Texas On-Site Insights
Information about On-Site Wastewater Treatment Systems in Texas
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TNRCC Approves New Rules for On-Site Wastewater Systems; Training, Site Evaluation Requirements Are Strengthened

In December, the Texas Natural Resource Conservation Commission (TNRCC) adopted broad revisions to rules regulating technical standards for and installation of new on-site sewage facilities (OSSF). Households in suburban or rural communities use these systems as alternatives to centralized wastewater treatment facilities, which are more common in urban areas.

"Increasing residential development in rural areas across the state means that more and more Texans are turning to on-site sewage facilities as a convenient and affordable means of treating household wastewater," said TNRCC Commissioner John Baker. "Past experience shows that these systems can develop serious problems when the technology used is inappropriate for the soil conditions or inadequate for the lot size or when the system has been installed incorrectly. These problems, like leaking tanks or flooded drainfields that expose raw or inadequately treated effluent, pose significant threats to both human health and the environment. In revising the OSSF rules, our aim has been to protect Texas while ensuring that the septic system remains a viable option for a growing population of Texans."

The TNRCC worked closely with counties, installers, and the industry in revising the rules. The agency held 11 public meetings throughout the state on the proposed revisions and consulted with a 14-member ad hoc advisory committee to help shape the final rules.

The revisions update technical standards and criteria to reflect changes in the OSSF industry that have occurred since the rules were first issued in 1989. The rules specify standards for cluster and drip systems, intermittent sand filters, and leaching chambers. The revisions eliminate the percolation test as the sole factor for determining whether an OSSF is feasible for a particular site, and establish a site evaluation process based on soils analysis to ensure that the proper types of OSSF will be installed. The rules also reduce certain setback requirements to allow greater flexibility in selecting among OSSF options.

The revisions implement a legislatively mandated certification program for designated representatives of local governments, who oversee OSSF installations for the TNRCC. The revised rules establish a certification program for site evaluators and enhance

existing certification of installers by requiring additional training to handle complex OSSFs.

In 1990, the state issued 18,000 permits for new OSSFs. In 1995, some 38,000 permits were issued. TNRCC estimates that roughly 45,000 new on-site sewage facilities will be permitted for 1996.

For more information, contact the TNRCC at (512) 239-4799. A complete set of the new rules can be found on the TNRCC WWW site, which is at http://www.tnrcc.state.tx.us.

TNRCC to Offer Series of Free Workshops to Discuss New Rules

The Texas Natural Resource Conservation Commission (TNRCC) is presenting a series of free, half-day workshops concerning the new agency rules regulating OSSF systems. The workshops will provide a broad overview of how the new rules will affect local permitting agencies, system designers, installers, and the public. Such topics as the rule-making process, certification, design and installation will be discussed. TNRCC staff will explain the new rules, distribute and discuss new guidance documents, and provide an opportunity for individuals to meet and ask questions of TNRCC staff.

Registration is not required. For details, call Michael Fahy at TNRCC at (512) 239-1490.

The following workshops will run from 8:30 AM to Noon:

- Jan. 30 -- Austin
- Feb. 4 -- San Antonio
- Feb. 5 -- Waco
- Feb. 6 -- Arlington
- Feb. 7 -- Tyler
- Feb. 10 -- San Angelo, Beaumont
- Feb. 11 -- Midland, Sugarland
- Feb. 12 -- Lubbock, Corpus Christi
- Feb. 13 -- Amarillo, Harlingen
- Feb. 14 -- Abilene, Laredo
- Feb. 19 -- El Paso

There is also a workshop in Houston February 10 beginning at 2 PM.

Annual Texas On-Site Wastewater Conference is April 13-15

The Fifth Annual Conference of the Texas On-Site Wastewater Treatment Research Council will be April 13-15 at the Plano, TX Convention Centre. Some of the topics to be discussed include the following: recent changes to TNRCC on-site regulations, soil as a treatment system, site characterization and evaluation, sand filter design, soils evaluation, septic tank treatment and design, operation and maintenance, wastewater treatment options, high strength wastewater, cluster systems, effluent filters, and inspecting existing systems.

