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New Braunfels, TX 78132

August 8, 2023

Mr. Thomas Hodge P.E.
President - Texas Water Company
1399 Sattler Road
Canyon Lake, TX 78132

Subject: SJWTX June 2022 - Water Availability Report & Drought Contingency and Emergency Plan

Dear Mr. Hodge,

I am a customer of Texas Water Company and I have read the subject report and reviewed its five (5) Appendices. I am concerned the report overlooks the impact of prolonged droughts as I see no mention of the use of the Texas Water Company Drought Contingency and Emergency Plan which for my location requires customers to progressively reduce outside use of water and with Stage 4 eliminate outside use of water except when necessary to sustain livestock.

I note for over a year (since June 20, 2022) my home has been under continuous Stage 2 or 3 water restrictions. From an "eyes wide open perspective" customers of the Texas Water Company do not see within the SJWTX June 2022 - Water Availability Report content calling attention to the SJWTX Drought Contingency and Emergency Plan and the potential need (now reality) to reduce water usage for perhaps long periods of time. In a sense this is in conflict with two examples from the SJWTX June 2022 - Water Availability Report:

- **Page 10 III.3. Projected Supply** (third paragraph from the top): *"Together with the existing surface water contracts and groundwater supply, CLWSC has sufficient water supply to meet the projected demand over the next twenty years and beyond."*
- **Page 14 Section IV: Conclusions** (fourth paragraph from the top)
"The water supply is shown to be in excess of demand over the next 20 years."

Basically the 2022 Water Availability Report paints a rosy picture that we have plenty of supply but fails to note during droughts, customer usage of water will be restricted. As a result, I believe the June 2025 - Water Availability Report should be transparent about the Drought Contingency and Emergency Plan and implementation of water restrictions during droughts so that customers and others can see their usage may potentially need to be reduced to protect the supply.

My ask: I request the Texas Water Company June 2025 - Water Availability Report identify the Drought Contingency and Emergency Plan and include descriptive content about its progressively more severe water usage restrictions as a state required control method to ultimately protect in-home and livestock water supplies.

Thank you.

Sincerely,



Jonathan Gulick



JUNE 2022 | **WATER AVAILABILITY REPORT**

REVIEWED

By David Vollbrecht at 9:43 am, Dec 19, 2022

**APPROVED IN COMMISSIONERS
COURT 12-29-22**

Canyon Lake Water Service Company

Water Availability Report

For

Comal County Commissioners Court

199 Main Plaza
New Braunfels, Texas 78130

June 2022

Acknowledgement

This report was produced under the guidance of Mr. George Perkins, P.E. by Canyon Lake Water Service.



George Perkins
George Perkins, P.E.

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Section I: Introduction

Canyon Lake Water Service Company (CLWSC), is an investor owned water utility operating under the Public Utility Commission of Texas (PUCT), Certificate of Convenience (CCN) #10692 located in South Central Texas (Figure 1). The water system provides high quality water and exceptional customer service to an approximate population of 69,051 which equates to 23,017 connections (approximate) in CLWSC's CCN. Of those total connections, approximately 22,790 are in Comal County, serving a population of approximately 68,370 residents as of January 2022.

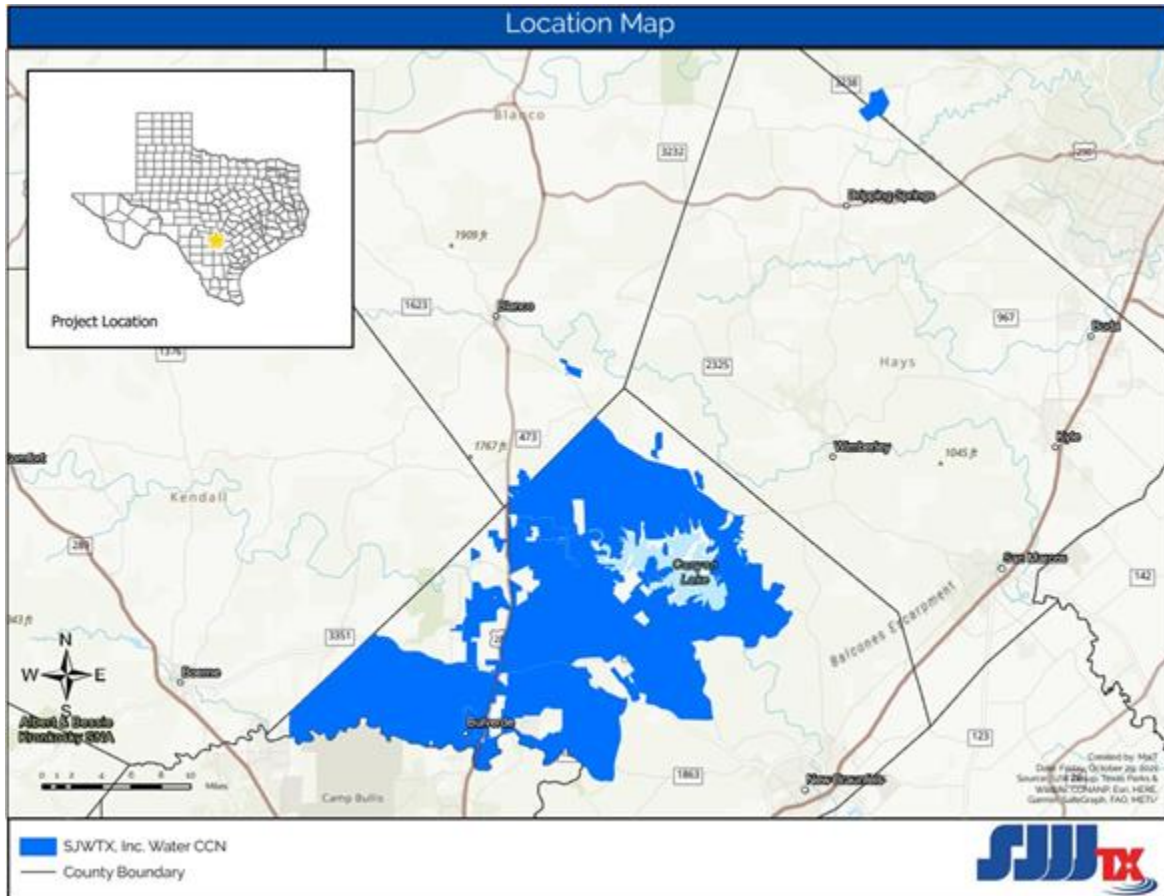


Figure 1: Location Map

I.1. Purpose

With the goal of describing the relationship between existing and future water supplies, this update to the 2019 Water Availability Report presents CLWSC's continued ability to provide a diverse water supply to match current and projected demands. This update is designed to promote collaborative planning between CLWSC and local jurisdictions, and in turn, assist Comal County in making decisions related to water supply and proposed developments for the next 20 years.

Water availability reports are written in response to Comal County Subdivision Rules and Regulations; which require water retailers with 1,000 or more connections to demonstrate their ability to meet current demands and support 20-year projected growth.

I.2. Background

The original Canyon Lake Water Supply Corporation became an operating entity in 1994 as a member-owned non-profit water utility, consolidating 46 separate groundwater systems. In 2006, the water supply corporation was purchased by San Jose Water Texas (SJWTX), Inc., a subsidiary of SJW Group (formerly SJW Corporation), a utility holding company with subsidiary operations in California (San Jose Water Company), Connecticut (Connecticut Water Service), Maine (Maine Water Company) and Texas (SJWTX). Upon purchase in 2006 the name of the utility was changed to SJWTX, Inc, dba Canyon Lake Water Service Company (CLWSC).

Established as San Jose Water Company in 1866, SJW Group is one of the largest privately owned water companies in the United States. In addition to operations in Texas, provided through SJWTX, SJW Group also provides service to over one million residents of Santa Clara and Santa Cruz Counties in Northern California through San Jose Water Company.

