Texas On-Site Insights
Information about On-Site Wastewater Treatment Systems in Texas
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450 Participate in Annual On-Site Conference in College Station

More than 450 individuals with an interest in learning more about on-site wastewater issues and 25 exhibitors converged on College Station March 10-12 for the 4th annual conference of the Texas On-Site Wastewater Treatment Research Council.

Conference attendees heard a keynote presentation by Gilbert Telez of the U.S. Environmental Protection Agency's Region 6 Office that presented a federal perspective about on-site wastewater issues. That was followed by a talk by Joe Vogel of the Texas Natural Resource Conservation Commission (TNRCC) that dealt with compliance and enforcement issues for programs administered by TNRCC.

Concurrent sessions provided detailed practical information on such broad topics as on-site wastewater treatment and disposal systems; operations, maintenance and sampling of these systems; legal issues; small business needs; and soils training. For example, the treatment and disposal session featured talks about aerobic systems, spray irrigation, drip irrigation, low pressure dosing, and comments from TNRCC regulators. The session on operations and maintenance contained presentations on proper sampling and testing techniques, certified laboratory analyses, and operations and management of different types of systems. Included in the legal session were presentations on the TNRCC compliance review process, TNRCC enforcement policies, and assistance the Texas Attorney General's can provide in supporting enforcement actions. In the soils training workshops, participants received hands-on training about how to identify individual soil types and series, and their characteristics. Although all the names of all the presenters can't be listed here because of space constraints, speakers and moderators from Texas universities included Bruce Lesikar and Tom Hallmark of Texas A&M University and Dudley Burton of Baylor University.

One of the most popular events associated with this conference was site visits to the new on-site wastewater treatment training center at the Texas A&M University Riverside campus near Bryan. Texas A&M University faculty and students and members of the Texas On-Site Wastewater Association provided conference participants with guided tours of the site. Participants were particularly interested in observing the many different types of systems installed at the site and how these will be used for training opportunities.

"We were especially pleased with this year's conference," said Council chairman Rick Goldberg, "because of the number of the people who participated and the amount of

practical information that was provided. We hope many of the people that attended the conference will be able to take back useful information to their regions." Conference attendees received a proceedings. We will continue to publish articles about many of the presentations given at the conference in this and future issues of "Texas On-Site Insights." Please note that copies of the proceedings are out-of-print and additional copies are not available.

On-Site Council Awards Grants for Training Centers in El Paso, Weslaco, Creation of WWW Site

The Texas On-Site Wastewater Treatment Research Council awarded three grants to develop training centers and produce a World Wide Web (WWW) site at its May 1996 meeting.

Bruce Lesikar, a scientist with the Texas Agricultural Extension Service (TAEX) and the Texas A&M University (TAMU) Agricultural Engineering Department, was awarded grants to develop on-site wastewater treatment regional training centers in El Paso and Weslaco, in cooperation with the Texas Engineering Extension Service (TEEX), the Texas On-Site Wastewater Association, and the Texas Natural Resource Conservation Commission. Last year, this team developed a regional on-site wastewater treatment training center at the TAMU Riverside campus near Bryan. Others likely to be involved in this project include Roy Childers of TAEX and the Agricultural Engineering Department, Robert Wiedenfeld of the TAMU Agricultural Research and Extension Center in Weslaco, and Suresh Pillai, Lloyd Fenn, and Seiichi Miyamoto of the TAMU Agricultural Research and Extension Center in El Paso. "These centers provide a place where professionals, scientists, local government officials, and interested citizens can go to get hands-on experience in different on-site wastewater treatment systems," Lesikar said. "These centers are a way to educate the public and study how these systems perform." The centers are also used to train on-site wastewater professionals in courses offered by TEEX and TAEX. For details, contact Lesikar at (409) 845-7453 or "B-Lesikar@tamu.edu"

A technology transfer project was awarded to Ric Jensen, who leads the public information efforts for the Texas Water Resources Institute (TWRI). In this project, TWRI will develop a comprehensive WWW site for the Council that will include newsletters with information about on-site wastewater treatment produced by TWRI, information on how to apply for grants from the Council, laws and regulations that affect on-site wastewater, fact sheets with information homeowners can use, and links to related sites. During the past year, Jensen and TWRI webmaster Jonathan Jones have worked to develop a WWW site TWRI called "Texas WaterNet" that contains extensive searchable information on water research at Texas universities. "Texas WaterNet" can be accessed at [http://twri.tamu.edu] For details, contact Jensen at (409) 845-1851 or "RJensen@tamu.edu"

TWDB Funds "Innovative" On-Site System in Lower Valley that Uses Clustered Septic Tanks, Wetlands

The Texas Water Development Board (TWDB) will fund an innovative wastewater disposal system for a South Texas colonia that features clustered septic tanks and wetlands. Earlier this year, TWDB awarded a grant of $879,000 to the City of Mercedes, which will build and maintain the system. Mercedes provided local matching funds. The system will serve the Saenz and DeAnda colonias, which house 150 residents. These colonias are expected to rapidly expand and soon may house more than 300 residents. Currently, residents rely on substandard septic tanks and outhouses to dispose of wastes. The project calls for building 2,400 feet of 6-inch sewer line and a lift station that will carry wastewater to a 12-acre site north of the colonias. There, effluents will be treated in a cluster of 16 septic tanks and a constructed wetlands. The final effluent can be discharged to a nearby drainage ditch or used for landscape irrigation. This is one of six TWDB projects to develop alternative and innovative approaches to meet wastewater treatment needs in colonias. TWDB hopes the project will be an example of a cost-effective, low-cost method to treat wastewater in colonias. It will also provide long-term data on how these systems perform. For details, contact Sam Angoori at TWDB at (512) 475-2068.

TAMU to Study Constructed Wetlands to Treat On-Site Wastewater

Texas A&M University (TAMU) has been awarded a grant to demonstrate the use of constructed wetlands to control nonpoint source pollution caused by failing on-site wastewater treatment and disposal systems. The project coordinator is Bruce Lesikar of the TAMU Agricultural Engineering Department. TAMU collaborators include Richard Weaver of the Soil and Crop Sciences Department, Jim Davis of the Wildlife and Fisheries Sciences Department, Guy Fipps and Ann Kenimer of the Agricultural Engineering Department, and Suresh Pillai of the TAMU Research and Extension Center at El Paso.

The grant was awarded by the Texas Natural Resource Conservation Commission and the U.S. Environmental Protection Agency as part of the 319-h program.

The goal of the project is to establish four demonstration sites over the Gulf Coast and Carrizo-Wilcox aquifers. The demonstration projects will be used with data now being collected at four existing sites over the Gulf Coast, Trinity and Edwards aquifers. Data collected from these sites and information gathered from other studies will be used to develop design standards for subsurface flow constructed wetlands that can be used to treat domestic wastewater in rural and suburban areas of Texas. More information on this project will be featured in future issues of "Texas On-Site Insights." For details, contact Lesikar at (409) 845-7453 or "B-Lesikar@tamu.edu"

Texas A&M-El Paso, UTEP Researchers Use High Tech Methods to Assess Contamination from On-Site Systems

Researchers in El Paso are developing and testing new high tech methods to identify whether on-site wastewater treatment systems may be contaminating groundwater quality. Lead researchers in the project are Suresh Pillai of the Texas A&M University Research Center in El Paso and Richard Mroz of the Clinical Laboratory Sciences Program at the University of Texas at El Paso.

Student worker Edgar Rubio (to left) and TAES technician Kenneth Widmer take this sample from a septic drainfield near El Paso.

The research is needed because protecting groundwater quality is a major environmental priority. The vast majority of rural Texans and many Texas cities rely on groundwater for drinking water so it's essential that aquifers be protected so the water is safe to drink. These concerns are increased in colonias (areas with inadequate water or wastewater treatment) because many residents obtain drinking water from shallow wells that may be contaminated from failing on-site wastewater treatment systems.

Background Information

In the past 20 years, the border region of El Paso-Juarez has experienced considerable population growth and now contains more than 2 million residents. Many of the poorer people that have moved into the region live in colonias. For example, studies by the Texas Water Development Board show that there are more than 120 colonias in the El Paso-Juarez region that are home to more than 50,000 people. Typically, individual families in colonias have to rely on improperly designed and undersized septic tanks and drainfields or cesspools. There are also concerns that raw or inadequately treated wastewater from Juarez may be contributing to groundwater pollution. Colonias have been linked to groundwater quality problems by many studies. Some reports suggest that rates of Hepatitis A are 500% higher than normal in San Elizario, a colonia east of El Paso. Other surveys show that many wells in Juarez contain bacterial species that suggests that contamination from fecal matter may have occurred.

Identifying Contaminant Sources

In this project, Pillai and Mroz focused on studying microbial pathogens that are present in shallow, transboundary groundwater systems. They hope to use this data to assess

whether wastewater from on-site systems and other sources was a source of contamination.

From June to August 1993, Pillai and Mroz took groundwater samples from 19 domestic wells that are located along the Rio Grande in the Riverside and Pericho subdivisions. All the wells were part of the Rio Grande alluvial aquifer and were located within a 300 foot radius of each other and within 1,500 feet of the Rio Grande. None of the wells was more than 24 feet deep. Most of the residents using these wells lived in substandard housing units in colonias, although cotton and pecan farms were nearby. Most of the homes in this study used either septic tanks or had no wastewater treatment facilities.

An important part of this research involved the ways used to analyze the samples. Samples were collected from these wells using standard protocols. The samples were filtered and membranes were later transferred to centrifuge tubes. Selective bacterial strains were isolated by placing small amounts of the samples on selective and general growth media. Bacteria were identified to determine if they resulted from sewage contamination. Some of the techniques that were used included developing rapid biochemical profiles, subjecting samples to a Colilert test [assesses the ability of a contaminant to metabolize specific substrates], generating antibiotic resistance profiles, and developing enterobacterial repetitive intergenic consensus (ERIC) fingerprints using DNA amplification. The ERIC-DNA technique involved scanning and digitizing photographs of the genetic makeup of the bacteria and using that data to generate a two-dimensional image.

Results and Discussion

Pillai and Mroz observed a variety of different bacterial strains that were isolated from individual domestic wells. Almost all the wells contained heterotrophic bacteria populations. None of the wells tested positive for fecal coliforms such as *E. coli,* although *Enterobacteria* strains such as *Enterobacter spp., Klebsiella spp.,* and *Serratia spp.* were often found.

Pillai and Mroz believe this research is important because it may provide new, more accurate tools to examine how on-site wastewater treatment systems may be influencing groundwater quality. For example, a previous study by local public health agencies used the Colilert test to identify coliform and fecal coliform contamination. That study showed that many wells were contaminated by coliforms. However, this investigation suggests that using the Colilert test often produces false positives. "This study shows that the Colilert test may not be appropriate to identify coliform levels in groundwater systems because so many microbial populations with different metabolisms can be found," Pillai says.

Later, the researchers focused on the *Enterobacter* group, since no *E. coli* bacteria were identified. *Enterobacter* isolates were screened to determine if they originated from sewage, based on multiple antibiotic resistance profiles. Results showed that bacterial strains from domestic wells sited closely together were not genetically similar and probably originated from different sources. Nitrate levels averaged 32 parts per million

(well above U.S. Environmental Protection Agency standards) and Pillai believes it is unlikely that these high levels could be caused by loadings from failing on-site systems. He suggests that some of the high nitrate levels may have originated from agricultural processes -- not failing on-site wastewater treatment systems.

Conclusion

This type of research provides needed additional information about how on-site systems may impact the environment. Many studies examine whether levels of typical contaminants (total suspended solids, nitrates, and fecal coliform) are found in surface and ground waters where on-site wastewater systems may be failing. The unique part of this research is that it tries to go a step further and use high tech clinical methods to assess specific sources of contamination, whether it may be caused by on-site systems or other activities.

NOTE: Pillai and Mroz published an article about this research, "Characterization of Bacterial Isolates from a Shallow Aquifer Suspected to be Contaminated by Urban Wastes," in 1995 in *The Journal of the Environmental Science and Health* (pp. 2159-2184). For details, contact Pillai at (915)859-9111 or "S-Pillai@tamu.edu" or Mroz at (915) 747-8214 or "rmroz@utep.edu"

TRA Develops Innovative Method to Assess Site Specific Performance of On-Site Systems

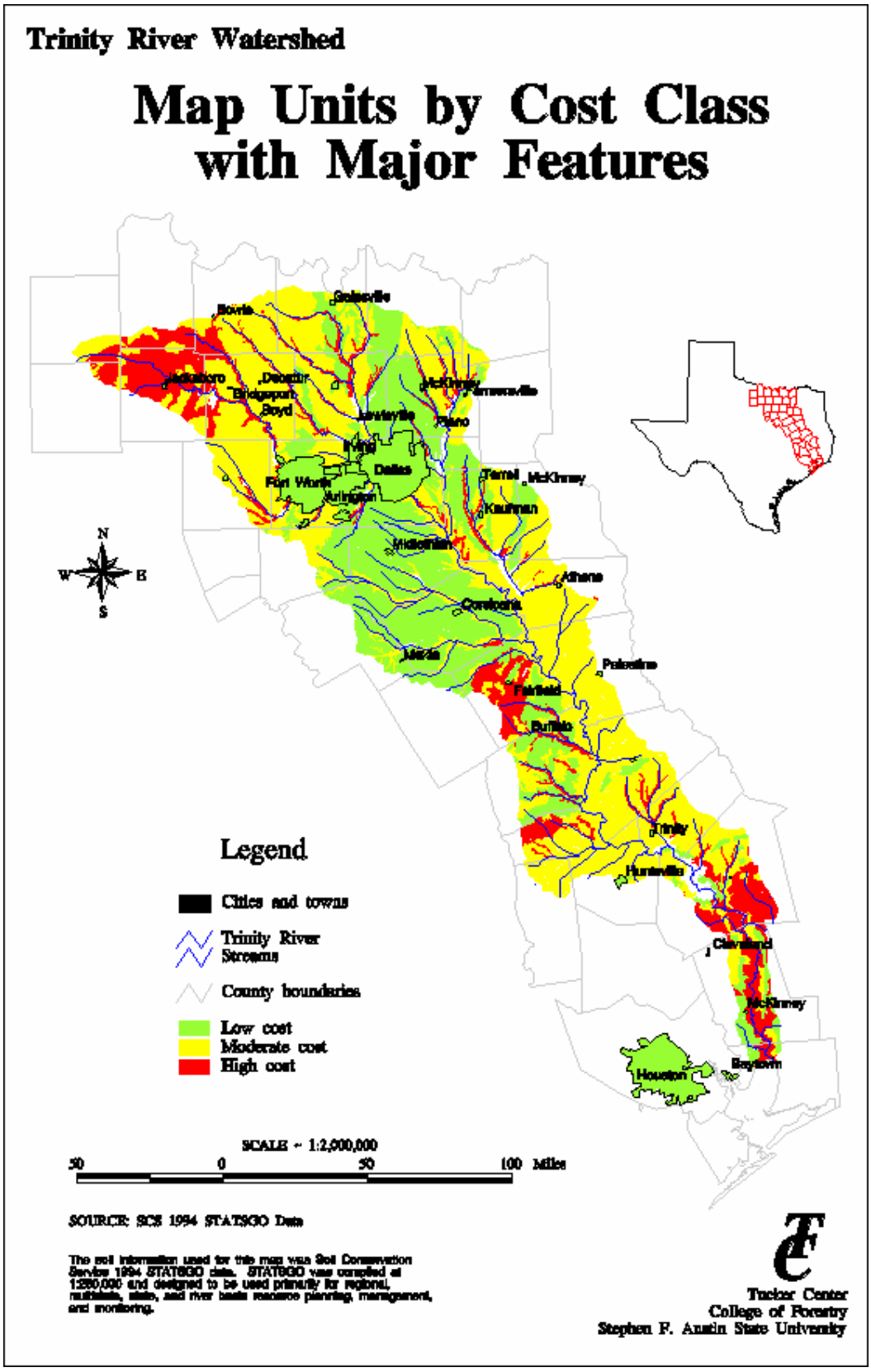
An innovative method to evaluate the suitability of specific on-site wastewater treatment methods for broad ecoregions in the Trinity River watershed has been developed through a comprehensive team effort led by the Trinity River Authority (TRA). This method could be used as an improved method to site on-site wastewater systems if it can be adapted for other regions of Texas.

