

TEXAS WELL OWNER NETWORK

*PROTECTING GROUNDWATER RESOURCES
AND HUMAN HEALTH*



Joel Pigg


Texas A&M AgriLife Extension Service

Burleson & Milam Groundwater Summit
August 14, 2019



Funding provided by TSSWCB through a
Clean Water Act §319(h) grant
provided by the US EPA.

BACKGROUND

1. Over 1,000,000 private water wells in Texas.
 2. About 2.2 million Texans in rural areas and those living on small acreages rely on private wells for drinking water.
 3. About 10% of the total population and 20% of the population living outside of city limits drink well water.
 4. Two to 50% exceed nitrate MCL depending on region (TWDB 2003-2008 data for 3,861 wells).
- 

In Texas, a household well is exempt from water quality regulations, including exemption from water quality monitoring to assure the well water is safe to drink.

Groundwater pollution can often be prevented - the well owner is responsible for assuring safe drinking water.





Texas Well Owner Network Program Goals

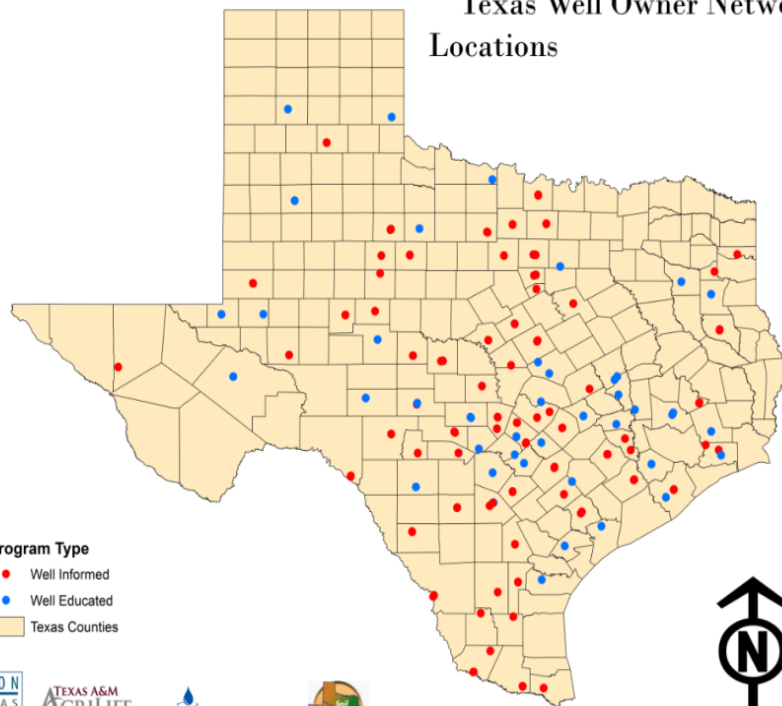
Desired Outcomes

1. Changes in knowledge, awareness, attitudes and actions of private well managers.
2. Improvement of private well management to safeguard homeowner health and protect water resources.