According to the latest U.S. Census Bureau statistics, among counties with populations greater than 10,000, Comal County was the 2nd fastest growing in the United States in 2016-2017. Overall, population growth in the county for 2019-2021 is reported as 4.91%. Situated between Austin and San Antonio, the Canyon Lake community continues to attract new residents. This growth has resulted in the new construction of housing, schools, parks, and a variety of businesses and service industries. For the three- year period of 2019 through 2021 growth in the CLWSC service area (based on metered connections) increased at an effective annual rate of 13.7%. This increase in connections can be partially attributed to acquisitions since the previous Water Availability Report.

In 2001, CLWSC's Water Availability Report was approved and accepted by the Comal County Commissioner's Court. CLWSC drafted updates in 2004, 2007, 2009, 2013, 2016 and 2019 which were each subsequently approved by the Comal County Commissioner's Court. Since the 2019 report, CLWSC has acquired the Kendall West system. Since the Kendall West system is outside of Comal County and is not connected to any other CLWSC systems, that system is not addressed in this report. CLWSC also acquired Texas Country Estates, Clear Water Estates, and Canyon Lake Villas, all of which are in Comal County. This 2022 report updates the population and demand forecasts and describes how CLWSC will meet future water demand within their Comal County service area.

I.3. Climate

The Canyon Lake area experiences a humid climate with an average of approximately 37 inches of rain annually. Daily average temperatures between 1992 and 2022 ranged from the mid- 50s to mid-90s (°F) in spring and summer and from the upper-30s to upper-70s (°F) in winter. Table 1 provides the average high and low monthly temperatures in addition to average monthly precipitation.

Table 1: Climate Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Max Temp (°F)	61.1	64.8	71.5	78.4	84.7	90.9	94.0	95.7	89.7	81.0	70.3	63.0
Avg. Min Temp (°F)	39.5	42.6	49.5	56.4	64.8	71.1	73.0	73.0	68.3	58.9	49.4	41.7
Avg. Precipitation (in)	2.41	2.04	2.76	2.71	4.59	4.03	2.81	2.27	3.25	5.12	2.99	2.13
Note: Data from the National Weather Service Canyon Dam, TX Station; Normals for the period of 1992-2022.												

Section II: Demand

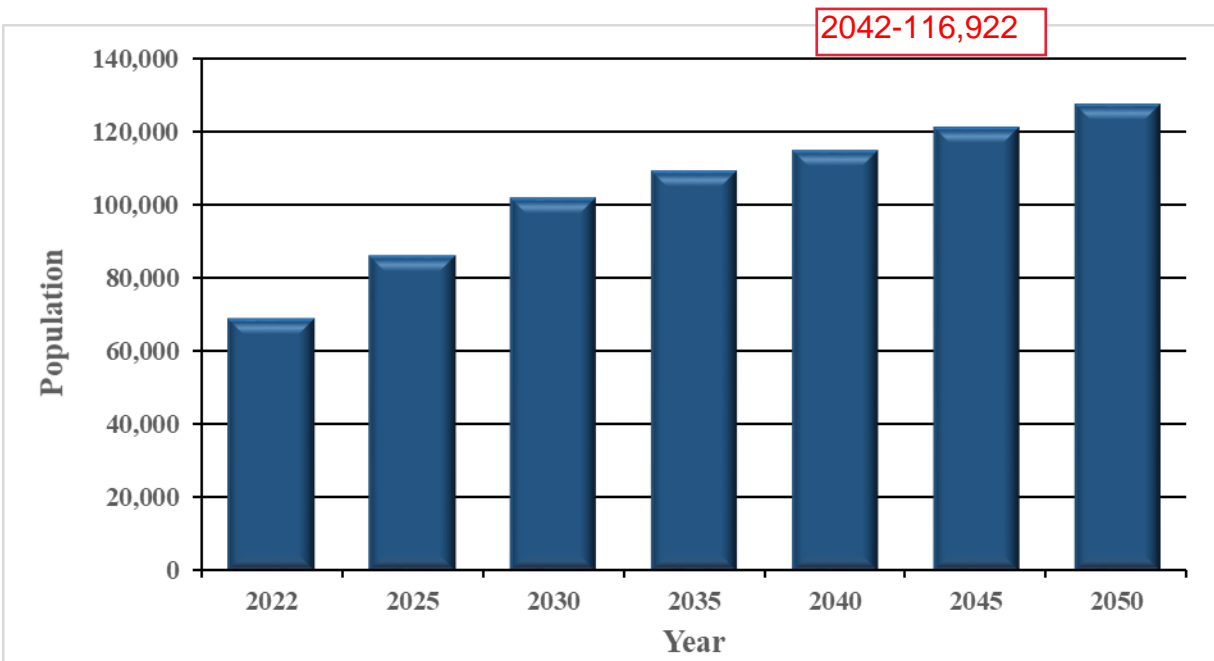
II.1. Service Area and Population

The CLWSC service area covers approximately 244 square miles over much of northern and western Comal County, and a small area within southern Blanco County. Table 2, provides population projections for the CLWSC service area over an approximate twenty-year period from 2022 to 2045. The initial population estimate for the year 2021 was based upon existing CLWSC records for number of meters in December 2021 assuming an average of 3 persons per meter. Projections for the years 2022 through 2045 are based upon actual growth trends within the system over the period 2016-2021. Excluded from our projections are tracts of land in Comal County that are restricted development such as Guadalupe State Park.

In development of the 2022 Water Availability Report, the Texas Water Development Board(TWDB), projections for the CLWSC service area in the 2017 Region L Water Plan showed that a population of 68,370 would not be reached until near the year 2050. Additionally, the 2021 TWDB Region L Water Plan showed CLWSC not reaching the same population until approximately 2034. The population projections created by BTS, for the 2019 Water Availability report most accurately projected the growth CLWSC has seen since the last water availability report. The previous population projections were able to predict the 2022 population, within 2,000 people. Given this high level of accuracy, CLWSC will continue to use the population projections prepared by BTS for the 2019 Water Availability Report.

Table 2: CLWSC Population Projections (2022 - 2050)

Year	2022	2025	2030	2035	2040	2045	2050
CLWSC Service Area Population Projection	68,370	85,659	101,216	108,798	114,516	120,531	126,853
Annual Growth Rate		7.8%	3.4%	1.5%	1.0%	1.0%	1.0%



The 2013 Water Availability Report utilized population projections from the 2012 Region L Regional Water Plan (2012 Water Plan). The 2012 Water Plan identified three water user groups which contribute to the population of the CLWSC service area: CLWSC, BMWD (in Comal County) and a portion of the City of Bulverde. The projection of populations for these areas in the 2012 Water Plan were reasonable for the service area, therefore, those projections were incorporated into the 2013 Water Availability Report. During development of the 2016 Water Availability Report, however, it was noted that the proposed population projections for the 2016 Region L Regional Water Plan (2016 Water Plan) showed significant divergence from actual population growth in the CLWSC service area as noted below:

- The 2016 Water Plan provides population projections for CLWSC and Bulverde, but does not provide an indication of where the former BMWD populations in Comal County have been re-allocated.
- The 2016 Water Plan total projected population for CLWSC combined with the entire City of Bulverde for the year 2020 is less than the estimated 2016 population of the whole CLWSC service area, which includes only a portion of Bulverde.
- The rate of growth presented in the 2016 Water Plan is 3% per year between 2020 and 2040, whereas the overall projected rate of growth for the same period was estimated by CLWSC in 2016 to be 4.0%.

In preparing for the 2019 Water Availability Report, it was noted that growth in the CLWSC service area has continued to accelerate, as has been the case for the remainder of Comal County. Total connections to CLWSC systems in Comal County were 13,982 in 2017, which increased to 15,105 connections in 2018. This indicates a rate of growth for the CLWSC in Comal County in 2018 of 8.0% for the year, compared to 6.3% growth for the period 2016-2018. Based on recent growth trends, projections for the period through 2040 have been revised to reflect the more aggressive growth pattern witnessed. These projections have been shared with the Texas Water Development Board (TWDB) and the Region L Planning Group for coordination and discussion regarding impacts to the Region L and State Water Plans.