Early registration is $30 and must be paid by March 23. The registration fee is $60 after that date. Registration fees must be sent to Mary Garrett and Associates, Inc., who is organizing the conference. Their fax number is (512) 225-4505. The conference hotel is the Harvey Hotel and their phone number is (214) 578-8555. A special rate has been set for the conference of $55 for one person.

For more details, contact Warren Samuelson of the Texas Natural Resource Conservation Commission (TNRCC) at (512) 239-47999, or e-mail his secretary, Annette Maddern, at amaddern@smtpgate.tnrcc.state.tx.us.

"New Garden" Videotapes Describe Natural On-Site Systems

A series of educational videos produced for public television describe many issues related to wastewater treatment and disposal. The videos are part of the "New Garden" series which emphasizes environmentally friendly methods to grow and maintain gardens and landscapes. The series is produced by Ron Zimmerman of Zimmerman and Associates, Inc., of San Antonio. Episodes that deal with wastewater issues include "Wastewater Wetlands" (#512), "Plants that Clean the Air" (#701), "Indoor Greywater Systems" (#707), and "Man-Made Marshes" (#711). Many of the videos include interviews with experts who provide hands-on demonstrations of how to develop and maintain these systems. In "the Man-Made Marshes" videotape, Bill Wolverton of the National Aeronautics and Space Administration Stennis Space Center in Mississippi showcases reed rock filters and constructed wetlands he developed for treating wastewater at individual residences, and larger systems he developed for small communities that use open marshes and free-flowing wetlands. He describes the functions of such wetlands plants as duckweed, reeds, rushes, and cattails in these systems. Zimmerman also publishes the *New Garden Journal* which describes these topics. To subscribe to the Journal or to receive a full list of videotape titles, send a self-addressed, stamped envelope to: The New Garden, P.O. Box 6121, San Antonio, TX 78209.

EPA Gulf of Mexico Program Takes Regional Perspective on Near Coastal On-Site Wastewater Issues

Although many of us think of on-site wastewater issues only in Texas, there are comprehensive efforts to examine on-site programs and systems throughout the region. An example of this collaborative work is a recent meeting of on-site wastewater professionals from throughout the Gulf of Mexico region, and follow-up efforts led by the U.S. Environmental Protection Agency's Gulf of Mexico Program (GMP), based at Stennis Space Center, MS.

In 1993, GMP organized the Gulf States On-Site Wastewater System Conference that met in Tallahassee, FL. The goals of that meeting were to compare regulatory structures used to manage on-site wastewater systems in states bordering the Gulf of Mexico (Texas, Louisiana, Mississippi, Alabama, and Florida), and ranking and identifying top problems and challenges concerning on-site wastewater in the region. GMP published the proceedings of the meeting in 1995. Texas participants included Warren Samuelson and Sherman Hart of the Texas Natural Resource Conservation Commission (TNRCC).

"The broad interest of the EPA Gulf of Mexico Program," explained Fred Kopfler, a senior environmental scientist, "is to examine a variety of issues that impact the Gulf, including shellfish restoration, the introduction of non-native aquatic plant and animal species, hypoxic or dead zones where dissolved oxygen levels are less than 2 milligrams per liter, and habitat degradation. Our on-site wastewater work falls under the shellfish restoration program because you cannot support healthy shellfish populations if a significant amount of fecal coliform bacteria and nutrients are being introduced by failing on-site wastewater treatment systems."

Comparing Gulf States On-Site Wastewater Programs

The first part of the report compares state on-site wastewater management programs throughout the region in such areas as the level of flows that constitute on-site systems, how systems are regulated, methods used for site evaluation and final inspection, setbacks to surface water, the distance systems must be separated from groundwater formations, minimum lot sizes, regulation of black and gray water, special rules for flood-prone areas, and many others. At the time the conference met, Texas was more progressive than other states in many areas. For example, Texas was the only state with rules specifically for marinas and houseboats. Texas required a half-acre site for on-site systems when residents rely on a public water supply and a 1-acre lot for a private well. In contrast, Mississippi did not have any minimum lot size criteria. Texas was the only state to require that final inspections be performed by certified state or local employees. Texas' education and training programs were judged to be the most highly developed of any state in the region. Louisiana is the only Gulf state which permits surface discharges from on-site systems. When there are poor soil conditions, Louisiana may allow surface discharges if aerobic treatment is provide after effluents leave the septic tank and before wastewaters are discharged.

