Protecting Your Water Supply

TWON
TEXAS
Well Owner
NETWORK

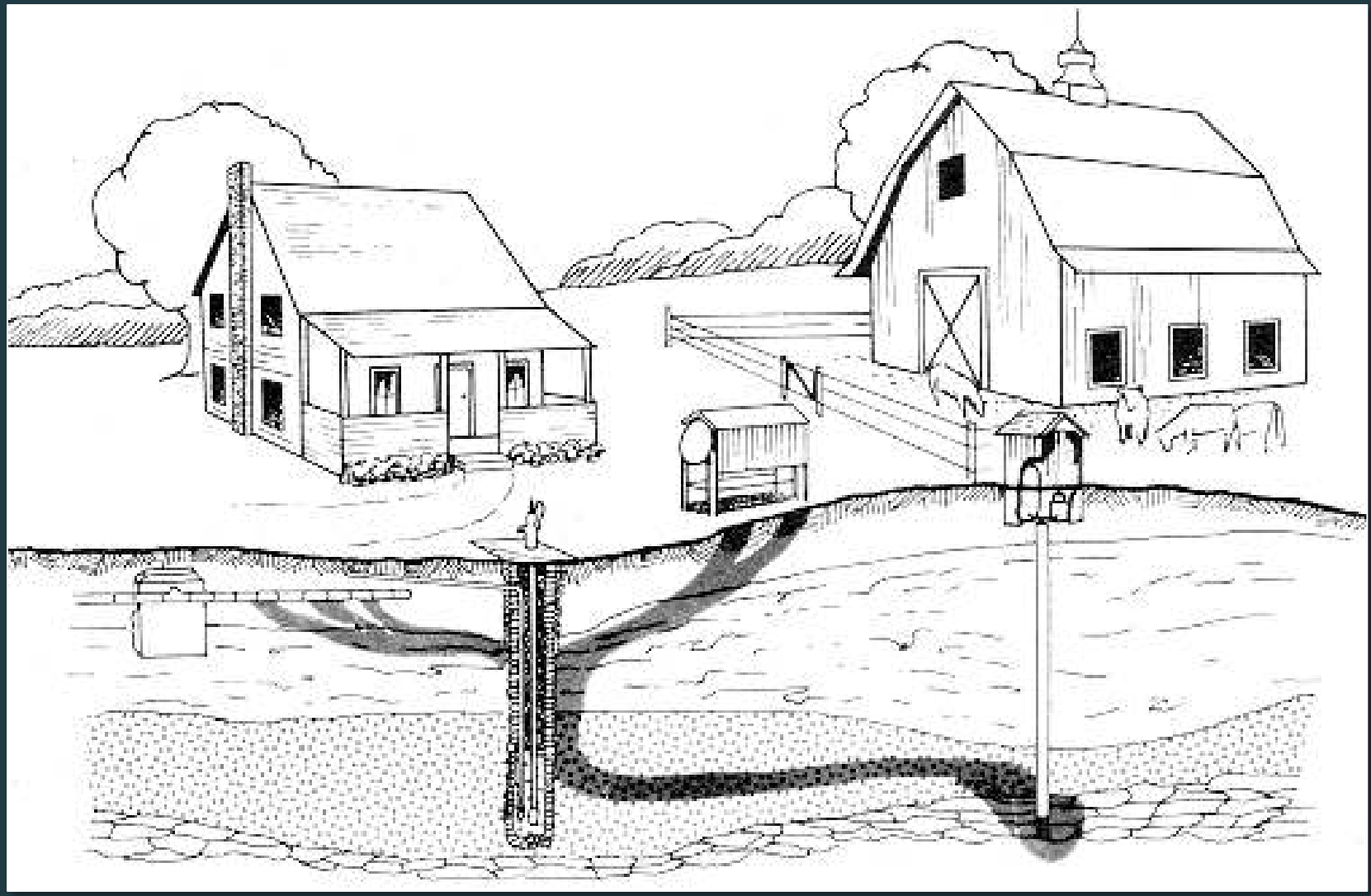
Abandoned Wells

- What is it?
- Who can plug the well?
- Why a problem?
  - Safety
  - Nuisance
  - Environmental
  - Legal

Around homes, farms, industrial sites, and urban areas in every county in the state, an estimated 150,000 water wells have been abandoned without being properly plugged

What is the Law ?

