

Chapter 1. INTRODUCTION

More than one hundred small communities across Kansas (typically those with less than 200 homes) are unsewered or have inadequate wastewater treatment and disposal systems, resulting in chronic problems with surfacing sewage or direct pipe discharges to the ground surface or into mine shafts. A small community includes incorporated and unincorporated cities, lakefront communities, and clusters of homes in unincorporated areas of counties. Many problems are due to the age of onsite wastewater systems, poor soils, small lot sizes, poor construction, sizing and/or maintenance of the systems. These conditions present public health and environmental problems and are in violation of state and local laws and regulations. However, solutions are available to address these problems.

The purpose of this manual is to provide information to community leaders, environmental health specialists and concerned citizens so they can assist communities having inadequate wastewater treatment facilities. All potential solutions are encouraged to be evaluated, from homeowner education about system maintenance and water conservation; the potential of clustering wastewater treatment for several homes into a common system; and centralized collection and treatment using alternative, as well as conventional collection/treatment systems. Management of all systems, from onsite to centralized, is emphasized throughout this manual. The information presented here is comprehensive and diverse. The more you utilize the various ideas presented herein, the more successful a project you will ultimately develop to address a small community wastewater problem.

A. Historic Perspective

Septic tank/soil absorption systems were not constructed in great numbers until after World War II. Returning veterans, rapid population growth, the availability of rural electric service, federal home loan guarantee programs, rapid economic growth, and other factors contributed to rapid development outside of sewerred urban areas. Rural homes with running water historically had cesspools or direct pipe discharges, which often lead to pollution of water resources.

At that time, public (regulatory) control over septic tank system installation in Kansas was non-existent or only advisory. Design requirements for onsite septic tank/lateral field systems began to be developed by state and local agencies and were largely in place by the early 1960's. Since then, state and local governments have formulated and implemented procedures for preconstruction approval of septic tank systems. These procedures, and the standard design requirements, have greatly reduced the occurrence of surface malfunctions and plumbing backups for new systems. However, old systems installed before design requirements were in place, systems on small lots in rural communities, systems installed in soils with limiting conditions, and new systems that are overloaded or not maintained, continue to fail.

Numerous small communities have been in existence for many years and have never been sewerred. Individual onsite systems were installed for each residence, often on very small lots, and with no site evaluation to ensure that adequate soils are present for the soil absorption system. And more

often than not, there were no standards for construction available so a great deal of innovation was used, including the use of car bodies as septic tanks! When these communities were established, the proliferation of water-using devices in homes had not begun and private water wells for individual homes were common. With the availability of rural water, many of these homes now have appliances, including dishwashers and washing machines, increasing the quantity of wastewater that the already inadequate systems have to handle. Even when residents want to repair or replace a failing system, they are unable to do so because of small lot sizes. As a result, wastewater discharge pipes are found running to ditches in front and back of homes.

These situations need to be corrected. Often times, the community as a whole cannot afford the traditional solution of installing gravity flow collection systems leading to a centralized treatment facility. Even with a generous mix of grant and loan funds, the cost of this solution is simply prohibitive due to the low number of connections. People are often surprised to learn that the bulk of the cost of sewerage a small community is in the collection system. Municipalities, local government planning departments, consulting engineers, and government agencies continue to propose centralized sewers for rural communities. This is typically done without a detailed review of the feasibility of improving the performance of existing onsite systems, and without serious evaluation of alternative collection systems such as pressure and vacuum systems.

The lack of knowledge about alternative collection and treatment technologies has led to a high degree of design conservatism among engineering consultants, sanitarians, and environmental health specialists, the principal sources of professional advice available to local governments. Training and education in design, installation and maintenance of onsite systems has been aimed at environmental sanitarians and installation contractors, not at the local planning and government officials and design engineering community who are primarily responsible for recommendations regarding public sewer installations. Until alternatives are evaluated, traditional, often prohibitively expensive, wastewater systems will continue to be recommended, and will continue to be too expensive to solve the problem.

The Federal Clean Water Act provided construction grants to cities and communities from 1972 to 1990. Grants to finance collection and treatment facilities could be obtained for up to 90% of the cost of a project. During this time, many small communities in Kansas constructed sewers, with the treatment system usually being a lagoon. In 1990, the construction grants program was discontinued and replaced by the Low Interest Revolving Loan Fund program (see Chapter 3) . Financial assistance is still available but it is low interest loan money rather than grant money. Some grant money is still available from United States Department of Agriculture (USDA) Rural Development (RD) Rural Utilities Service (RUS) and the Kansas Department of Commerce and Housing (KDOCH) Community Development Block Grant Program (CDBG), but there is stiff competition for these grant funds.

Funding is more than just securing financing to build a project. Funding a project should be considered a process that has distinct steps and does not end when construction is completed.

Funding agencies are encouraging applicants to develop their plans for funding concurrently with their preliminary engineering report and environmental assessments (Chapter 8). Funding plans encompass financing construction, paying for the operation of a system, maintaining financial viability, and preparing for future needs.

The remaining unsewered communities with failing onsite wastewater systems present the most difficult problem. Either they didn't want sewers when the grant money was available and they don't want them now, or they couldn't afford them even with the grant money and they can't afford them now. Nevertheless, populations are concentrated in these areas and the environmental and public health risks are still present (Chapter 2).

For rural communities, the most prevalent adverse impact of constructing new sewers and treatment facilities will be economic. Economic impacts can be reduced by implementing less costly alternatives. This handbook will introduce and expand on how to evaluate small communities for the best, most cost effective solution to the problem of small unsewered communities with failing onsite wastewater systems (Chapter 8), explain wastewater treatment and collection alternatives (Chapters 4, 5 and 6), sewer district formation (Chapter 10), the process of determining community capacity to operate a system (Chapter 7), how to hire an engineer (Chapter 9), funding options (Chapter 11) and finally how to maintain the viability of the new system for the long term (Chapter 12).

B. Getting Started to Develop a Wastewater Management Improvement Project

Each project has a similar life cycle. At some point, a project is born. A community is spurred into action for a number of reasons. Complying with an environmental enforcement action by the state or local regulatory agency, providing service to an unserved area, overcoming health hazards, promoting economic development, and upgrading or rehabilitating a deteriorating utility system are reasons often given for pursuing the development of an improvement project.

It is critical to record the reason(s) why the community believes it should develop an improvement project. This written record can help the engineer understand what motivated the community into action, and allows him to develop a project that fits the needs and desires of the community. The information can be used by community leaders to maintain the focus of the project, possibly saving money by avoiding delays caused by indecisiveness or developing items not really needed. The information can be used to tell funders why your community is seeking financing. It can be used in public education campaigns, and to help remind dissenting voices why the community decided to take action.

Governmental leaders and community officials are responsible for the proper maintenance, administration, operation, and rehabilitation of any utility system a community owns. They can hire others to assist them or adopt service contracts that have others run the community's system for them, but in the end they are responsible for the utility and its operation. The development of a project to solve a small community wastewater problem will require teamwork based on

community wide support. It is a process of defining the problem, identifying the best solution, keeping the community, funding agents and regulators involved and informed, implementing the solution, and assuring long term maintenance of the entire system. The result will be customized for each community, but the process is similar.