Setting Priorities for the Region

On the second day of the meeting, participants used the nominal group technique to identify the most important issues concerning on-site wastewater in the region. Conference attendees were asked to list their top ranking responses to a problem statement. Responses were listed on a flip chart and then each member was allowed to privately and anonymously rank the problem statements.

The highest ranked responses to the problem statement, "List three contaminants you feel threaten shellfish harvesting areas in the Gulf of Mexico" were fecal coliform, pathogens, toxic substances, nitrogen, sewage, heavy metals, and agricultural runoff. Participants ranked public and industry education, repair of malfunctioning on-site wastewater systems, enforcement of existing laws, restrictions on development, and elimination of sewage outfalls as the most important "actions that could be taken to reduce contamination of shellfish harvesting areas." Finally, participants were asked to list and prioritize "features in the on-site wastewater regulatory program that they felt are most important to improve shellfish harvesting areas." Top responses included requiring lifespan inspection, maintenance and monitoring, required use of water conserving fixtures, mandatory homeowner/ home buyer education when homes are bought and sold, establishment of performance-based standards, mandatory use of repair permits with state

oversight, and providing flexibility from state and local governments to allow homeowners to use alternative technologies. The recommendations were sent to the governors of the Gulf states and to state on-site wastewater regulatory agencies.

GMP On-site Wastewater Initiatives

Kopfler explained that GMP continues to support on-site wastewater research and training activities along the Gulf coast. The program is identifying areas along the coast with large numbers of on-site systems and is assessing the impact of failing systems on water quality at those sites. The program also has funded the use of alternative systems (reed-rock filters, constructed wetlands, and peat biofilters) at some sites. They are developing model legislation for on-site wastewater systems that policy makers in coastal areas can utilize to more effectively regulate these systems and improve their performance. The program has funded educational programs and displays.

NOTE: Kopfler said there are opportunities for scientists, extension agents, and local governments to apply for funding from GMP in subject areas pertaining to on-site wastewater. GMP accepts unsolicited pre-proposals, keeps them on file, and may consider them for funding. For details, contact Kopfler at (601) 688-2712 or kopfler@pelican.gmpo.gov.

Axtell School District Chooses Drip Irrigation System to Treat Wastewater On-Site

A small school district in Central Texas is using a new drip irrigation system to treat wastes and reduce the amount of wastewater it sends to area streams.

Rick Goldberg stands near the football stadium at Axtell ISD. The drip irrigation system he designed helps irrigate the practice field and other sites at the school.

The Axtell Independent School District (ISD), near Waco, recently installed a new drip irrigation system. The system was installed by Rick Goldberg of Austin, who recently was the Chairman of the Texas On-Site Wastewater Treatment Research Council. It was designed by John Winkler of Waco.

Goldberg says he believes that drip irrigation systems are useful to treat wastewaters on-site in many situations, including large applications like this school as well as for individual homeowners. "This was the best system for Axtell ISD in terms of public health and recycling wastewater." Goldberg says. "The cost was less than a package plant. Perhaps most importantly, the old treatment plant wasn't working well and regulators in the area did not want the school to continue discharging into a water course.

This system dramatically reduces the amount of wastewater that will flow into streams because it uses the land to help treat wastewaters. These same factors -- cost, effectiveness of treatment, and reliability, also make it a good choice for individual homeowners."

The system uses an 11,000-gallon septic tank to provide primary treatment and to help solids settle out. From the septic tank, effluents flow into a 6,000-gallon pump tank and are distributed to a 120,000-square-foot drainfield. The drainfield is divided into eight zones, which include a 40,000-square-foot football field. The other zones are utilized to provide additional disposal areas. The system utilizes three, 2-inch spin clean filters which work in parallel. Each filter is covered with a 140-micron screen and can treat 16,000 gallons per minute. The outside edge of each filter is serrated, and the filters are placed atop one another like a stack of poker chips.

