The concentrations



of fecal coliform indicated a violation of the secondary contact water quality standard.

The Notice of Violation also requested the Holmes County Commissioners provide the EPA “with a schedule of improvements and costs for providing sanitary sewer service to the Unincorporated Village of Charm.” After a door-to-door survey was conducted by EPA officials, Ohio Department of Health representatives and Holmes County sanitarians, they realized that onsite treatment did not exist in many cases. Visual inspections led the survey team creek-side, where they discovered straight pipe discharges saturating the area with sewage and household waste. Nearly thirty of the small community’s homes and businesses were discharging raw sewage to nearby ditches and tributaries of Doughty Creek.

Centralized vs. Decentralized

In the spring of 1999, the Charm Sewage Advisory Committee was formed. The committee was comprised of business owners and residents affected by the EPA orders. They set out to determine the “scope of the problem” and the financial feasibility of a central sewer system. The Committee agreed that the Holmes County Environmental Management District would act as advisors for the project. After lengthy meetings with all parties, the Management District

responded to the Ohio EPA with a statement that “the threat of enforcement action and fines has created an environment of panic that is interfering with Charm’s ability to reach an organized, affordable solution that involves community participation and understanding.”

A feasibility study was conducted to determine the service area, number of users, total discharge volumes and various funding options. As a result of the study, the Holmes County Environmental Management District determined that “the construction of a public collection and treatment system will be a substantial financial burden on this community.” Final feasibility studies determined that a central sewer system for Charm, or connecting lines to the nearby Berlin Publicly Owned Treatment Works, would cost the community \$2.8-\$3 million. The limited number of connections resulted in an estimated access fee of \$12,568 per home. With no hope of state or federal funding, Holmes County Health Commissioner Dr. Maurice Mullet announced, “Sewering Charm doesn’t make economic sense.”

On September 28 and October 17, 2000 the Ohio EPA conducted another round of water quality sampling and found fecal coliform levels in the tributary to be as high as 590,700 CFU/100 mL. They again attributed the poor water quality to the fact that “poorly treated and raw sewage is being discharged from failing and inadequate home sewage disposal systems in Charm and many residences have no disposal system at all.” They also determined that “because of small lot sizes and poor soils, failed or inadequate home sewage disposal systems can not be replaced or repaired. Public sewers are the clear alternative to abating this environmental and public health problem.” The community received orders that “residents

*“poorly treated
and raw sewage
is being discharged
from failing and
inadequate home
sewage disposal
systems in Charm
and many residences
have no disposal
system at all”*

shall abandon their on-lot sewage disposal systems and connect to the sanitary sewer.”

Immediate action needed to be taken to address the unsanitary conditions in Doughty Creek. The Holmes County General Health District issued letters to property owners lacking adequate treatment or disposal. The letters required compliance with the current sanitary code by upgrading, repairing or installing new onsite treatment and disposal systems. These systems would need to remain in use until funding could be secured for a central sewer system.

The Commissioners and Health Department faced an extensive list of difficult site conditions that made the installation of conventional onsite systems impossible. Dr. Mullet stated, “The problem is putting an acceptable treatment system on these small lots. I’m not sure it’s going to be possible.”

The Health Department began the search for alternative methods that met environmental protection needs and allowed for affordable long-term usage.

Why the Push to Sewer?

The Clean Water Act of 1972 paved the way for many of our current water quality and environmental laws, including the USEPA Phase II Storm Water Regulations. These regulations place significant focus on non-point source discharges, including home sewage treatment systems. Inadequately treated wastewater not only creates a public nuisance, but significant health risks. As a result of these risks, guidelines have been established to calculate the maximum amount of a pollutant a waterbody can receive and still meet water quality standards. One parameter of water quality that is closely scrutinized is fecal coliform. According to studies tabulated by the

USEPA, pathogens are one of the top causes of waterbody impairment. If it is found that the waterbody does not meet the established criteria, it is placed on the “303(d) list.” The Walhonding watershed, which incorporates the Doughty Creek tributaries that run through Holmes County, was placed on this list in 1998.

