Cypress Creek Project
Groundwater Workshop
April 19, 2023

WELLS 101

Robin Gary
Watershed Association
robingary@wimberleywatershed.org

ACKNOWLEDGEMENTS

- I am not a hydrogeologist, a well driller or a pump servicer, but I know and have worked with many of them in the last 19 years.
- I am a geographer.
- Groundwater science, well drilling and servicing require skill, tenacity, grit, and knowledge.
- Thankfully, we have some of the brightest talent, most caring individuals, and most experienced folks living and working in the Hill Country.







Photos by Rene Barker and Robin Gary

HOW YOUR WELL WORKS

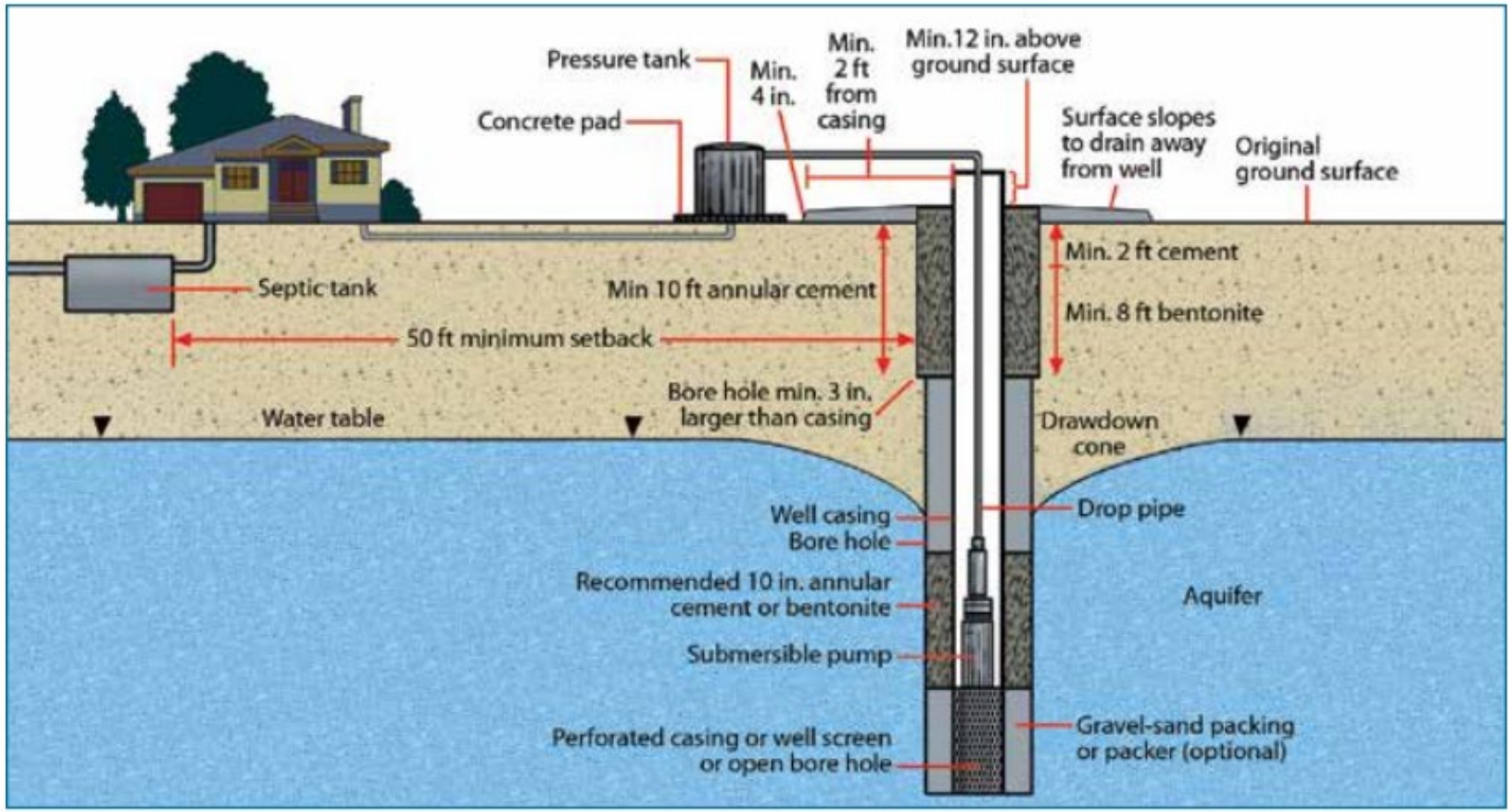
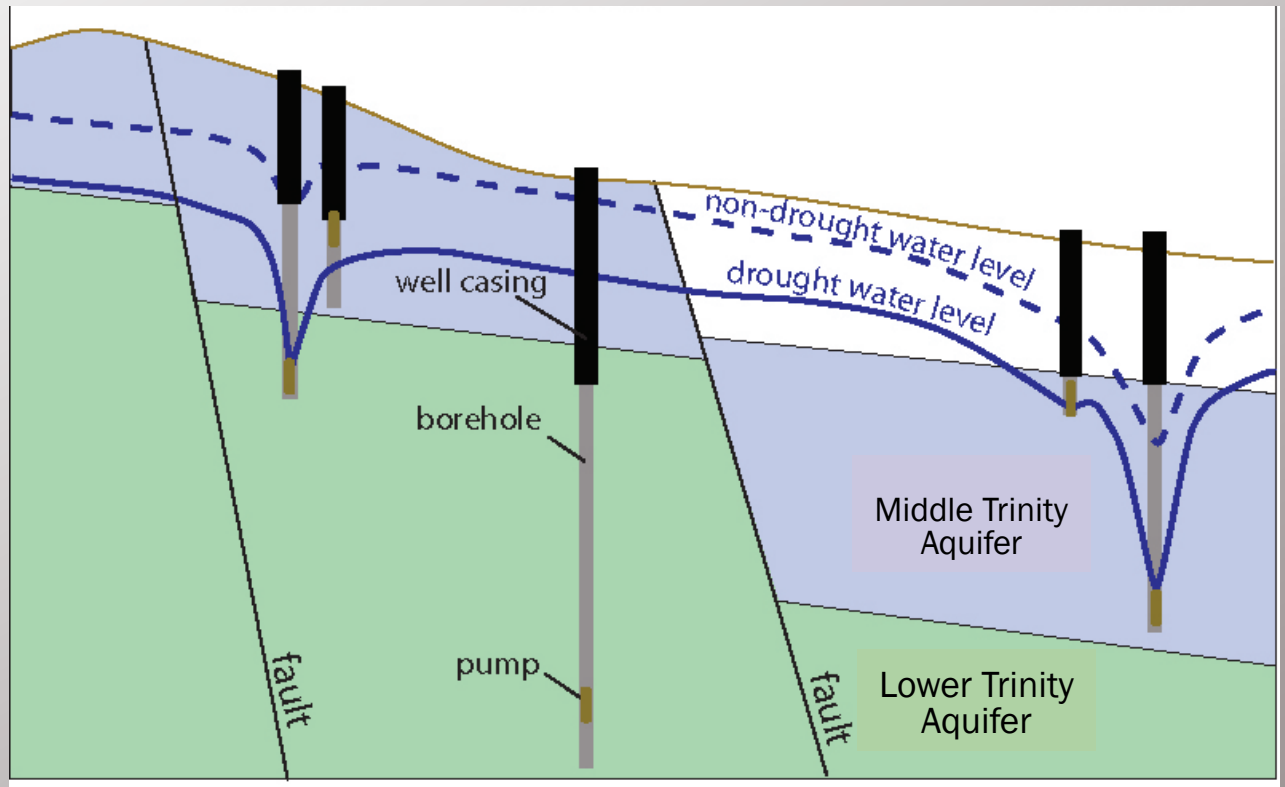