The system processes 30 gallons of wastewater per minute. Two 2.5-horsepower electric pumps are used to move effluents from the pump tank to the drainfields and to flush the system. The system automatically flushes the drainfield lines twice each day to keep them clear. The system is flushed at pressures of 55-60 pounds per square inch (psi). The backflush for each filter takes 15 seconds. If the filters get dirty and pressure in the system increases to more than 80 psi, an automatic backflush occurs. Clogs can be removed through flushing, and scouring (water is sent through the system at a rate of 2 ` per second).

The main drip irrigation line is 0.5" in diameter and is buried 8" below ground. Each emitter discharges 0.6 gallons of wastewater per hour. Pressure ranges in the system from 7 to 70 pounds per square inch (psi). The emitters in the drip lines are installed 2 ` apart. The lines are set 2' apart from each other.

Goldberg says the system, which was installed in 1995, is working effectively so far. "We taught the Axtell school personnel how to maintain the system and how to flush the field lines periodically," he says. "We also showed them how to look for areas where vegetation growth is uneven. You can usually suspect the field lines are clogged if the vegetation is too lush in one spot. One of the reasons we chose this system is that Axtell ISD has a lot of room for a drainfield. As long as grass grows, this system will continue to effectively treat wastewater and it won't restrict the activities and use of the field," Goldberg says. "You can practice on it while it's being irrigated or shortly afterwards."

Other Drip Irrigation Systems Designed by Goldberg

Goldberg has also designed and installed other drip irrigation systems. He published a paper titled "Preliminary Results -- Drip Irrigation of Anaerobic Wastewater in a Residential Application in Travis County," that was presented at the 1996 Texas On-Site Wastewater Treatment Research Council Annual Conference in College Station. The paper is part of that proceedings.

In that paper, Goldberg describes a drip irrigation system designed for a five-bedroom house on a steep lot overlooking Lake Travis. Because the system is near Lake Travis, it

had to be approved by the Lower Colorado River Authority. The pre-treatment system utilizes two, 1250-gallon septic tanks and a 1,000-gallon pump tank in series. A passive particle filter is located at the end of the second septic tank to lessen the load on the sand filter. Effluents are distributed through the use of a 0.5 horsepower submersible pump, a media filter and controller, 1.5" diameter PVC supply and return lines, and 3,000 linear feet of drip irrigation tubing. Operating pressure for the system is 45 psi. A 12" transparent pipe was placed in the field flush flow line to detect if solids were being flushed through the system. The system was installed in March 1994 and has functioned well since with no evidence of organic buildup on the sand filter or on drip irrigation lines. Effluents are dosed into a grass- and tree-lined area in the front yard and alternated between two zones. Because the front yard has a 15% downward slope, a pressure-compensating emitter is used to spread effluents evenly in the disposal area.

"I wanted to design this site to determine if a high level of pretreatment can reduce clogging in drip irrigation systems and to investigate how well a drip irrigation system could function when used with anaerobic treatment," Goldberg says. "So far, the results are very promising. The system is functioning well and is producing high quality effluent."

For details, contact Goldberg at (512)329-0066.

LCRA Installs Constructed Wetlands at Blessing, System Will Be Extensively Monitored

The Lower Colorado River Authority (LCRA) has developed a project to evaluate the use of constructed wetlands along the Texas coast to treat small flows of domestic wastewater. The project was funded through a Clean Water Act Section 319 (h) grant from the U.S. Environmental Protection Agency (EPA). The grant is being administered by the Texas Natural Resource Conservation Commission (TNRCC). The purpose of the project is to examine and demonstrate the use of constructed wetlands as an effective method to treat wastewater along the Texas coast. Currently, many systems in the region fail because of high rainfall, clay soils that prevent infiltration, shallow groundwater tables, and small lot sizes.

Burt Carter of LCRA (to right) describes the constructed wetlands at Blessing, TX, while Warren Samuelson of the TNRCC looks on.