The project was spearheaded by Richard Browning and Sam Scott of the TRA Environmental Division. Other lead participants include Ken Awtrey of Pineywoods Resource Conservation and Development, Inc. (RC&D), Febe Ortiz of the Southeast Texas RC&D, Inc., Dan Schellenberg of Second Nature Systems, P.R. Blackwell of Stephen F. Austin State University's Tucker Center and College of Forestry, and Gene Lindemann and Harrell Geron of the U.S. Department of Agriculture's Natural Resource Conservation Service in Temple.

Background Information

There's currently a lot of interest in the use of constructed wetlands for on-site wastewater treatment. Wetlands show considerable promise for providing a low-cost, effective, ecosystem friendly approach to improve water quality. Still, a constraint that limits the use of wetlands for wastewater treatment is that few systematic methods are available to assess the feasibility of various wetlands designs in given settings.

The purpose of this project was to develop a ranking system that incorporates data on hydrology, slopes, soils, habitats and many other factors that impact the cost and


Trinity River Watershed
Map Units by Cost Class with Major Features
Bowie
Gainesville
Jacksboro
Decatur
Bridgeport
Boyd
McKinney
Farmersville
Lewisville
Plano
Irving
Dallas
Fort Worth
Arlington
Terrell
McKinney
Kaufman
Midlothian
Athens
Corsicana
Mexia
Palestine
Fairfield
Buffalo
Trinity
Huntsville
Cleveland
McKinney
Houston
Baytown
N
W
E
S
Legend
Cities and towns
Trinity River Streams
County boundaries
Low cost
Moderate cost
High cost
SCALE = 1:2,000,000
50
0
50
100 Miles
SOURCE: SCS 1994 STATSGO Data
The soil information used for this map was Soil Conservation Service 1994 STATSGO data. STATSGO was compiled at 1:250,000 and designed to be used primarily for regional, multistate, state, and river basin resource planning, management, and monitoring.
Tucker Center
College of Forestry
Stephen F. Austin State University

effectiveness of constructed wetlands on particular sites. Both vegetated submerged bed systems (commonly called "reed rock filters") and free water surface wetlands were evaluated in the project. After going through the evaluation process, water managers are provided with new information on such topics as costs for construction, operations and maintenance and system performance. The methodology can also be used to evaluate the feasibility of proposed designs of specific constructed wetlands and to predict operations and maintenance costs of these systems.

Use of a Systems Model to Assess Wetlands Feasibility

As part of this effort, team members developed a systems model to determine the feasibility of constructed wetlands for different sites. The model prompts users to answer a series of broad questions that determine whether a constructed wetlands may be effective in particular situations. This process involves ranking such site factors as soils, geology, slopes, existing vegetation, hydrology and climate, and the likelihood of flooding. Model users are also asked to gather information and respond to a series of specific questions about how serious problems of this nature are at the proposed site. Ideally, people using the model should utilize existing data, maps, and published reports as well as on-site evaluations. Each answer is scored (higher numbers indicate that more serious challenges may exist) and the overall point total provides an initial indication of how feasible a site may be. A flowchart is provided that tells model users what they need to do when particular answers are provided.

Evaluating Specific Sites within the TRA Watershed

During the project, leaders developed complex maps and databases. For example, ARC/INFO geographic information systems (GIS) software and soils data from the STATSGO database were used to develop maps of the watershed that display where conditions exist that are best to support constructed wetlands. Analyses were performed for the TRA watershed as a whole and specific assessments were conducted for four broad ecoregions -- the Blackland prairie, the Post Oak Savannah and Pineywoods, Gulf coastal prairies and marshes, and cross timbers and prairies. Data and maps were created to identify such factors as frequency of annual flooding, annual precipitation, water table depth, the presence of clay soils that will support lagoons, the ability of soils to drain properly and support septic absorption field lines, features that may restrict the use of standard drainfields, surface soil textures, the percent slope, major land resource areas, the presence of natural vegetation, the amount of open (non-forested) lands that requires minimal clearing, and soil suitability for wetland plants.