In 2018 BTS prepared a technical memorandum, *Development of Population Projections for CLWSC, 2020-2070*, a copy of which is included with this report as Appendix B. This technical memorandum provides a description of the justifications and methodology for the development of CLWSC service area population projections in Comal County, and was submitted to TWDB as a basis for discussions regarding growth in Comal County.

In previous discussions with TWDB staff and its consultants it has been clarified that, although there was no dispute regarding the population projections prepared by BTS and CLWSC, the county-wide populations projections cannot be significantly altered beyond projections provided by the Office of the State Demographer (OSD) base on the 2010 census. Due to the world-wide pandemic, the 2020 census results have not been used to adjust the population projections in the OSD and thus the population projections used in 2019 should be continued into this 2022 report until the projections are updated based on the 2020 census results. In preparing for the 2022 report, CLWSC continues to use the projections from the 2019 Water Availability Report as they have more accurately projected the current count of connections as opposed to the OSD projections.

II.2. Current and Future Water Use

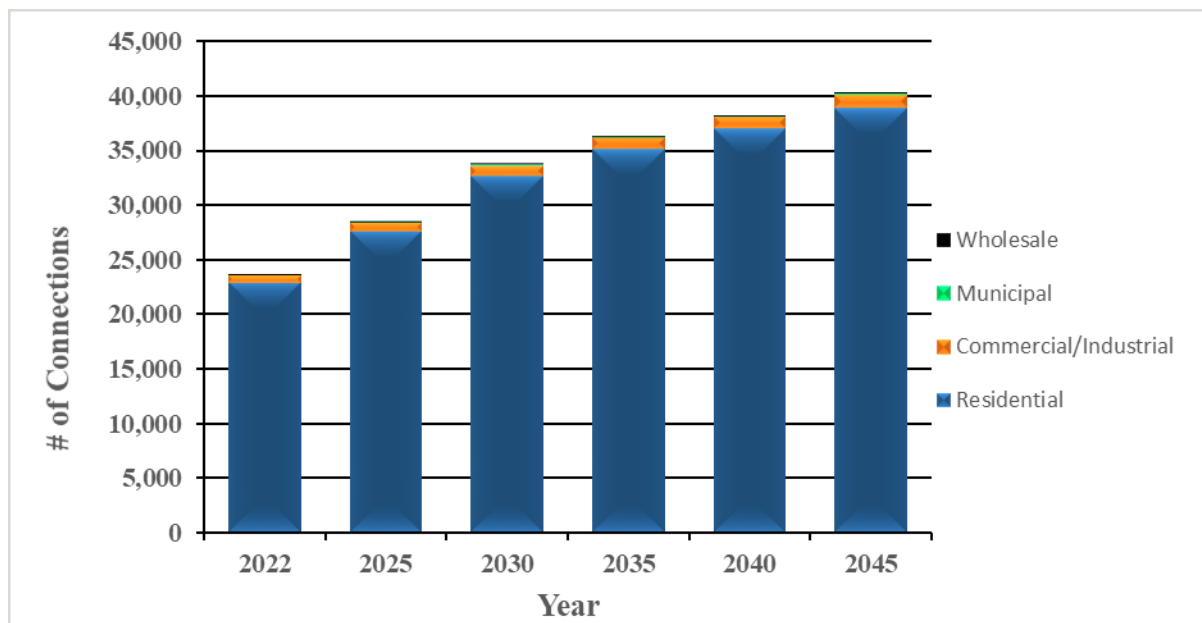
CLWSC provides water utility services to residential, commercial, municipal and other customers which include churches/religious organizations, and hospitals. The majority of connections are residential totaling approximately 23,017, as of January 2022. Table 3, provides the number and type of connections within the CLWSC system in addition to the projected number of connections for the period of time between 2021 - 2050.

CLWSC forecasts that future growth in connections will be proportional to population increases and that development will follow historical trends between the various types of connections. According to CLWSC staff, wholesale will most likely not increase. Table 3 presents projected connection counts for CLWSC for the period from 2021 to 2045. The number of connections for the CLWSC service area were estimated based upon the population projections listed in Table 2. This estimate was based upon the assumption that there are 3 persons per connection. By the year 2045 it is estimated that CLWSC will serve 40,174 connections.

Table 3: CLWSC Number and Type of Connections (2022 - 2045)

Year	2022	2025	2030	2035	2040	2045
Residential	23,017	27,687	32,715	35,166	37,014	38,958
Commercial/Industrial	665	799	945	1,016	1,069	1,125
Municipal	53	63	75	80	85	89
Wholesale	2	2	2	2	2	2
Total	23,737	28,551	33,737	36,264	38,170	40,174

2042-39,970



CLWSC has made great efforts to promote conservation with the help of county regulated conservation measures for new developments. Table 4, provides the projected water usage by customer type for CLWSC for the years 2021-2045 in acre-feet. The projected demand was estimated using an average per capita demand based upon actual metered production rates from 2010 -2021. An average (GPCD), of 112 or 336 gallons per day per connection including unaccounted for water losses. Average retail use discounting water loss gives us a total billed usage of about 221 gallons per day per connection (calculated from meter billing records).

Water that is produced and cannot be accounted for through metering is considered unmetered water, and is not billed. Water that is accounted for either by measurement other than metering or estimation, such as water used for main flushing during construction, firefighting, and main flushing / auto flush hydrants at dead end mains. CLWSC meters flow during and keeps records of construction flushing and dead end flushing. CLWSC also receives estimates of water used by local fire departments during hydrant testing and firefighting activities. Unbilled, but metered water generally accounts for about 3% of total water produced by CLWSC (average taken from 5 years of historic data). In 2021 unbilled metered water accounted for closer to 4%, however, much of this additional flushing was in response to major system outages as a result of the 2021 winter freeze. We used 3% for estimating future year usage numbers.

Since ownership transition to SJWTX, Inc., upgrades of old/damaged customer meters has resulted in a dramatic decrease in unaccounted for water. In addition, a large number of leaks within the CLWSC service area can be attributed to poor design and construction techniques. More stringent design and construction standards have been adopted by CLWSC, which has resulted in a large decrease in unaccounted for water. Since 2005 unaccounted for water has been greatly reduced from 31.8% (2005) to the current three-year average rate of 20% (2021). With the acquisition of existing systems, the challenge of reducing unaccounted for water is significant. CLWSC has established leak detection and water main replacement programs and will continue to replace old/damaged meters and water lines in an effort to achieve our goal 10% or less of unaccounted for water by 2040.

