



Normal flow. April 2021.
Photo by Tosca.



Zero flow. October 2022.
Photo by Robin Gary

Clean Rivers Program
Coordinated Monitoring Meeting
March 15, 2023

WATERSHED ASSOCIATION PROGRAM UPDATES

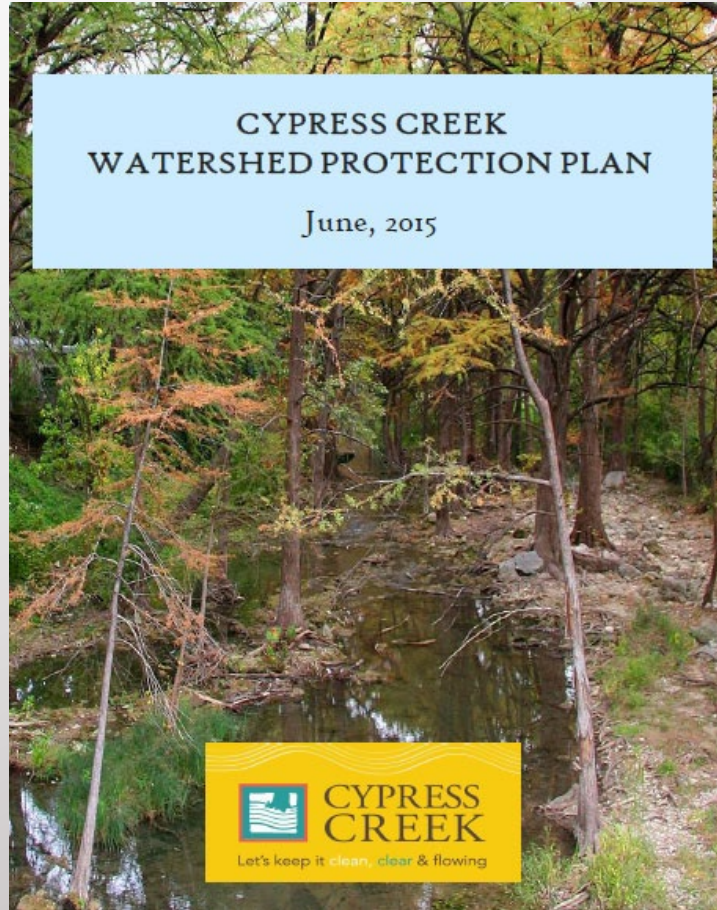
David Baker

Watershed Association

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CYPRESS CREEK WATERSHED PROTECTION PLAN & EPA 319 GRANT

- 319 Grant funds go until Aug 2023.
- Watershed Association helping wrap up deliverables.
- Working on a sustainability plan.
- Cypress Creek listed on 303D list for impaired DO and aquatic life.
- Clear need to continue work.



RIPARIAN WORKSHOP
LEARN, SHARE, INSPIRE!

Hays County's Sentinel Peak Preserve, Blanco River. Wednesday, March 22, 2023, 10am-2pm

Public and private riparian landowners and practitioners across Hays County are invited to a Riparian Workshop at Sentinel Peak Preserve to discuss the importance of riparian lands, access best practices, stewardship, and tips and tricks for maintenance.

Space is limited. Details and to RSVP: <https://forms.gle/WamijSL4F6Rm5z6>

CYPRESS CREEK
Let's keep it clean, clear & flowing



Welcome to the Wimberley Valley!

Let's keep it clean, clear & flowing

Based on the findings of the 2010 Inland Aquatic Camp, the Inland Aquatic Management Team (IAMT) and Regional Inland Aquatic Management Team (RIAMT) were established. Remediation (long-term) planning and self-assessments were conducted and design requirements and design were developed to the Inland Aquatic Management Team (IAMT) and Regional Inland Aquatic Management Team (RIAMT).

Water quality in the Wimberley Valley depends on water pumped from our aquifers. Most water withdrawn from the Middle Trinity Aquifer is used for irrigation. The water is treated and pumped to the Wimberley Valley. Much of the year, that water provides most of the base-flow to the major concrete channel of the Wimberley Valley - Cypress Creek and the Barton River.

The health of the aquifer, springs, and creeks are important to the life who live here and the life who visit. Local well drilling is a concern to drought. Though we need good water wells in dry springs due to excessive drought, we can better regulate and protect through efficient water management.

Upper Trinity Aquifer
Middle Trinity Aquifer
Lower Trinity Aquifer

CYPRESS CREEK
Let's keep it clean, clear & flowing



DROUGHT & GROUNDWATER PUMPING IMPACTS ON JACOBS WELL FLOW

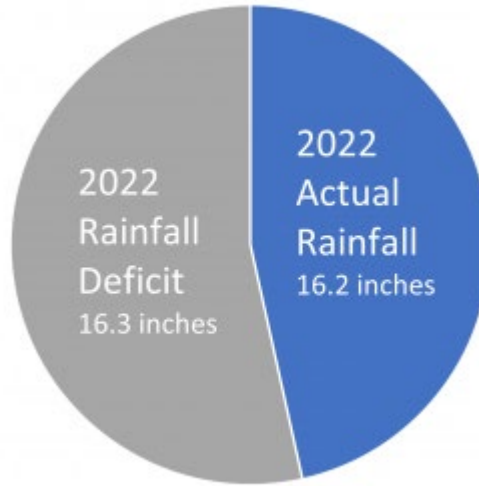
- Zero flow for the 5th time
- Less than have average rainfall
- Impacts on Cypress Creek and inflows to Blanco River and Edwards Aquifer

Days of Zero Flow at Jacob's Well

Year	Number of Days
2022	35
2013	14
2011	18
2009	33
2000	manual measurements only

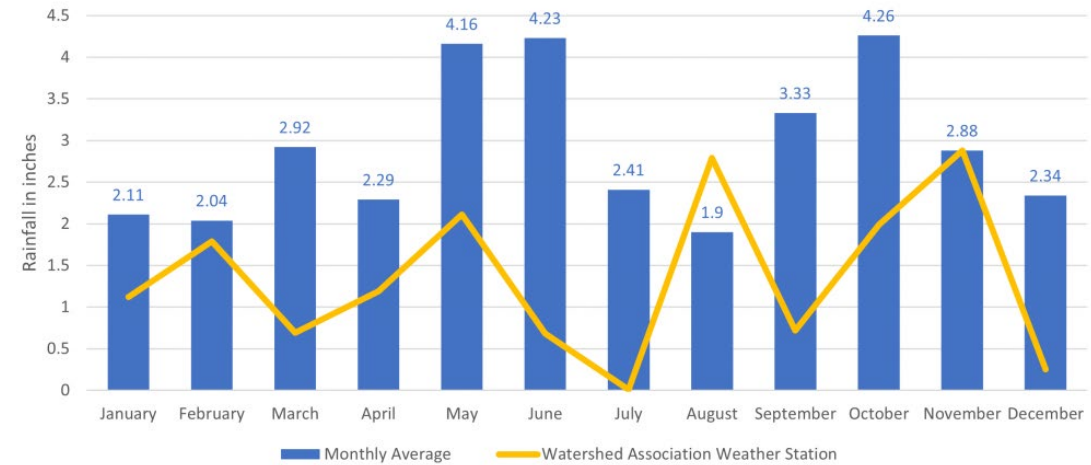
2022 IN REVIEW FOR JACOB'S WELL & CYPRESS CREEK

Average Annual Rainfall: 34.87 inches

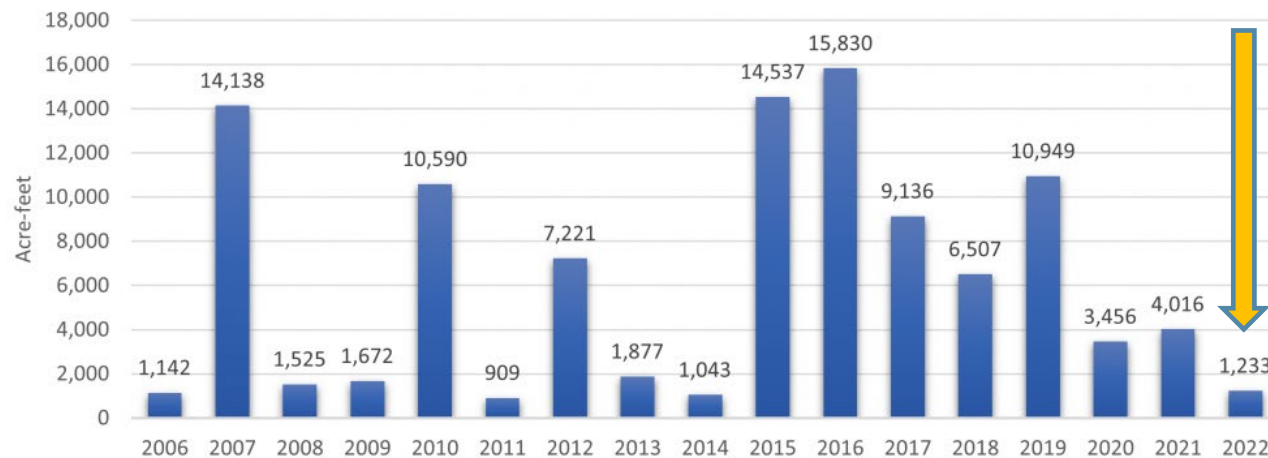


Watershed Association, 2022

Monthly Average vs. 2022 Measured Rainfall



Jacob's Well Estimated Annual Discharge in Acre-Feet



DROUGHT & GROUNDWATER PUMPING IMPACTS ON JACOBS WELL FLOW

- Woodcreek North development surge – 400 additional lots on the market.
- Aqua Texas test wells and coordinated monitoring effort for aquifer test.
- Research and discussions with Aqua Texas on ways to reduce impact to spring flow.

Opportunities for Additional Wastewater Reuse in Woodcreek and Wimberley

April 2021



Project Objectives & Overview

A mass balance approach was used to analyze the supply and demand of Aqua Texas wastewater effluent for allowable reuse in and around Woodcreek and Woodcreek North. Using treated effluent in place of groundwater for the golf courses and other current uses would be preferred, and is a way to reduce pumping in the Jacob's Well Groundwater Management Zone (JWGMZ) and lessen impacts on Jacob's Well.

Comparison to Other Golf Courses

In order to assess whether additional effluent could be used on the golf courses, average irrigation demands of several other golf courses, all located in Austin, were examined and shown in the table below. At present, the Woodcreek North golf course is not operating or receiving irrigation water. Therefore, assuming the same irrigation water use as 2002 – 2010, the Quickstart

Current Wastewater P

Currently, all wastewater effluent is pumped to a wastewater treatment facility located in Springs Road to the Quicks Texas is permitted by TCEQ of golf course (including the Woodcreek North) and a fu wastewater treatment facility conditions is provided in the maximum effluent available f

Opportunities for Reducing Non-Revenue Water in Woodcreek North

April 2021



Project Objectives & Overview

The potential costs and benefits associated with identifying and repairing leaks within the water distribution system in Woodcreek North was assessed. Current non-revenue water (NRW) estimates were compared to those at other small systems in Texas, and then potential funding opportunities to pay for leakage reduction activities were identified.

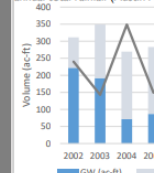
Non-Revenue Water is the "distributed volume of water that is not reflected in customer billings" (AWWA, 2012). It is made up of **unbilled authorized consumption**, **apparent losses** (data handling errors, metering inaccuracies, and unauthorized consumption), and **real losses** (including leakage on transmission and distribution mains and service connections).

Potential NRW Reduction Strategies

Leak detection and repair. (a) Passive: identifying leaks through review of billing records, flow records, or similar data; (b) Active: identifying leaks through the use of visual inspection or leak detection equipment

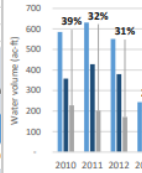
Use of Treated Effluent

Based on data provided by from 2002 – 2010 Quickstart 303 ac-ft/year of water. Of 303 ac-ft (37% is groundwater, time, due to rainfall and other available time-series of annual total rainfall (Austin A



Current NRW in Woodcreek North

NRW trends in Woodcreek North for the past ten years are shown in the chart below. NRW since 2010, with a cur through 2019). The average approximately 68 ac-ft; this and distribution and equates permit volume.



Comparison to Other U

Average NRW losses are sh values as reported to the Te (TWDB) by other utilities in improvement has been made of loss is unavoidable, there reduce NRW to fall within t Texas (approximately 17% day losses are nearly double small utilities.

Population
Woodcreek North, 2015 – 20
Small Utilities in Texas (i.e. se 10,000 customers), 2015 med
All Texas Utilities, 2015 media
*Gallons per Service Connect

For further info

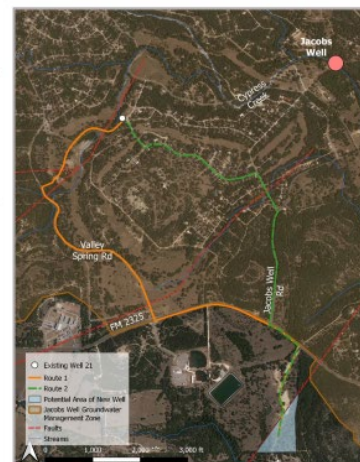
Opportunities to Reduce Pumping near Jacob's Well: Cost Estimates for Proposed Pipeline Routes

Costing Model
The Texas Water Development Board's Uniform Cost Model (UCM) was used as a framework to assess well and pipeline costs. The costs presented in the table below were developed based on required pipeline and well design parameters, as well as engineering, environmental permitting, legal, project management, system operations and maintenance, and interest costs. No fees for groundwater use, land acquisition, or groundwater rights were considered in this analysis. The Net Annual Cost accounts for the savings involved in shutting down operation of wells 21 and 22 that are currently in service.

Conclusions The two pipeline routes offer flexibility for the path to take from the potential groundwater well site to the existing ground storage tank at Well 21. Route 2 is the shortest and most affordable route in terms of project costs and annual operations and maintenance (O&M) costs. For Route 2, with an annual average demand of 167 gpm, the lowest total project cost estimate is \$933,000, excluding land acquisition. If current annual demand were tripled to 500 gpm, to simulate future potential growth, the lowest total project cost estimate is \$1,762 million. More importantly, the annual costs, including debt service and O&M, range from \$75,000 to \$145,000 for the three scenarios. All scenarios assume that a single new well would be required. Also, preliminary geochemical analyses indicate no treatment of the down dip water would be needed.

Next Steps

1. Identify a suitable location for a new well.
2. Conduct aquifer pump tests to determine the sustainability of a down dip well(s).
3. Explore funding opportunities for substituting water sources.



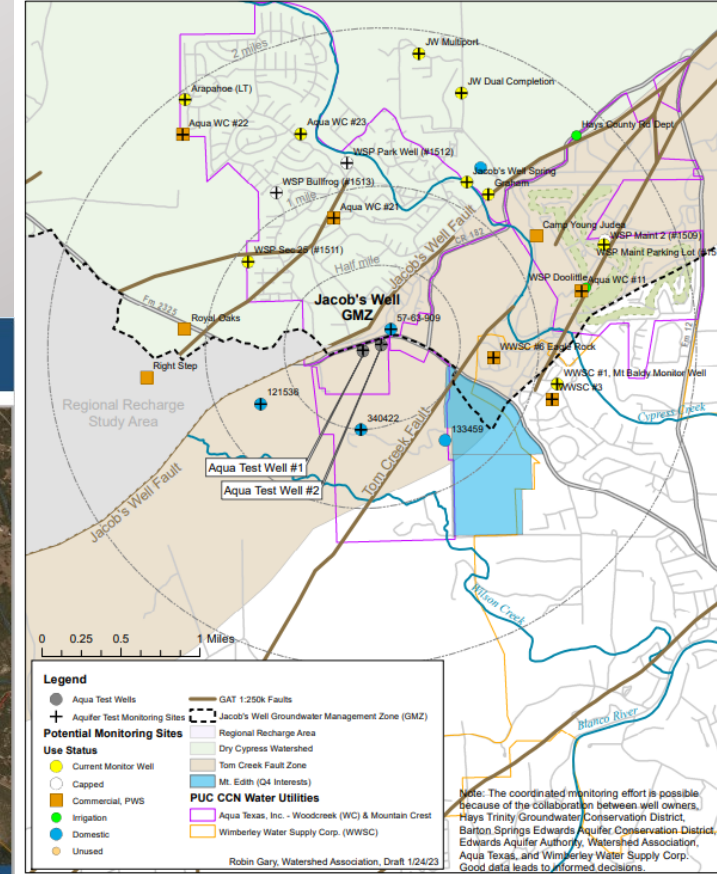
Route No.	Total Length of Pipeline (mi)	Length in Rock (mi)	Length in Soil (mi)	Number of Roadway Crossings
1	2.27	1.52	0.75	4
2	1.82	1.53	0.29	6

Right: Pipeline routes from potential well down dip of JWGMZ to Well 21
Bottom: Estimated Total Project Costs and Net Project Costs

Average Demand (gpm)	Peak Design Demand (gpm)	Total Pipeline Cost	Total Well Cost	Total Project Cost	Annual Debt Service	Annual O&M, Pumping Costs	Total Net Annual Cost	Net Cost of Water, per 1,000 gallons (Excl. Debt Service)	Net Cost of Water, per 1,000 gallons (Excl. Debt Service)
167	200	\$346,000 - \$529,000	\$492,000 - \$620,000	\$838,000 - \$1,149,000	\$63,000 - \$71,000	\$19,000 - \$26,000	\$83,000 - \$97,000	\$0.85 - \$0.91	\$0.08 - \$0.16
210	252	\$505,000 - \$700,000	\$552,000 - \$608,000	\$1,057,000 - \$1,308,000	\$75,000 - \$86,000	\$23,000 - \$26,000	\$98,000 - \$112,000	\$0.76 - \$0.87	\$0.07 - \$0.10
500	600	\$984,000 - \$1,052,000	\$778,000 - \$799,000	\$1,762,000 - \$1,851,000	\$120,000 - \$126,000	\$48,000 - \$51,000	\$168,000 - \$177,000	\$0.52 - \$0.55	\$0.06 - \$0.07

For further information contact: David Baker | Email: davidbaker@wimberleywatershed.org | Phone: 512-722-3390

Aqua Woodcreek North Test Wells Proposed Aquifer Test Coordinated Monitoring Sites



Legend

- Aqua Test Wells
- Aquifer Test Monitoring Sites
- Potential Monitoring Sites
- Use Status
- Current Monitor Well
- Capped
- Commercial, PWS
- Irrigation
- Domestic
- Unused
- GAT 1:250K Faults
- Jacob's Well Groundwater Management Zone (GMZ)
- Regional Recharge Area
- Dry Cypress Watershed
- Tom Creek Fault Zone
- Mt. Edith (O4 Interests)
- PUC CCN Water Utilities
- Aqua Texas, Inc. - Woodcreek (WC) & Mountain Crest
- Wimberley Water Supply Corp. (WWSC)