- According to state law (TX Occupations Code Title 12 Chpt 1901.255(a)): A water well is considered abandoned if it is not in use
  - A water well is considered *in use* if: It is a non-deteriorated well that contains the casing, pump, and pump column in good condition, or
  - It is a non-deteriorated well that has been appropriately capped for future use, or
  - It meets one of three other selected criteria related to beneficial use, similar users, or governmental program



Abandoned wells can be pathways for pollutants

Abandoned Wells

Abandoned Wells

Local News

Text message saves Kemp police chief after falling in abandoned well

Credit: WFAA
Kemp Police Chief Jimmy Council was rescued from an abandoned water well Tuesday morning after he fell in while responding to a loose livestock call.

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by JOSH DAVIS

WFAA
Posted on May 7, 2013 at 12:20 PM
Updated yesterday at 12:20 PM

KEMP -- Kemp Police Chief Jimmy Council was rescued from an abandoned water well Tuesday morning after he fell in while responding to a loose livestock call.

Around 9 a.m., Chief Council met a Kaufman County Sheriff's deputy at the scene near FM 2860 about halfway between US Highway 175 and FM 1985.

A short time later, the chief contacted Kemp City Hall by text message to

Gallery

SEE ALL 3 PHOTOS »

Capping Abandoned Wells

- Under Texas law, the landowner is responsible for plugging abandoned water wells and is liable for any water contamination or injury that results
- Another alternative is to cap the well
  - If the well is “non-deteriorated” and in good condition

Proper Caps ?

Capping a Well

Three criteria for capping a well

- A cap must fit tightly and be properly sealed to prevent surface pollutants from entering well
- The cap should support 400 pounds to minimize the risk of a person falling into the well
- To protect children and animals, the cap should not be easily removed by hand and not easy to lift.

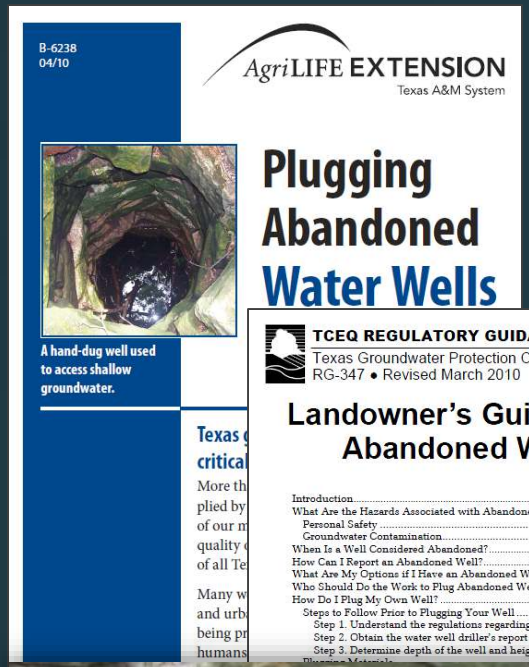
Who Should Plug the Well?

A landowner may plug wells with less than 100 feet of standing water in the well.

But, a contractor may have **better equipment** and **understanding** of the **geological conditions** that affect how the well should be plugged.

Plugging an Abandoned Well

- Understand the regulations that apply
- Obtain the water well driller's report
- Determine well depth and height of standing water
- Remove obstructions from well
- Remove as much casing as possible
- Disinfect the well by adding bleach
- Fill the well with plugging material
- Complete and submit a state well plugging report to TDLR and a local groundwater conservation district



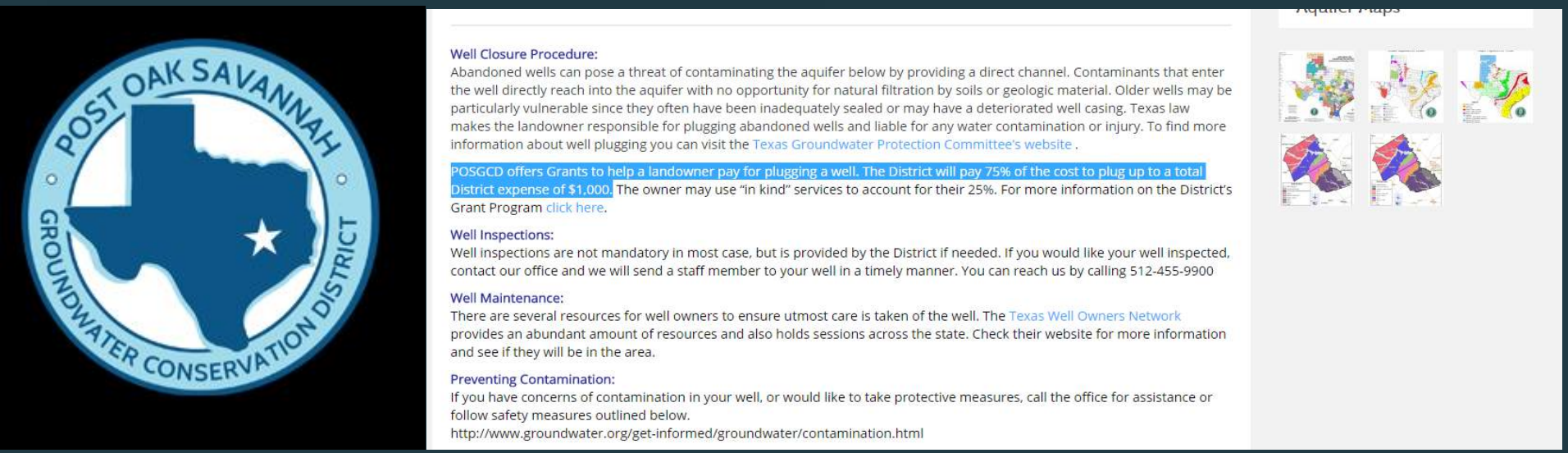
Who Should Plug a Well ?

- If the water well is located within a GCD the landowner should notify the district of their intention to plug the well Inquire about any district forms or fees
- Seek the district's professional consultation about any other compliance issues that may apply

Materials for Plugging Abandoned Wells

Assistance from GCD

POSGCD offers Grants to help a landowner pay for plugging a well. The District will pay 75% of the cost to plug up to a total District expense of $1,000.



Well Closure Procedure:
Abandoned wells can pose a threat of contaminating the aquifer below by providing a direct channel. Contaminants that enter the well directly reach into the aquifer with no opportunity for natural filtration by soils or geologic material. Older wells may be particularly vulnerable since they often have been inadequately sealed or may have a deteriorated well casing. Texas law makes the landowner responsible for plugging abandoned wells and liable for any water contamination or injury. To find more information about well plugging you can visit the Texas Groundwater Protection Committee's website .

POSGCD offers Grants to help a landowner pay for plugging a well. The District will pay 75% of the cost to plug up to a total District expense of $1,000. The owner may use "in kind" services to account for their 25%. For more information on the District's Grant Program click here.

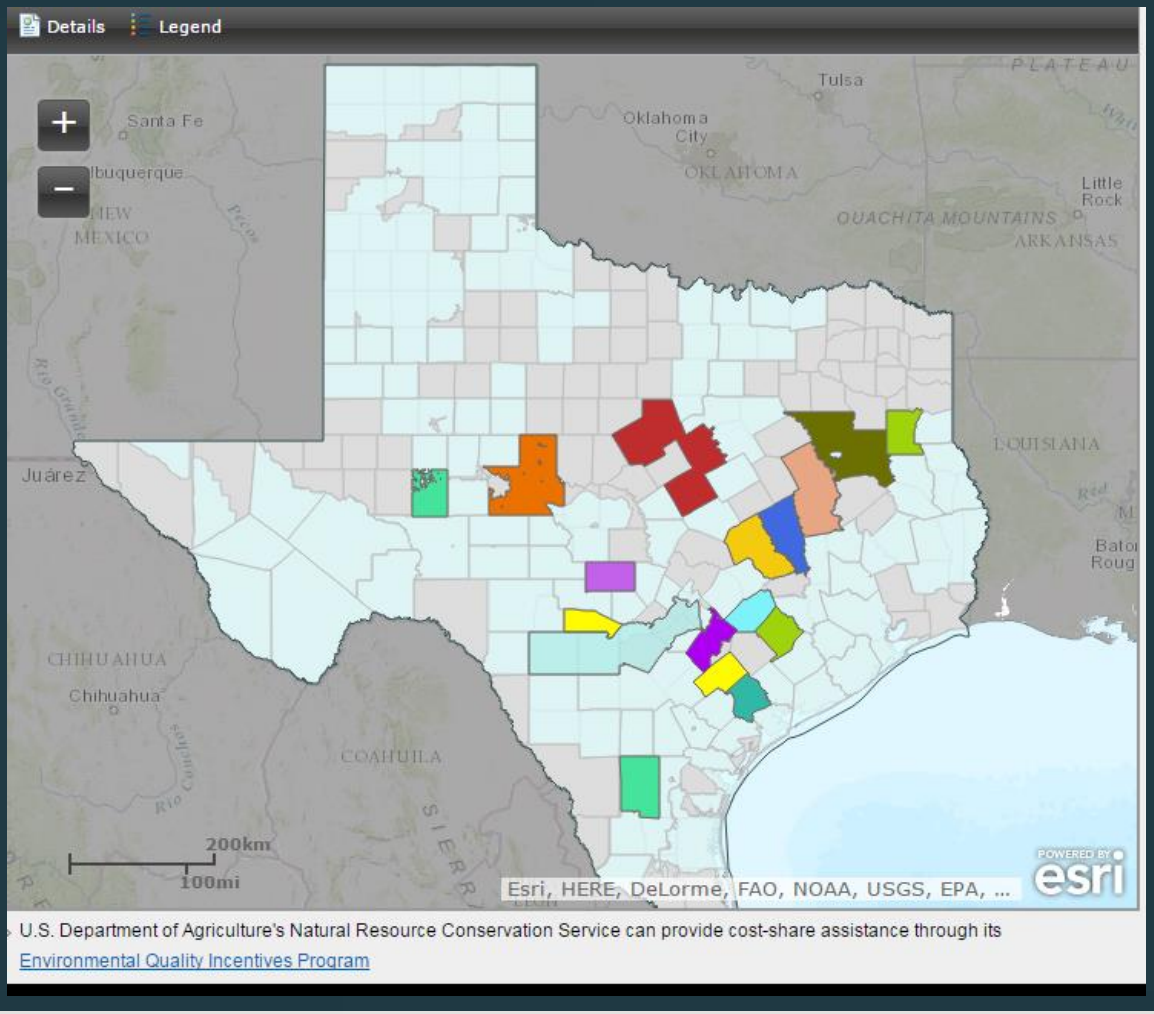
Well Inspections:
Well inspections are not mandatory in most case, but is provided by the District if needed. If you would like your well inspected, contact our office and we will send a staff member to your well in a timely manner. You can reach us by calling 512-455-9900

Well Maintenance:
There are several resources for well owners to ensure utmost care is taken of the well. The Texas Well Owners Network provides an abundant amount of resources and also holds sessions across the state. Check their website for more information and see if they will be in the area.

Preventing Contamination:
If you have concerns of contamination in your well, or would like to take protective measures, call the office for assistance or follow safety measures outlined below.
http://www.groundwater.org/get-informed/groundwater/contamination.html

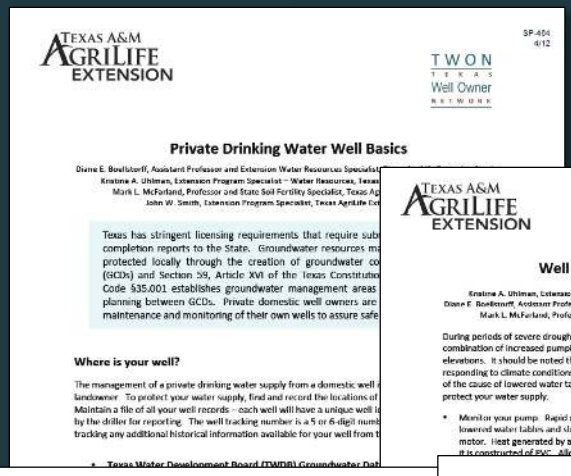
http://www.posgcd.org/

Other Assistance



http://tgpc.state.tx.us/water-wells

Resources on specific water quality issues available through: twon.tamu.edu and agrilifebookstore.org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SP-484
4/12

TWON TEXAS Well Owner NETWORK

Private Drinking Water Well Basics

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Texas has stringent licensing requirements that require sub
completion reports to the State. Groundwater resources ma
protected locally through the creation of groundwater co
(GCDs) and Section 59, Article XVI of the Texas Constitutio
Code §35.001 establishes groundwater management areas
planning between GCDs. Private domestic well owners are
maintenance and monitoring of their own wells to assure safe

Where is your well?