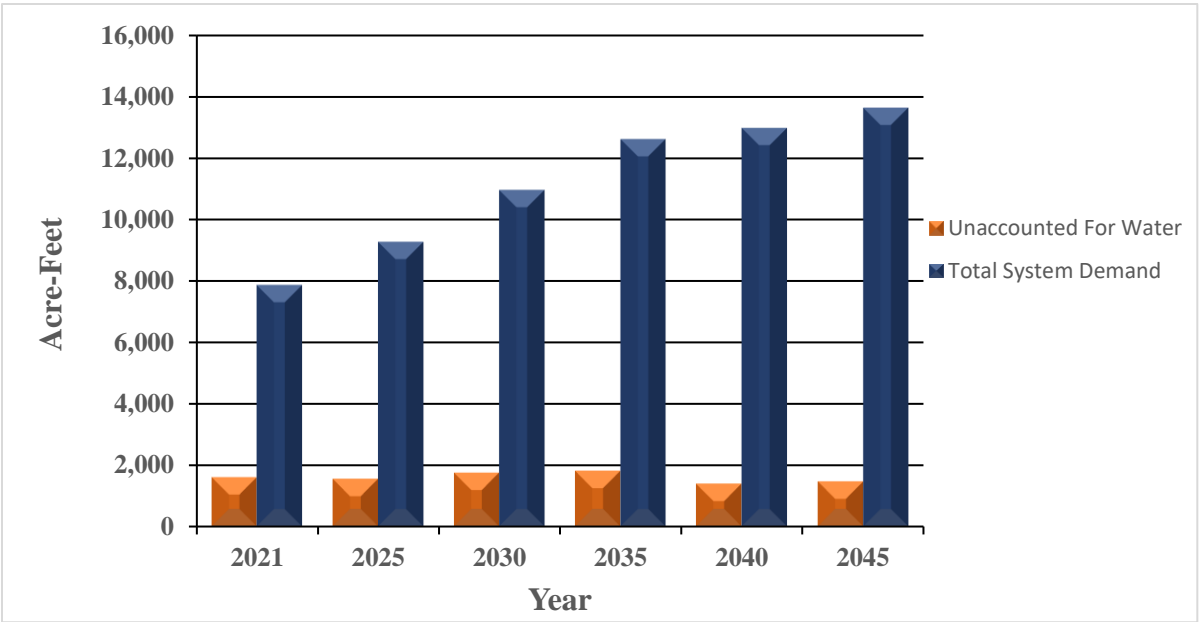
Table 4: CLWSC Projected Water Use by Customer Type in Acre-Feet (2021 - 2045)

	2021	2025	2030	2035	2040	2045
Customer Metered Demand	6,120	7,444	8,872	10,412	11,162	11,728
Unmetered Use Accounted For	316	283	340	402	432	455
Unaccounted For Water	1,594	1,537	1,740	1,799	1,381	1,454
% Unaccounted for Water	20%	17%	16%	14%	10%	10%
Total System Demand	7,853	9,264	10,952	12,613	12,975	13,636

national average unaccounted-14%+/-

2042-13,239

Table 5: CLWSC Projected Total Demand in Acre-Feet (2021 - 2045)



Section III: Supply

III.1. Water Sources

CLWSC provides water to its customers via two primary sources of water: treated surface water from Canyon Lake and groundwater from the Trinity Aquifer. CLWSC has a total of 6,852 acre-feet/yr. of surface water under contract. 6,000 acre-feet/yr. of raw surface water is under contract from the Guadalupe- Blanco River Authority (GBRA). This water is pumped from diversion points within Canyon Lake to three surface water treatments plants (WTP): Triple Peak WTP on the south side of the lake, Sybil Lightfoot on the Guadalupe River upstream of Canyon Lake, and Park Shores WTPs on the north side of the lake (Figure 2). Triple Peak WTP, Park Shores WTP and Sybil Lightfoot WTP have estimated daily treatment capacities of 2.5 Million Gallons per Day (MGD), 6.0 MGD and 0.5 MGD, respectively. An additional 722 acre-feet/yr. of surface water is sourced via the Western Canyon Project for use within the Bulverde Service Area. The remaining 130 acre-feet/yr. of surface water is sourced from the Guadalupe River above Canyon Lake, through transfer of rights from a pre-existing agreement between GBRA and the former Rebecca Creek MUD, which has been incorporated in the CLWSC Canyon Lake Shores system. The GBRA agreement for the supply of 130 acre-feet/yr. to the Sybil Lightfoot WTP is due to expire in 15 years (2037). It is currently anticipated that this, and all other agreements will be extended beyond their current expiration dates.

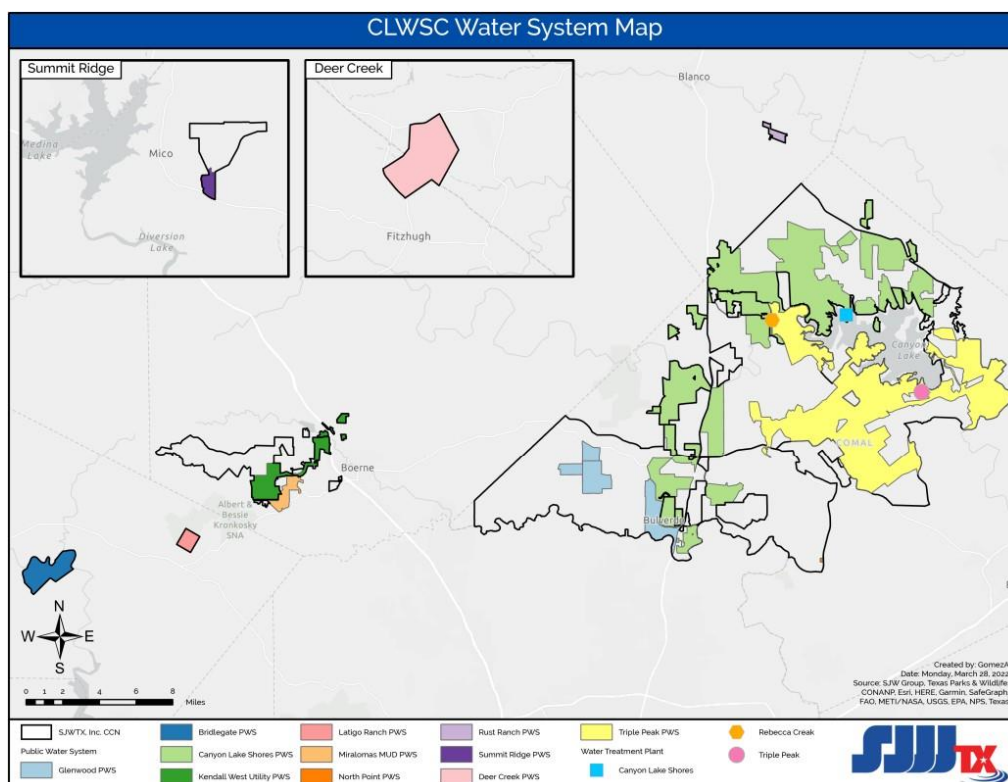


Figure 2: CLWSC Water Systems

Groundwater from the Trinity Aquifer is also provided via forty-six (46) water wells (40 active and 6 inactive) within Comal County. In March 2019, a report titled "Groundwater Availability Report" was completed by Wet Rock Groundwater Services, LLC and is shown as Appendix C. It has been reviewed by the original creator and in his expert opinion still accurately reflects conditions within the aquifer. The following conclusions are presented in the groundwater availability report. **Actual well production numbers are summarized in the report update summary on the first 4 pages of Appendix C.**

**Table 1-A=well numbers and flows
in groundwater report**

- Groundwater is produced mainly from the Middle Trinity Aquifer within the Lower Glen Rose and Cow Creek Formations. Recharge to the Trinity Aquifer is increased due to localized faulting and flow from Cibolo Creek and the Guadalupe River. Recharge to the Trinity Aquifer for the years 1992 to 2004 in Comal County was estimated using the recharge rates developed from WRGS (2008) and Ockerman (2007) for the Guadalupe and Upper Cibolo Creek Basins respectively. For the years 1992 to 2004 average recharge to the Trinity Aquifer within the Guadalupe and Upper Cibolo Creek Basins was 61,201 acre-feet/yr. and 17,994 acre-feet/yr. respectively; total recharge averaged 79,194 acre-feet/yr. Not only does the total annual precipitation amount play a major role in recharge, but when each precipitation event occurs and how much precipitation a given event produces is even more important;
- CLWSC operates forty-six (40) active wells and six (6) inactive wells (not capped) in Comal County. The active wells within Comal County have a total capacity of 7,884 gpm or 8769 acre-feet/yr.; the inactive wells within Comal County have a total capacity of 270 gpm or 290 acre-feet/yr.; the capacity calculations assumed each well pumping for 16 hours/day for 365 days. Total capacity was determined using the updated capacity of the well by WRGS where available, and the TCEQ well capacity ratings;
- Transmissivities calculated from the aquifer tests ranged from 32 ft²/day up to 66,300 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 9,306.85 ft²/day;
- To ensure that groundwater is produced at a sustainable rate and volume, CLWSC has installed a monitoring well network equipped with continuous data recorders. Based upon water level data taken since 2011, the Trinity Aquifer in the Canyon Lake area has experienced stable water levels over the long term. There are shorter duration cycles of lower water level during times of increased pumping and drought coupled by a recovery of water level during precipitation events; and
- Based upon recharge estimates and long term groundwater monitoring data, the projected withdrawal of water from wells within the Trinity Aquifer for the next twenty years by CLWSC is sustainable and substantially less than the average recharge to the aquifer between 1992 and 2004.