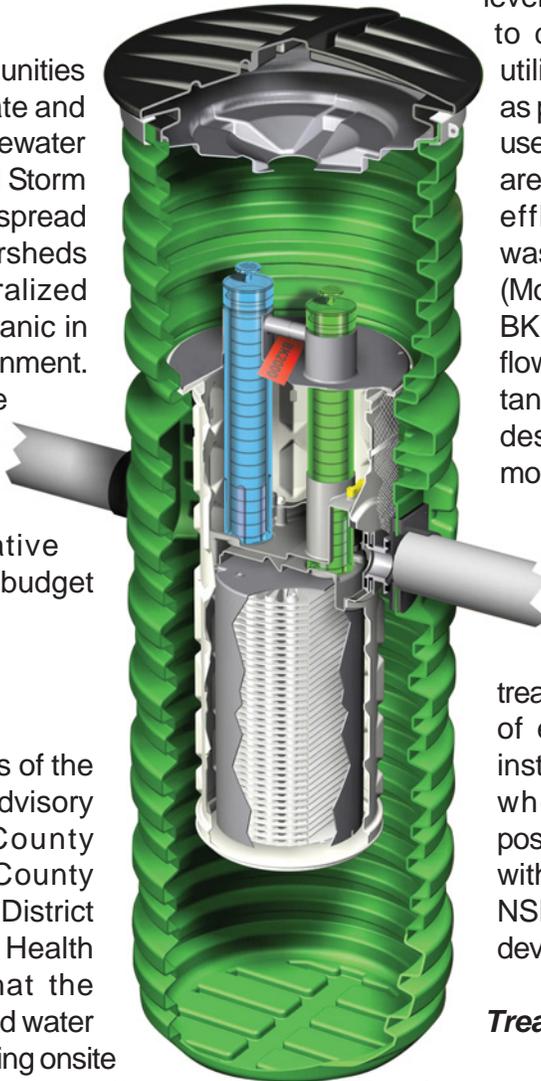
In Ohio alone, over 500 communities have been required to evaluate and eliminate sources of illicit wastewater discharges under the Phase II Storm Water Regulations. The widespread evaluation of individual watersheds and the push toward centralized sewer systems has incited panic in the pocketbooks of local government. With over 1 million home sewage treatment systems in use throughout Ohio, local regulatory agencies are relying heavily on innovative technologies to manage the budget crunch.

Clearly, a Better Solution

Through the combined efforts of the Ohio EPA, Charm Sewage Advisory Committee, Holmes County Commissioners, Holmes County Environmental Management District and Holmes County General Health District, it was decided that the problems of project funding and water quality could be solved by utilizing onsite treatment and disposal systems. On August 27, 2001, the County Commissioners issued the following statement to Ohio EPA: “After considering all of the relevant information, the Board of Commissioners respectfully declines to be a party to the proposed findings and orders at this time. Instead, the Board believes that proper enforcement of the sanitary code is sufficient to address the remaining unsanitary condition in the village and that such enforcement is currently underway.”

The Village of Charm’s problems were solved at an approximate cost of \$2,000 per home. Where

