

2019 ANNUAL REPORT



All photos were taken during the Trinity Oasis, LLC 30 day pump test.



Every drop counts!

*Clearwater UWCD
P.O. Box 1989
Belton, Texas
www.cuwcd.org*

Photos Courtesy of Dr. Joe C. Yelderman Jr., Baylor University



District Mission Statement

Develop and implement an efficient, economical and environmentally sound groundwater management program to protect and enhance the water resources of the District.

Clearwater Underground Water Conservation District

Annual Report - Fiscal Year 2019

The Annual Report for Fiscal Year 2019 (FY19) is presented to the Directors of the Clearwater Underground Water Conservation District (CUWCD or District) by May of the following Fiscal Year (May 2020). This report summarizes the activities and accomplishments of the District during FY19 focusing on administrative tasks, management plan requirements, and miscellaneous activities. Most activities are based on the District's fiscal year; however, information dealing with well registration, permitting, and production are based on the 2019 calendar year.

2018-2019 Board of Directors



Jody Williams
Precinct 3

Gary Young
Precinct 2

Leland Gersbach
Precinct 1

David Cole
At-Large

Scott Brooks
Precinct 4

Contents

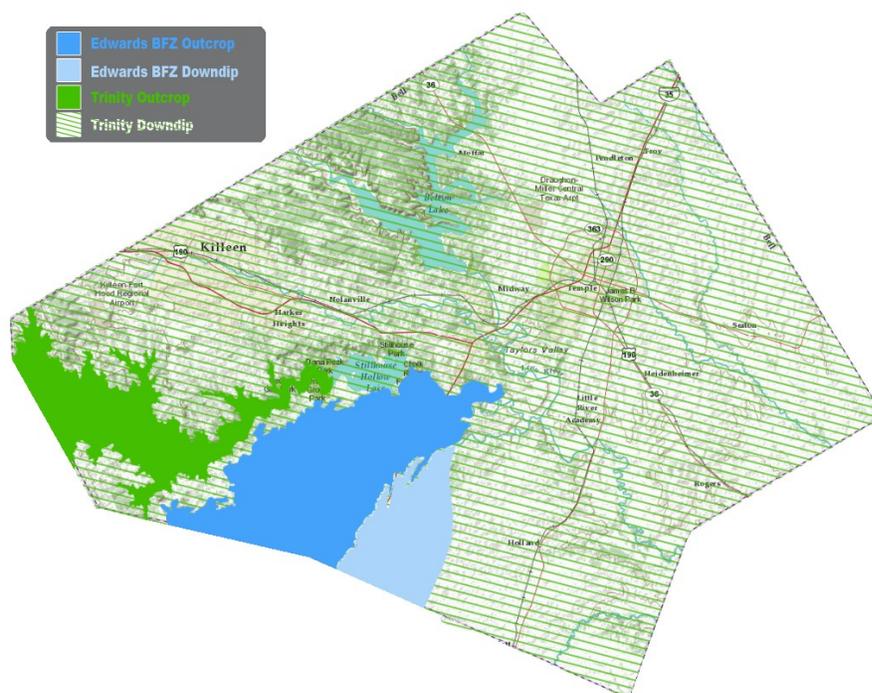
1. Introduction	5
2. Administrative Tasks	5
A. Contracts / Agreements	6
1. Technical Consulting Services	6
2. Legal Services	8
3. Other Services	8
B. Financial Items	9
1. Budget and Tax Rate	9
2. Financial Audit	9
C. Miscellaneous Policies / Issues	10
1. District Rule Amendments	10
2. Bylaws Revised	10
D. Board of Directors	10
1. District Officers	10
2. Meetings - FY19 (Oct 2018-Sept 2019)	11
E. Management Plan	11
3. Management Plan Requirements	11
A. Providing the Most Efficient Use of Groundwater	12
1. Well Registrations	12
2. Permitted Well Applications	12
3. Groundwater Database	13
4. Annual Newsletter	18
B. Controlling and Preventing Waste of Groundwater	19
C. Addressing Conjunctive Surface Water Management Issues	19
D. Addressing Natural Resource Issues Which Impact the Use and Availability of Groundwater, and which are impacted by the Use of Groundwater	20
E. Addressing Drought Conditions	20
1. Monitor Drought Conditions in the Edwards Aquifer	21
2. Monitor Drought Conditions in the Trinity Aquifer	22
F. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, and Brush Control, Where Appropriate and Cost-Effective	23
1. Conservation	23
2. Rainwater Harvesting	23
3. Brush Control	233
4. Recharge Enhancement	24
G. Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resources	24
1. Salado Springs	24

2. (a) Static Water Level Measurements	25
2. (b) Changes in Water Levels	26
4. Miscellaneous Activities	26
A. Abandoned Wells.....	26
B. Bell County Water Symposium.....	27
C. Internet Site.....	27
5. Summary	28

1. Introduction

The Clearwater Underground Water Conservation District was created by the State legislature in 1989 to manage the groundwater resources of Bell County. The District was approved by the voters of Bell County in August 1999 and opened its doors for business in February 2002. Clearwater's fiscal year runs from October 1st through September 30th. This report summarizes the accomplishments and activities of the District during FY19; but reflects registration, permitting, and production figures for the 2019 calendar year.

The District manages the groundwater resources from two major aquifers: The Trinity and The Edwards (BFZ) in Bell County, TX. The Trinity aquifer underlies all of Bell County and is below the Edwards (BFZ), while the Edwards (BFZ) is located in just the southern part of the county.



The Trinity aquifer is comprised of three water bearing layers within the boundaries of Bell County. These layers are the Upper Trinity (Glen Rose), Middle Trinity (Hensell), and Lower Trinity (Hosston). Other water bearing formations in Bell County are Alluvium, Austin Chalk, Buda, Edwards Equivalent, Kemp, Lake Waco, Ozan, and Pecan Gap.

2. Administrative Tasks

Administrative tasks include internal administrative activities necessary for a groundwater district to function effectively. Management Plan requirements include the required tasks and activities identified in the District's Management Plan. Miscellaneous activities include other activities and programs that have been an integral part of the District but are not required by the Management Plan.

A. Contracts / Agreements

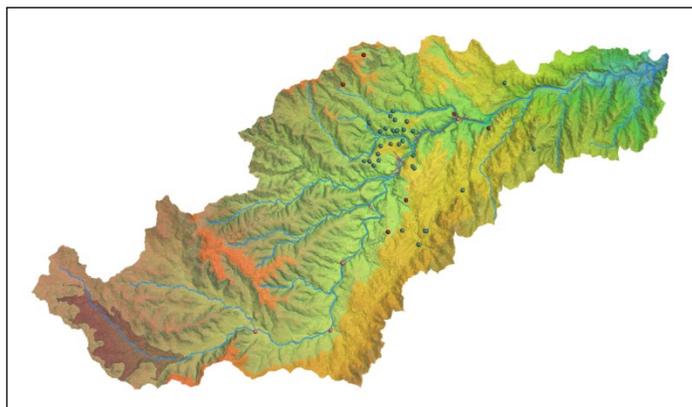
1. Technical Consulting Services

LRE Water, LLC / WSP, USA

Clearwater UWCD has continued with a professional services contract for general consulting with LBG-Guyton Associates that began in calendar year 2014 and included fiscal years FY14, FY15, FY16, FY17 and FY18. In January of 2018, LBG-Guyton was sold to WSP, USA. WSP, USA continues to provide technical representation of the district in GMA 8 relating to development of desired future conditions associated with required joint planning. In FY19, Clearwater UWCD began a professional services contract with LRE Water, LLC who provides administrative and technical reviews of drilling and operating permits along with investigative analysis of aquifer conditions and well construction complaints.

Allan R. Standen, LLC

Clearwater UWCD maintains a professional services contract with Allan R. Standen LLC for general consulting services and the annual update of our 3D model. The 2019 updates included the addition of new geophysical and well drilling logs from throughout the county to the 3D model. Updating our model on an annual basis allows for a more accurate analysis and use of this tool by district staff, consulting hydrogeologists, and landowners for well development and prognosis of the aquifer depths prior to drilling. The tool also continues to assist the district in source aquifer determination of newly drilled wells.



Salado Creek Watershed from Bell County 3D
Groundwater Model

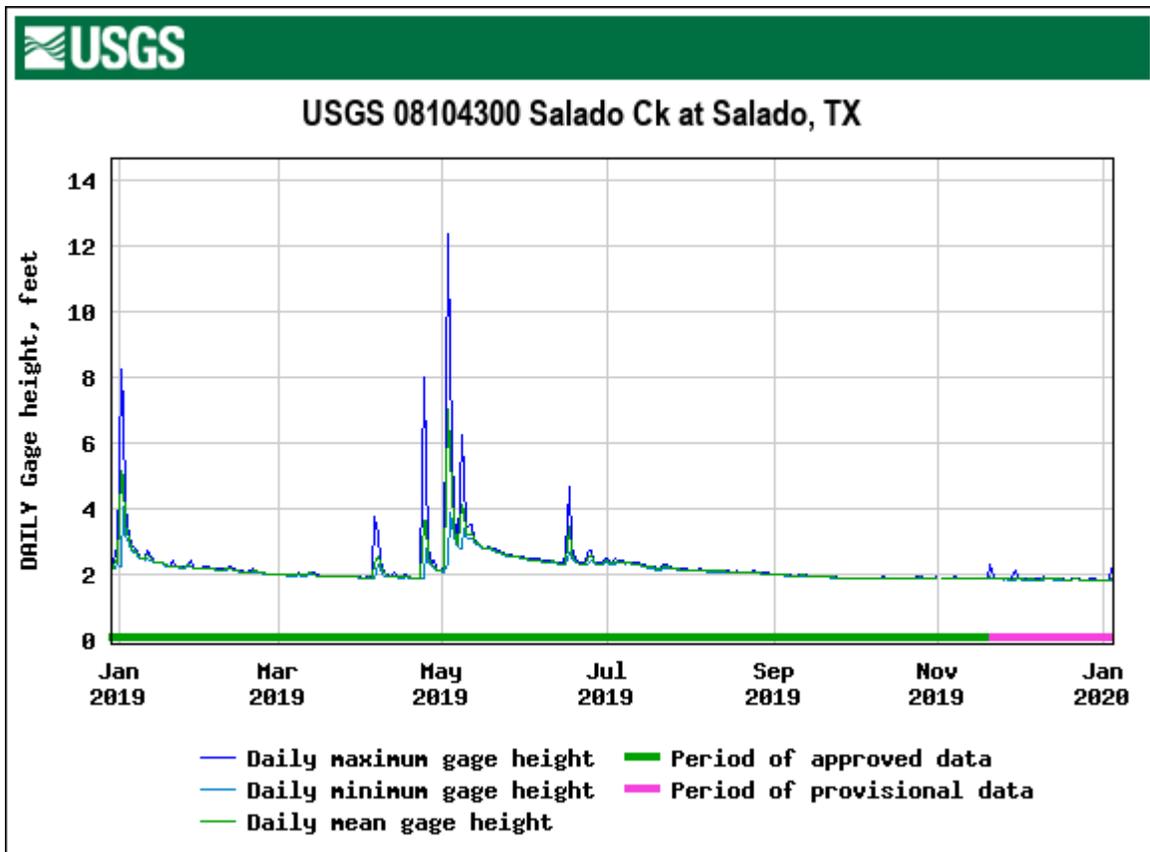
Halff Associates, Inc

Halff Associates, Inc. created and continues to manage the District's online GIS website. This GIS platform allows the District web-based access to the entire database of wells that has been compiled through the years. All well information is available online to staff as well as the public. Some of the information available includes well latitude and longitude along with ground level elevation of the well head and total depth of well. In 2019, Halff Associates continued technical support and hosting of the District's online GIS website.

U. S. Geological Survey, Texas Water Science Survey

During the spring of 2013 the USGS gauging system was installed in the Salado Creek and the process of analyzing the data and recalibrating the system began. Throughout 2019, the system was continuously fine-tuned to ensure accuracy of the data collected. This gauging system and relationship with the USGS have proved to be an important step forward in monitoring spring flow both now and well into the future. The image below shows the 2019 stream flow data taken by the gauging system in Salado Creek. The live data can be found online on our website:

<http://www.cuwcd.org/salado-springs/salado-creek-gauges/>



Baylor University, Department of Geology

Clearwater UWCD continues to contract with the Department of Geology at Baylor University to conduct research projects. The overall goal for the proposed research is to gain a deeper understanding of the Northern Segment of the Edwards Aquifer. Specifically, knowledge of how much recharge occurs and the pathways that recharge takes to the aquifer will greatly assist groundwater resource management. An enhanced scientific understanding of the Northern Segment of the Edwards Aquifer will provide insight to CUWCD and community stakeholders, as well as support collaboration between the district and community in future decision-making processes that will be impacted by the Endangered Species Act.

In FY19, the District jointly contracted with WellIntel and Baylor University to deploy a groundwater-level monitoring network in the District to complement ongoing monitoring in the Middle Trinity

aquifer. The goal of this program is to gain experience in how the WellIntel technology works and to become familiar with the data management and analytical capabilities, and to demonstrate how the instrumentation of private wells pumping in the Middle Trinity aquifer can provide insight into the stress experienced by the aquifer, over and above what is being seen by dedicated monitoring wells.

The studies the District has funded can be found on our website: <http://www.cuwcd.org/aquifer-science/edwards-bfz-aquifer/>

2. Legal Services

The District requests legal consulting services on an as-needed basis and utilizes Lloyd Gosselink Rochelle & Townsend, P.C. (LGRT) for consultation. LGRT was the District's sole advisor during FY19 which included the following issues:

- Research and guidance on permitting issues, spacing issues, rule interpretation, public hearing notices, meeting cancellation notices, conservation easements and topics allowed for discussion in closed session.
- Representation of groundwater districts at Texas Water Conservation Association Groundwater Sub-Committee on Desired Future Conditions.
- Research and guidance on the listing of the Salado Salamander, the process for comments and support of CUWCD as they engaged as a stakeholder with the Bell County Adaptive Management Coalition.

3. Other Services

Bell County Adaptive Management Coalition

The Board entered into an interlocal agreement beginning in fiscal year 2012 that continued into fiscal year 2019. CUWCD, the Bell County Commissioners Court, Village of Salado, Salado Water Supply Corporation, Temple Area Builders Association and Billie Hanks, Jr. have collectively contributed \$360,737.74 since 2012 to evaluate current science and to develop new science regarding the Edwards (BFZ) aquifer and the Salado Salamander habitat. Total expenditures for FY12 - FY19 are \$283,462.12 leaving a balance of \$77,847.17 to fund the FY20 studies. The District defends the position that regulating mechanisms are in place (by CUWCD) on spring flow to protect the specie.

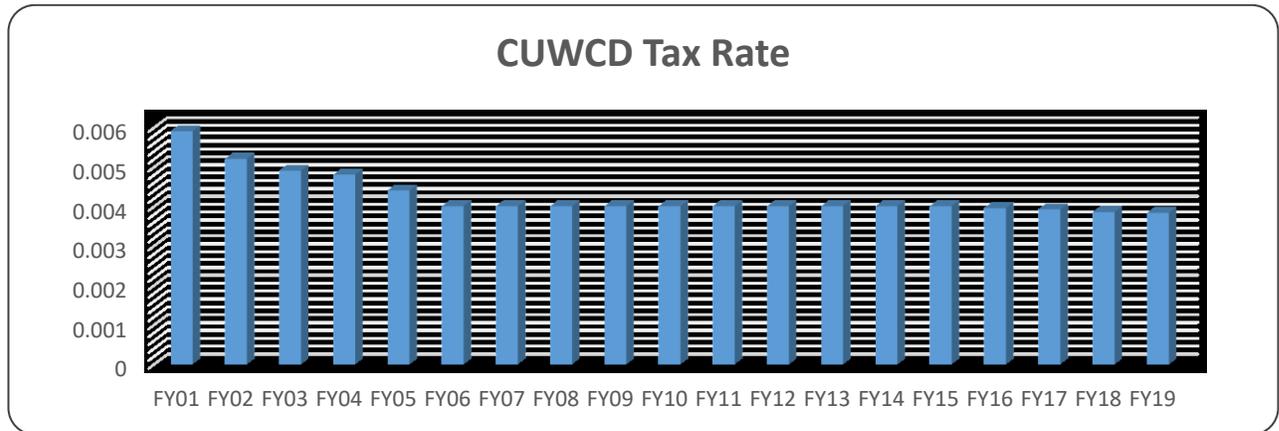
Alton D. Thiele, P.C.