A valuable product of this phase of this project was the development of a map that classifies specific areas within the TRA watershed by the relative cost of developing and maintaining a constructed wetlands system. In general, the map shows that the Blackland prairies in the central part of the watershed have the greatest potential for low-cost sites where constructed wetlands can be effectively utilized (see map on page 4).

Designing and Testing Site Specific Wetlands Systems

In the last phase of the project, a specific constructed wetlands treatment system was designed for each of the ecoregions in the TRA watershed. These model systems were developed based on environmental and site factors including detailed information on water tables, climate, and anticipated flows. A detailed design summary is shown for each model system. The model systems include a reed rock filter designed for a single family home in the cross timbers, and open surface wetlands that are meant to treat wastes from a small town (171 people) in the Blackland Prairie, and a mobile home park with flows of 3,500 gallons per day in the Pineywoods. TRA staff also conducted a detailed case study to demonstrate the use of the feasibility model to evaluate the use of a free water surface wetlands on a 10-acre site in TRA coastal marshes.

Summary

Constructed wetlands have been identified as a promising alternative method to treat on-site wastewater from individual homes and small towns in many areas of Texas. However, data on the effectiveness of these systems in specific watersheds has generally been lacking. This report provides a thorough method to intelligently assess how well constructed wetlands may perform in particular areas of the TRA watershed. The overall approach presented in this study may also prove to be extremely useful to provide an initial screening of how well constructed wetlands will function in other areas of the state. Still, most of the information in this report is based on existing maps and databases and previously published studies. Site-specific data based on field studies and measurements will still be needed in most cases to better assess how well constructed wetlands will actually function.

NOTE: For details, contact Browning at TRA at (817) 467-4343, Schellenberg at (409) 638-4263, Awtrey at (409) 568-0414, or Blackwell at (409) 468-1191.

Austin Completes Study to Evaluate Suitability of On-Site Systems

The City of Austin has recently published the final draft of a report to identify and evaluate a variety of alternative on-site wastewater collection, treatment, and disposal technologies that may be suitable for specific areas of the city's extra-territorial jurisdiction (ETJ). The study was conducted by Susan Parten of Community Environmental Services, Inc. for Austin's Water and Wastewater Utility. Chris Guzman of the utility managed the project for the city. A steering committee is providing review and direction for this effort. Its members include representatives from the Austin-Travis County Health and Human Services Department and various City of Austin departments.

In Phase I of the project, the consultant team performed the following tasks: 1) assessed and mapped representative geographic land types in the area, 2) identified wastewater collection, treatment, and disposal systems that may work well in the region, 3) evaluated alternative systems for suitability and cost-effectiveness in local conditions, 4) identified relevant federal, state and local regulations, 5) described options for local management of

on-site systems, and 6) evaluated management approaches to determine how suitable these systems may be for local conditions.

Results of the study included development of a map and a geographic information system (GIS) that identifies 15 different land types. The map emphasizes features that affect on-site wastewater treatment and disposal. On-site wastewater treatment and disposal systems that could be used in the region were evaluated. Fact sheets were developed that include information on design, performance, and applications of individual technologies. A questionnaire was distributed to 175 property owners who use some type of on-site wastewater system in the project area. Project leaders also developed a matrix format which uses data on costs, environmental suitability, legal and regulatory considerations, operational reliability, and required technical expertise. The matrix was used to rate on-site treatment and disposal systems in each land type. Roughly a third of survey respondents indicated they had some type of problem with the performance of their systems.

The Austin City Council recently approved funding for Phase II and III of the project. Key components include design, construction, and monitoring of on-site systems and technologies, and gathering field data of selected systems and their performance. Most of the laboratory work will be done through the Austin Water Utility laboratories and its Center for Environmental Research. For details, contact Parten at (512) 443-2733 or Guzman at (512) 322-2894.