The management of a private drinking water supply from a domestic well
landowner. To protect your water supply, find and record the locations of
Maintain a file of all your well records – each well will have a unique well
by the driller for reporting. The well tracking number is a 5 or 6-digit numb
tracking any additional historical information available for your well from t


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Well Owner Drought Response

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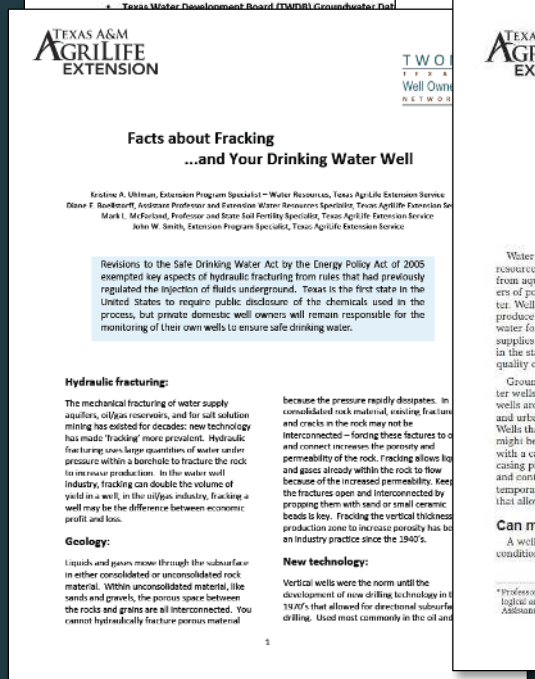
During periods of severe drought, groundwater resources are relied upon to provide water. The combination of increased pumping and the loss of recharge often results in lowered water table elevations. It should be noted that some aquifers are less reliant on recent recharge and/or may be responding to climate conditions that occurred during decades prior to the current drought. Regardless of the cause of lowered water tables, there are several best management practices recommended to protect your water supply.

- Monitor your pump. Rapid cycling of the pump on and off over short periods of time is the result of lowered water tables and slow static water level recovery. Rapid pump cycling will burn out the motor. Heat generated by a submersible pump in lowered water tables can damage the drop-pipe if it is constructed of PVC. Allow your pump to rest or, if possible, throttle-down your pumping rate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Facts about Fracking ...and Your Drinking Water Well

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Revisions to the Safe Drinking Water Act by the Energy Policy Act of 2005 exempted key aspects of hydraulic fracturing from rules that had previously regulated the injection of fluids underground. Texas is the first state in the United States to require public disclosure of the chemicals used in the process, but private domestic well owners will remain responsible for the monitoring of their own wells to ensure safe drinking water.

Hydraulic fracturing:

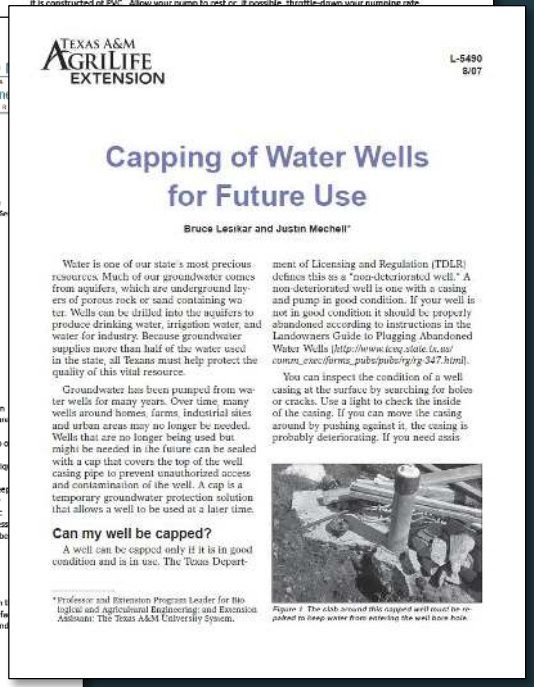
The mechanical fracturing of water supply aquifers, oil/gas reservoirs, and for salt solution mining has existed for decades; new technology has made 'fracking' more prevalent. Hydraulic fracturing uses large quantities of water under pressure within a borehole to fracture the rock to increase production. In the water well industry, fracking can double the volume of yield in a well, in the oil/gas industry, fracking a well may be the difference between economic profit and loss.