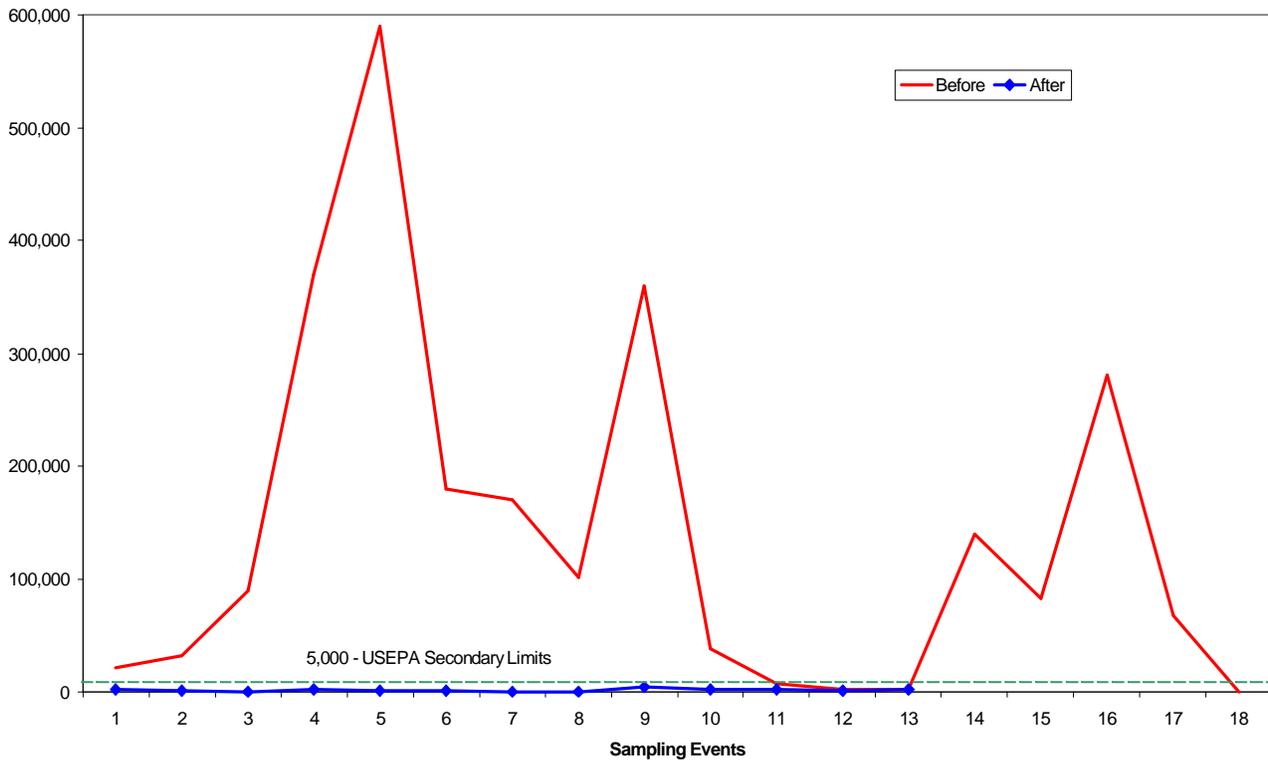
needed, the homes had new septic tanks installed for primary treatment. The tanks are concrete and multi-chambered with baffles and an outlet filter. Often properties had been subdivided so many times that standard sized effluent disposal fields were not an option. Variances at a county level allowed the Health Department to design disposal systems that utilized as much of the existing soil as possible. A modified mound was used to provide additional absorption area. To achieve the highest quality effluent, Norweco Bio-Kinetic wastewater management systems (Model BK 2000) were installed. The BK 2000 provides non-mechanical flow equalization through the septic tank, allowing the tank to achieve design retention time and to settle more solids. With flow equalization, the smaller disposal beds will have additional time to further treat the effluent without being subject to surge flow conditions. Advanced treatment is achieved without the use of electricity, which usually isn’t installed in Amish homes. In cases where onsite disposal wasn’t possible, the effluent was disinfected within the BK 2000 by an integral, NSF Standard 46 listed, disinfection device.



Treatment Efficiency

As a result of installing new septic tanks and BK 2000’s, environmental conditions in Holmes County are improving. Original test data found concentrations of fecal coliform as high as 590,700 CFU/100 mL. That is 118 times stronger than the USEPA secondary contact water quality criteria. Four months of water quality studies conducted by the Holmes County General Health District from May 25, 2004 through August 25, 2004, indicate the average fecal coliform concentration in Doughty Creek is 1,454 CFU/100 mL. Furthermore, not a single sample exceeded the EPA 5,000 CFU/100 mL limit. In several samples the levels were <50 CFU/100 mL.

Fecal Coliform Concentrations Before and After System Upgrades



A Solution for Long-Term Success

The decision to construct a collection system and treatment works or to use onsite treatment and disposal must be evaluated on a community by community basis. The Ohio EPA now considers the Village of Charm to “have no action pending,” because the residents of Charm, the Holmes County Commissioners and the Ohio EPA worked together to reach a reliable, affordable solution to their water quality problems. The solution to the Village of Charm’s problems has confirmed the accuracy of the USEPA Response to Congress which stated “Adequately managed decentralized

systems can protect public health and the environment as well as provide long-term solutions for the nation’s wastewater needs.” The development of advanced onsite treatment technologies, such as the Bio-Kinetic wastewater management system, provides regulators and citizens options for dealing with environmental challenges.

For additional information on the BK 2000 or Norweco’s full line of advanced onsite treatment technologies please call: (419) 668-4471, send a fax: (419) 663-5440, email: email@norweco.com or visit us on the web at www.norweco.com.



220 REPUBLIC STREET
 NORWALK, OHIO, USA 44857-1196
 TELEPHONE (419) 668-4471
 FAX (419) 663-5440
www.norweco.com

DISTRIBUTED LOCALLY BY: