Director
Regional Rural Development Office, USDA
Chippewa Falls, WI

Dear Sir:

My name is Paul Koehler, and I operate a Septage Disposal Business located in Cedar Falls, WI. I am submitting for your review and consideration, the enclosed proposal for funding an innovative septage disposal system for rural Wisconsin residents. The proposal is to receive funding support for the development and construction of the system.

The proposal contains a statement of needs, benefits of an improved system, description of the process, projected costs, and attachments from technical support people. I am requesting that you review the contents of the proposal, and I would appreciate sitting down and discussing any possible source of funding that may exist.
Thank you for considering my proposal, and any support will be appreciated.

Sincerely,

Paul Koehler,
Koehler Septic and Plumbing, Inc.
Menomonie, WI

A Proposal
For
Funding an Improved Rural Septage Disposal System

Presented to:
Regional Rural Development Office, U.S.D.A.

By
Paul Koehler
Koehler Septic and Plumbing, Inc.

Fall, 2004

Need for Improved Septage Disposal System

As recently as 1950, a quarter of America's homes had no flush toilet. With some States topping 50 percent. In Wisconsin, more recently in 1970, twenty six point two percent (26.2%) of the homes had septage designed systems. This figure increased from 1970 to 1990 by two point one percent (2.1%). More recently, as we look at the 1990 census, we see the number of rural homes increasing by more than two point one percent (2.1%). In fact, close to thirty one (31%) of homes in Wisconsin have septic tank or cesspool systems. This will continue to increase with the low cost financing of homes, and the desire of families to more onto hobby farms and small acres of land.

Generally, homeownership rates rose in each decade since 1950, except in the 1980's when it remained unchanged in the United States. Ownership rates rose from fifty five percent (55%) in 1950 to sixty six percent (66%) in the year 2000. In Wisconsin during this same period of time homeownership rates increased from sixty eight point four percent (68.4%) to ninety one point one percent (91.1%) in the year 2000. As we look at the rural factor in these rates, we can see that two things occur from this increase. First, the septage systems of cities became maxed out, and along with EPA Standards caused cities to expend taxpayer dollars for large upscale improvements in the systems. Also, the increase in homeownership in the rural areas increased the number of septic and cesspool systems.

This same trend is happening as well for the entire United States where we see an increasing number of single family residence and hobby farms. Also, there is an increasing usage of water waste disposal flushing systems in family and commercial farms causing increased need for septage disposal. The increases in septage disposal outside of cities with septage treatment facilities is causing Departments of Natural Resources, including Wisconsin, concern about the purity and condition of groundwater used for public consumption, recreation, and game management. With the increase in rural homeownership, the number of wells that the homes needed also increased. In 1990, forty two point two percent (42.2%) of all homes had drilled or dug wells. Some of the wells were in cities. However some homes chose to have wells rather than city systems or the city system wasn't available to some homes. The increase in wells over the years has caused the Nitrate levels in the ground water to increase, and Wisconsin with a large coverage of sandy loam soil maybe environmentally vulnerable to how septage can be disposed of in a much safer means than currently exists. (1990 &2000 U.S. Census Data)

Septage disposal is a matter of concern for the consumer if effective and efficient disposal means are not developed. Costs in this area could make residential development outside of cities prohibitive, which in turn would negatively impact the housing industry, and rural economy of Wisconsin. Septage disposal systems must improve beyond the current technique of field spreading by septage haulers. To improve in this area a system must be developed that deals with the nitrate levels

prior to field spreading. Such improved systems would treat the septage for harmful microorganisms that increase nitrate levels.

Another problem confronts the rural homeowner, and the state of Wisconsin. It's called the Median household income. The median household income is low enough to cause concern. That is people living in rural areas, and having septage disposal systems may not have enough cash on hand to purchase septic pumping systems if more economical systems are not developed. In 1969 the poverty level of people living in Wisconsin was nine point eight percent (9.8%). This increased to ten point seven percent (10.7%) in 1990. Today that figure includes a larger number of people living in rural households than in 1969. The median household income in Wisconsin as of the year 2000 is slightly over thirty thousand dollars ($30,000). This adds to the plight of what these rural people are going to do with septage disposal from their rural homes.