Geology:

Liquids and gases move through the subsurface in either consolidated or unconsolidated rock material. Within unconsolidated material, like sands and gravels, the porous space between the rocks and grains are all interconnected. You cannot hydraulically fracture porous material because the pressure rapidly dissipates. In consolidated rock material, existing fractures and cracks in the rock may not be interconnected – forcing these factures to open and connect increases the porosity and permeability of the rock. Fracking allows liquids and gases already within the rock to flow because of the increased permeability. Keeping the fractures open and interconnected by propping them with sand or small ceramic beads is key. Fracking the vertical thickness of production zone to increase porosity has been an industry practice since the 1940's.

New technology:

Vertical wells were the norm until the development of new drilling technology in the 1980's that allowed for directional subsurface drilling. Used most commonly in the oil and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8/07

Capping of Water Wells for Future Use

Bruce Lesikar and Justin Mechell*

Water is one of our state's most precious resources. Much of our groundwater comes from aquifers, which are underground layers of porous rock or sand containing water. Wells can be drilled into the aquifers to produce drinking water, irrigation water, and water for industry. Because groundwater supplies more than half of the water used in the state, all Texans must help protect the quality of this vital resource.

Groundwater has been pumped from water wells for many years. Over time, many wells around homes, farms, industrial sites and urban areas may no longer be needed. Wells that are no longer being used but might be needed in the future can be sealed with a cap that covers the top of the well casing pipe to prevent unauthorized access and contamination of the well. A cap is a temporary groundwater protection solution that allows a well to be used at a later time.

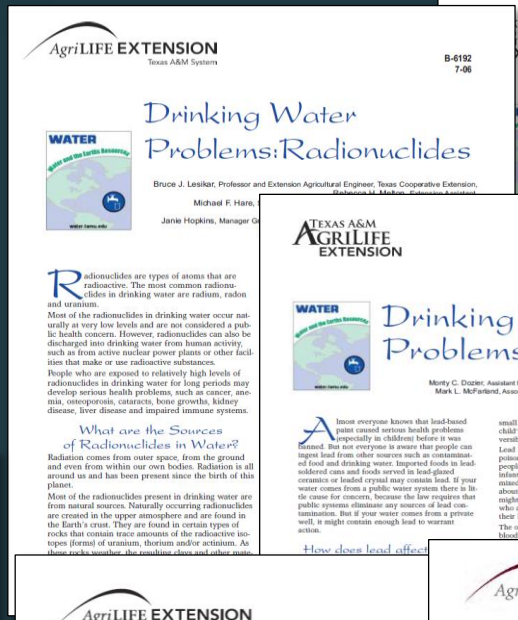
Can my well be capped?

A well can be capped only if it is in good condition and is in use. The Texas Department of Licensing and Regulation (TDLR) defines this as a "non-deteriorated well." A non-deteriorated well is one with a casing and pump in good condition. If your well is not in good condition it should be properly abandoned according to instructions in the Landowners Guide to Plugging Abandoned Water Wells [http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-347.html].

You can inspect the condition of a well casing at the surface by searching for holes or cracks. Use a light to check the inside of the casing. If you can move the casing around by pushing against it, the casing is probably deteriorating. If you need assis

Figure 1. The slab around this capped well must be re-packed to keep water from entering the well bore hole.

*Professor and Extension Program Leader for Biological and Agricultural Engineering; and Extension Assistant, The Texas A&M University System.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B-6192
7-06

WATER

Drinking Water Problems: Radionuclides

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Michael F. Hare,
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Radionuclides are types of atoms that are radioactive. The most common radionuclides in drinking water are radium, radon and uranium.