Water quality varies to some extent throughout the Trinity aquifer. In some cases a well will produce water with levels of total dissolved solids or sulfates in excess of levels established by TCEQ as secondary standards. These TCEQ secondary standards are equivalent to federal standards, and have been established to address aesthetic issues in drinking water such as taste, odor and color, rather than health issues. In order to maintain consistently high quality water in the CLWSC water system, CLWSC blends water from wells with contaminants in excess of secondary standards with water from wells containing those same contaminants in concentrations below the secondary standard, thereby producing water with overall quality which meets secondary standards. Water quality is monitored at entry points (ground storage tanks) before water enters the system following blending or other treatment, and is in compliance with all state and federal water quality standards. Appendix D contains information from the TCEQ sanitary survey.

III.2. Raw and Treated Surface Water Contracts

CLWSC has a total annual volume of 6,130 acre-feet of raw surface water contracts with GBRA. Appendix E provides a summary of the contracts. Of the total 6,130 acre-feet/yr. of raw surface water, 6,000 acre-feet of raw water is under five contracts with GBRA and is withdrawn from diversion points within Canyon Lake. The surface water is then treated at the Triple Peak WTP, the Park Shores WTP, and the Sybil Lightfoot WTP. Of the 130 acre-feet/yr. of surface water is sourced from the Guadalupe River above Canyon Lake, through transfer of rights from a pre-existing agreement between GBRA and the former Rebecca Creek MUD. 722 acre-feet/yr. of treated surface water is sourced via the Western Canyon Project, and is provided through two contracts one for 322 acre-feet/yr and another for 400 acre-feet/yr. Both contracts expire in 2037, however CLWSC plans to extend these and is already working with GBRA to consolidate and extend them further into the future.

III.3. Projected Supply

The groundwater availability report estimates that CLWSC has approximately 8769 acre-feet/yr. of available groundwater via thirty-eight active wells in Comal County. This estimate was based on numerous aquifer tests throughout the CLWSC service area, and includes only those 40 CLWSC wells which are active in Comal County. There are an additional 5 inactive CLWSC wells in Comal County which could be activated to provide an additional production capacity of up to 290 acre-feet/year. The process of estimating the available groundwater supply is detailed in the groundwater availability report in Appendix C. The groundwater availability report also discusses recharge to the Trinity Aquifer within Comal County which shows that average recharge between 1992 and 2004 was approximately 79,194 acre-feet/yr. To ensure that the Trinity Aquifer is being produced at a sustainable volume, CLWSC has instituted a monitoring well network throughout their service area to ensure that water levels are maintained.

Together with the existing surface water contracts and groundwater supply, CLWSC has sufficient water supply to meet the projected demand over the next twenty years and beyond. Table 6 provides the projected total supply and excess capacity for the years 2021-2045.

Table 6: CLWSC Projected Total Supply in Acre-Feet (2021 - 2045)

Year	2021	2025	2030	2035	2040	2045
Available Groundwater Supply	8,769	8,769	8,769	8,769	8,769	8,769
Available Surface Water Supply	6,852	6,852	6,852	6,852	6,722	6,000
Total Water Supply	15,621	15,621	15,621	15,621	15,491	14,769
Total System Demand	7,853	9,264	10,952	12,613	12,975	13,636
Excess Capacity	7,768	6,357	4,669	3,008	2,516	1,133

2042-15,202 supply
2042-13,239 demand
1963 excess

CLWSC is continually planning for future growth beyond the twenty-year planning horizon set forth by Comal County. CLWSC is engaged in ongoing discussions with other regional water suppliers, including GBRA and NBU, regarding potential opportunities and agreements which might result in additional future water supplies for CLWSC. Discussions range from water purchase agreements as well as public-private partnerships which would allow CLWSC to participate in large-scale water supply projects which might otherwise be limited solely to public entities. SJWTX is also pursuing a near term large scale well field development project.

To attempt to meet the needs of the next fifty years and beyond CLWSC has and will continue to research other sources of water to better diversify the water supply to its customers. Future water supply sources beyond the twenty year planning horizon that may be developed include:

- Activation of existing inactive wells;
- New Trinity Aquifer wells;
- Carrizo Aquifer supply;
- Water reuse;
- Aquifer storage and recovery (ASR)
- Acquisition of nearby systems with surplus supply

Water reuse is currently being implemented at the three wastewater treatment plants owned and operated by CLWSC: HEB SH46 WWTP, River Crossing - Carriage House WWTP and Vintage Oaks - Grove WWTP. Treated effluent from each of these plants is used for landscape or golf course irrigation.

III.4. Water Supply Vulnerability

In order to comply with **Senate Bill 3**, and add to its system redundancy CLWSC has added backup diesel-fueled generators to operate wells and pumps in the event of emergency. Opportunities for emergency interconnects with other water utilities are also continually reviewed. Emergency interconnects would not be used for normal operation, but rather to aid in potential emergency situations. **CLWSC has added 8 new generators to sites in 2022, CLWSC as ordered an additional 9 generators that are set to be delivered by end of year in 2022 and be installed in 2023.**

III.5. Consolidation of Public Water Systems

Canyon Lake Water Service Company (CLWSC), provides water service to over 20,000 connections in Comal County, all within our approved Certificate of Convenience and Necessity (CCN). Each individual connection is part of a unique Public Water System (PWS), as defined by the TCEQ. As adjacent PWSs grow, a point is reached when it becomes feasible to interconnect two PWS, usually via a pipeline. Once interconnected, CLWSC petitions the TCEQ to administratively combine the two water systems into one PWS for regulatory compliance purposes. Most recently, in 2021, CLWSC connected the Triple Peak system to the Clear Water Estates system. In 2020, the Canyon Lake Shores PWS was merged with the Summit North PWS.

CLWSC currently operates twelve Public Water Systems, five of which are in Comal County. The largest of our water systems is the Canyon Lake Shores system with 11,811 active connections. Followed by our Triple Peak system with 10,345 connections, Glenwood with 634 connections, Texas Country Estates with 104 connections, and Northpoint with 32 connections. Canyon Lake Shores and Triple Peak are both served by the Trinity Aquifer groundwater and surface water from our three surface water treatment plants located adjacent to Canyon Lake.

Consolidation of small Public Water Systems is a goal of TCEQ, facilitating objectives including improved economy of scale, improved water supply reliability and reduced administrative costs for both the utility and the regulators. CLWSC's goal is to consolidate all PWSs in our CCN in western Comal County into a single Public Water System. That goal will be realized as future development occurs and pipelines are constructed to meet increasing demand for service from multiple sources.

Triple Peak and Canyon Lake Shores Public Water Systems

These two systems include over 98% of all CLWSC customers. Individually, each qualifies as a large water system as defined by Comal County subdivision regulations. While they are regulated as two separate PWS by the TCEQ, with respect to water supply they are in a sense interconnected as they both share the use of Canyon Lake as a major source of water. CLWSC has 6,130 acre-feet/year of untreated water under contract that it can draw directly from Canyon Lake at either of our three treatment plants, and can distribute the use of that water as needed by each system.

CLWSC's facility Master Plan for the Bulverde area calls for a 12" pipeline parallel to SH 46 that will interconnect the Canyon Lake Shores PWS at River Crossing with the Triple Peak PWS at Smithson Valley High School. The timing of construction of this pipeline will be driven by the needs of development in the area, proposed widening of SH 46 by Texas Department of Transportation (TXDOT), and CLWSC's ability to acquire easements and the availability of funding. Recent plans by TXDOT to begin the SH 46 widening project by 2020 have since been revised, and a projected date of construction has not yet been formalized. A reasonable estimate is that this should be completed in either 2024 or 2025.