An annual audit of the District's finances is required by Chapter 36.153 of the Texas Water Code to determine the financial condition of the district. Alton D. Thiele, P.C., Certified Public Accountant located in Belton, Texas provides the annual financial audit for the District. For more information, see section "B.2 Financial Audit" later in this report.

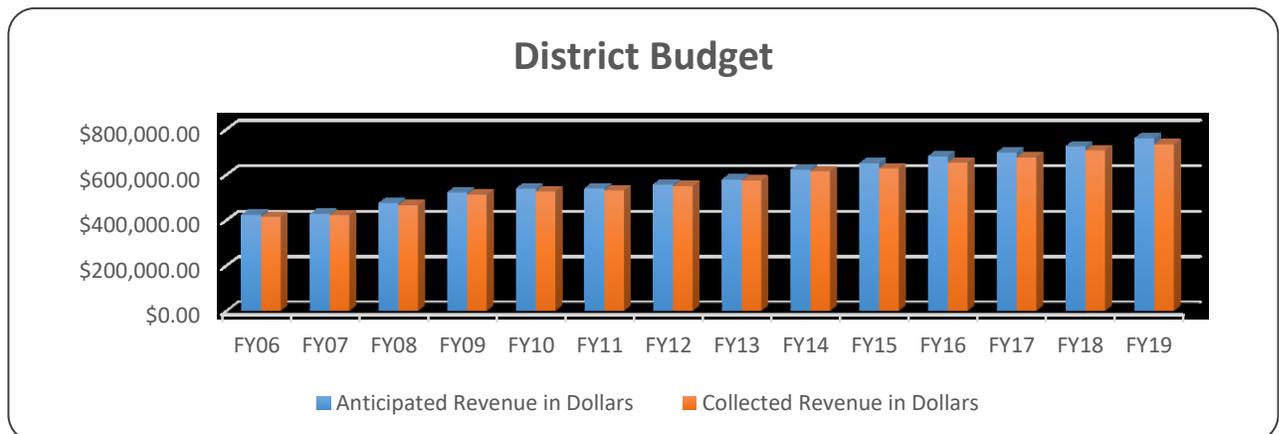
B. Financial Items

1. Budget and Tax Rate

The adopted tax rate for FY19 was \$0.00383/\$100 valuation. The Board voted to lower the tax rate for the fourth consecutive year. Since the inception of the District, the Board has consistently lowered or kept the same tax rate since it began assessing taxes. Two workshops (June and July) were held in 2018 to develop an operating budget for the upcoming fiscal year (FY19) and to set the corresponding ad valorem tax rate. The Board voted to lower the tax rate for FY19 to \$0.00383/\$100 valuation.



The Budget for FY19 was \$759,711.00, actual income collected was \$733,178.84. The total expenditures for FY19 were \$605,608.82. The Board prescribed closing the year with \$127,570.02 being returned to the Reserve Fund.



The approved budget for FY19, along with the schedule of revenues and expenditures is attached as Appendix A.

Online: <http://www.cuwcd.org/public-records/cuwcd-budget/>

2. Financial Audit

An annual audit of the District's finances is required by Chapter 36.153 of the Texas Water Code to determine the financial condition of the District. Alton D. Thiele, P.C., Certified Public Accountant

located in Belton, Texas provided the 2019 annual financial audit for the District. The audit began immediately at the closing of FY19 on September 30, 2019 and they concluded their audit and submitted their findings to the District in February 2020.

See Appendix B for FY19 Financial Audit.

Online: <http://www.cuwcd.org/public-records/audits/>

C. Miscellaneous Policies / Issues

1. District Rule Amendments

The Board amended the District Rules in March 2016 in accordance with Chapter 36 requiring public notice, a public hearing, and Board approval. The suggestions to the rule amendments were based on the legislative mandates from the seven bills that were passed by the Texas Legislature that affected Chapter 36 of the Texas Water Code, previous discussions, construction standards and water quality within the District.

See our website for complete rules: <http://www.cuwcd.org/regulatory-program/district-rules/>

2. Bylaws Revised

At the time the District Rules were amended, the rules that addressed the operations of the District were deleted and moved to the Bylaws. The Board of Directors approved the amendments to the Bylaws by resolution on April 13, 2016.

See our website for complete Bylaws: <http://www.cuwcd.org/district-overview/bylaws/>

D. Board of Directors

1. District Officers

The Board of Directors, per District bylaws, elect officers annually at the first board meeting of the calendar year. The FY 2019 Officers are identified below with the office they held and precinct they represent. The a map of the Bell County Commissioner Precincts serves as the precinct boundaries for the District.

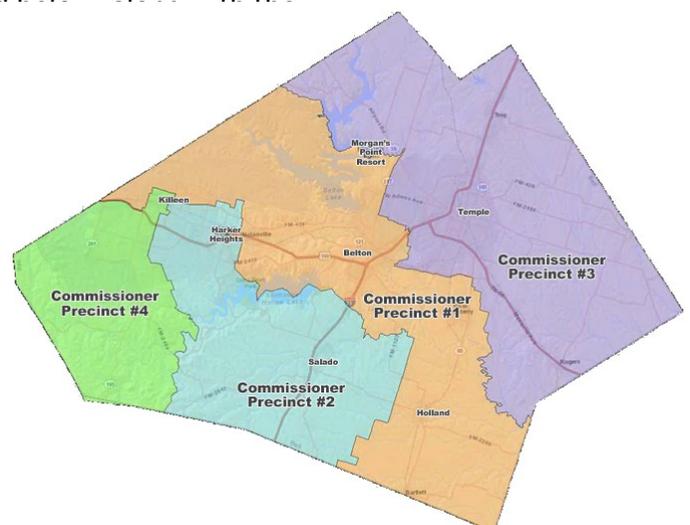
Leland Gersbach, President – Precinct 1

David Cole, Vice President – At Large

Gary Young, Secretary – Precinct 2

Jody Williams, Director – Precinct 3

Scott Brooks, Director – Precinct 4



In October of 2018, Director Wallace Biskup resigned as the Precinct 3 Director. Jody Williams was appointed as the new Precinct 3 Director on December 12, 2018 and sworn in on January 9, 2019.

2. Meetings - FY19 (Oct 2018-Sept 2019)

The Board of Directors held 13 Board meetings and 1 informational meeting in FY19. The Workshops and regular Board meeting agendas included discussion and presentations on the topics listed below.

- Presentations by USGS Water Science Group
- Presentations by Baylor University regarding current status of the Edwards (BFZ) Aquifer
- Legislative updates
- Conduct hearings on drilling and operating permits
- Salado Salamander issues as it pertains to CUWCD's governance of groundwater

All board meeting agendas, minutes, and financial reports can be viewed online by visiting <http://www.cuwcd.org/public-records/>

E. Management Plan

Texas Water Code, Chapter 36.1071--36.1073, states the District Management Plan must be reviewed and readopted every 5 years. The plan is then subject to approval by the Texas Water Development Board (TWDB). Clearwater's Management Plan was due to the TWDB by March 6, 2016. Proposed revisions for the 5-year update to the District Management Plan went through one preliminary review by the Texas Water Development Board (TWDB). The revised Management Plan was accepted on January 13, 2016 by the Board following the public hearing on the revised Management Plan. Afterwards, the Board adopted the revised plan. The Management Plan was sent to TWDB for approval prior to the due date, March 6, 2016. The District received approval from TWDB on February 19, 2016. The current Management Plan was amended on January 9, 2019 with changes only being made to the DFC and Subsidence sections of the current plan. The Management Plan was sent to TWDB for approval prior to the due date and the District received approval from TWDB on March 12, 2019. The current Management Plan is set to expire on January 13, 2021. The District Management Plan can be found on CUWCD's website at: <http://www.cuwcd.org/district-overview/management-plan/>

4. Management Plan Requirements

The District Management Plan identifies the goals and objectives of the District and provides performance standards and tracking methods to measure the District's effectiveness in meeting these goals. The District goals are mandated by Texas Water Code Chapter 36, Section 36.1071. Although all groundwater conservation districts are subject to these goals, each district chooses how to best

implement the goals within their district by establishing their own objectives and performance standards.

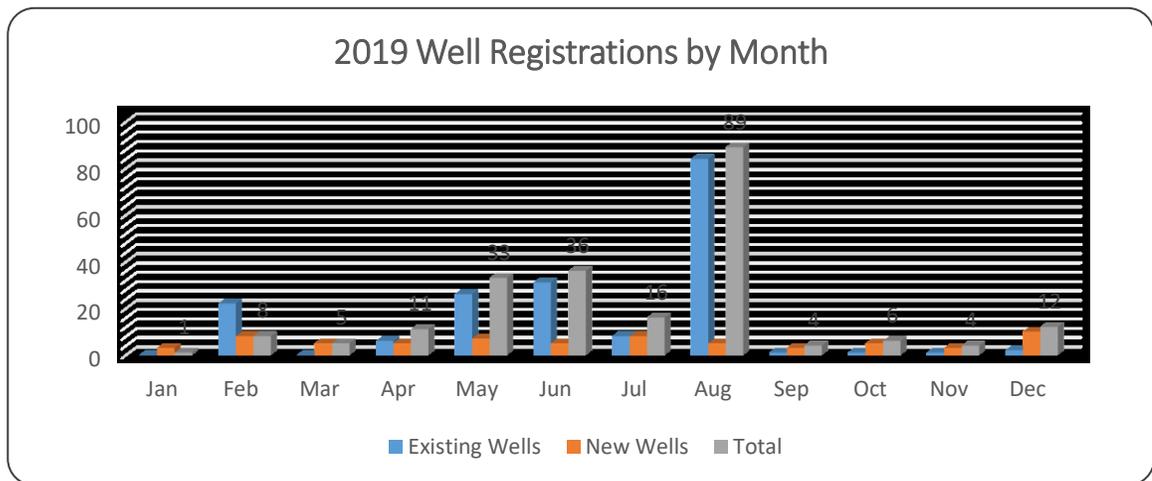
A. Providing the Most Efficient Use of Groundwater

1. Well Registrations

Objective: Each year, the District will require the registration of all wells within the District’s jurisdiction.

Objective Satisfied

During calendar year 2019, 249 wells were registered. The tables below summarize well registration and permitting activity from January 1, 2019 through December 31, 2019.



Appendix C for Master Registration Table

2. Permitted Well Applications

Objective: Each year, the District will require permits for all non-exempt use of groundwater in the District as defined in the District rules, in accordance with adopted procedures.

Objective Satisfied

Of the 249 wells registered in 2019, only 10 of those were classified as non-exempt. The Table below summarizes the non-exempt wells or permits that were approved during 2019 and the corresponding permits that were issued where applicable.

Non-Exempt Permitted Well Registrations for 2019 Calendar Year

Well #	Land Owner	Ac-Ft / Year	Aquifer	Use	Permit Type
N1-19-003P	Gary Kelley	0.197	Lower Trinity	Domestic	Drilling & Operating
N1-19-007P	Lone Star Land Partners, LLC	0.60	Middle Trinity	Domestic	Drilling & Operating
N1-19-008P	Lone Star Land Partners, LLC	0.60	Middle Trinity	Domestic	Drilling & Operating
N2-19-001P	CenTex Acres 1	0.61	Middle Trinity	Domestic	Drilling & Operating
N2-19-002P	CenTex Acres 2	0.61	Middle Trinity	Domestic	Drilling & Operating
N2-19-003P	Mike Eveans	0.50	Middle Trinity	Domestic	Drilling & Operating

3. Groundwater Database

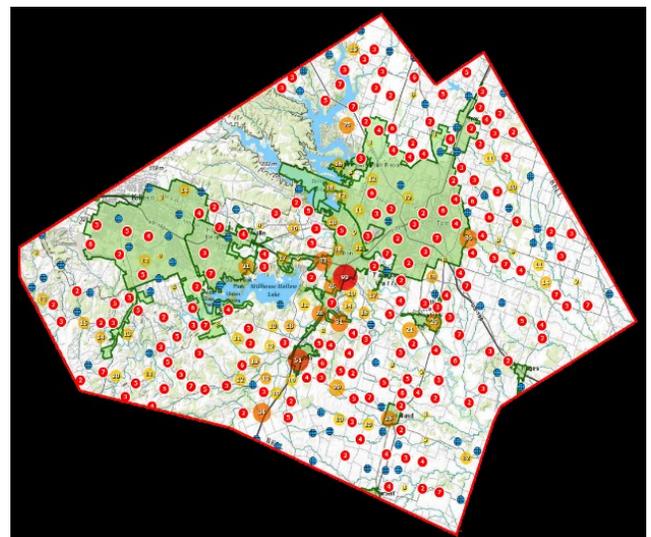
Objective: Each year, the District will maintain a groundwater database to include information relating to well location, production volume, and other pertinent information deemed necessary by the District to enable effective monitoring of groundwater in Bell County.

Objective Satisfied

District GIS Database

The District maintains an online GIS system and works closely with Halff Associates, Inc. to provide web-based access to our ever growing database of well information. Every well registered in the District is available in our database with latitude and longitude and the elevation of the land surface at the well head. With the well information, the District can attach production and permit information along with other pertinent data. The public maps are available on the District website's homepage, or by going to the following web address and clicking on Public Access Maps:

<http://www.cuwcd.org/>



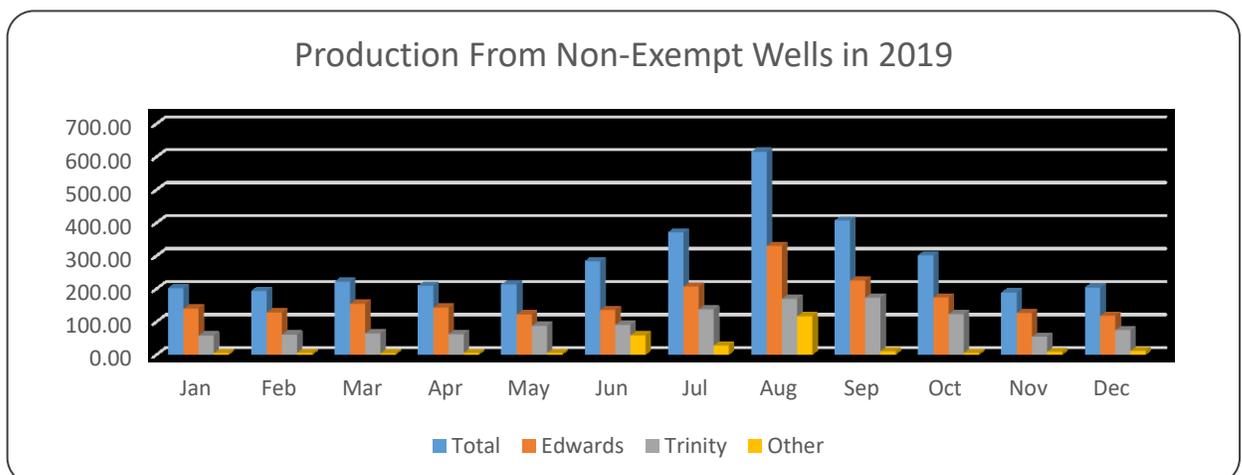
Non-exempt Well Production

The District continued collecting data from non-exempt wells during 2019. Monthly production reports are required by the 5th day of the following month for all wells with operating permits. The tables below show the total permitted amount for the non-exempt wells and their total production. In 2019, actual water production figures were significantly lower than the amount permitted. Part of this is due to the issuance of Historic and Existing Use Permits (HEUP). The HEUPs are issued for the full permit amount, regardless of whether the permittee will be using this amount during the year.