Figure 28. Domestic well diagram. Well construction and plugging specifications accepted by the Texas Department of Licensing and Regulations are shown at https://www.tdlr.texas.gov/wwd/wwdspecs.htm.

DROUGHT AND WELLS

THE WEEK June 29, 2007



Adapted from Brian Hunt, BSEACD

not to scale

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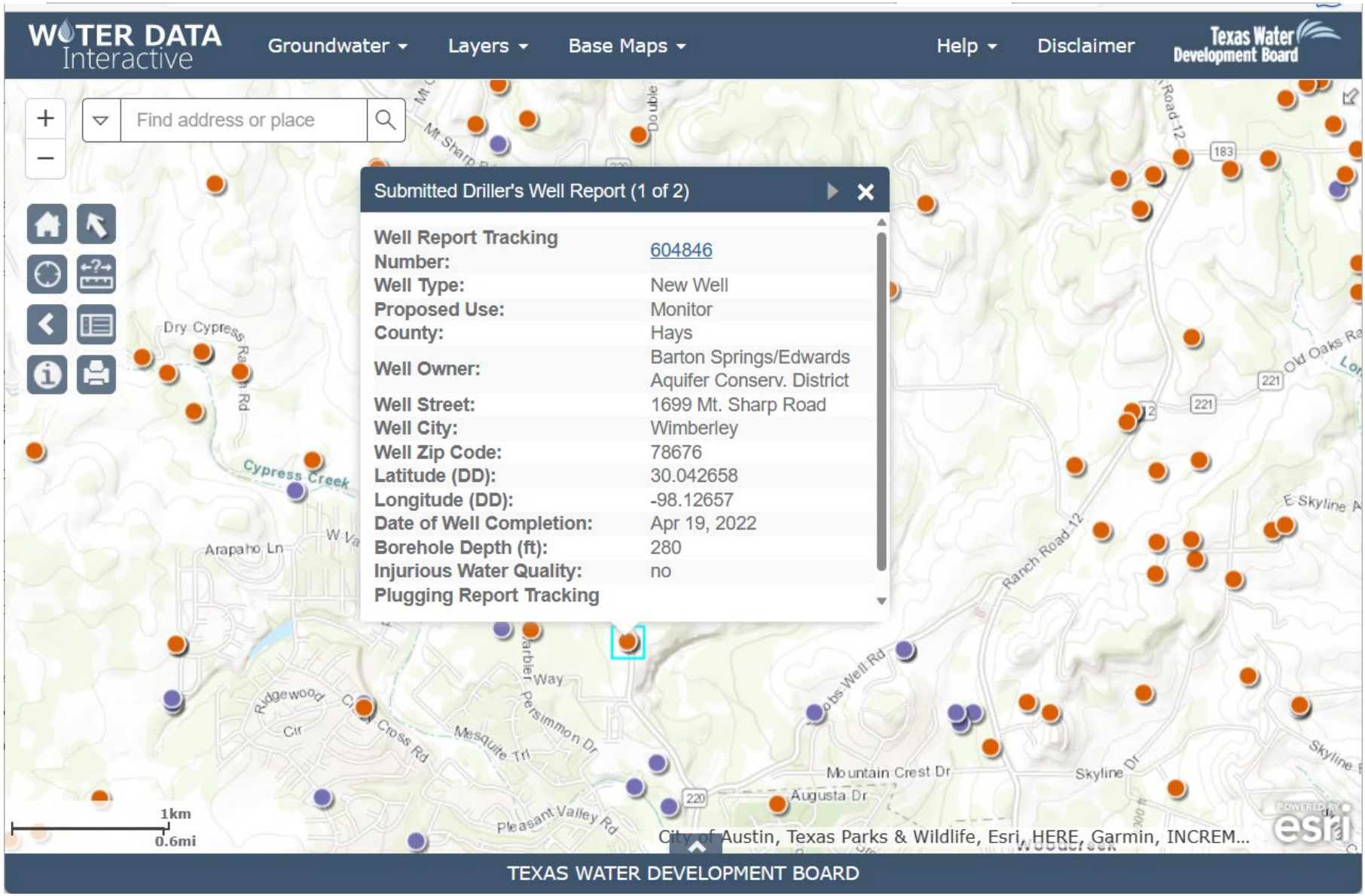
FINDING YOUR WELL RECORDS

