Landowner's Guide to Plugging Abandoned Water Wells

Texas Groundwater Protection Committee
March, 2006; RG-347

Water is one of our state's most precious resources. Groundwater derived from many aquifers supplies over half of the water used in the state. Protecting the quality of this vital resource is the responsibility of all Texans.

For many years groundwater has been pumped through water wells. Over the years, many wells around homes, farms, industrial sites, and urban areas have been abandoned without being properly plugged. Not only are these wells potential groundwater-contamination avenues, many are a safety hazard to children and animals. Although plugging an abandoned well takes time and money, these wells are a threat that cannot be ignored.

Texas law makes the landowner responsible for plugging abandoned wells. The landowner is also held responsible for injury or pollution related to the abandoned well. This publication is provided to help landowners understand how to plug a well properly. Before you begin the process of plugging a well, it is highly recommended that you seek advice from your local groundwater conservation district, a licensed water well driller and/or pump installer in your area, or the Water Well Driller/Pump Installer Section of the Texas Department of Licensing and Regulation (TDLR).

Abandoned wells are regulated by the TDLR and local Groundwater Conservation Districts through Texas Occupations Code, Sections 1901.255 and 1901.256.

Phone numbers for the TDLR and groundwater conservation districts are included on pages 6 - 8. A map showing the location of the state's groundwater conservation districts is on page 9.

WHAT ARE THE HAZARDS ASSOCIATED WITH ABANDONED WELLS?

Personal Safety

This hazard is obvious to anyone who has encountered an unmarked and uncovered large diameter well. Accidents involving humans and animals falling into abandoned wells have happened and continue to occur. Even when a well is covered, the soil around the well may be unstable and can cave in. The liability associated with abandoned wells has not really been tested in Texas. A good question for a landowner with an abandoned well to ask is, "Do I want to be the first legal test case in Texas?"

Groundwater Contamination

An abandoned well is a direct conduit from the surface to the aquifer below. Contaminants that enter the well are introduced directly into the aquifer with no opportunity for natural filtration by soils or geologic materials. If a contamination incident occurs with a concentrated chemical, the potential for health-threatening levels in the underlying aquifer is high. This puts other wells in the aquifer at risk, particularly those wells on the same property or those that are close to the abandoned well. Just one gallon of 2,4-D herbicide can contaminate about three to four million gallons of water. In terms of groundwater, approximately that much water would be held in the upper three feet of an aquifer over a 20-acre area.

Co-mingling of Groundwater

A well open to more than one aquifer will allow water to migrate out of a zone with higher pressure head and enter a zone with lower pressure head. In many areas of Texas, deep aquifers are under high pressures and are extremely salty. When the casing from a high pressure well deteriorates and the well is

abandoned without proper plugging, continual upward flow of salty water from the deeper aquifer will cause contamination of the shallow, freshwater aquifer. Also, any pollutants that occur in one zone can migrate to another zone through the well.

Loss of Aquifer Pressure Head

Pressure head in artesian (freely flowing) aquifers is depleted as water discharges either at land surface or to less pressurized aquifers. Unplugged abandoned wells contribute to the regional depletion of pressure head within an aquifer. Eventually the decline in pressure head causes flowing wells to stop flowing and the water level in nearby wells placed in the same aquifer to decline.

WHEN IS A WELL CONSIDERED ABANDONED?

According to state law, a well is considered abandoned if it has not been used for six consecutive months. However, a well can be considered in use in the following cases:

- a non-deteriorated well that contains the casing, pump, and pump column in good condition, or
- a non-deteriorated well that has been capped.

If you are uncertain whether your well is legally abandoned, call a licensed water well driller in your area, the Water Well Driller/Pump Installer Section of the TDLR, or the local groundwater conservation district (if one exists). (See map on page 9.)

WHO SHOULD DO THE WORK TO PLUG ABANDONED WELLS?

As the landowner, you may do the work necessary to plug an abandoned well on your property. If you plan to do so, first notify the Water Well Driller/Pump Installer Section of the TDLR of your intent to plug the well and the method you will use. You should request a state well plugging form and the well plugging specification (See example on page 13) or download a plugging report from the TDLR Web site at www.license.state.tx.us/wwd/wwdforms.htm. You can enter your plugging report online. To enter your report online you will need a login name, password and GPS coordinates (Latitude & Longitude. You can call the number on the last page of the guide to get your login name and password. Then go to http://www.license.state.tx.us/wwd/wwd.htm and click on Texas Well Report Submission and Retrieval System to enter your plugging report. Within 30 days after the well is plugged, you must enter the plugging report online or send a copy of the completed form to the TDLR. You must send a copy to the local groundwater conservation district (if one exists).

If the well is within a groundwater conservation district, notify the district of your intention to plug the well. Request the district's well plugging application and pay any applicable fees as required. Seek the district's professional consultation regarding any other compliance issues to be considered.

You can hire a licensed water well driller and/or pump installer to seal and plug an abandoned well. In some cases this is recommended because a well contractor has the equipment and an understanding of soil conditions that affect how the well should be properly plugged. Figures 1 - 8 illustrate various types of well constructions. These well types are ordered to indicate the degree of difficulty in plugging. Landowners may be able to plug well types I - V (Figures 1 - 5); however, only a licensed well driller should plug well types VI - VIII (Figures 6 - 8).

Figure 1
WELL I - Dug Well

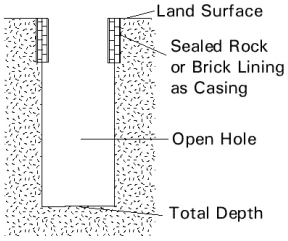


Figure 2
WELL II - Drilled Well

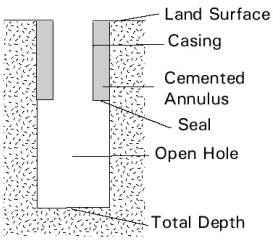


Figure 3
WELL III - Drilled Well

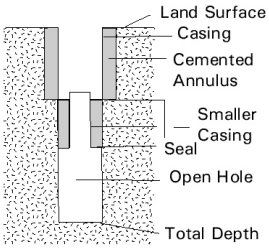


Figure 4
WELL IV - Drilled Well

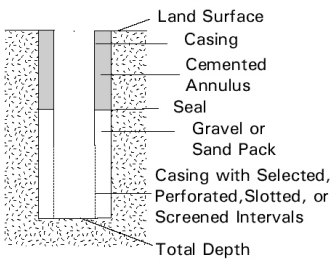


Figure 5
WELL V - Drilled Well

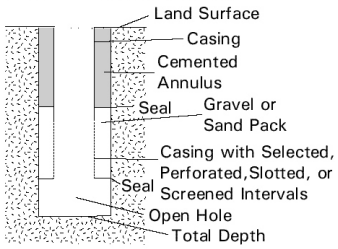


Figure 6
WELL VI - Drilled Well

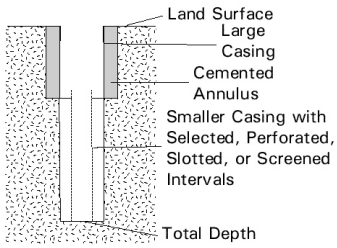


Figure 7
WELL VII - Drilled Well

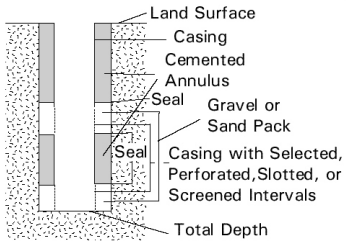
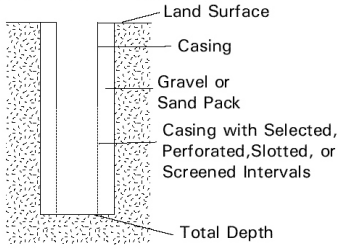


Figure 8
WELL VIII - Drilled Well



HOW DO I PLUG MY OWN WELL?

Well plugging may appear to be a simple process - just dump something into the open well until it's full. That might take care of the safety hazard, people and animals could no longer fall into the well. However, unless you use the right plugging materials and methods you will end up with a poorly sealed well, one that will continue to allow contaminants to enter the groundwater.

To do the job right, it is essential that you use the correct plugging materials and install them properly, according to state regulations and any local groundwater conservation district specifications that may exist. Regulations developed by the state outline the procedures and materials that are to be used for plugging abandoned wells and are reflected in this document. State of Texas Rules and Regulations, Title 16, Texas Administrative Code, Chapter 76 contain these standards. These rules are available by contacting the state agencies listed on page 6. If a groundwater conservation district is present, please consult with the district to determine if district specifications exist.

Plugging Procedures

Before beginning the plugging operations you need to gather some information on the construction of the well (Figures 1 - 8) and the local geology. If the well is drilled through a confining layer that separates two different aquifers (Figure 7; Well Type VII), special procedures must be used. It is recommended this type of plugging be done by a licensed well driller or pump installer. Information on the geology of the area may be difficult to determine, but possible sources include the original well driller's log, the well permit registration filed with the local groundwater conservation district, and local well drillers familiar with the area. Figures 9 - 11 on pages 4 and 5 illustrate plugging methods for various circumstances.

Plugging Materials

Several materials may be used to plug an abandoned well. These materials form an impermeable plug that prevents water flow. These materials include:

- Cement: A neat portland or construction cement mixture of not more than seven gallons of water per 94 pound sack of dry cement, or a cement slurry that contains cement along with bentonite, gypsum or other additives mixed to the manufacturer's recommendations.

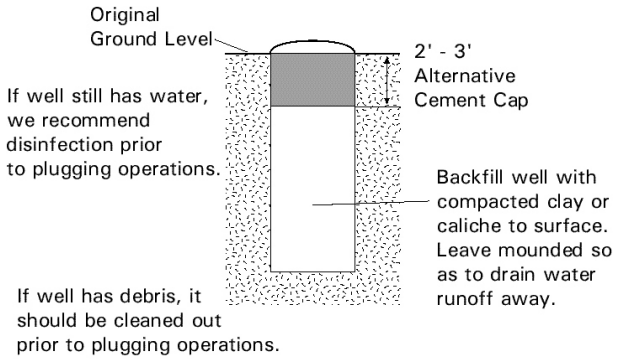
- Bentonite: A sodium hydrous aluminum silicate clay mineral (montmorillonite) commercially available in powdered, granular, or pellet form, which is mixed with potable (drinkable) water and used for a variety of purposes including the stabilization of borehole walls during drilling, to control potential or existing high fluid pressures encountered during drilling below a water table, and to provide a seal in the annular space between the well casing and borehole wall.

- Bentonite Grout: A fluid mixture of sodium bentonite and potable water mixed at manufacturer's specifications to a slurry consistency that can be pumped through a pipe directly into the annular space between the casing and the borehole wall. Its primary function is to seal the borehole in order to prevent the subsurface migration or communication of fluids.

Bentonite clay swells to about 10 times its original size when in contact with water. The swollen clay forms a dense, virtually impermeable, putty. Gravel sometimes fills the bottom of certain types of wells. Local soils can sometimes be used to complete the plugging, however a variance must first be obtained from TDLR.

Landowners who wish to do their own work should consider using coarse grade bentonite chips (average size of 3/8 to 3/4 inches). The chips are easy to handle and are less likely to form a bridge within the well casing. If a bridge forms, the well will not plug properly (Figure 11). This expensive mistake will require the hole to be bored out and the plugging procedure repeated.

Figure 9
Plugging a Large Diameter/
Hand Dug Well



Well Plugging Steps

Step 1. Measure the dimensions of the well. Measurements must be taken of the well diameter, depth, and water level. Accurate measurements (not estimates) will allow the correct calculation of the total well volume and the volume of water in the well. This information is needed to determine the amount of materials that are needed for plugging. Remember that volume calculations depend on the shape of the well. Most wells are cylindrical; however, some have other shapes that must be considered for accurate calculation of volume. Refer to *Volume Formulas*, the example *Plugging Materials Calculation*, and the *Plugging Materials Calculation Table* on page 10.

Step 2: Remove all obstructing materials from the well. It is critical that fill materials do not slump or settle; therefore, obstructions that may cause incomplete filling of the voids must be removed. Remove the pump, pump rods, pipes, and any other equipment from the well. Floating debris, such as wood staves, should also be removed. One method used to accomplish debris removal is flushing. If water is pumped into the well, floating debris will move to the top as the well fills with water. Flushing may not be possible with larger diameter wells due to the volume of water required. In any event, as much debris as possible must be removed from the well before plugging.

Step 3. Disinfect the well by adding household bleach. It is recommended that all wells containing standing water be disinfected to kill existing microorganisms. This can be accomplished by adding chlorine bleach at the rate of 1 gallon of bleach for every 500 gallons of water and is equivalent to a "shock" chlorination concentration of 100 parts per million chlorine. The chlorination process ensures that disease causing microorganisms are not sealed in the aquifer. Refer to the example *Chlorine Volume Calculations* on page 11 and the *Disinfection Calculation Table* on page 12.

Step 4. Remove as much casing from the well as possible.

Step 5. Fill the well with plugging materials. The exact procedure for plugging will depend on

well construction, depth, diameter, aquifer type, availability of materials, and the level of protection required. Figures 9 -11 illustrate three different methods used to plug a well properly based on the well type (hand dug versus drilled) and amount of water standing within the well (standing water greater than 100 feet versus less than 100 feet).

Step 6. Complete and mail a state well plugging form to TDLR at the address indicated below. Comply with reporting requirements of your local groundwater conservation district (if one exists). An example of a completed state well plugging form is included on page 13.

Water Well Driller/Pump Installer Section
Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, Texas 78711
512/463-7880

Figure 10
Plugging Drilled Wells That Have Greater Than 100 Feet of Standing Water

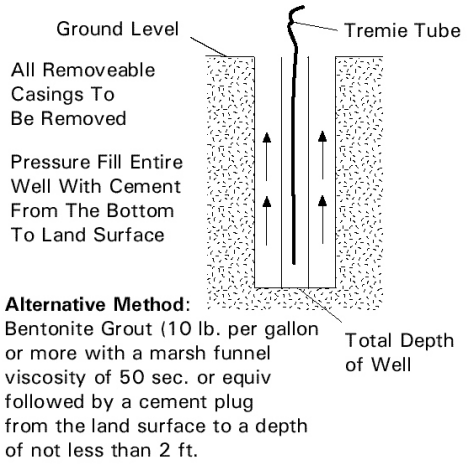
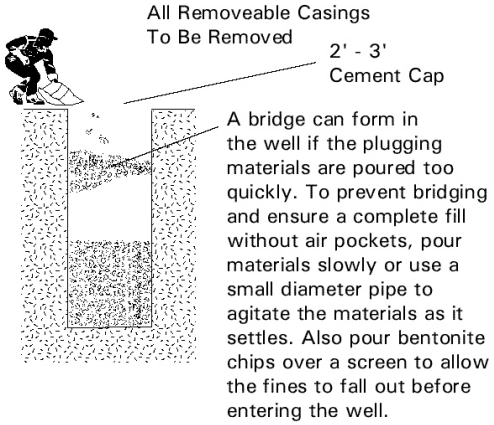


Figure 11
Plugging Drilled Wells That Have Less Than 100 Feet of Standing Water



STATE AND LOCAL AGENCIES THAT CAN PROVIDE INFORMATION PERTAINING TO WELL PLUGGING

STATE AGENCIES

Texas Department of Licensing and Regulation
Water Well Driller/Pump Installer Section.....t: (512) 463-7880
Texas Commission on Environmental Quality
Groundwater Planning & Assessment.....t: (512) 239-4514
Texas State Soil and Water Conservation Board.....t: (254) 773-2250
Texas Agricultural Extension Service .....t: (409) 845-4747

LOCAL GROUNDWATER CONSERVATION DISTRICTS
(MAP EXPLANATION - See map on page 9.
For the most current contact information, see
http://www.texasgroundwater.org/tagdmembers.htm)

1.	Anderson County Underground Water Conservation District	t: (903) 729-8066
2.	Bandera County River Authority & Groundwater Conservation District	t: (830) 796-7260
3.	Barton Springs / Edwards Aquifer Conservation District	t: (512) 282-8441
4.	Bee Groundwater Conservation District	t: (361) 358-2244
5.	Blanco-Pedernales Groundwater Conservation District	t: (830) 868-9196
6.	Bluebonnet Groundwater Conservation District	t: (936) 825-7303
7.	Brazoria County Groundwater Conservation District	t: (281) 331-3197
8.	Brazos Valley Groundwater Conservation District	t: (979) 764-3491
9.	Brewster County Groundwater Conservation District	t: (432) 837-6235
10.	Central Texas Groundwater Conservation District	t: (512) 756-9041
11.	Clear Fork Groundwater Conservation District	t: (325) 776-2710
12.	Clearwater Underground Water Conservation District	t: (254) 933-0120
13.	Coastal Bend Groundwater Conservation District	t: (979) 531-1412
14.	Coastal Plains Groundwater Conservation District	t: (979) 245-1708
15.	Coke County Underground Water Conservation District	t: (325) 453-2232
16.	Collingsworth County Underground Water Conservation District	t: (806) 447-2800
17.	Corpus Christi Aquifer Storage and Recovery Conservation District	t: (361) 880-3222
18.	Cow Creek Groundwater Conservation District	t: (830) 816-2504
19.	Culberson County Groundwater Conservation District	t: (432) 283-8182
20.	Edwards Aquifer Authority	t: (210) 222-2204
21.	Emerald Underground Water Conservation District	t: (325) 392-5156
22.	Evergreen Underground Water Conservation District	t: (830) 569-4186
23.	Fayette County Groundwater Conservation District	t: (979) 968-3135
24.	Fort Bend Subsidence District	t: (281) 342-3273
25.	Fox Crossing Water District	t: (325) 648-2222
26.	Garza County Underground and Fresh Water Conservation District	t: (806) 495-4425