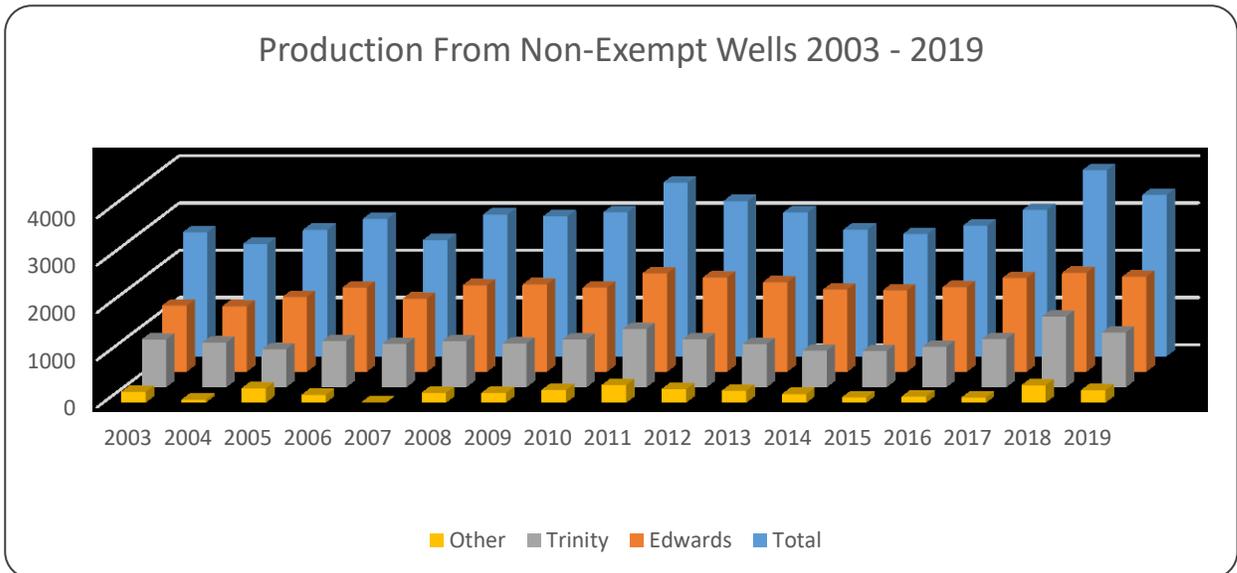
2019 Permitted Wells

	Permitted Ac-Ft	# Permitted Wells	Actual Use Ac-Ft	# Active Permitted Wells	% Usage
Edwards (BFZ)	2,510.47	54	1,994.45	45	79.45%
Trinity (total)	4,499.21	65	1,147.43	48	25.50%
Glen Rose	132.05	5	48.84	4	36.99%
Hensell	469.68	35	88.82	23	18.91%
Hosston	3,897.48	25	1,009.77	21	25.91%
Other Aquifers	578.50	21	256.72	16	44.38%
Total	7,588.18	140	3,398.6	109	44.79%

The following chart shows 2019 production by month and aquifer. Production was at its highest level during the month of August with a monthly withdrawal of 614.38 ac-ft. Throughout the year, withdrawals from the Edwards BFZ were consistently higher than from the Trinity aquifer. Production from other source formations was minimal throughout the year. Production from other source formations is higher during summer months which reflects agriculture irrigation necessary at that time of year.



In the following graph, production from 2019 (109 wells) is shown compared to production in years 2003 through 2018. Overall production in 2019 was 3,398.6 ac-ft which is slightly lower than the total production in 2018. The Edwards (BFZ) had a total production for 2019 of 1,994.45 ac-ft, total Trinity aquifer production was 1,147.43 ac-ft, and other formations produced 256.72 ac-ft of water.



See Appendix D for 2019 Well Production Report

Groundwater Transport

During 2019, six entities in Bell County transported groundwater outside the District. A total transport of 87.38 ac-ft. occurred from the Edwards BFZ aquifer and 92.43 ac-ft. from the Trinity aquifer. The District is allowed by state law to charge a transport fee of \$0.025/1,000 gallons transported. This generated a total revenue of \$1,464.77 for 2019.

Entity	Aquifer	County	Ac-Ft	Gallons	Fee
Bell-Milam-Falls WSC	Lower Trinity	Falls, Milam, Williamson	26.13	8,514,011	\$212.85
Central Texas WSC	Lower Trinity	Falls, Milam	63.00	20,529,720	\$513.24
East Bell WSC	Lower Trinity	Falls	0.77	250,555	\$6.26
Jarrell-Schwertner WSC	Edwards (BFZ)	Williamson	87.38	28,472,608	\$711.82
Little Elm Valley WSC	Lower Trinity	Falls	1.67	542,961	\$13.57
O&B WSC	Lower Trinity	Falls	0.86	281,240	\$7.03
		TOTAL	179.81	58,591,095	\$1,464.77

Water Loss in Public Water Systems

The District tracks water loss of all public water supply systems in Bell County that utilize groundwater. Real Losses, also referred to as physical losses, are actual losses of water from the system and consist of leakage from transmission and distribution mains, leakage and overflows from the water system's storage tanks and leakage from service connections up to and including the meter.



Water leaking from a supply line

Bell County Water Loss 2014-2019

Entity	2019 Loss (% of water)	2018 Loss (% of water)	2017 Loss (% of water)	2016 Loss (% of water)	2015 Loss (% of water)	2014 Loss (% of water)
Armstrong WSC	19.00	18.00	11.12	15.74	15	13
Bell Co. WCID #2	14.00	11.10	9.20	8.34	11	9
Bell Co. WCID #5	24.71	16.72	20.97	10.64	14	15
Bell-Milam-Falls WSC	41.92	36.60	29.03	32.06	26	34
Central Texas WSC	9.00	8.00	8.30	9.25	NA	NA
City of Troy	21.70	34.75	17.20	9.94	N/R*	24.5
East Bell WSC	14.42	16.21	12.54	8.23	14.64	13.71
Jarrell-Schwertner WSC	50.00	48.04	49.33	50.72	56.45	54.25
Little Elm Valley WSC	20.75	23.04	22.16	25.30	33	27
Moffat WSC	26.00	26.70	19.68	10.43	16	6.37
Oenaville/Bellfalls WSC	6.42	7.39	8.99	15.29	16.6	14.47
Pendleton WSC	22.03	24.43	20.30	23.94	17.23	22.73
Salado WSC	8.30	9.76	7.60	8.80	9.8	9.6

* Not Reported

Exempt Well Production

Each year, the exempt wells that have been registered are evaluated. The aquifer from which they are producing is determined and an estimate of their total annual production is calculated. The results are shown below for exempt wells registered through December 31, 2019. Most of the exempt wells in Bell County are used for domestic purposes and their use estimate assumes 106 gallons/person per day (USGS estimate of domestic use outside of a municipal water system) and 2.76 persons/household (U.S. Census Bureau, Population Estimates Program (PEP) July 1, 2019). Exempt well use estimate factors out all plugged, capped, monitor and inactive wells in the database.

2019 Exempt Well Production

	Reserved	Estimated Use*	# Wells
Edwards (BFZ)	825 ac-ft	361 ac-ft	841
Trinity	1,419 ac-ft	765 ac-ft	1,505
Other Aquifers	N/A	790 ac-ft	1,478
Total	2,244 ac-ft	1,916 ac-ft	3,824
* Domestic use estimate assumes 106 gallons/person per day (USGS estimate of domestic use outside of a municipal water system) and 2.84 persons/household (U.S. Census Bureau, Population Estimates Program (PEP) July 1, 2019)			

See Appendix E for 2019 Exempt Well Use

Combined Well Production Data

Combining the production from the non-exempt wells with the estimated production from the exempt wells, the following production figures result:

Aquifer	Non-Exempt Well Production (Ac-Ft / Year)	% of Total Permitted	Estimated Exempt Well Production (Ac-Ft / Year)	% of Total Reserved	Total Production (Ac-Ft / Year)	% of Total Available
Edwards (BFZ)	1,994.45	79.45	361	43.76	2,355.45	36.41
Trinity	1,147.43	25.50	765	53.91	1,912.43	20.64
Other Aquifers	256.72	44.38	790	N/A	1,046.72	N/A
Total	3,398.6	44.79	1,916	55.66	5,314.60	27.12

The chart above shows that overall, exempt wells account for approximately 55.66% of all the

groundwater produced in Bell County. In the Trinity, 53.91% of production is attributed to exempt wells and in the Edwards BFZ, exempt wells account for 43.76% of groundwater production.

Overall, production from the Edwards BFZ aquifer accounts for 36.41% of total groundwater used in Bell County and the Trinity aquifer accounts for 20.64% of total groundwater used in Bell County.

Modeled Available Groundwater - Analysis of Permits and Exempt Use Reserves (in acre feet)

Aquifer	MAG Modeled *	Reserved for Exempt	Managed	HEU Permit	Operating Permit	Remaining MAG
Edwards (BFZ)	6,469	825	5,644	2,209.70	300.77	3,133.53
Trinity	9,266	1,419	7,847	1,502.60	2,996.61	3,350.10
Paluxy	0			0	0	0
Glen Rose (Upper)	974	693	281	61.90	70.15	148.95
Hensell (Middle)	1,099	548	551	259.30	210.38	81.32
Hosston (Lower)	7,193	178	7,015	1,181.40	2,716.08	3,117.52

* The Modeled Available Groundwater (MAG) is the estimated amount of water available for permitting assigned to Clearwater UWCD by the Executive Administrator of TWDB.

See Appendix F for the 2019 Edwards and Trinity Aquifer Status Reports

4. Annual Newsletter

Objective: Each year, the District will disseminate educational information on groundwater through publication of a District newsletter.

Objective Satisfied

Annually, the District publishes a newsletter and mails it to registered well owners in Bell County. In 2019 the total number of newsletters printed were 3,300 with 3,154 copies directly mailed to well owners. The others are handed out to people that come into the office and electronic copies are emailed out to permit holders and other interested parties.

See Appendix G for Annual Newsletter.

Online: <http://www.cuwcd.org/district-overview/district-newsletter/>

B. Controlling and Preventing Waste of Groundwater

Outreach and Education

Objective: Each year, the District will disseminate educational information on controlling and preventing the waste of groundwater focusing on water quality protection through at least one classroom or public presentation.

Objective Satisfied

District staff is available to speak to any group within our geographical boundaries. In 2018, District staff reached over 2,493 adults and children in Bell County directly through giving presentations and making contact at event booths. We often give power point presentations to adult groups explaining the District and how we function along with covering important water topics like conservation and watershed management.

In the classroom, we provide the Major Rivers curriculum and give supporting presentations with an Enviroscope watershed model and rainfall simulator. We make sure to always have handouts for the kids like color changing pencils, rulers and cups that change color when cold water is poured in. All handouts are branded with district information and most items have water conservation tips printed on them.

See Appendix H for Education and Outreach Events.

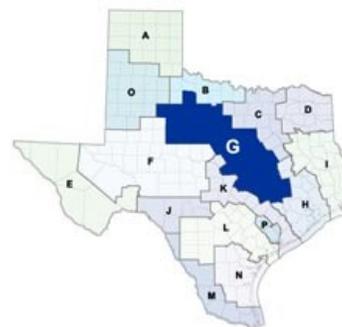
C. Addressing Conjunctive Surface Water Management Issues

Regional and Joint Planning Process Participation

Objective: Each year, the District will participate in the regional planning process by attending a minimum of two meetings of the Brazos G Regional Water Planning Group per fiscal year.

Objective Satisfied

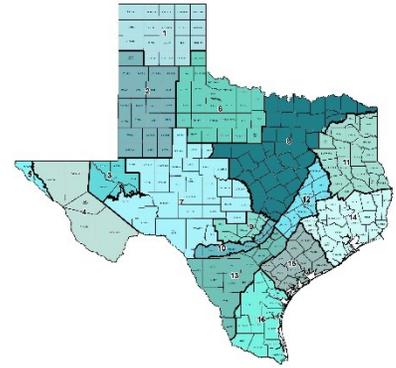
During FY19, District General Manager Dirk Aaron attended the scheduled meetings listed below. Dirk Aaron was also elected by the GMA8 Membership to represent the Groundwater Management Area as an appointed member of Region G. Dirk also serves on the Brazos G Scope of Work Committee.



March 20, 2019	Attended	July 10, 2019	Attended
May 22, 2019	Attended	September 25, 2019	Attended

Online: <http://www.brazosgwater.org/>

In addition to the regional planning group, District General Manager Dirk Aaron and Director Gary Young also attended the meetings for Groundwater Management Area 8. Groundwater Management Areas were created in order to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs or their subdivisions, consistent with the objectives of Section 59, Article XVI, Texas Constitution.



November 30, 2018	Attended	July 26, 2019	Attended
May 6, 2019	Attended		

Online: <http://www.gma8.org>

D. Addressing Natural Resource Issues Which Impact the Use and Availability of Groundwater, and which are impacted by the Use of Groundwater

Monitoring Water Quality

Objective: Each year the District will monitor water quality within the District by obtaining water samples from wells and testing the water quality of at least 6 wells.

Objective Satisfied

The District has an in-house water quality lab and offers a free screening service to registered well owners. Testing parameters include coliform bacteria; alkalinity; conductivity / total dissolved solids; fluoride; hardness; nitrate; nitrite; pH; phosphate; and sulfate. During FY19, the staff conducted screening on 75 groundwater samples. 28 samples tested were from the Edwards (BFZ) aquifer, 3 samples from the Upper Trinity, 31 samples from the Middle Trinity, 6 samples from the Lower Trinity, and 7 samples from other formations.

The District’s lab is intended to provide a general water quality screening only. When a certified test is needed, the District sends properly collected well samples to BioChem located in West, Texas. During FY19, no samples were sent out for certified testing.

A summary of the well screening results are shown in Appendix I.

E. Addressing Drought Conditions

The District’s Management Plan requires that the General Manager, Staff and Board of Directors review the District’s drought status on a monthly basis. The decisions to declare drought levels per the District’s Drought Management Plan approved December 17, 2009, are reviewed weekly by the General Manager. The Drought Management plans are designed to reflect conditions of the Trinity

and Edwards (BFZ) Aquifers independently of each other based on the specified triggers (PDI and/or Spring Flow).

1. Monitor Drought Conditions in the Edwards Aquifer

Objective: Each year, the District will monitor drought conditions in the Edwards aquifer through the process established in the drought management plan for the Edwards aquifer adopted by the Board of Directors.

Objective Satisfied

Under the Edwards BFZ Drought Management Plan, a drought stage is triggered when either the Precipitation Deficit Index (PDI) is less than a drought state trigger condition exceeding for a period of 28 consecutive days and shall be reduced or terminated when the PDI is greater than the trigger condition exceeding for a period of 42 consecutive days, or the average spring discharge measured via stream flow gauges in Salado Creek fall below the trigger level for the periods described time.

Online: <http://www.cuwcd.org/regulatory-program/drought-management/edwards-drought-management-plan/>

EDWARDS BFZ AQUIFER DROUGHT STATUS



Below are the declared stages during the fiscal year.

Date	Declared Drought Stage	Salado Creek Acre ft/Month	Salado Creek CFS	PDI Total	PDI % Total
10/9/2018	Stage 3 Drought	2,010.05	33.78	28.07	85.06
11/11/2018	No Drought	7,420.17	124.7	34.76	105.32
12/10/2018	No Drought	40,543.78	681.36	36.45	110.46
1/7/2019	No Drought	124,661.31	2,095.00	39.89	120.89
2/11/2019	No Drought	4,352.14	73.14	40.8	123.64
3/12/2019	No Drought	3,123.97	52.5	39.27	119.01
4/7/2019	No Drought	9,667.05	162.46	37.05	112.26
5/6/2019	No Drought	304,801.97	5,122.36	45.35	137.41
6/9/2019	No Drought	4,560.4	76.64	46.15	139.87
7/1/2019	No Drought	4,037.96	112.00	50.12	151.88
8/12/2019	No Drought	1,824.40	30.66	48.36	146.63
9/4/2019	No Drought	1,185.32	19.92	46.71	141.53

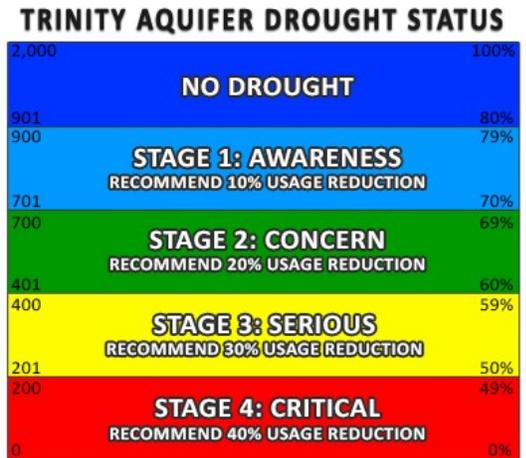
2. Monitor Drought Conditions in the Trinity Aquifer

Objective: Each year, the District will monitor drought conditions in the Trinity aquifer through the process established in the drought management plan for the Trinity aquifer adopted by the Board of Directors.

Objective Satisfied

Under the Trinity Aquifer Drought Management Plan, a drought stage is only to be triggered when the Precipitation Deficit Index (PDI) is less than a drought state trigger condition exceeding for a period of 28 consecutive days and shall be reduced or terminated when the PDI is greater than the trigger condition exceeding for a period of 42 consecutive days.

Online: <http://www.cuwcd.org/regulatory-program/drought-management/edwards-drought-management-plan/>



Below are the declared stages during the fiscal year.

Date	Declared Drought Stage	PDI Total	PDI % Total
10/8/2018	Stage 1 Drought	26.31	79.71
11/11/2018	No Drought	35.09	106.32
12/10/2018	No Drought	37.43	113.43
1/7/2019	No Drought	40.74	123.45
2/11/2019	No Drought	41.19	124.81
3/12/2019	No Drought	39.22	118.86
4/7/2019	No Drought	36.34	110.10
5/6/2019	No Drought	44.59	135.13
6/9/2019	No Drought	46.1	139.7
7/1/2019	No Drought	50.69	153.61
8/12/2019	No Drought	48.38	146.63
9/4/2019	No Drought	48.27	146.26

F. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, and Brush Control, Where Appropriate and Cost-Effective

1. Conservation

Objective: Each year, the District will promote conservation by conducting an annual scholastic contest on water conservation or; distributing conservation brochures/literature to the public.

Objective Satisfied

The District's Management Plan requires promotion of conservation by one outreach method/activity. During 2018, the District exceeded this requirement by aggressive outreach through classroom presentations, District's website, and other public presentations such as the annual Water Symposium. District staff reached over 2,493 adults and children in Bell County directly through giving presentations and making contact at event booths where conservation materials were both discussed and handed out.

See Appendix H for Education and Outreach Events.

2. Rainwater Harvesting

Objective: Each year, the District will promote rainwater harvesting by posting information on rainwater harvesting on the District web site.

Objective Satisfied

The District's Management Plan requires promotion of rainwater harvesting by posting information on the District website. The District satisfied this requirement by including a segment on rainwater harvesting on its website under the Education menu tab along with a link to the Texas A&M AgriLife Extension website and their Rainwater Harvesting Manual. Also included are links to Rainwater Harvesting Contacts and Suppliers and to the Texas A&M AgriLife Extension manual on Rainwater Harvesting Landscape Methods. The District's office has a rainwater harvesting setup for demonstration purposes.

<http://www.cuwcd.org/education/rainwater-harvesting/>

A copy of the posted information is included under Appendix J.

3. Brush Control

Objective: Each year, the District will provide information relating to brush control on the District web site.

Objective Satisfied

The District's Management Plan requires promotion of conservation by providing information relating to brush control on the District website. The District satisfied this requirement by including

a segment on brush control on its website under the Education menu tab. For additional information on brush control, links to the Texas A&M AgriLife Extension website are provided. Also included is a link to the Brush Management Fact Sheet produced by Environmental Defense.

<http://www.cuwcd.org/education/brush-control/>

A copy of the posted information is included under Appendix K.

4. Recharge Enhancement

Objective: Each year, the District will provide information relating to recharge enhancement on the District web site.

Objective Satisfied

The District's Management Plan requires promotion of conservation by providing information relating to recharge enhancement, and the District satisfied this requirement by including a segment on recharge enhancement on its website under the Education menu tab. For additional information on recharge enhancement, links to the Texas State Soil and Water Conservation website, and the Leon River Restoration Project website are provided. In addition, the District has contracted with Baylor University to help gain a better scientific understanding of the Edwards (BFZ) and its recharge zone.

<http://www.cuwcd.org/education/recharge-enhancement/>

A copy of the posted information is included under Appendix L.

G. Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resources

1. Salado Springs

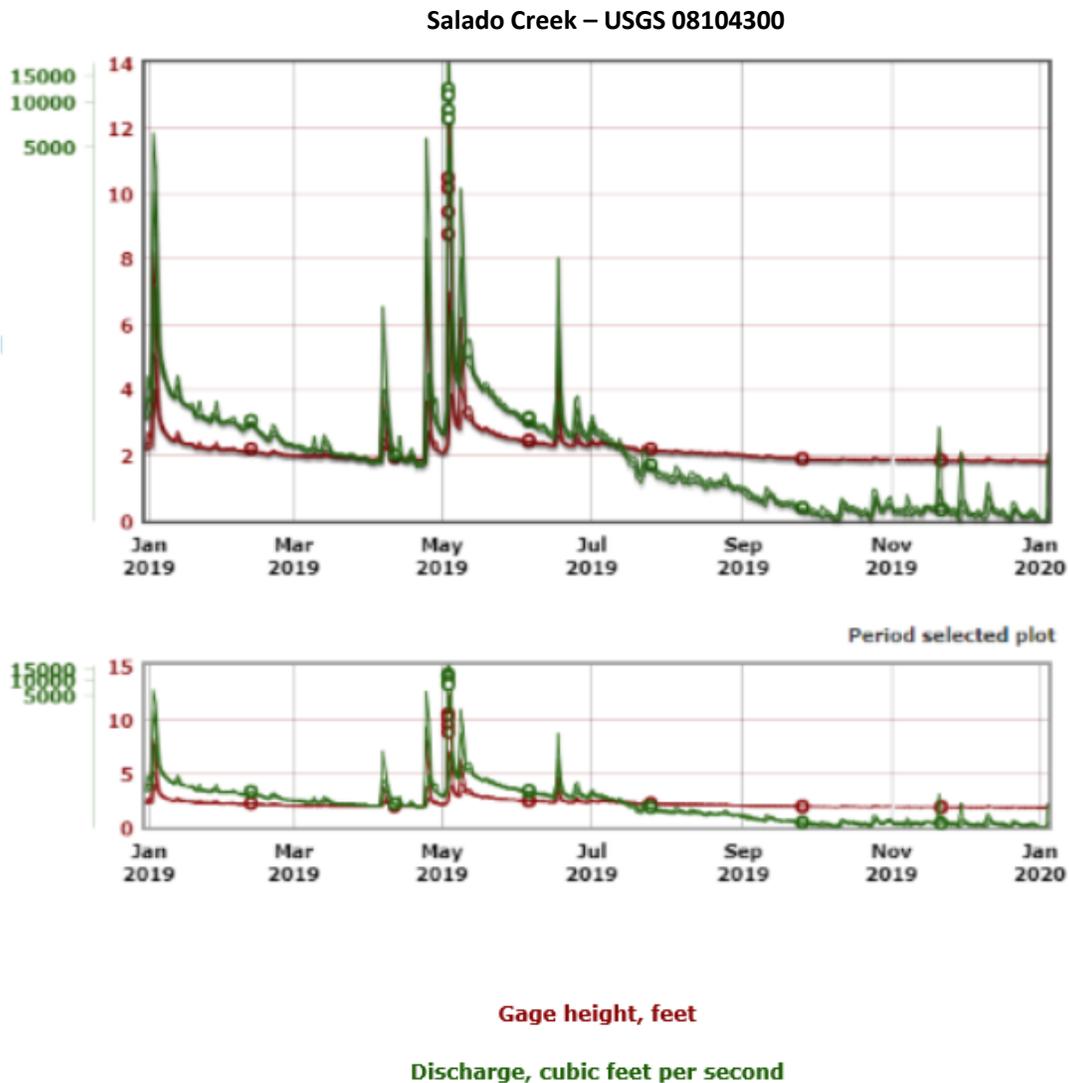
Objective: Each year, the District will include a summary of the monthly average discharge rate of Salado Springs and a discussion of the conservation measures implemented (if any are necessary) to avoid impairment of the Desired Future Conditions for the Edwards aquifer established by GMA-8, in the Annual Report to the Board of Directors.

Objective Satisfied

The gauges in the Salado Creek have been an important mechanism to protect spring flow. The District began collecting data from the Salado Creek stream flow gauges during FY08 with the assistance of multiple contractors. During the spring of 2013 an upgraded gauge package by the USGS Water Science Group was installed and the process of analyzing the data and recalibrating the system began. This process was lengthy, but essential to ensure accuracy of the data collected. The new gauges and relationship with the USGS have proved to be an important step forward in monitoring spring flow. The live data can be found online on our website:

<http://www.cuwcd.org/salado-springs/salado-creek-gauges/>

Below is a screen shot of the spring flow data for the calendar year 2019.



2. (a) Static Water Level Measurements

Objective: Each year, the District will collect at least 5 water-level measurements from the Trinity aquifer monitor wells located in the District.

Objective Satisfied

The Texas Water Development Board (TWDB) typically measures water levels in selected wells in January each year. Clearwater measures water levels in selected wells four times annually to collect more comprehensive data on water levels in Bell County.

Comparing the water level measurements taken by the District with those taken by the TWDB is sometimes difficult due to differences in measurement procedures and equipment. Clearwater primarily uses a Sonic Wave Meter and only utilizes an e-line if necessary. Large producers are asked to turn the pump off at least one hour prior to the measurement to allow the aquifer levels

time to stabilize. TWDB typically uses a steel tape or an airline and does not request the pump to be turned off. During calendar year 2019, the District took 11 water level measurements from 50 wells.

The District has been increasing continuous monitor well locations throughout Bell County, thus some wells have very little historical information. Adding these wells is essential to have a broader spectrum of data to analyze in future years. The District has 13 continuous monitor wells that are monitored by TWDB. The continuous water level measurements can be viewed on TWDB's website at: <https://waterdatafortexas.org/groundwater>.

A copy of the measurements is included under Appendix M.

2. (b) Changes in Water Levels

Objective: Each year, the Annual Report to the Board of Directors will include a discussion of the change in water-levels in each Trinity aquifer subdivision for which a Desired Future Condition is established by GMA-8.

Objective Satisfied

The District prepares a monthly status report (Appendix F – Trinity Aquifer Status Report 2019) that explains the status of the Trinity aquifers by layer at any given time. The DFC analysis from 2000 to present compares DFC adopted drawdown to actual drawdown figures for Bell County. In addition, potential production from both permitted wells and exempt wells is compared to MAG with figures showing how much actual water is available for permitting.

5. Miscellaneous Activities

In addition to the Management Plan requirements, Clearwater is involved in several miscellaneous activities as follows:

A. Abandoned Wells

The District continues to coordinate with the Texas Department of Licensing and Regulation (TDLR) to identify and investigate reports of abandoned wells. After initial investigation, staff refers abandoned wells to TDLR for further investigation, determination of corrective action, and enforcement. The District did not refer any abandoned wells to TDLR during the calendar year 2019.

The District continues to work with the Bell County Public Health District for assistance in locating abandoned wells when septic systems are inspected. The District promotes the plugging of abandoned wells by distributing educational information at various conferences and events and hosting well plugging demonstrations with the Texas A&M AgriLife Extension.

According to records from the Texas Department of Licensing and Regulation, during 2019 a total of 17 wells were plugged in Bell County.

B. Bell County Water Symposium

Clearwater sponsored its eighteenth annual water symposium on November 6, 2019 at the Texas A&M University - Central Texas Campus. Event partners included Bell County Engineer's Office, HALFF Associates, KPA Engineers, LRE Water LLC, Lloyd Gosselink Attorneys at Law, WSP and Texas A&M AgriLife Extension-Bell County.

Topics that were discussed:

- *State of the District "Successes, Concerns and Actions* – Dirk Aaron, General Manager, Clearwater UWCD
- *Whisky's for Drinkin', Water's for Fightin': The Tumultuous History and Collaborative Future of Water Management Texas.* – Dr. Robert Mace, Interim Executive Director & Chief Water Policy Officer, Texas State University
- *Texas Water Development Board Update: Science, Infrastructure & Support*
John Dupnik, Deputy Executive Administrator, Office of Water Science and Conservation, Texas Water Development Board
- *Bell County Challenges and Prospects for the Future* – Honorable David Blackburn, Bell County Judge
- *Bell County Legislative Panel* - Moderator: Leah Martinsson, Executive Director, TAGD, Senator Dawn Buckingham, District 24, Representative Brad Buckley, District 54, Representative Hugh Shine, District 55
- *Keynote Address* – Representative Lyle Larson, District 122, Chairman of the House Natural Resource Committee
- *Caring, Collaboration and Outreach for the Future – Hill Country Alliance* – Charlie Flatten, Water Policy Program Manager, Hill Country Alliance
- *State of the Brazos River Basin and BRA* – Tiffany Malzahn, Environmental and Compliance Manager, Brazos River Authority
- *Groundwater Science for Sound Policy* – Dr. Joe Yelderman, P.G., Professor of Geology, Baylor University
- *GCD Case Study of Management and Policy* – Doug Shaw, General Manager, Upper Trinity GCD, Dirk Aaron, General Manager, Clearwater UWCD

The District set up a display booth and distributed water conservation packets as well as other information on water quality protection and information on the aquifers in Bell County. Approximately 157 people attended the symposium.

Refer to Appendix N for an agenda of the meeting.

Online: <http://www.cuwcd.org/education/annual-water-symposium/>

C. Internet Site

The District's web site continues to grow on a monthly basis. The web site contains general information about the District and Board of Directors along with a calendar of events and meeting agendas. Press releases and other water related articles are posted to continually provide water related resources to the residents of Bell County.

Below are some highlights of the website available to the public:

- [Current Drought Status](#)

- [Access to online GIS Maps](#)

- [Educational Resources](#)

- [Link to TWDB Groundwater Levels](#)

- [Texas Drought Monitor](#)
- [Salado Creek Gauges](#)
- [District Rules](#)
- [Management Plan](#)
- [Link to TWDB Texas Reservoir Levels](#)
- [Public Records](#)
- [District Forms and Documents](#)

The website can be viewed at <http://www.cuwcd.org>

6. Summary

Based on the leadership of the Board of Directors and management under the executive direction of the General Manager, District staff continued expanding their efforts in developing in-depth aquifer science, enhancing educational outreach to public schools and civic organizations, and refining data base management for the District records.

The District staff has expanded the educational efforts in a partnership with Texas A&M AgriLife Extension, Master Naturalist, and Master Gardener programs. Strategies include: an education trailer (mobile classroom), classroom curriculum, science day events, field days, Earth Day events, and informative presentations for civic organizations.

Clearwater UWCD has maintained the relationships with Bell County, the Village of Salado, USGS, and Baylor University to continue efforts to better understand the Edwards BFZ Aquifer and its complex of springs and recharge features. Knowing that the Salado Salamander is designated as threatened by USFWS, validated the continued need to better understand the habitat and identified threats. Maintaining the regulatory system of protecting the spring flow has been validated by the USFWS decision to list the salamander as threatened rather than endangered. The 2015, 2016 and 2017 final reports from USFWS can be found on our website at <http://www.cuwcd.org/salado-springs/salado-salamander/>.

The District is also committed to continuing our efforts to enhance the network of monitor wells in the three layers of the Trinity Aquifer in order to measure drawdown relative to pumping. This allows the Board of Directors to manage the aquifers to the DFC rather than simply to the MAG. The District continues to monitor over 50 wells in both the Trinity and Edwards (BFZ) Aquifers.