- Since 2003, Texas Department of Licensing and Regulation (TDLR) has required online submission of driller logs.
- Texas Water Development Board maintains the Water Data Interactive that shows:
  - **Purple Dots:** Groundwater Database (water quality)
  - **Orange Dots:** Submitted Drillers Reports (well construction)
  - **Note:** Toggle on well locations using the Groundwater tab
  - **Pro Tip:** Addresses or well record numbers can go into the Location Search bar



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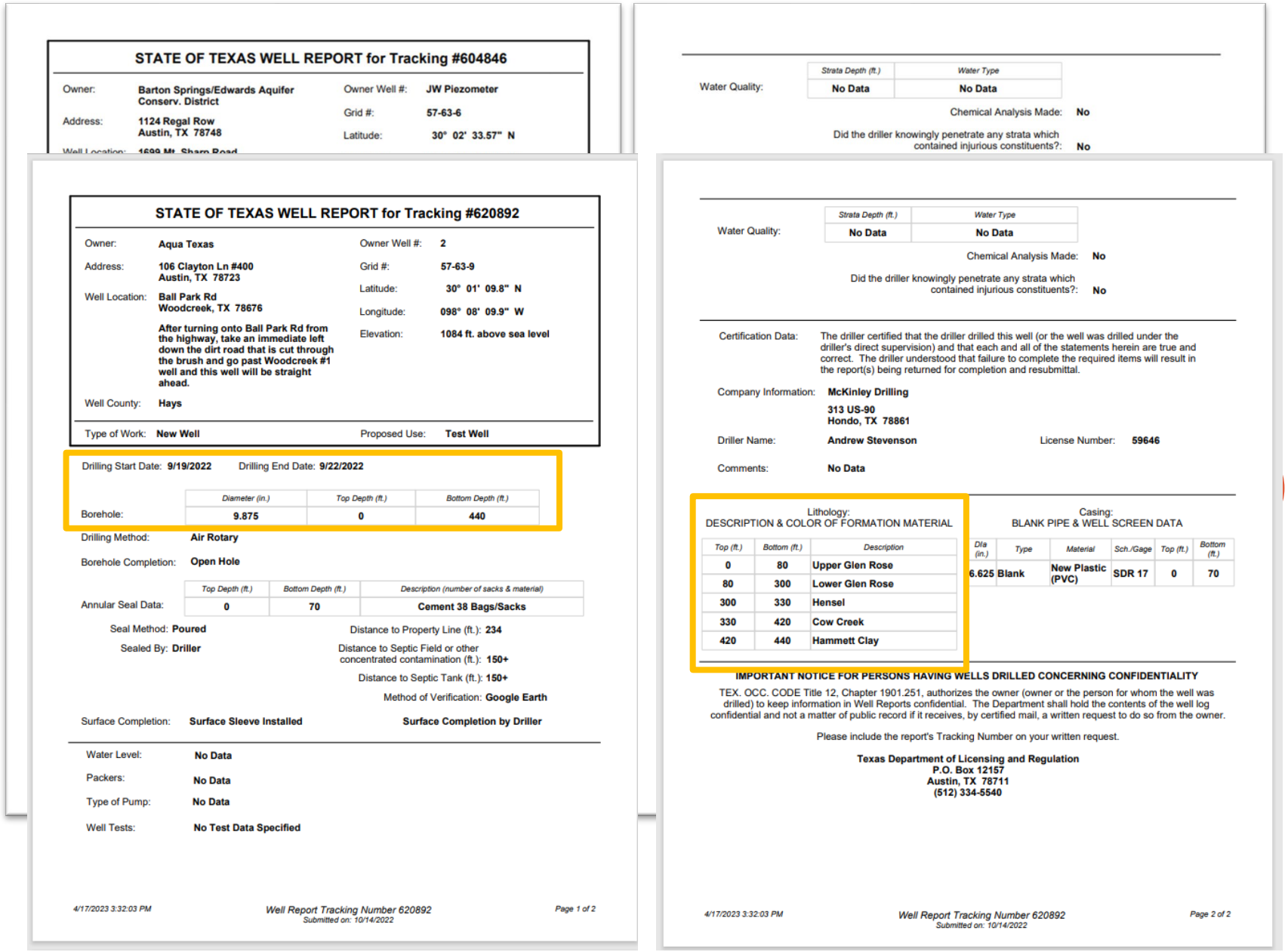


STATE OF TEXAS WELL REPORT for Tracking #604846

Owner: Barton Springs/Edwards Aquifer Conserv. District
Address: 1124 Regal Row Austin, TX 78748
Owner Well #: JW Piezometer
Grid #: 57-63-6
Latitude: 30° 02' 33.57" N

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: No

Did the driller knowingly penetrate any strata which contained injurious constituents?: No

STATE OF TEXAS WELL REPORT for Tracking #620892

Owner: Aqua Texas
Address: 106 Clayton Ln #400 Austin, TX 78723
Well Location: Ball Park Rd Woodcreek, TX 78676
After turning onto Ball Park Rd from the highway, take an immediate left down the dirt road that is cut through the brush and go past Woodcreek #1 well and this well will be straight ahead.
Well County: Hays
Owner Well #: 2
Grid #: 57-63-9
Latitude: 30° 01' 09.8" N
Longitude: 098° 08' 09.9" W
Elevation: 1084 ft. above sea level