On-Site Issues in Lower Rio Grande Valley Include Working with Rapidly Growing Population, Enforcing Rules

Texas' Lower Rio Grande Valley is an area that many people want to move to and live in. The Lower Valley (which includes Willacy, Cameron, Hidalgo, and Starr counties and is near the U.S. - Mexico border) is convenient for emigrants from Central America. The climate is warm year-round so it attracts many retirees. Within an hour, you can be on the beach at South Padre Island or in thriving cities like Brownsville, Matamoros, and McAllen. Because of this growth, Hidalgo County leads Texas in terms of the numbers of new permits that are issued and the amount of fees collected. Based on the 1990 census, there are 35,290 on-site systems in Hidalgo County and 17,705 on-site systems in Cameron County. Almost all the systems are being installed in unincorporated areas.

Being a boom area is great for many people, organizations, and businesses. But trying to keep up with this rapid growth is challenging for those who have to regulate on-site wastewater systems like Ray Rodriguez of the Cameron County Health Department. "The challenge for us is to try to find ways to be most effective and help as many people as possible with the limited manpower we have," Rodriguez says. "County health departments work together with each other, with Natural Resource Conservation Commission (TNRCC) personnel like David Gonzalez of the regional office in Harlingen, and with authorities in Mexico. We realize it's a common border and we share problems and concerns. Working together makes us much stronger than if any of us tried to control things on our own." For example, an official in a nearby county might tell a co-worker of how he's had success enforcing regulations. TNRCC helps audit programs and

provides technical assistance about the use of plastic or fiberglass storage tanks and systems that require engineered designs. The key is that all agencies communicate well with each other and everyone discovers information they might not normally be able to access.

County Regulatory Programs

All the counties in the Lower Rio Grande Valley except Starr County have an authorized on-site wastewater program. Many of the counties began their own on-site wastewater programs in the early 1990s. For example, Hidalgo County initiated its on-site program in 1992. "When we began, we typically only responded to about 150 requests for on-site wastewater permits in Hidalgo County," says Roy Tijerina of the Hidalgo County Health Department. "We feel many other unpermitted systems were also being installed. Now, the number of unpermitted systems being installed is down dramatically and we check 300 to 500 systems per month." Between 150 and 200 on-site systems are being inspected in Cameron County each month.

This drainfield was installed to serve a mobile home near Indian Lake in the Lower Rio Grande Valley. In this case the drainline was covered with a geotextile fabric.

Cameron County requires that individuals wanting to install an on-site system must submit a license application with information on the type of dwelling, number of bedrooms, the number of septic tanks on the property, the amount of drainline, and results of a percolation test. After the application has been submitted, an inspector will inspect a site and perform two percolation tests. After the percolation test holes have been prepared and saturated overnight, an inspector will visit the site the following day. They require that landowners sign a form indicating that existing structures on the site will be demolished, used for storage, or put up for sale within 30 days after a new home has been constructed on a site. Property owners are required to make required improvements within 30 days to systems that do not meet state standards or legal action can be taken.

Cameron County has developed a checklist that inspectors use when examining a system and deciding whether it can be certified. The checklist includes such information as distances to property lines, wells, and buildings, the presence of clean-out plugs, and if water meters are present. Items relating directly to the septic tank include the amount of

space between multiple septic tanks, whether tanks are level, the manufacturer's name, and tank capacity. The minimum lot size required by the county is a half acre for single family residences which have access to public water supplies for household use (in these cases, groundwater from individual wells cannot be utilized). Minimum lot sizes are one acre for lots that use individual wells. There must be a spacing of 150 feet between wells and on-site drainfields.

Innovative Ways to Enforce On-Site Performance

Last year, model ordinances and enforcement orders were approved by the Texas Attorney General's Office and by Hidalgo and Cameron County. The model ordinances and enforcement orders are sweeping. A powerful component of Hidalgo and Cameron county's programs require that individuals cannot be connected to electricity and publicly supplied water until an approved on-site wastewater system is installed and working properly. "People have to show that they have a legal, permitted system that performs properly before they can be connected to a community water supplier or hooked up for electricity or other utilities," Tijerina says. "This is a very valuable tool for us," "because everyone needs and wants drinking water and electricity. The need for a properly functioning on-site system becomes much more obvious."