Glenwood Public Water System

The Glenwood System is currently a separate PWS served by a combination of Trinity Aquifer groundwater and treated surface water purchased from the Guadalupe Blanco River Authority (GBRA) Western Canyon Project. CLWSC has contracted with GBRA for 722 acre feet of treated water under two separate contracts. Design of a 16" water transmission line from Blanco Road, along Amman Road to Bulverde is also under development. This pipeline will connect the Glenwood System directly to the Canyon Lake Shores System. It is anticipated that this pipeline will be in service in 2023, at which time the Glenwood System will be incorporated in the Canyon Lake Shores System.

North Point and Texas Country Estates

The Northpoint system is a groundwater only system that is located near the intersection of FM 1863 and FM 3009. The Northpoint system is entirely dependent upon two wells in the Trinity Aquifer. CLWSC constructed a second well at Northpoint in 2013. CLWSC will provide additional or alternative sources of water as development occurs and funding permits.

CLWSC acquired Texas Country Estates (PWS: TX0460223) as of January 20th, 2022 and is located on FM 306 and south of FM 2673. This system is exclusively single-family homes with a total connection count of 104. There are three wells located within the development with a total capacity of 250gpm. These wells typically run with a combined output of 150gpm.

CLWSC does not consider the water supply currently available at North Point or Texas Country Estates sufficient to allow the creation of new subdivisions. The water supply is sufficient for the existing customers. CLWSC will make further improvements as needed to serve new residential connections within the existing subdivisions.

The North Point and Texas Country Estates systems are mentioned in this Water Availability Report for future planning purposes only, not for the purpose of meeting county subdivision platting regulations. We include this information in order to give a complete description of the CLWSC system and for the reason that we fully expect it to be interconnected to one of the major PWSs within the 30 year planning horizon of this report. We understand that no new subdivision should be permitted which would connect only to one of these smaller systems, and CLWSC will not provide a water availability letter to do so unless they are first interconnected with one of the major systems.

Section IV: Conclusions

CLWSC provides water utility service to approximately 68,466 people within Comal County. CLWSC provides exceptional water service to its customers and is in good standing with the TCEQ. There are no outstanding deficiencies in any of the CLWSC systems.

The CLWSC service area has experienced rapid growth over the past decade and in the years since the 2013 Water Availability Report update State estimates of growth have been significantly lower than actual. It is anticipated that this growth will continue into the future, at a decreasing but still significant rate. Based upon the most recent update to the Region L Plan, the CLWSC's population in Comal County is expected to increase to 79,783 people by the year 2040, but CLWSC estimates a more reasonable 2045 population to be 120,531. Future growth in connections will be proportional to population increases with connection count growing from the current number of connections (23,737 connections) up to an estimated 40,174 connections in the year 2045. The overwhelming majority of the total connections are residential, followed by commercial, municipal, wholesale and other.

The total demand for the CLWSC is projected to increase from 7,853 acre-feet/yr. in 2021 to 13,636 acre-feet/yr. in 2045. The total demand includes projected water usage plus unaccounted for water. This percentage has been significantly reduced since 2005 from 31.8% with the replacement of old customer meters and more stringent design and construction specifications for water line replacement. CLWSC projects that unaccounted for water will be reduced to 10% and is persistently striving to find ways to be more efficient with our water to ensure that we maintain good stewardship of our natural resources.

CLWSC's water supply is diverse and includes both surface water via Canyon Lake and groundwater from the Trinity Aquifer. CLWSC has 6,852 acre-feet/yr. of surface water rights presently, with 6000 acre-feet/yr. still under contract in 2042, CLWSC plans to renew all of its present surface water contracts, and an estimated groundwater supply of 8,769 acre-feet/yr. The water supply is shown to be in excess of demand over the next 20 years. This excess will allow for future growth and provide redundancy during emergency conditions. CLWSC has the experience and resources to meet the projected demand within its service area over the next 20 years.

CLWSC currently operates six Public Water Systems, four of which are in Comal County. The largest is the Canyon Lake Shores system with 11,978 active connections. The next in size are our Triple Peak system with 10,715 connections, Glenwood with 642 connections, Northpoint with 32 connections, and Texas Country Estates with 107 connections. Canyon Lake Shores and Triple Peak are both served by a combination of Trinity Aquifer groundwater and surface water from our three surface water treatment plants located adjacent to Canyon Lake. The North Point and Texas Country Estates systems are mentioned in this Water Availability Report for future planning purposes only, not for the purpose of meeting county subdivision platting regulations.

Section V: References

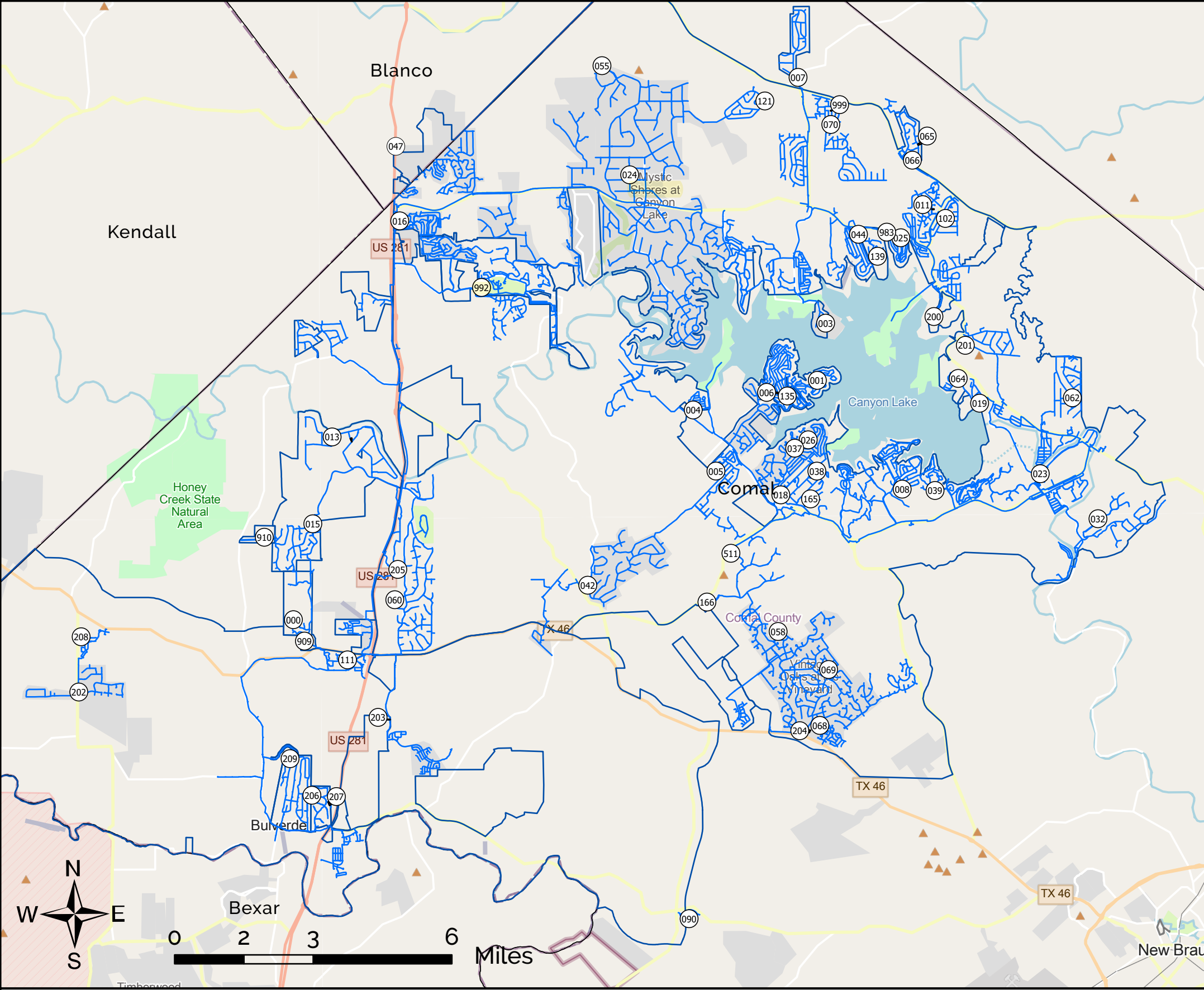
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Appendix A

CLWSC Water System Map

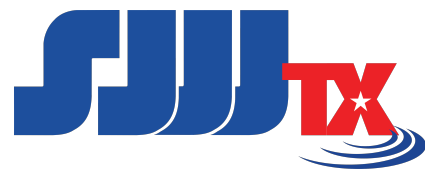
(Map revised per Comal County Engineer request December 2019)

Water System Map



	Station Name	Wells (gpm)	Ground Storage (gal)	Elevated Storage (gal)	Pressure Tanks (gal)	Pumps (gpm)	PWS
203	45 Ranch Turnout		1,500,000.00				CLS
000	Angel Hills Station		160,000.00				CLS
006	Astro Hills Well No. 1	90	90,000.00				TP
006	Astro Hills Well No. 2	600					TP
202	Blanco RD Turnout		50,000.00		5,000.00		CLS
166	Campus Turnout		500,000.00				TP
026	Canyon Lake Forest Well No. 1	100	100,000.00				TP
037	Canyon Lake Forest Well No. 2	384					TP
135	Canyon Lake Hills Hampton	150	63,000.00		5,000.00		TP
003	Canyon Lake Island	298	19,000.00		2,000.00		CLS
200	Canyon Lake Villas	250					CLS
201	Clear Water Estates No. 1	300	100,000.00				TP
201	Clear Water Estates No. 2	300					TP
016	Comal Hills Station		16,000.00		2,500.00		CLS
019	Crystal Heights Station		10,000.00				TP
013	Cypress Springs Well No. 2	65	16,000.00		5,000.00		CLS
062	Emerald Valley Station		87,780.00				TP
070	Fir Well	400					CLS
139	Hancock Oak Hills	37					CLS
111	HEB Well	11	168,000.00				CLS
008	Highland Terrace		12,000.00		200.00		TP
102	Hillcrest Well	36	15,500.00	500,000.00			CLS
004	Lakeview Park Well No. 1	203	56,000.00		5,000.00		TP
015	Lantana Ridge Station		64,000.00		5,000.00		CLS
042	Mountain Spring			250,000.00			TP
064	Mt. Lookout Station		10,000.00				TP
024	Mystic Shores 1		750,000.00				CLS
055	Mystic Shores 2		483,000.00		5,000.00		CLS
023	Netherhill Well	76	60,000.00				TP
090	North Point Well No. 1	36	10,000.00		1,125.00		NP
090	North Point Well No. 2	11					NP
000	Oakland Estates - Whitebrook	60					CLS
090	Oakland Estates Rancher's Circle	50	54,000.00				CLS
209	Panther Station		140,000.00		5,000.00		CLS
060	Rebecca Creek			100,000.00			CLS
001	River Crossing			750,000.00			CLS
205	Riviera	600	37,000.00				TP
992	Rodeo Drive Station		250,000.00				CLS
005	Rolling Hills Well No. 1	400	23,000.00				TP
005	Rolling Hills Well No. 2	400					TP
206	Saddleridge #1-Box Canyon	34					CLS
207	Saddleridge #3-BlackGold	IA					CLS
983	Scenic Terrace Lake Bluff	110					CLS
025	Scenic Terrace Well	180	16,470.00				CLS
999	Spruce Well	IA					CLS
047	Stallion Estates		1,000,000.00		15,000.00		CLS
065	Stallion Springs No. 1	IA					CLS
066	Stallion Springs No. 2	28	6,000.00		2,500.00		CLS
018	Startzville			500,000.00			TP
007	Summit Estates at Fischer Well 1	70	35,000.00		5,000.00		CLS
007	Summit Estates at Fischer Well 2	600					CLS
121	Summit North No. 1	32	10,000.00		1,125.00		CLS
044	Tamarack Well	95	20,000.00		5,000.00		CLS
011	The Point Well	73	225,000.00				CLS
032	The Summit Station		78,000.00		2,000.00		TP
039	Triple Peak Tank		150,000.00				TP
511	Valley View Station		140,000.00				TP
208	Ventana			750,000.00			CLS
068	Vintage Oaks Well No. 1	165					TP
069	Vintage Oaks Well No. 2	IA	50,000.00		5,000.00		TP
058	Vintage Oaks Well No. 3	90	483,000.00				TP
204	Vintage Oaks Wells No. 4	54					TP
038	Watts Lane	137					TP
165	Woodlands Well No. 1	346					TP
165	Woodlands Well No. 2	800					TP
910	Woods at Spring Branch (Springwood)	IA	6,500.00		2,500.00		CLS

SJWTX, Inc. CCN CLWSC Stations
 County Water Main



Created by: GomezA
Date: Monday, July 25, 2022
Source: Map data ©
OpenStreetMap contributors,
Microsoft, Facebook, Inc. and its
affiliates, Esri Community Maps
contributors, Map layer by Esri

Appendix B

Development of Population Projections
for CLWSC, 2020-2070

Population Projection Development

When comparing the results of the population estimates prepared by BTS for the 2019 three year water availability report to 2020 census data for Comal county, we determined that the estimate was prepared by BTS was accurate to within 2000 people. Due to this relatively high level of accuracy, we decided to utilize Mr. Boyds method again and modify it for our projections of 2022 to 2025. This was done with permission from Mr. Boyd and utilized spreadsheets and data that he was willing to share with us.

I have included his original memorandum in this appendix for reference.

George Perkins P.E.



8-31-2022

Technical Memorandum

To: SJWTX, Inc. dba Canyon Lake Water Service Company:
Thomas Hodge, PE, President
Larry Bittle, General Manager
Brian Waltman, PE, Engineering Manager

From: Robert G Boyd, PE

Date: October 10, 2018

Subject: Development of Population Projections for CLWSC, 2020-2070

Executive Summary

SJWTX, Inc., dba Canyon Lake Water Service Company, is in the process of developing a Water Facilities Master Plan for internal planning purposes as well as an updated to its Water Availability Report as required by Comal County. Over 90% of the Canyon Lake Water Service Company service connections are within Comal County. Records of growth within the service area in Comal County show an effective annual growth of 6% from 2013 to the end of 2017, with 2018 growth on pace to exceed 8%. Population projections included in the 2016 Region L Water Plan (part of the Texas Water Development Board's 2017 State Water Plan) include a projected 2030 population for the service area in Comal County of 43,715 while the current connection counts for the service area correlate to a population of 48,612. The 2016 Region L Water Plan projections do not reflect recent rapid growth in Comal County, and therefore cannot realistically be used as the basis for population projections for planning purposes or water availability analysis. Historic growth, planned future developments, and open developer commitments to supply water were used to develop future population projections for the service area within Comal County independent of the 2016 Region L Water Plan projections. Population projections for the period from 2020 to 2070 have been developed to reflect effective annual growth of 8% from 2018 to 2020, followed by a decrease from 8% to 1% annual growth between 2020 and 2030, then steady 1% annual growth to 2070.

Purpose

BTS of Texas LLC (BTS) has prepared this technical memorandum to present the justification and methodology for development of population projections independent of projections included as part of the 2016 Region L Water Plan for the service area of SJWTX, Inc. dba Canyon Lake Water Service Company (CLWSC), specifically within Comal County, Texas.