"LCRA is excited about this project," says Burt Carter, who supervises on-site wastewater programs for the agency. "It was structured so that we can obtain quality data about how well-constructed wetlands function in treating small flows of domestic wastewater. This type of data has often been lacking and we need more of it. We also

hope this type of system may be viable to treat domestic wastewaters and replace failing systems along much of our coastal service area. It's low-cost, low-maintenance, and reliable." Adds Ed Schulze of the Matagorda County Environmental Health Department (MCEHD), which regulates on-site wastewater systems in the area, "We've had a good idea for some time that constructed wetlands would work well in inland areas or parts of the coast that don't receive a lot of rain, but we average 48" of precipitation a year here. This project will go a long way towards determining if constructed wetlands are viable for this part of the Texas coast."

Background Information

The wetlands are located in the small town of Blessing, which is south of El Campo and just 10 miles north of the Texas coastline. The site was chosen because coastal waters in the region (including Matagorda Bay, Tres Palacios Bay, Caranchua Bay, and Powderhorn Lake) were identified as having high levels of fecal coliform bacteria in an LCRA nonpoint source pollution study. Later, LCRA identified specific on-site wastewater disposal facilities that have the greatest likelihood of contaminating surface and ground waters with raw or poorly treated wastewater. LCRA used an evaluation matrix that incorporates the volume of wastewater, soils, the distance from systems to waters, the number of system failures, and the age of the systems, to rank the risk of failure of various on-site systems in the region and the likelihood that they could be remedied with new and innovative technologies. Blessing was ranked 11th out of 16 sites that were reviewed, signifying that there were opportunities to develop a demonstration site there.

System Design and Construction

Both constructed wetlands in Blessing have a similar design. The systems are designed to receive flows from a two-bedroom house (120 gallons per day) and a three-bedroom home (180 gallons per day). An effluent meter on each pump line measures the volume of wastewater being generated.

Primary treatment is provided by a septic tank. Effluents flow from the septic tank to the first of two wetlands cells that are operated in series. Each cell is 5' wide x 2' deep x 20' long. The operating depth of the wastewater in each cell is 13," which places it several inches below the top of the gravel and mulch. A small berm surrounds each cell to prevent rainfall runoff from entering the wetlands. Only the first cell is lined (it uses a 60-mil synthetic mesh) because it is anticipated that most of the fecal contaminants will be

removed there. The system was designed to operate mainly under gravity flow conditions. The only pumping that is required is to lift effluents from the septic tank into the first cell because of the lack of slope at the sites. Following treatment in the wetlands cells, effluents are routed to two drainfields.

The cells are filled with small rocks and planted with a variety of wetlands plants. The first cell (where wastewater will be of a poorer quality and most of the treatment will occur) contains canna lilies, horsetail, thalia and irises. The second cell was planted with canna lilies, umbrella sedge, tarrow, and square-stem spike rush. The cells are maintained so this is a subsurface wetlands system to minimize contact between the wastewater and the public.

Because a goal of this project is to gather data and determine how well the system performs, it contains additional monitoring and data gathering features that would not likely be found in a typical system. Four 300-gallon pump tanks have been installed to gather data on the amount of water that flows between each system component. LCRA hopes to be able to determine how much water is lost to evaporation and plant growth (evapotranspiration), as well as how much water is flowing through the system. The system utilizes the existing drainfield and a newly installed drainfield, and the performance of both units will be compared. A monitoring well and capped observation standpipes will be sampled to determine how well the drainfields are able to distribute effluents from the system.

Construction began in July 1996 and the wetlands began to receive treated wastewater in November. All construction was done by members of the Texas Agricultural Extension Service (TAEX) and the Agricultural Engineering Department at Texas A&M University including researchers Roy Childers and Bruce Lesikar and several students.

A thrust of this project will be to determine if constructed wetlands can reduce the amount of organic matter in effluents and reduce soil plugging. If this occurs, it could mean that higher volumes of wastewater could be treated by the soil system.