Type of Work: New Well
Proposed Use: Test Well

Drilling Start Date: 9/19/2022 Drilling End Date: 9/22/2022

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	9.875	0	440

Drilling Method: Air Rotary
Borehole Completion: Open Hole

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	0	70	Cement 38 Bags/Sacks

Seal Method: Poured
Sealed By: Driller
Distance to Property Line (ft.): 234
Distance to Septic Field or other concentrated contamination (ft.): 150+
Distance to Septic Tank (ft.): 150+
Method of Verification: Google Earth
Surface Completion: Surface Sleeve Installed
Surface Completion by Driller

Water Level: No Data
Packers: No Data
Type of Pump: No Data
Well Tests: No Test Data Specified

4/17/2023 3:32:03 PM Well Report Tracking Number 620892 Submitted on: 10/14/2022 Page 1 of 2

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: No

Did the driller knowingly penetrate any strata which contained injurious constituents?: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: McKinley Drilling
313 US-90
Hondo, TX 78861

Driller Name: Andrew Stevenson
License Number: 59646

Comments: No Data

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	80	Upper Glen Rose
80	300	Lower Glen Rose
300	330	Hensel
330	420	Cow Creek
420	440	Hammett Clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
6.625	Blank	New Plastic (PVC)	SDR 17	0	70

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

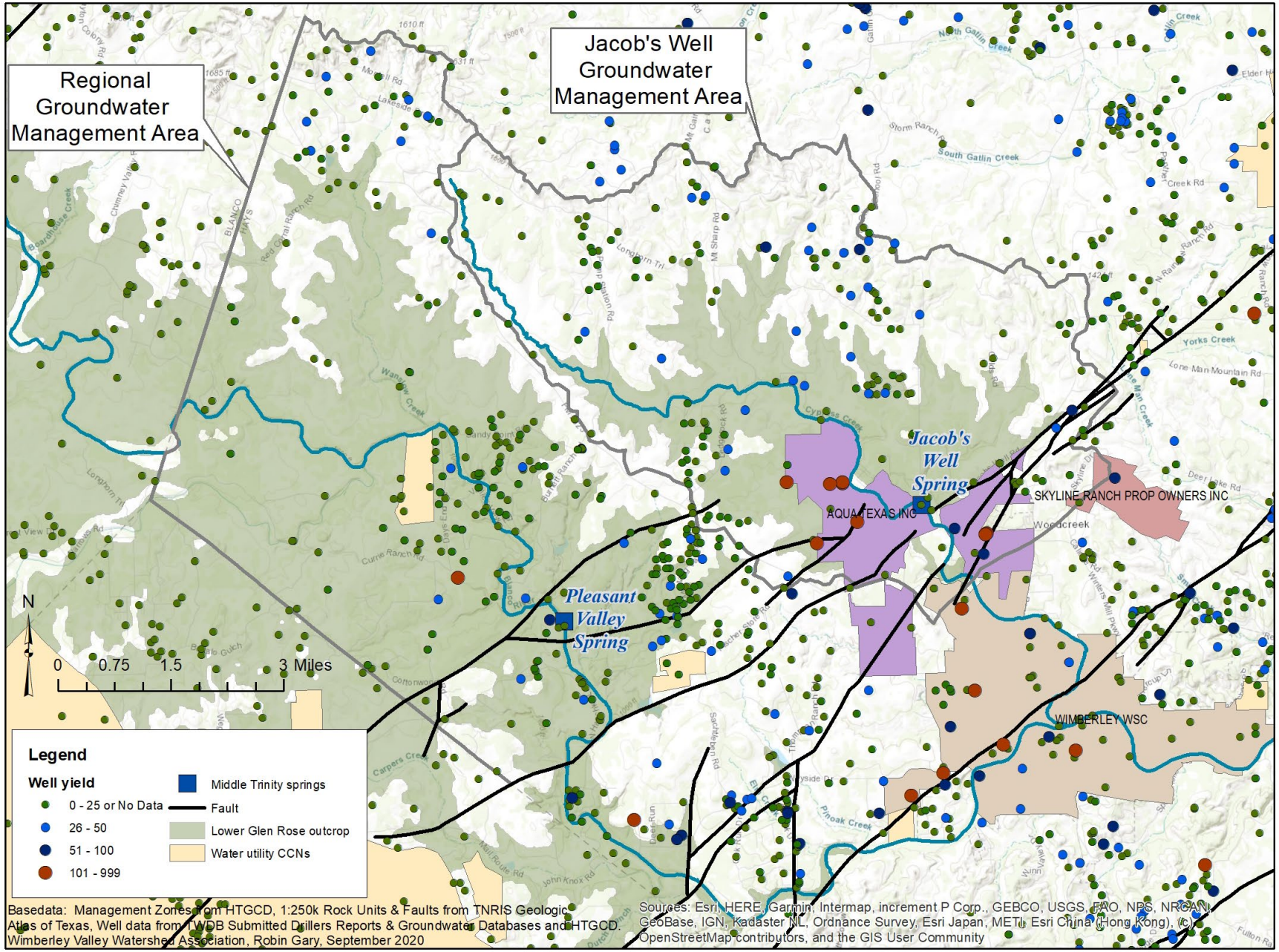
TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