People who pump groundwater must still provide a water test to show the water is safe to drink. On-site systems can be grandfathered in and still considered legal if lots are properly sized. When the land is subdivided, or if the on-site wastewater system fails, systems have to be fixed and brought up to current standards.

When problems with failing systems do occur, county health department officials often file cases with Justice of the Peace (JP) courts, and with county and district attorneys. If individuals are found guilty of violating on-site ordinances, they can be fined and put in jail for up to two weeks. "We need cooperation to make these programs work," Rodriguez says. "We often find that it is much quicker for us to work through JPs because they know us personally and are close to issues in their neighborhoods." Rodriguez noted a case where a family wouldn't work to fix their failing system. Raw wastewater flowed from their lot into a neighbor's property and down the street. County officials took photos, gathered other documentation, issued citations, and contacted the JP. The JP sent the constable to meet the family and the family fixed the system two days after appearing in court.

There are some special problems with mobile home parks. Often, a person sells a mobile home designed for 2 people to a large family with many children. This causes problems because it increases the amount of wastewater that's being generated and can overload the original system design. "We had a case where a family of 8 moved into a small mobile home," Rodriguez says. "We had to ask them to move out because they were generating more waste than the on-site system could treat and the system couldn't be expanded." Fortunately, the county was able to work with a local bank to refund the money the family paid for the mobile home and helped them find a site they could move to that would support a legal on-site system. Rodriguez adds that efforts are being made to

inform people to be careful about buying lots in colonias that are large enough to support a legal on-site wastewater treatment system.

Working to Make Systems Affordable

This area faces some special problems because so many of the people who move to the area from Central America are poor. If someone cannot afford to install a system, they may be able to obtain financing from such public sources as the Farmers Home Administration and the Urban County Development Council. Those who don't qualify have to obtain a loan from standard commercial lending institutions. "One problem we have is that installers will provide financing, but will charge very high interest rates," Rodriguez says. "A system may be advertised for $900, but may cost as much as $1,800 before the homeowner is done paying for it," Rodriguez says.

Construction guidelines are not available in Spanish yet, but Rodriguez hopes they will be produced in the future. A concern is that many of the immigrants from Central America are not literate in Spanish or English. Rodriguez suggests that a better option may be to hire more technical experts who are fluent in Spanish and English. Some residents want to install their own system to save money. County officials say they work with them to do the job properly. "It typically is more time-consuming and more difficult for someone who is not an expert to install a system themselves," Rodriguez says, "and these problems are aggravated when language skills are poor. We're happy to work with them to get the system installed correctly."

Summary

There's no doubt that on-site wastewater treatment is a major issue in the Lower Rio Grande Valley. That's proven by looking at the number of new systems being installed and the many people migrating to the region. On-site wastewater officials in the region have shown that innovative approaches can be taken to make sure that these systems are installed and maintained properly. Particularly promising are regulations that force residents to have a permitted system before publicly supplied drinking water and electricity are supplied. Even though many of the newest residents of the Lower Valley are poor, work is going on to help alert them of potential problems and providing advice about how to build and maintain their own systems.

In the near future, the Lower Valley will benefit from a new on-site wastewater treatment training center that was recently approved for funding by the Texas On-Site Wastewater Treatment Research Council. The center will be located at the Texas A&M University Research and Extension Center in Weslaco. Personnel from that center, including Robert McGee and Robert Wiedenfeld, and professionals from Texas A&M University like Bruce Lesikar of the Agricultural Engineering Department will lead this effort. Many local leaders, regulators, and on-site professionals will also work to make the center a success. "We need education and information for regulators, elected officials, professionals, and their customers," Rodriguez says. "Some of these people have never seen a properly functioning on-site wastewater system or do not realize that there are alternative systems that will work well in specific situations. The Center should really help in that regard."

NOTE: For details, contact Rodriguez at (210) 399-4661, or Tijerina at (210) 383-6221.