Most of the radionuclides in drinking water occur naturally at very low levels and are not considered a public health concern. However, radionuclides can also be discharged into drinking water from human activity, such as from active nuclear power plants or other facilities that make or use radioactive substances.

People who are exposed to relatively high levels of radionuclides in drinking water for long periods may develop serious health problems, such as cancer, anemia, osteoporosis, cataracts, bone growths, kidney disease, liver disease and impaired immune systems.

What are the Sources of Radionuclides in Water?

Radiation comes from outer space, from the ground and even from within our own bodies. Radiation is all around us and has been present since the birth of this planet.

Most of the radionuclides present in drinking water are from natural sources. Naturally occurring radionuclides are created in the upper atmosphere and are found in the Earth's crust. They are found in certain types of rocks that contain trace amounts of the radioactive isotopes (forms) of uranium, thorium and/or actinium. As

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2-04

WATER

Drinking Water Problems: Lead

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Almost everyone knows that lead-based paint caused serious health problems (especially in children) before it was banned. But not everyone is aware that people can ingest lead from other sources such as contaminated food and drinking water. Imported foods in lead-soldered cans and foods served in lead-glazed ceramics or leaded crysal may contain lead. If your water comes from a public water system there is little cause for concern, because the law requires that public systems eliminate any sources of lead contamination. But if your water comes from a private well, it might contain enough lead to warrant action.

small amounts of it. Lead poisoning can cause a child's mental and physical development to be irreversibly stunted.

Lead in drinking water is not a main source of lead poisoning, but it can increase the amount of lead people are exposed to. This is particularly risky for infants who drink baby formulas and juices that are mixed with water containing lead. On average, about 10 to 20 percent of a child's lead exposure might come from drinking water; however, infants who are fed formula could get 40 to 60 percent of their lead intake from water.

The only way to detect lead poisoning is with a blood test. The Centers for Disease Control and

How does lead affect

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L-5451
2-04

Drinking Water Problems: Iron and Manganese

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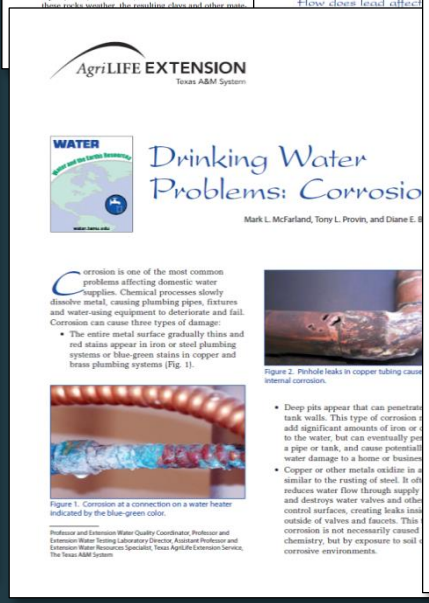
w do iron and manganese nter drinking water?

nd manganese are common elements in the rust. As water percolates through soil and ran dissolve these minerals and carry them ndwater. Also, iron pipes can corrode and ron into a household water supply.

w do I know if my water tains iron or manganese?

earance and/or taste of water can indicate ence of iron and manganese. For example, brown (iron) or black (manganese) particles visible when water is drawn from the tap. particles of iron and/or manganese may come rroded pipes or from the water supply itself. nicles form because oxygen in the plumbing s oxidizing and precipitating the iron and nese.

t is clear when it comes from the tap but s form and settle out after the water has sat ckle, the iron and/or manganese is in the supply itself. It is dissolved in the water and s invisible until it oxidizes and precipitates. ines water from the tap is a reddish color. caused by colloidal iron–iron that does not rticles large enough to precipitate. ese usually is dissolved in water, although shallow wells contain colloidal manganese es water a black tint.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WATER

Drinking Water Problems: Corrosio

Mark L. McFarland, Tony L. Provin, and Diane E. B

Corrosion is one of the most common problems affecting domestic water supplies. Chemical processes slowly dissolve metal, causing plumbing pipes, fixtures and water-using equipment to deteriorate and fail. Corrosion can cause three types of damage:

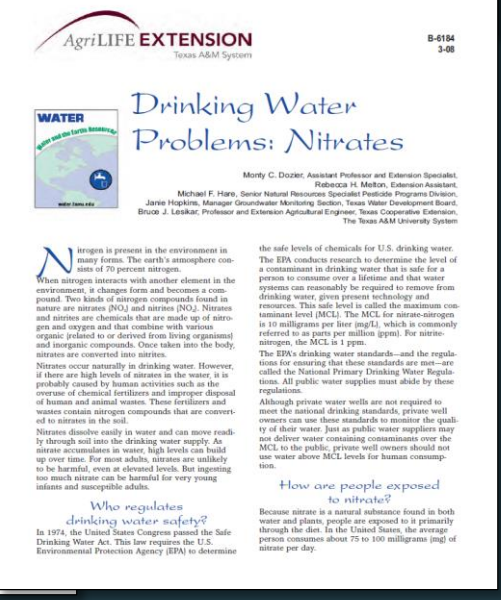
- The entire metal surface gradually thins and red stains appear in iron or steel plumbing systems or blue-green stains in copper and brass plumbing systems (Fig. 1).

Figure 1. Corrosion at a connection on a water heater indicated by the blue-green color.

Professor and Extension Water Quality Coordinator, Professor and Extension Water Testing Laboratory Director, Assistant Professor and Extension Water Resources Specialist, Texas AgriLife Extension Service, The Texas A&M System

Figure 2. Pinhole leaks in copper tubing caus internal corrosion.

- Deep pits appear that can penetrat tank walls. This type of corrosion add significant amounts of iron or to the water, but can eventually pe a pipe or tank, and cause potentiall water damage to a home or busine
- Copper or other metals oxidize in similar to the rusting of steel. It oft reduces water flow through supply and destroys water valves and othe control surfaces, creating leaks insi outside of valves and faucets. This corrosion is not necessarily caused chemistry, but by exposure to soil corrosive environments.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3-08

WATER

Drinking Water Problems: Nitrates

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Nitrogen is present in the environment in many forms. The earth's atmosphere consists of 70 percent nitrogen.

When nitrogen interacts with another element in the environment, it changes form and becomes a compound. Two kinds of nitrogen compounds found in nature are nitrates (NO_3) and nitrites (NO_2). Nitrates and nitrites are chemicals that are made up of nitrogen and oxygen and that combine with various organic (related to or derived from living or organisms) and inorganic compounds. Once taken into the body, nitrates are converted into nitrites.

Nitrates occur naturally in drinking water. However, if there are high levels of nitrates in the water, it is probably caused by human activities such as the overuse of chemical fertilizers and improper disposal of human and animal wastes. These fertilizers and wastes contain nitrogen compounds that are converted to nitrates in the soil.

Nitrates dissolve easily in water and can move readily through soil into the drinking water supply. As nitrate accumulates in water, high levels can build up over time. For most adults, nitrates are unlikely to be harmful, even at elevated levels. But ingesting too much nitrate can be harmful for very young infants and susceptible adults.

Who regulates drinking water safety?

In 1974, the United States Congress passed the Safe Drinking Water Act. This law requires the U.S. Environmental Protection Agency (EPA) to determine the safe levels of chemicals for U.S. drinking water. The EPA conducts research to determine the level of a contaminant in drinking water that is safe for a person to consume over a lifetime and that water systems can reasonably be required to remove from drinking water, given present technology and resources. This safe level is called the maximum contaminant level (MCL). The MCL for nitrate-nitrogen is 10 milligrams per liter (mg/L), which is commonly referred to as parts per million (ppm). For nitrite-nitrogen, the MCL is 1 ppm.

The EPA's drinking water standards—and the regulations for ensuring that these standards are met—are called the National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

Although private water wells are not required to meet the national drinking standards, private well owners can use these standards to monitor the quality of their water. Just as public water suppliers may not deliver water containing contaminants over the MCL to the public, private well owners should not use water above MCL levels for human consumption.

How are people exposed to nitrate?

Because nitrate is a natural substance found in both water and plants, people are exposed to it primarily through the diet. In the United States, the average person consumes about 75 to 100 milligrams (mg) of nitrate per day.