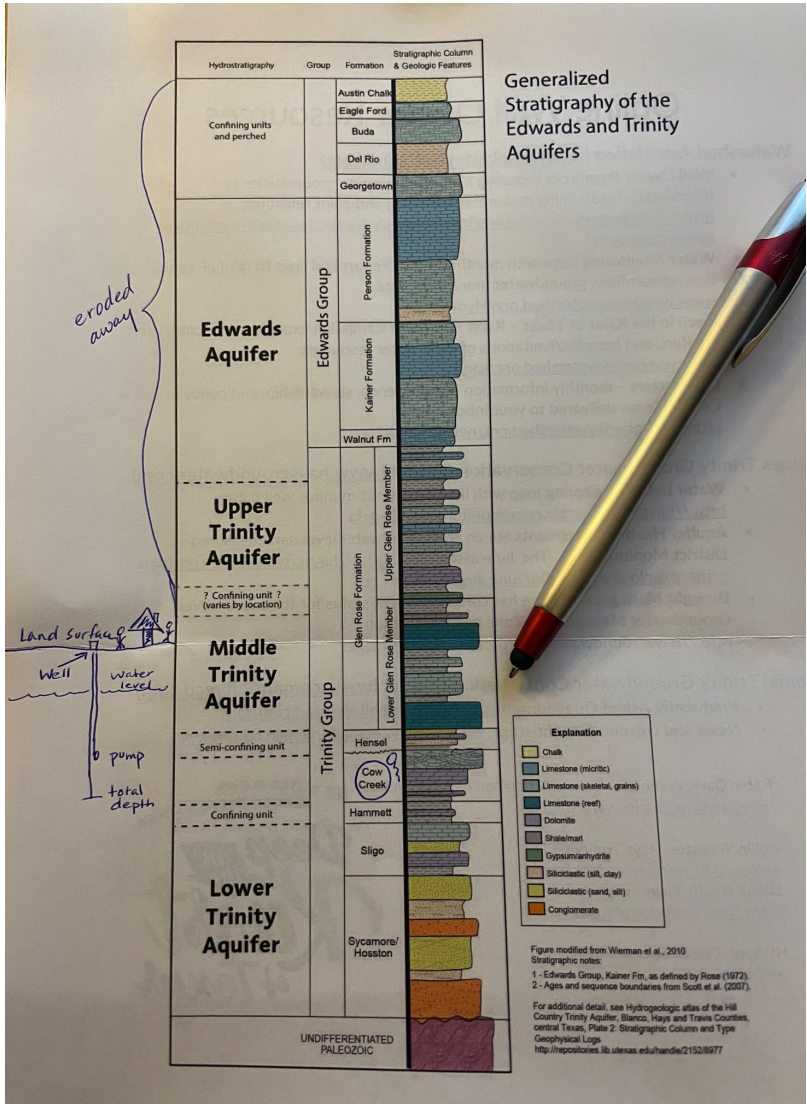
Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

4/17/2023 3:32:03 PM Well Report Tracking Number 620892 Submitted on: 10/14/2022 Page 2 of 2

HOW YOUR WELL WORKS





WELL COMPONENTS

WHAT THE WELL?

Pump Protector

Barton Springs Edwards Aquifer CONSERVATION DISTRICT

What does it do?

It protects submersible pumps from burning out due to low yield or low water levels.

How does it work?

It monitors the pump's electrical current and automatically trips a switch to turn off the pump if it runs too long.

Do you have one?

We recommend these for all wells, especially shallow wells or wells with known supply issues.

GROUNDWATER COMPONENTS OVERVIEWS:
WWW.BSEACD.ORG/WTW

WHAT THE WELL?

Pressure Tank

Barton Springs Edwards Aquifer CONSERVATION DISTRICT

What does it do?

It provides pressure for household or irrigation use. Sizes range from 10-200 gallons., average size is 44 gallons.

How does it work?

It maintains a constant water pressure and turns the pump on once a set volume is used. For example, a 44 gallon tank has a drawdown of 16 gallons.

Do you have one?

Most well systems have one. Most commonly they are small, blue metal tanks. They are often confused with a storage tank, but they are much smaller.

GROUNDWATER COMPONENTS OVERVIEWS:
WWW.BSEACD.ORG/WTW

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WELL COMPONENTS

WHAT THE WELL?

Storage Tank

Barton Springs Edwards Aquifer CONSERVATION DISTRICT

What does it do?

It stores water for peak household or irrigation demand and allows the pump to gradually fill tank. Sizes range from 2,500-6,000 gal.

How does it work?

A float switch triggers pump once the water in the tank gets below the set level. Storage tanks reduce stress on the pump.

Do you have one?

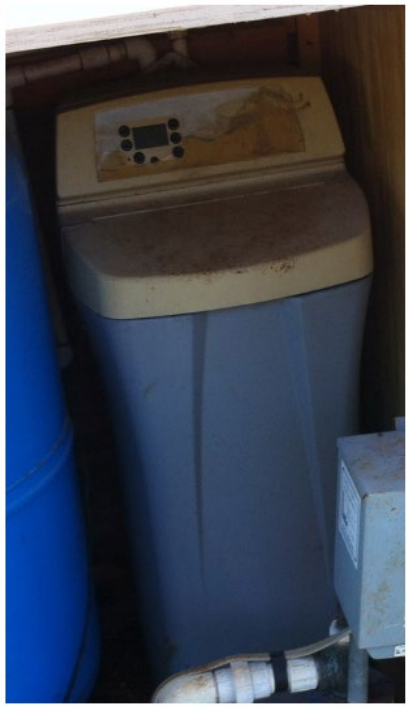
Storage tanks are especially useful for wells in drought-prone aquifers or in formations with low yield. They also can be filled by external supplies in emergencies.

GROUNDWATER COMPONENTS OVERVIEWS:
WWW.BSEACD.ORG/WTW

WHAT THE WELL?

Water Softener

Barton Springs Edwards Aquifer CONSERVATION DISTRICT



What does it do?

It is a common treatment system for "hard" water that reduces the amount of calcium in the water.

How does it work?

It uses a chemical reaction to substitute calcium ions for either sodium or potassium ions (not as likely to leave deposits in pipes). Often there is a charcoal filter incorporated as pretreatment.

Do you have one?

Water softeners (even those with charcoal filters) do not remove harmful bacteria or nitrates and do not reduce total dissolved solids.

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WELL COMPONENTS

WHAT THE WELL?

UV Light System

Barton Springs Edwards Aquifer CONSERVATION DISTRICT

What does it do?

UV light systems neutralize harmful bacteria without changing the taste of the source water.

How does it work?

Water passes through pre-filters to remove particles that would create shadows where bacteria could hide then through a light tube where the UV rays neutralize remaining bacteria.

Do you have one?

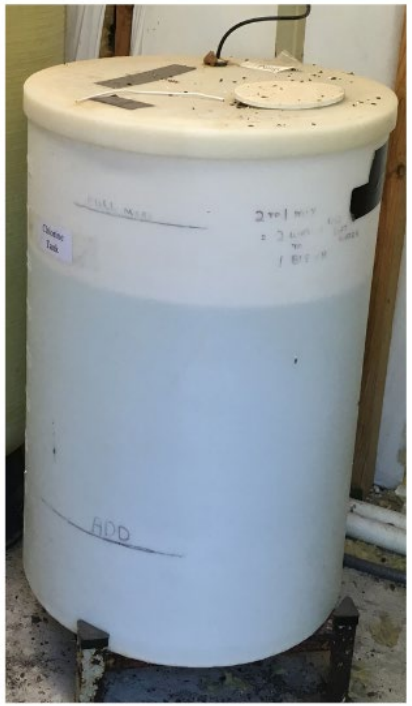
The UV light bulb should be replaced annually to maintain effective treatment. Pre-filters will need to be cleaned/replaced throughout the year.

GROUNDWATER COMPONENTS OVERVIEWS:
WWW.BSEACD.ORG/WTW

WHAT THE WELL?

Chlorinator

Barton Springs Edwards Aquifer CONSERVATION DISTRICT



What does it do?

Chlorine water treatment methods work to eliminate odor issues and disease causing bacteria.

How does it work?

Injected chlorine kills harmful bacteria and oxidizes constituents such as iron and manganese. Usually comes in liquid or pellet forms.

Do you have one?

Often paired with filtration. Consult with your professional installer to ensure proper treatment through dosage and equipment functionality.

GROUNDWATER COMPONENTS OVERVIEWS:
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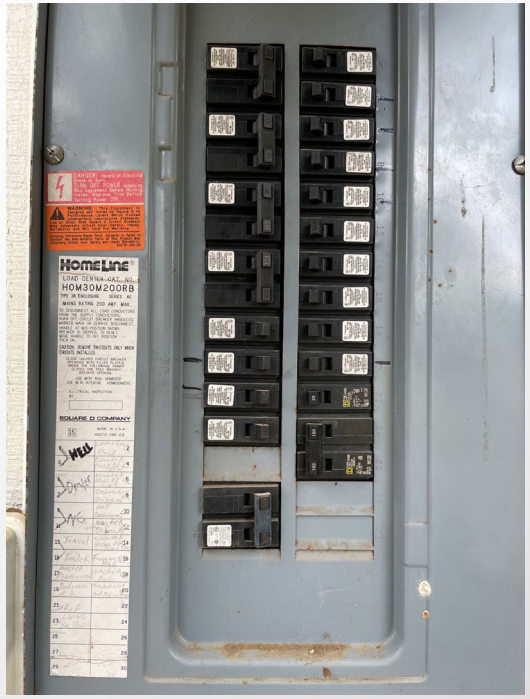
A WELL PROFESSIONAL'S ADVICE



General Practices:

1. Know where your breaker is.
2. Know where your main cutoff valve is. Exercise your main cutoff valve 1-2 times a year.
3. Have your well system checked every few years. Servicers will check for leaks, check pressure tank and pre-charge, and status of components.
4. Pumps have a certain number of starts and stops. Well components (storage and pressure tanks work to minimize those start/stops.

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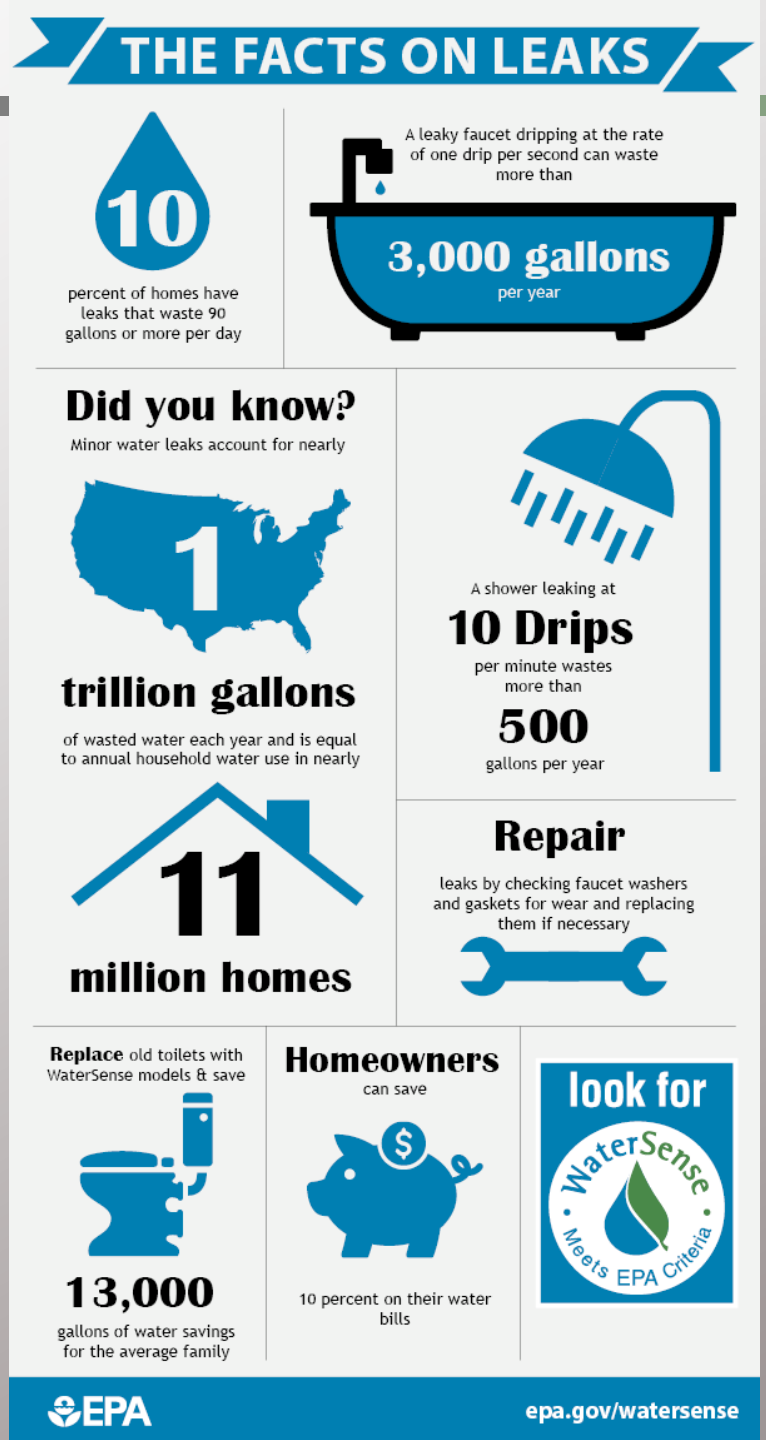
LEAKS