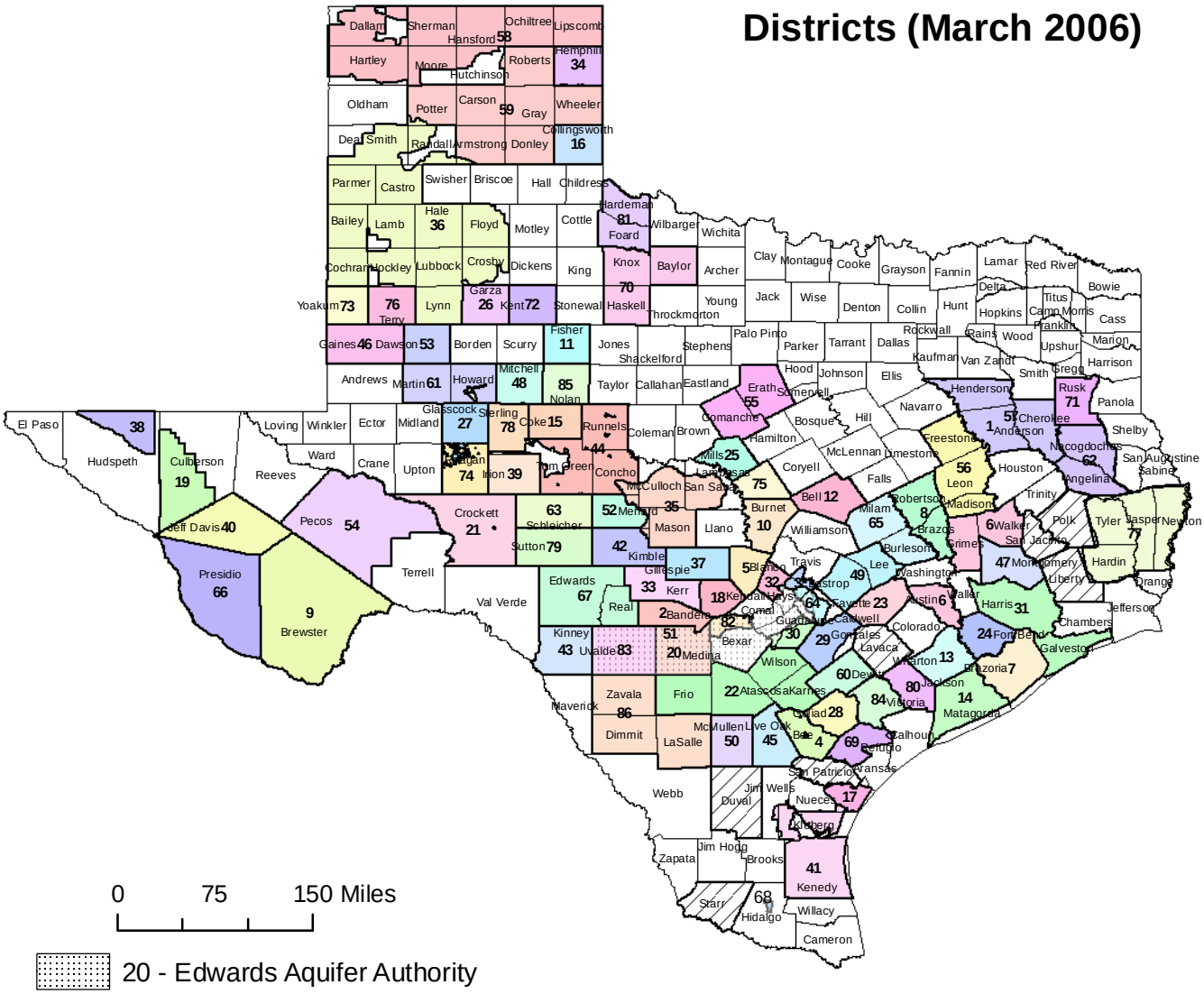
LOCAL GROUNDWATER CONSERVATION DISTRICTS
(MAP EXPLANATION) - Continued