Obviously, there is a problem, and my company, Koehler Septic and Plumbing, Inc., has been working with several different groups to come up with a system from Septage Haulers in rural Wisconsin.

What an Improved System Would Bring to Rural Wisconsin

The benefits of an improved septage system at the site of septage haulers would benefit residents of Wisconsin rural and municipal communities in the following ways.

1. In the system that we have designed, and is being proposed the groundwater would be recharged with reduced nitrate levels per foot.

2. The tax supported municipal treatment facilities that in most cases are at capacity due to the building boom, would have a reduced demand, saving tax payers money.

3. The rural environment would benefit from treated septage and purer water prior to disposal. This would make the wells that rural homeowners drill for water safer, and freer of harmful nitrates.

4. Septage haulers would be able to maintain reasonable fee structures for rural residents, small businesses, and farms. This would make the pumping of systems more affordable.

5. Fossil fuel usage by the septage haulers would be reduced significantly.

Description of the Proposed System

My company, Koehler Septic and Plumbing, Inc., is proposing the following system.

The SMART-Treat septage purification system (Small Media Aerobic Reactor Treatment System) This system would provide local septage haulers with their own on site sized small treatment plant. A plant that would have benefits to residents, small rural businesses, farms, and septage haulers. The system would work in the following steps.
First, the septage hauler would pump a rural resident, small business, or farm septic tank. Instead of field spreading the effluent, or taking the effluent to municipal treatment facilities, the hauler would take the affluent to their own site.

Second, the septage would be pumped from the haulers truck into their own sized treatment plant. Potentially, a 5000 gallon per day processing plant (SMART-Treat) would handle the septage in the following manner.

Third, the septage hauler would drive into his own enclosed facilities and unload the septage into a tank that contains an initial screening device called a Pro-Guard Screw Screen. His is the first step in cleaning the effluent. This is an inside facilities, which protects the area from smells and noise.

Fourth, from the first screening tank, the effluent moves to an underground settling tank. This is again screened for objects in the effluent.

Fifth, the affluent then moves to a third tank called a SMART-Treat Aerobic Reactor. It is in this tank that purification starts with water being separated from the affluent. The affluent then moves to the next tank.

Sixth, it is the fourth tank that the effluent moves through two one thousand gallon bio-solids settlers. The highly treated effluent then dissipates into the drain field.

Seventh, the bio-solids are then pumped to a storage tank, where the septage hauler can store for convenient disposal in land fills or field spreads. Keep in mind that this effluent is treated.

Attached to this proposal are more detailed descriptions of the tanks and flowage.

Projected Costs for Improved Rural Septage Disposal System

This proposal is being submitted on the basis that this is the first system like it in the State of Wisconsin, and as a pilot system would have overhead costs that normally my company would need support for. In a pilot septage system such as SMART-Treat, adjustments will have to be made by engineers to streamline the system for effectiveness and efficiency. This will increase the cost of start up, which my company would need as we further refine the system to make it affordable to other septage haulers.

The initial cost of a septage haulers local treatment system has an estimated payback of two to three years. However, Wisconsin being a large rural agriculture state, rural development funds should be used to assist septage haulers in setting up on site systems for the benefits that have been mentioned in this proposal. Guaranteed loans, grants, and matching fund monies should be made available for septage haulers who are taking the risk to install such a system. The projected costs are as follows.

Thirty foot (30') by forty foot (40') structure to house the above ground tanks and equipment. Contractors estimate- $60,900.

Underground and above ground tanks-$31,500.

Biological Reactor, Screw Screen, and Bio-solids equipment-$28,500

Development of drainfield-$5,000

Plumbing, electrical, and labor are figured into the pricing of structure, tanks, and equipment.

Total Projected Cost- $125,900

Technical Support

Environmental Health Products and Service
Source Person- Ken Neu
(See attachment from Environmental Health Products and Service)

Ryan Construction
Source person-Richard Ryan
(See attachment from Ryan Construction)

Capacity Project, Indiana
Source person-Richard Wise
(See attachments on technical drawings)