Texas Well Owner Network

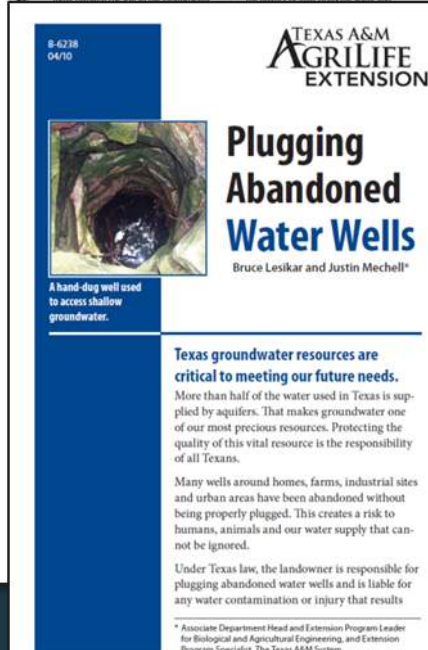
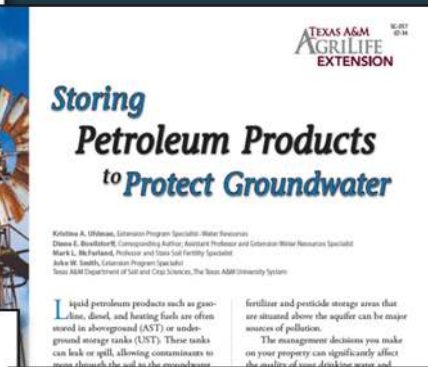
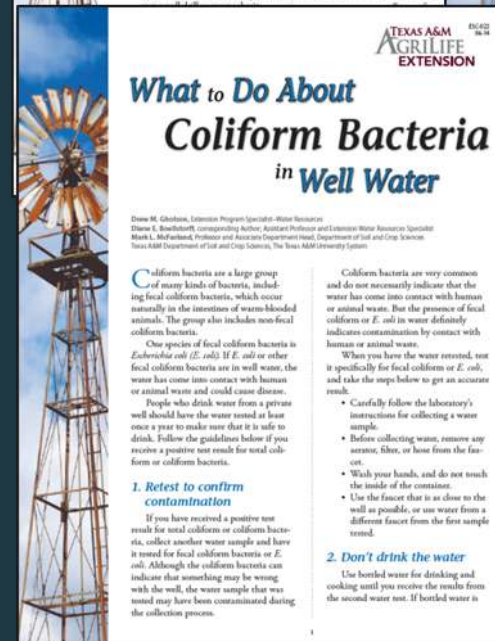
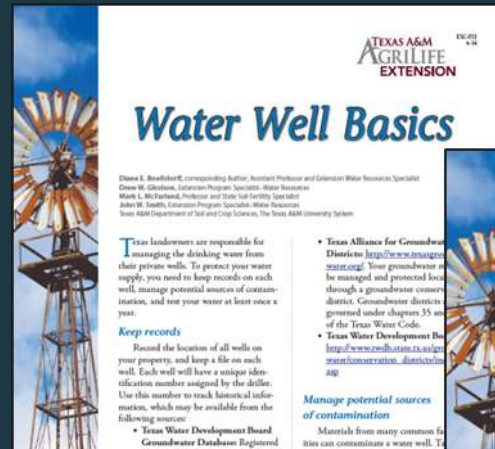
- TWON was established 2011
- 9,500 participants in workshops
- 200 events
- Covering 166 counties
- 2,000 newsletter subscribers

Texas Well Owner Network
Locations



Program Type

- Well Informed
- Well Educated
- Texas Counties



Texas groundwater resources are critical to meeting our future needs.

More than half of the water used in Texas is supplied by aquifers. That makes groundwater one of our most precious resources. Protecting the quality of this vital resource is the responsibility of all Texans.

Many wells around homes, farms, industrial sites and urban areas have been abandoned without being properly plugged. This creates a risk to humans, animals and our water supply that cannot be ignored.

Under Texas law, the landowner is responsible for plugging abandoned water wells and is liable for any water contamination or injury that results

* Associate Department Head and Extension Program Leader for Biological and Agricultural Engineering, and Extension Program Specialist, The Texas A&M University.

TWON Educational Trainings

Two Program Types

– “*Well Educated*”

- All day, 4 - 6 hour training program
- Water sample screening
- 8 chapter topics

– “*Well Informed*”

- 1 hour educational program
- Water sample campaign
- Screening result interpretation
- Wellhead protection



TWON Educational Trainings

“Well Educated”

1



Aquifer 101
Aquifers of Texas

5



Water Quantity

2



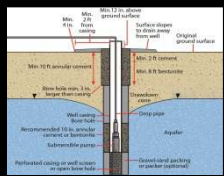
Watersheds and
Aquifers

6



Water Quality and
Testing

3



Private Water Well
Basics

7



Water Treatment
Options

4



Onsite Wastewater
Treatment

8



Protecting Your Water
Supply

TWON Educational Training

“Well Informed”

1 hour program

– *Water Sample Screening*

- *E. coli* bacteria
- Nitrates
- Total Dissolved Solids
- Arsenic (location driven)

– *Education Program*

- Explanation of results
- Wellhead protection
- Stimulate initial interest and responsibility



Water Well Testing FAQs

How often should the well be tested?

- Annually for bacteria
- Every few years for general chemistry such as nitrates and salts
- As frequently as needed for other contaminants of concern

How much will it cost?