27.	Glasscock Groundwater Conservation District	t: (432) 354-2430
28.	Goliad County Groundwater Conservation District	t: (361) 645-1716
29.	Gonzales Underground Water Conservation District	t: (830) 672-1047
30.	Guadalupe County Groundwater Conservation District	t: (830) 303-4188
31.	Harris-Galveston Coastal Subsidence District	t: (281) 486-1105
32.	Hays Trinity Groundwater Conservation District	t: (512) 858-9253
33.	Headwaters Groundwater Conservation District	t: (830) 896-4110
34.	Hemphill County Underground Water Conservation District	t: (806) 323-8350
35.	Hickory Underground Water Conservation District No. 1	t: (915) 597-2785
36.	High Plains Underground Water Conservation District No. 1	t: (806) 762-0181
37.	Hill Country Underground Water Conservation District	t: (830) 997-4472
38.	Hudspeth County Underground Water Conservation District #1	t: (915) 964-2932
39.	Irion County Water Conservation District	t: (915) 835-2015
40.	Jeff Davis Underground Water Conservation District	t: (432) 426-3441
41.	Kenedy County Groundwater Conservation District	t: (361) 592-9347
42.	Kimble County Groundwater Conservation District	t: (915) 446-4826
43.	Kinney County Groundwater Conservation District	t: (830) 563-9699
44.	Lipan-Kickapoo Water Conservation District	t: (915) 469-3988
45.	Live Oak Underground Water Conservation District	t: (361) 449-1151
46.	Llano-Estacado Underground Water Conservation District	t: (915) 758-1127
47.	Lone Star Groundwater Conservation District	t: (936) 494-3436
48.	Lone Wolf Groundwater Conservation District	t: (915) 728-2298
49.	Lost Pines Groundwater Conservation District	t: (512) 581-9056
50.	McMullen Groundwater Conservation District	t: (361) 449-7017
51.	Medina County Underground Water Conservation District	t: (830) 741-3162
52.	Menard County Underground Water District	t: (915) 396-3670
53.	Mesa Underground Water Conservation District	t: (806) 872-9205
54.	Mid-East Texas Groundwater Conservation District	t: (979) 536-2805
55.	Middle Pecos Groundwater Conservation District	t: (915) 395-2460
56.	Middle Trinity Groundwater Conservation District	t: (254) 965-6705
57.	Neches and Trinity Valleys Groundwater Conservation District	t: (903) 541-4845
58.	North Plains Groundwater Conservation District	t: (806) 935-6401
59.	Panhandle Groundwater Conservation District	t: (806) 883-2501
60.	Pecan Valley Groundwater Conservation District	t: (361) 275-8188

LOCAL GROUNDWATER CONSERVATION DISTRICTS
(MAP EXPLANATION) - Continued

61.	Permian Basin Underground Water Conservation District	t: (432) 756-2136
62.	Pineywoods Groundwater Conservation District	t: (936) 630-0582
63.	Plateau Underground Water Conservation & Supply District	t: (915) 853-2121
64.	Plum Creek Conservation District	t: (512) 398-2383
65.	Post Oak Savannah Groundwater Conservation District	t: (512) 455-9900
66.	Presidio County Underground Water Conservation District	t: (432) 426-3441
67.	Real-Edwards Conservation and Reclamation District	t: (830) 234-3158
68.	Red Sands Groundwater Conservation District	t: (956) 383-3695
69.	Refugio Groundwater Conservation District	t: (361) 526-1483
70.	Rolling Plains Groundwater Conservation District	t: (940) 422-1095
71.	Rusk County Groundwater Conservation District	t: (903) 643-9900
72.	Salt Fork Underground Water Conservation District	t: (806) 237-2160
73.	Sandy Land Underground Water Conservation District	t: (806) 456-2155
74.	Santa Rita Underground Water Conservation District	t: (915) 884-2893
75.	Saratoga Underground Water Conservation District	t: (512) 556-8271
76.	South Plains Underground Water Conservation District	t: (806) 637-7467
77.	Southeast Texas Groundwater Conservation District	t: (409) 423-4357
78.	Sterling County Underground Water Conservation District	t: (915) 378-2704
79.	Sutton County Underground Water Conservation District	t: (915) 387-2369
80.	Texana Groundwater Conservation District	t: (361) 782-2663
81.	Tri-County Groundwater Conservation District	t: (940) 887-3239
82.	Trinity Glen Rose Groundwater Conservation District	t: (210) 349-6484
83.	Uvalde County Underground Water Conservation District	t: (830) 278-8242
84.	Victoria County Groundwater Conservation District	t: (361) 573-6004
85.	Wes-Tex Groundwater Conservation District	t: (325) 236-6033
86.	Wintergarden Groundwater Conservation District	t: (830) 876-3801

Texas Groundwater Conservation Districts (March 2006)



0 75 150 Miles

20 - Edwards Aquifer Authority

Created, but Unconfirmed by Voters

Counties without GCDs

(For most current map, see
htttp://www.tceq.state.tx.us/permitting/water_supply/groundwater/mapgcd.html)

Texas Commission on Environmental Quality

This map was prepared by the TCEQ for display purposes only. No claims are made to the accuracy or completeness of the information shown here nor is this map suitable for any othe use. The scale and location of mapped data are approximate. The groundwater conservation district boundaries are not land survey data and may not accurately depict legals descriptions. For more information about this map, please contact TCEQ Groundwater Planning and Assessment Team.