The system is being monitored by MCEHD and LCRA, and results will be submitted to TNRCC. Influent and effluent wastewater samples are being tested for biochemical oxygen demand, total suspended solids, fecal coliform bacteria, and nutrients. A rain gauge has been installed to collect precipitation data and additional weather information will be provided by the National Weather Service observatory at Palacios, TX.

Summary

The project involved a lot of teamwork between many organizations and many individuals played key roles in its design, construction, and maintenance. For example, Schulze worked with LCRA to identify the site, talk with homeowners who may want to use the technology, and to monitor construction. "We want to demonstrate that these systems don't produce foul odors or attract mosquitoes, but are a very effective way of treating wastewater that also provides an attractive landscape," he says. Even though the area has been hit by cold spells this winter, the thalia and horsetail are still growing and treatment is excellent.

Carter and Schulze say they hope many people in the region will come to Blessing and view the system. "We feel that people will want to consider using these systems at their sites once they have observed these constructed wetlands and seen how they work first," Carter says. Schulze believes these systems may be inviting to the region's residents if they can be built for a low cost. "They are not that difficult to build, especially if an individual wants to do some of the work himself and has experience in construction."

Florida Video Explains Proper Design, Operation, of On-Site Systems

The Florida Department of Health has produced a videotape that describes principles of the proper design, construction, and maintenance of on-site wastewater systems. The 30-minute video, "Protecting Florida's Water: Proper Septic Tank System Use and Maintenance," was produced in 1994.

Sections of the videotape describe how the proper design of on-site systems can protect surface and ground water supplies, health risks posed by failing systems, increased costs that homeowners may face if systems are not properly operated and maintained, and principles that need to be considered in siting and designing these systems. For example, the video provides an in-depth description of household activities that may adversely affect the operation of on-site systems including washing multiple loads of laundry in rapid succession during one day, using bleach along with laundry detergent, excessive use of kitchen garbage disposals, and the disposal of household and landscape chemicals.

The videotape can be purchased for $5 from the Department. For details, call them at (904) 488-4070.

Texas STEP "Self Help" Program Used to Remedy Failing Systems Near Eagle Pass, Sunset, Colorado County

The use of community volunteers and "sweat equity" to replace failing on-site wastewater systems continues to grow in Texas. The Texas Small Towns Environmental Program (Texas STEP), a coordinated effort by many state agencies, is making great strides in helping communities help themselves and improve their infrastructure for wastewater and drinking water treatment.

Currently, Texas STEP is being utilized to improve water and wastewater operations at Arroyo Colorado Estates (featured in a previous issue of *Texas On-Site Insights*), Pueblo

Nuevo, Alleyton, Sunset, and other sites. In many cases, failing on-site wastewater systems are being replaced.

Volunteers and community leaders from Pueblo Nuevo turn the first shovel of dirt to replace failing septic tanks with collector and service lines that will be connected to a small sewer.

Many agencies are working to incorporate Texas STEP into their programs, including the Texas Natural Resource Conservation Commission (TNRCC), the Texas Department of Housing and Community Affairs (TDHCA), the Texas Water Development Board (TWDB), the Texas Department of Health (TDH), and the Texas General Land Office (GLO). These programs are similar in nature, but vary slightly in the types of assistance that can be provided. For example, TDHCA may provide grant funds, while some of the other agencies place more of an emphasis on team building and technical assistance.

Replacing Failed Systems on the Border

The TNRCC is working with TDH and other agencies to utilize Texas STEP to remedy failing on-site wastewater systems in the small town of Pueblo Nuevo (284 homes), which is near Eagle Pass in Maverick County.

Kassie Sutton of the TDH Region 8 Office in Uvalde is the coordinator of the Pueblo Nuevo project and describes conditions there. "Most of the homes use cesspools and don't have an approved on-site wastewater treatment system," Sutton says. "Even those with septic tanks and drainfields have difficulty getting their systems to perform properly because soils are tight, groundwater tables are high and many of these systems were built on small (100' x 75') lots that can't provide adequate treatment."