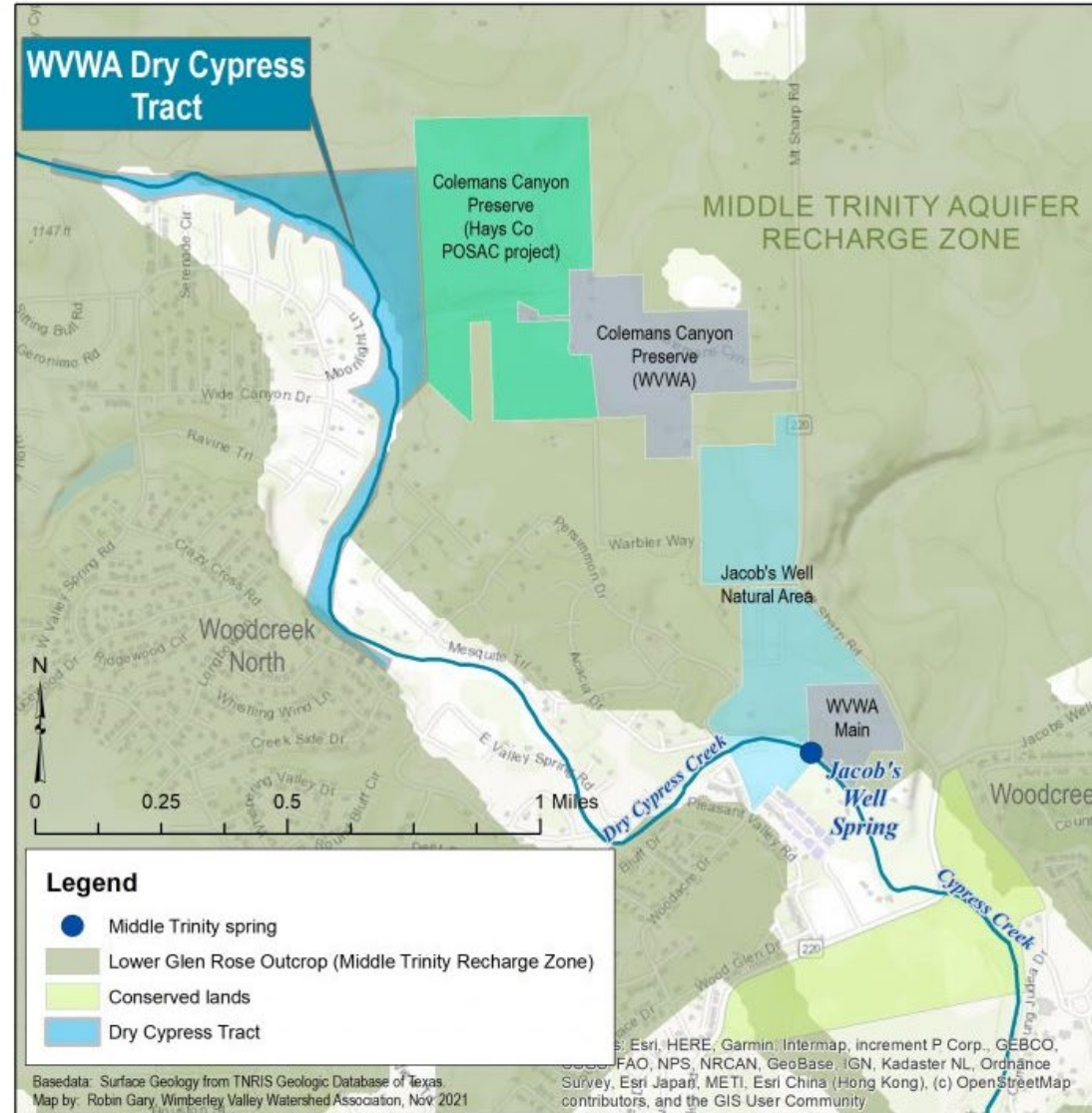
Note: The coordinated monitoring effort is possible because of the collaboration between well owners, Hays Trinity Groundwater Conservation District, Barton Springs Edwards Aquifer Conservation District, Edwards Aquifer Authority, Watershed Association, Aqua Texas, and Wimberley Water Supply Corp. Good data leads to informed decisions.

Robin Gary, Watershed Association, Draft 1/24/23



LAND CONSERVATION

- Hays County \$75M Parks and Open Space Bond Status
- Watershed Association projects: Dry Cypress and Colemans Canyon



CITY OF BLANCO WATER RECLAMATION TASK FORCE

- 2+ year collaborative work group
- Recommendation to transition from direct discharge to TLAP
- CRP data & biologic surveys show direct discharge negatively impacts water quality in the Blanco River
- Direct discharge happening for past 2 weeks @ 100,000 gal/day.



Blanco River looking upstream from the 165 Bridge, CRP site. Photo taken 3/10/23 by Robin Gary, Watershed Association

Blue Hole Primary School

The first One Water School in Texas!

Built with STEM principles to minimize water use, safely reuse, and protect community water supplies.

Harry L. Willett Foundation



THE MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY



O'CONNELL ROBERTSON

WHAT'S NEXT?

- Continue to inspire and inform One Water projects
- Coordinate with teachers, students, and families to teach One Water principles
- Develop One Water curriculum
- Unlock performance data to make publicly accessible
- Apply One Water principles at all building scales (residential, multi-family, commercial, neighborhood, etc.)

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