Map Printed March, 2006

VOLUME FORMULAS

Volume = surface area x depth

Volume of a Circular Cylinder = $\pi(r)^2 d$
where π = 3.1416;
r = radius of the circle
d = depth

Volume of a Rectangular Solid = a x b x d
where a = length of one side of a rectangle;
b = length of an adjacent side of a rectangle
d = depth

Volume of an Equilateral Polygonal Solid (Octagonal Solid, Hexagonal Solid, etc.) = $n(r)^2 d \tan \pi/h$
where n = the number of sides;
r = radius of the inscribed circle;
d = depth
π = 3.1416
h = tangent expressed as radians

EXAMPLE: PLUGGING MATERIALS CALCULATION

To calculate the needed number of 94-pound bags of portland cement (or 50-pound sacks of bentonite chips) to plug a well, divide the measured depth of the well by the number indicated in the table (for the measured diameter). For example, for a well 4 inches in diameter and 100 feet deep: 100 ft ÷ 16.2 ft = 6.17 bags of cement, or 100 ft ÷ 7.9 ft = 12.66 bags of bentonite chips.

PLUGGING MATERIALS CALCULATION TABLE

This table can be used to calculate the needed materials (cement or bentonite chips) required to plug a well.

WELL OR HOLE DIAMETER[1]	CEMENT[2]	BENTONITE CHIPS[3]
Inches	Linear Feet	Linear Feet
2	50.3	31.3
3	28.8	13.9
4	16.2	7.9
5	10.4	5.0
6	7.2	3.5
7	5.3	2.6
8	4.0	2.0
9	3.2	1.5
10	2.6	1.3
12	1.8	0.86
14	1.3	0.63
16	1.0	0.48
18	0.8	0.38
20	0.6	0.31
24	0.4	0.21
36	0.2	0.097
40	0.16	0.078
44	0.13	0.065
48	0.11	0.054

NOTES:
1. If measured well diameter falls in-between listed diameters, use the larger diameter to ensure adequate materials are purchased. Diameters are for cylindrical wells only.
2. The mixing ratio for the cement slurry is 7 gallons of water for each 94-pound sack of Portland cement used.
3. Bentonite chips used should be between 3/8- to 3/4-inch size.

EXAMPLE:
CHLORINE VOLUME CALCULATIONS

1. Find the Height of the Water Column in the Well

(measured total depth of the well) - (distance from the ground surface to the water surface) = (height of water column)

Example:

If the measured depth of the well is 100 feet, and the distance from the ground surface to the water surface is 45 feet, then; (100 feet) - (45 feet) = 55 feet = height of water column

2. Find the Number of Ounces of Chlorine Product Needed to Disinfect the Well

(height of water column) x (ounces of chlorine product added per linear foot, from Disinfection Calculation Table on page 12) = (ounces of chlorine product needed to disinfect the well)

Example:

If the measured depth of the well is 100 feet, the measured static water level is 45 feet, and the well or hole diameter is 12 inches, then;

(55 feet) x (1.490 ounces of chlorine product per foot, from Disinfection Calculation Table on page 12) = (81.95 fluid ounces of chlorine product to disinfect the well) / (128 fluid ounces per gallon) = 0.64 gallons of chlorine product

3. Disinfection Procedure

- Add (pour) calculated amount of chlorine product into well; and
- Allow mixture to stand (disinfect) for 8 to 10 hours prior to plugging.

GLOSSARY OF SELECTED TERMS

aquifer - geologic stratum or zone below the surface of the earth capable of producing groundwater

bridge - plugging materials that lodge part way down in a well bore so as to obstruct passage of subsequent plugging materials in reaching the bottom of the well bore

confining layer - geologic stratum or zone below the surface of the earth that impedes the movement of groundwater

neat portland cement - a finely ground, carefully proportioned mixture of limestone and shale (sold commercially)

pressure head - hydrostatic pressure expressed as the height that a column of water rises in a tightly cased well

surging - alternately raising and lowering a column of water in a well to induce water movement into and out of the well bore and aquifer

tremie tube - a tube or pipe running to the bottom of a well (after removal of casing) that is used to transport plugging materials to the bottom of the well; tube is raised as bottom of the well is filled

DISINFECTION CALCULATION TABLE

Disinfection of a well is recommended prior to conducting plugging actions. Disinfection, or "shock" chlorination, of the well is recommended to kill existing microorganism within the well water.