A local "head start" preschool with 150 students demonstrates the types of on-site wastewater treatment problems faced by local residents. A conventional system used by the school failed a few years ago and was replaced by another conventional system, which did not work. The on-site wastewater system was plagued by a small lot that was on a steep slope and received runoff from a nearby parking lot. The end result was that raw or partially treated wastewater was surfacing on the playground and schoolyard. "We had to issue an enforcement order and send kids home at times because conditions were unsafe because of the sewage," Sutton says.

The solution being implemented in the Texas STEP program involves constructing a 38,000' collector line and 27,000' of service lines. The system was designed by Loomis and Associates, Inc., of Austin. Construction began in December 1996.

Water service is now provided by the El Indio Water Supply Corporation (EIWSC). After the system is connected, EIWSC will bill residents for water and wastewater service. The City of Eagle Pass will provide wastewater treatment and will own and operate the collection system. The system will cost residents a $200 down payment and a monthly bill of roughly $20 per month. A Rural Utility Service Grant from the U.S. Department of Agriculture (USDA) will help pay for the initial connection fees. Although the "retail" cost of the system was projected to be $1.18 million, the actual cost will be only about $300,000 because much help and labor is provided by volunteers.

Developing a Small Diameter Sewer

The City of Sunset, in Montague County, is using Texas STEP to provide wastewater service for the first time to its 300 residents. In this project, TDHCA is the lead agency.

The main goal in this project is to replace failing on-site wastewater systems with a small diameter sewer, explains Danny Russell of the USDA Natural Resource Conservation Service (NRCS), who is one of the sparkplugs of the project. "Most of the residents of Sunset now have their own septic tank and drainfield, but we often have problems during wet weather where raw or partially treated wastewaters pool on top of the ground and back up into homes. A part of the problem is that many systems were not installed correctly and may have been put too deep in the ground."

This project is in the preliminary phase. So far, efforts have involved using high tech lasers to survey the hilly landscape and develop data that can be utilized in an AutoCAD software program. Volunteers from the Upper Elm Red Soil Water Conservation District have provided volunteer help in this efforts. Computerized maps that will be developed will aid in the design and construction of the finished system. "Learning about the topography here is essential because Sunset drains into four different directions. We want to take advantage of our slopes and use gravity, not pumping, to convey wastewaters from individual sites to their destination."

Russell says that project organizers are still contemplating what type of system will ultimately replace the malfunctioning on-site systems. An option being considered

includes filling existing septic tanks with sand so they can no longer be used and connecting each house to a small diameter sewer. Another proposal is to utilize a panel system that is covered with louvers and filled with sand. Effluents enter the panels and are treated by a sand filter.

"TDHCA and TNRCC showed us ways where we could help ourselves," Russell says. He notes that the estimated "retail" cost of this system was $1.2 million, while the total using Texas STEP's network of volunteers is projected at less than $360,000. Loomis and Associates, Inc. of Austin are also the engineers of this project.

Connecting Colorado County Residents

Colorado County is working with TDHCA to implement Texas STEP in the small town of Alleyton (80 homes), four miles east of Columbus on the Colorado River. TDHCA provided the county with a $350,000 community development grant and $100,000 in STEP funds to install a wastewater treatment plant and collection system.

Currently, many old septic tanks are collapsing, and effluents often spill onto the ground after heavy rains. "The problems are compounded because most of the homes in town utilize individual water wells for drinking water that are often less than 30' deep," says Robert Neath, the sparkplug for the project. "If sewage is not being treated properly, it could end up in our drinking water."

The emphasis of this project is to help everyone in the community to properly install service lines and hookups and to make sure everyone is connected to a new wastewater collection system. Much of the work involves teaching citizens how they should install lines and hookups. "Many people in Alleyton are on fixed incomes and live in homes that were built on small lots and simply could not otherwise afford new wastewater treatment systems," Neath says. "Many systems are old and in need repair. Texas STEP helps us correct this situation and protect the environment."

NOTE: For details about the Pueblo Nuevo project, contact Sutton at (210) 278-7173, or Hollon at (512) 327-1180. For general information on Texas STEP, contact George Freitag at the TNRCC at (512) 239-6123 or Cynthia Vallejo at the Texas Department of Housing and Community Affairs at (512) 475-3925.