- Varies depending on analyses selected.
- Basic *E. coli* test should be less than \$30

PROGRAM EVALUATIONS

2-phase evaluation approach:

1. Pre-test/post-test
2. One year delayed questionnaire

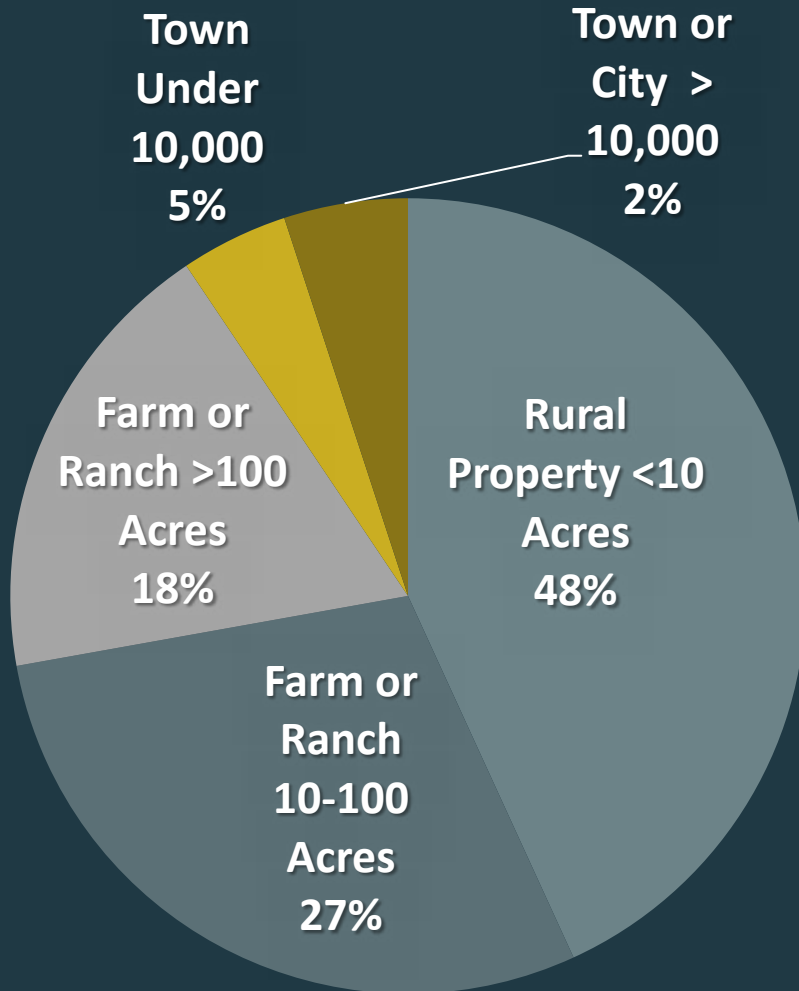
To evaluate:

- Knowledge gained
- Satisfaction with program
- “Intentions to change”