WELL OR HOLE DIAMETER[1]	VOLUME OF WATER (PER LINEAR FOOT)	REQUIRED CHLORINE (PER LINEAR FOOT) [2, 3]
Inches	Gallons/Foot	Fluid Ounces/Foot
2	0.16	0.041
3	0.37	0.094
4	0.65	0.165
5	1.02	0.259
6	1.50	0.381
7	2.00	0.508
8	2.61	0.660
9	3.30	0.838
10	4.08	1.036
12	5.88	1.490
14	8.00	2.031
16	10.44	2.650
18	13.22	3.354
20	16.32	4.145
24	23.50	5.966
36	52.88	13.430
40	65.28	16.579
44	78.99	20.061
48	94.00	23.873

NOTES:
1. Diameters are for cylindrical wells only.
2. Typical 5.25% to 6.0% chlorine product. Common product brand names include: Clorox, Purex, Sno-White, Kandu, Topco, etc.
3. Added volume produces an equivalent concentration of 100 parts per million of chlorine per linear foot of water.

(Please refer to the required calculations for appropriate volume of chlorine on page 11)

WELL PLUGGING FORM (EXAMPLE)

Texas Department of License and Regulation
Water Well Driller/Pump Installer Program
P.O. Box 12157 Austin, Texas 78711 (512)463-7880 FAX (512)463-8616
Email address: water.well@license.state.tx.us

This form must be completed and filed with the department within 30 days following the plugging of the well.

PLUGGING REPORT

A. WELL IDENTIFICATION AND LOCATION DATA

1) OWNER

Name	Address	City	State	Zip
John J. Jones	100 Main St	Houston	TX	75111

2) WELL LOCATION

County	Physical Address	City	State	Zip
Harris				

3) Owner's Well No.	Long.	Lat.	Grid # 60-60-1

4) Type of Well ☒ Water ☐ Monitor ☐ Injection ☐ De-Watering

5) N↑

Drill, Pump Installer, or Landowner performing the plugging operations must locate and identify the location of the well within a specific grid on a full scale gridded map available from Texas Natural Resource Information Service. The location of the well should be denoted within the grid by placing a corresponding dot in the square to the right. The legal description is optional.

B) HISTORICAL DATA ON WELL TO BE PLUGGED (if available)

6) Driller | License No.

7) Drilled / / | 8) Diameter of hole_____ Inches | 9) Total depth of well_____ feet.

C. CURRENT PLUGGING DATA

10) Date well plugged 4 / 4 / 2004

12) Name of Driller/Pump Installer or Well Owner performing the plugging
Will Dreller

License No. 10000 WI

13) CASING AND CEMENTING DATA RELATIVE TO THE PLUGGING OPERATIONS.

CASING LEFT IN WELL

DIAMETER (inches)	FROM(feet)	TO (feet)
7 7/8	0	200

CEMENT/BENTONITE PLUG(S) PLACES IN WELL

FROM (feet)	TO (feet)	SACKS
2	200	25 bentonite
2	0	2 cement

11) **REMOVE ALL REMOVEABLE CASING**
Please check box beside the method of plugging used

- ☐ Tremmie pipe cement from bottom to top.
- ☒ Tremmie pipe bentonite from bottom to 2 feet from From surface, cement top 2 feet.
- ☐ Pour in 3/8 bentonite chips when standing water in well is less than 100 feet depth, cement top 2 feet.
- ☐ Large diameter well filled with clay material from top to bottom.

COMMENTS

D. VALIDATION OF INFORMATION INCLUDED IN FORM

I certify that I plugged this well (or the well was plugged under my supervision) and that all of the statements herein are true and correct. I understand that failure to complete items 1 through 13 will result in the report(s) being returned for completion and resubmitted.

Company or individual's Name (type or print) Dreller Drilling

Address Rt 1 Box 1	City Wellville	State TX	Zip 78787

Signature Will Dreller (Licensed Driller/Pump Installer)	Date 4 / 4 / 2004	Signature (Apprentice)	Date / /

TDLR FORM a004WWD *White - TDLR* *Yellow - Owner* *Pink - Driller/Pump Installer*

Landowner's Guide to Plugging Abandoned Water Wells was designed and produced by the Texas Groundwater Protection Committee's Abandoned Water Well Closure Task Force in fulfillment of requirements given in §26.405 of the Texas Water Code. The effort was partially funded by the U.S. Environmental Protection Agency. While the information contained in the publication represents the contribution of each individual participating agency and group, the report as a whole is the work of the Committee and does not necessarily reflect all of the views and policies of each participating organization.

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Published and Distributed by the
Texas Commission on Environmental Quality
P.O.Box 13087
Austin, Texas 78711-3087

TEXAS GROUNDWATER PROTECTION COMMITTEE
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With Assistance From

Texas Cooperative Extension
Texas Water Well Drillers Advisory Council
Texas Rural Water Association
Texas Farm Bureau

Texas Groundwater Protection Committee
MC-147
P.O. Box 13087
Austin, Texas 78711-3087

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