Leaks

1. Unnecessary water use
2. Wear and tear on your pump and distribution system
3. Wear and tear on your septic system and drain field or spray area



EPA Leak Facts:

The average household's leaks can account for nearly 10,000 gallons of water wasted every year.

Ten percent of homes have leaks that waste 90 gallons or more per day.

Common types of leaks found in the home are worn toilet flappers, dripping faucets, and other leaking valves.

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A WELL PROFESSIONAL'S ADVICE

Denver Water's "Stop the Running Toilet" Campaign

How to Check For Leaks

1. Meters make it easy. But most domestic wells don't have meters.
2. Pressure Tank trick: Listen for your pressure tank to cycle while no water is being used. Pressure tanks can have a substantial volume that needs to be depleted before they kick on (44 gallon tank has a 16 gallon threshold; 85 gallon tank has a 28 gallon drawdown). If you have a big leak, you'll hear the pressure tank kick on.
3. Cutoff Valve trick: Close the main cutoff valve for a few minutes—don't use any water. Slightly open the valve (so water flow is an audible hiss) and pay attention to how long it takes for the pressure to adjust. If it's a significant amount of time, that means the water on the downstream side of the valve leaked out.
4.

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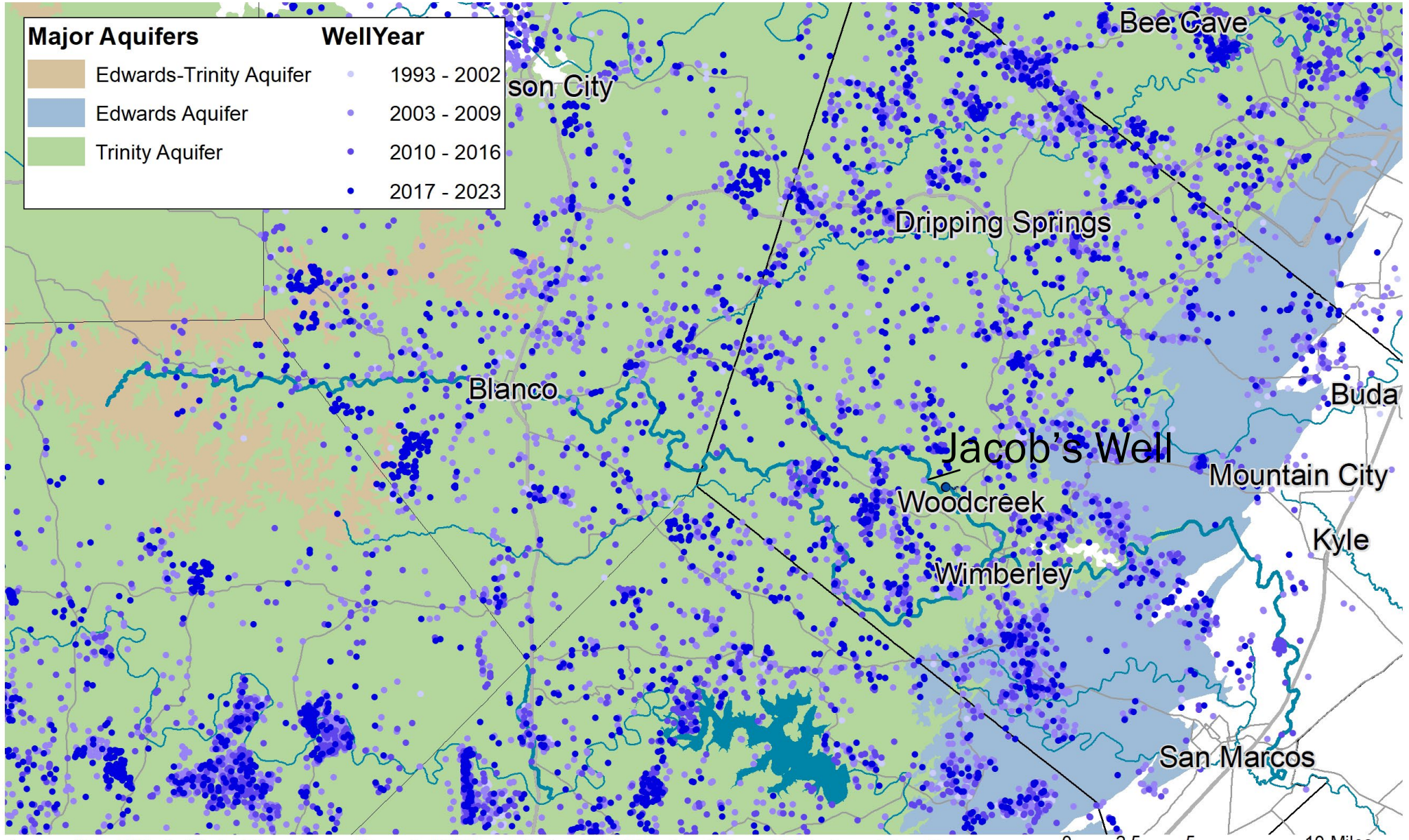
WELL TRENDS