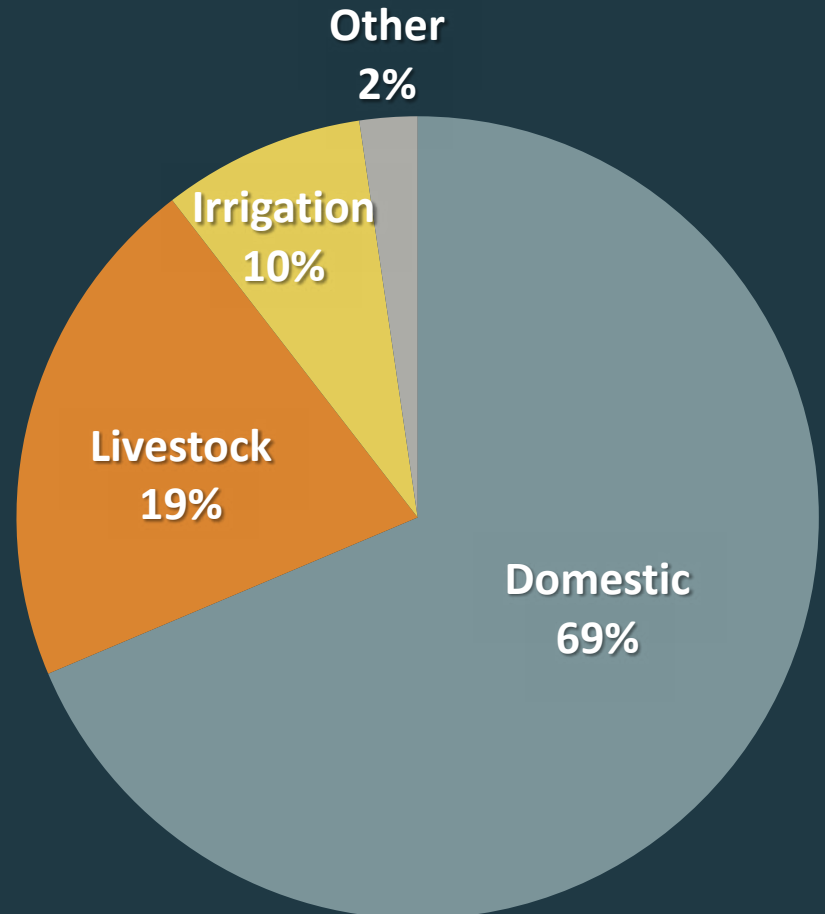


Who is our audience?

Primary Place of Residence



Primary Water Use



Evaluation Results

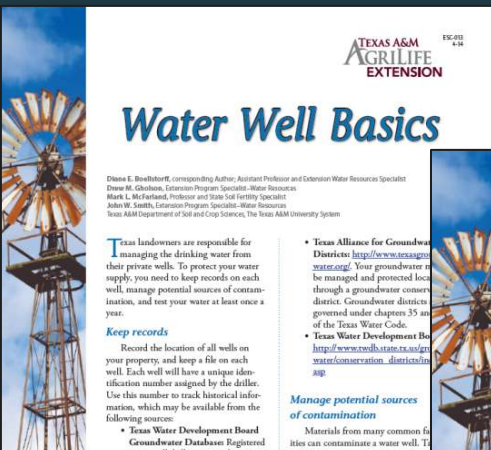
- *Knowledge Change*
 - Scores increase by 33 points
- *Satisfaction with the program*
 - 99%
- *Intentions to adopt BMPs*
 - Test my water once a year – 85%
 - Pump septic system regularly – 83%
 - Remove possible hazards from well house – 95%
 - Plug or cap any abandoned well on your property – 85%

One Year Follow-up Results

- 90% of those needing to clean out hazards from their well house had done so.
- 74% of participants who had wells near contamination sources (pet shelters, livestock yards, etc.) had moved or removed the sources.
- 36% of participants who needed to, plugged or capped their unused/deteriorated wells.
- 55% of those with septic tanks that needed pumping had pumped their tanks.
- 76% had shared TWON resources/ materials with others not at the training.



Engaging the Well Owner



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Water Well Basics

ES-415
4-14

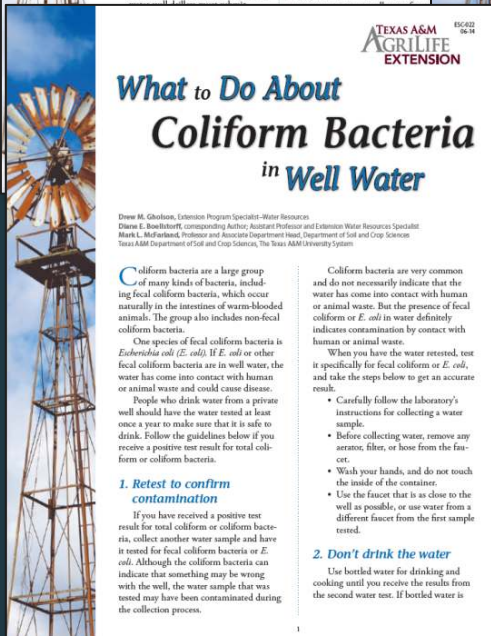
Diane E. Bowshoff, Corresponding Author, Assistant Professor and Extension Water Resources Specialist
Drew M. Gibson, Extension Program Specialist, Water Resources
Mark L. McFarland, Professor and State Soil Fertility Specialist
John W. Smith, Extension Program Specialist, Water Resources
Texas A&M Department of Soil and Crop Sciences, The Texas A&M University System

Texas landowners are responsible for managing the drinking water from their private wells. To protect your water supply, you need to keep records on each well, manage potential sources of contamination, and test your water at least once a year.

Keep records

Record the location of all wells on your property, and keep a file on each well. Each well will have a unique identification number assigned by the district. Use this number to track historical information, which may be available from the following sources:

- Texas Water Development Board Groundwater Database Registered



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What to Do About Coliform Bacteria in Well Water

ES-622
06-14

Diane E. Bowshoff, Corresponding Author, Assistant Professor and Extension Water Resources Specialist
Drew M. Gibson, Extension Program Specialist, Water Resources
Mark L. McFarland, Professor and Extension Department Head, Department of Soil and Crop Sciences
Texas A&M Department of Soil and Crop Sciences, The Texas A&M University System

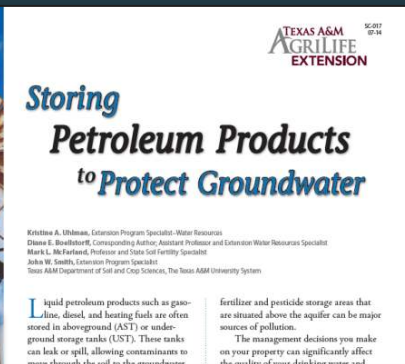
Coliform bacteria are a large group of many kinds of bacteria, including fecal coliform bacteria, which occur naturally in the intestines of warm-blooded animals. The group also includes non-fecal coliform bacteria.

One species of fecal coliform bacteria is *Escherichia coli* (*E. coli*). If *E. coli* or other fecal coliform bacteria are in well water, the water has come into contact with human or animal waste and could cause disease.

People who drink water from a private well should have the water tested at least once a year to make sure that it is safe to drink. Follow the guidelines below if you receive a positive test result for total coliform or coliform bacteria.

1. Retest to confirm contamination

If you have received a positive test result for total coliform or coliform bacteria, collect another water sample and have it tested for fecal coliform bacteria or *E. coli*. Although the coliform bacteria can indicate that something may be wrong with the well, the water sample that was tested may have been contaminated during the collection process.



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Storing Petroleum Products to Protect Groundwater

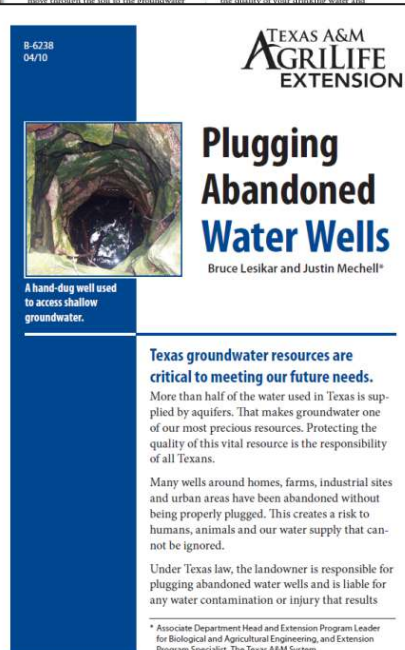
ES-617
05-14

Kristine A. Uhlmann, Extension Program Specialist, Water Resources
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Mark L. McFarland, Professor and State Soil Fertility Specialist
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Liquid petroleum products such as gasoline, diesel, and heating fuels are often stored in aboveground (AST) or underground storage tanks (UST). These tanks can leak or spill, allowing contaminants to move through the soil to the groundwater.

fertilizer and pesticide storage areas that are situated above the aquifer can be major sources of pollution.

The management decisions you make on your property can significantly affect the quality of your drinking water and



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Plugging Abandoned Water Wells

B-6238
04/10

Bruce Lesikar and Justin Mechell*

A hand-dug well used to access shallow groundwater.