Basemap: Water Utility Certificate of Convenience and Necessity (CCN) boundaries from Public Utility Commission, CCN Water Source information compiled from the 2022 State Water Plan and groundwater permits by groundwater conservation districts (BSEACD, HTGCD, and EAA). Groundwater Wells from Texas Water Development Board Submitted Well Drillers Reports. Map by Robin Gary, Wimberley Valley Watershed Association, March 2023

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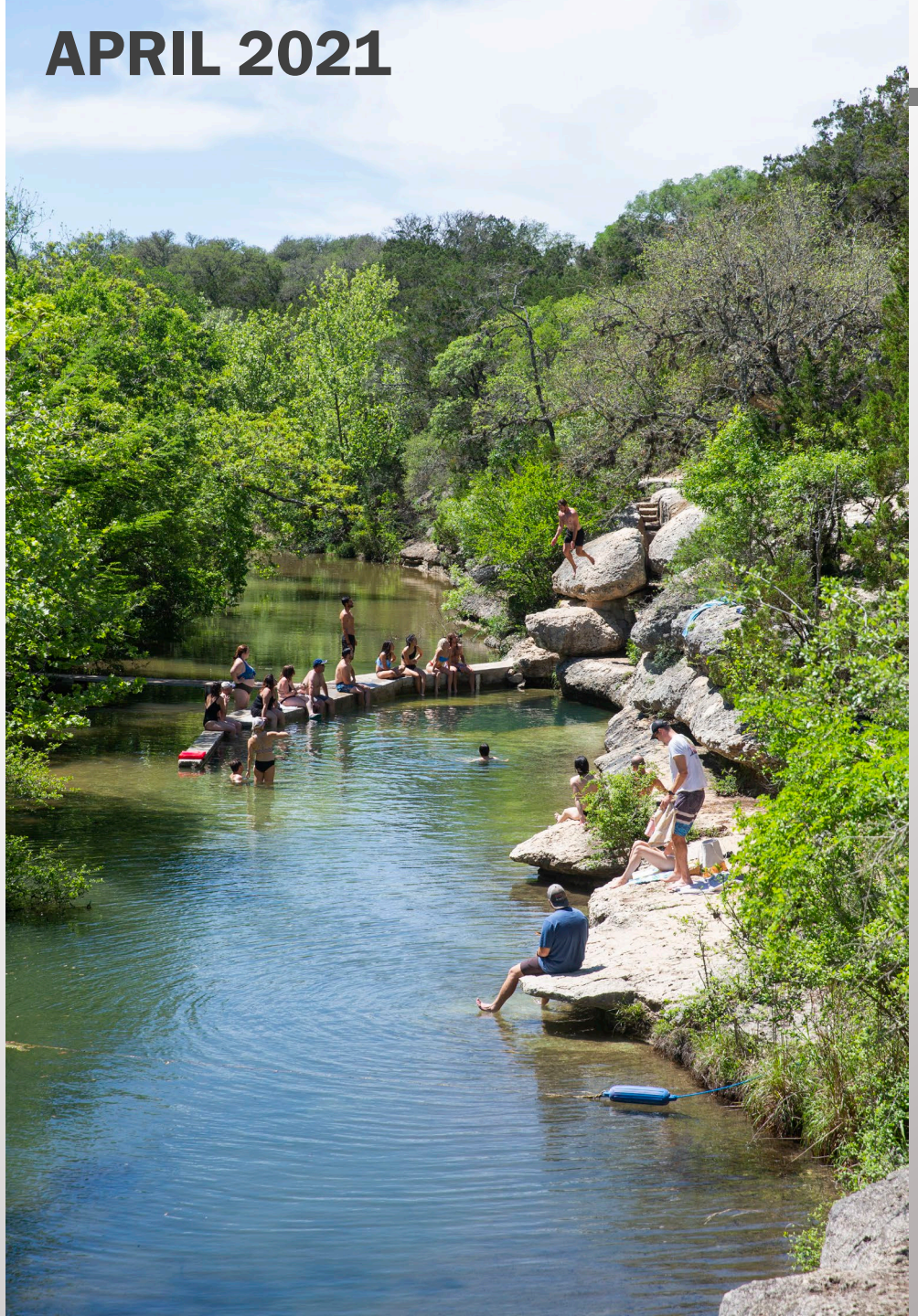
APRIL 2021



OCTOBER 2022

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HOW TO HELP

Denver Water's "Use Only What You Need" Campaign

- **Maintain a leak-free home and use only what you need.**
- **Switch to alternate supplies for non-potable uses:** One Water: rainwater, AC condensate, stormwater
- **Embrace the look and feel of the Hill Country:** Native plants are adapted to thin soils and drought/flood cycles and provide food sources for native animals.
- **Support and encourage conservation efforts:** Drought-time pumpage reductions extend available water supply and protect spring flow (and therefore creeks and rivers)
- **Support legislative/policy efforts that protect land and water resources:**
  - Texas Land and Conservation Fund – Texas Legislature (SB 2485, HB 3165, HJR 138)
  - Pristine Streams Protections - TCEQ rules
  - Regional Recharge Study Area – Hays Trinity Groundwater Conservation District research and rules

THANK YOU!

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