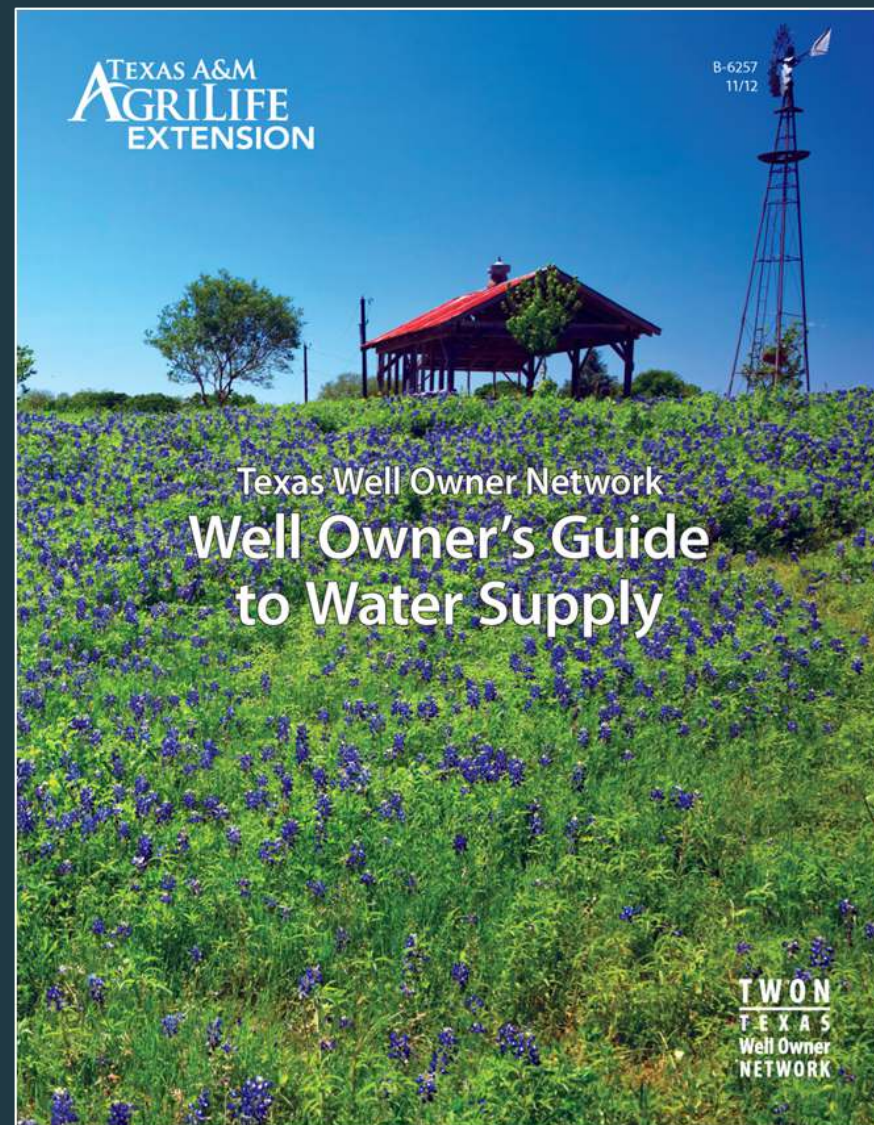
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B-6257
11/12

Texas Well Owner Network Well Owner's Guide to Water Supply

TWON
TEXAS
Well Owner
NETWORK

Resources Offered By TWON

TWON Series Fact Sheets



[Well Owner's Guide to Water Supply](#) 



[Animal Manure Storage to Protect Groundwater](#) 



[Hydraulic Fracturing and your Private Water Well](#) 



[Private Drinking Water Well Basics](#) 



[Protect Your Water Well During Drought](#) 




[Storing and Handling Pesticides to Protect Groundwater](#) 




[Storing Petroleum Products to Protect Groundwater](#) 



[Managing Hazardous Materials to Protect Groundwater](#) 



[What to Do About Coliform Bacteria in Well Water](#) 



[What to Do About Coliform Bacteria in Well Water \(Spanish\)](#) 



[Managing Fertilizers to Protect Groundwater](#) 



[Managing Livestock Holding Pens to Protect Groundwater](#) 



[Maintain Your Septic System to](#)



[Water Wells in Floodplains](#) 



[Protect Your Well Water and the](#)



[Protect Your Well Water and the](#)

Social Media and Email Contacts



This collage illustrates the digital presence of the Texas Well Owner Network (TWON). It features three main components: a Facebook page, a Twitter profile, and a newsletter header. The Facebook page, for 'Texas Well Owner Network' (@texaswellownernetwork), shows a cover photo with a windmill and the text 'TEXAS WELL OWNER NETWORK'. The page includes navigation tabs (Page, Notifications, Insights, Publishing Tools), a 'Promote' dropdown menu showing 30 post reaches and 6 engagements, and a recent post about a 'The Private Well Class' webinar. The Twitter profile, also for 'TEXAS WELL OWNER NETWORK', features a similar windmill cover image and a bio stating it is an educational training offered by the Texas A&M AgriLife Extension Service. The newsletter header at the top left shows 'Issue 7' and a search bar. The bottom right of the collage displays a 'Who to follow' list on Facebook, including users like Germain Ifedi, T.Vineyard, and Brandon Dukes.



Questions?