Background

CLWSC is an investor owned water utility operating under the Public Utility Commission of Texas (PUCT) Certificate of Convenience and Necessity (CCN) #10692. The CLWSC service area covers approximately 244 square miles over much of northern and western Comal County, and a small area within southern Blanco County. CLWSC also serves an area which includes land in both Hays and Travis Counties. Only that portion of the CLWSC service area which lies within Comal County is discussed in this TM. As of September 2018 the water system provides high quality water and exceptional customer service to an approximate population of 48,612 in Comal County via approximately 15,097 connections.

BTS was engaged by CLWSC in 2015 to prepare the 2016 triennial Water Availability Report for submittal to the County Engineer's Office of Comal County, Texas. That effort included reference to population and water demand projections through the year 2040. Typical of previous CLWSC Water Availability Report iterations, the intent was to utilize data from the Texas State Water Plan, as published and updated every 5 years by the Texas Water Development Board, as the basis for population projections. The 2016 update to the Region L Water Plan was released prior to completion of the 2016 CLWSC Water Availability Report. It was noted that the population data for the CLWSC service area in Comal County as reported in the 2016 Region L Water Plan indicated an estimated population in the year 2020 which was lower than the estimated population of the CLWSC Comal County service area in 2016 (based on system connections), and that the apparent projected rate of population growth for the service area in the 2016 Region L Water Plan was not consistent with growth trends for the service area in recent years. CLWSC and BTS therefore developed projected population growth based on recent trends along with demands for the years 2016 through 2040 for inclusion in the CLWSC Water Availability Report of 2016, which was submitted to and approved by Comal County.

BTS has subsequently been engaged by CLWSC to develop a Water Facilities Master Plan for the CLWSC service area and is also engaged in preparation of the CLWSC Water Availability Report for the year 2019. As part of these projects, development of updated population and demand projections are necessary. A review of connection and population growth in 2017 and 2018 indicates that the rate of growth in the Comal County portion of the CLWSC service area has continued to increase at a rate in excess of that projected by BTS and CLWSC for the 2016 Water Availability Report, and this recent historic rate of population increase also continues to further exceed the population projections for the area as tabulated in the 2016 Region L Water Plan.

Reasonable population projections are necessary to responsibly plan for adequate water supply, water production facilities and infrastructure to serve the future needs of CLWSC. In order to develop such reasonable projections, BTS has reviewed historic growth data as well as published population data for Comal County and CLWSC and has developed a growth model

for the CLWSC service area in Comal County which will provide the basis for responsible planning.

2017 State Water Plan Population Projections

Table 1 presents population projection data for Comal County taken from the 2016 Region L Water Plan.

Table 1. CLWSC Projected Populations, 2020-2072 (2016 Region L Water Plan)

	2020	2030	2040	2050	2060	2070
CLWSC Pop., Comal County	30,998	43,715	56,632	69,673	82,626	95,060
Population Increase	12,717	12,917	13,041	12,953	12,434	-
Effective Annual Growth	3.4%	2.6%	2.1%	1.7%	1.4%	-

As stated previously the current (September 2018) population of the CLWSC service area within Comal County is estimated to be 48,612. This estimated current population is approximately 57% more than projected by the 2016 Region L Water Plan for the year 2020, and approximately 11% more than projected for the year 2030. Therefore, it is not feasible to utilize the Region L Water Plan population projections for CLWSC for planning purposes.

It is noted that the overall 2016 Region L Water Plan population projections for Comal County appear to be in general conformance with projections from the Texas Office of the State Demographer as published on the Texas Demographic Center website (osd.texas.gov). Further, it appears that the recent rapid growth in Comal County has not been incorporated into any updates to the official state data.

Canyon Lake Water Service Company Population Projections

Table 2 presents populations for the CLWSC service area within Comal County for the period from 2013 to 2018.

Table 2. CLWSC Populations, 2013-2018 (CLWSC Connection Counts)

	2013	2014 ¹	2015 ²	2016	2017	2018 ³
CLWSC Pop., Comal County	34,056	35,410	38,434	40,179	42,494	45,524
Population Increase	1,354	1,543	1,745	2,315	3,030	3,088
Effective Annual Growth	4.0%	4.4%	4.5%	5.8%	7.1%	6.8%

Notes:

1. 2014 population growth does not include addition of population from Rebecca Creek MUD (1,481 persons) which was added in the 4th quarter of 2014.
2. 2015 and later population and population growth include addition of population from Rebecca Creek MUD.
3. 2018 growth reflects population of 48,612 from connection counts through September, 2018.

The population estimates are based upon existing CLWSC records for number and size of meters in the month of December preceding each respective year (2013 to 2018). Population increase and effective annual growth pertain to growth during the respective year. Note that

growth data for the year 2018 is only for the months of January through September. Effective average annual growth for the period 2013 through the end of 2017 was approximately 6%. Annual growth of at least 8% is anticipated for the end of 2018.

Table 3 presents population projection data developed by BTS and CLWSC for the service area within Comal County for the years 2020-2070.

Table 3. CLWSC Projected Populations, 2020-2070 (CLWSC Projections)

	2020	2030	2040	2050	2060	2070
CLWSC Pop., Comal County	56,701*	101,216	114,516	126,853	140,125	154,785
Population Increase	44,515	13,300	12,067	13,272	14,660	-
Population Growth	6.0%	1.2%	1.0%	1.0%	1.0%	-

*2020 population assumes 8% annual growth from 2018 to 2020, assuming current 48,612 population to begin 2019

Projections for the years 2020 through 2050 are based upon actual growth within the system over the period 2013 to 2017, the backlog of platted new subdivisions planned for development in the service area and service contracts currently in negotiation. An additional allowance was added for the period 2050 to 2070 projections for future development of large tracts of land within the service area at a limited annual growth rate of 1.0%. As noted in Table 3, the projected 2020 population is based on an assumed continued annual growth rate through 2018 and 2019 of 8%, which approximates the anticipated growth rate for 2018. Further, note that the projected effective annual growth in the service area is anticipated to drop sharply between 2020 and 2030 to level out at approximately 1.0% for the remainder of the planning period.

Conclusions

From the above discussion and presentation, it is recommended that CLWSC should proceed with planning for future development based upon an assumed 8% annual growth rate for the period 2018 to 2020, then reducing the estimated annual growth rate over the period 2020 to 2030 from 8% to 1%. From 2030 through 2070 an estimated annual growth rate of 1% can then be used for planning purposes. This will allow for a conservative projection in near-term years to capture large-scale growth in the system, while allowing for flexibility to push projected demands and associated improvements outward to later years if growth slows in those near-term years.



Signature

Date

11 OCT 2018

Appendix C

2019 Groundwater Availability Report



Wet Rock Groundwater Services, L.L.C.

Groundwater Specialists

TBPG Firm No: 50038

317 Ranch Road 620 South, Suite 303

Austin, Texas 78734 • Ph: 512-773-3226

www.wetrockgs.com

May 24, 2022

Mr. George Perkins, P.E.
Canyon Lake Water Service Company
1399 Sattler Rd.
New Braunfels, Texas 78132

RE: Canyon Lake Water Service Company Groundwater Availability Report

Dear Mr. Perkins:

Wet Rock Groundwater Services, LLC (WRGS) has reviewed the most recent Groundwater Availability Report sealed by Mr. Kaveh Khorzad, P.G. on June 5, 2019 which was a part of the Water Availability Study submitted to Comal County.

That groundwater availability report details the hydrogeology and groundwater infrastructure for the water systems located in Comal County owned by Canyon Lake Water Service Company (CLWSC). Based upon our review of that report, it is our opinion that the results are still valid today and acceptable to be used for the 2022 Water Availability Report.

The seal appearing on this document was authorized by Kaveh Khorzad, P.G. 1126 on May 24, 2022:



Kaveh Khorzad, P.G.
License No. 1126

Wet Rock Groundwater Services, LLC
TBPG Firm Registration No. 50038

REPORT OF FINDINGS

WRGS 19-002

Groundwater Availability Report

For

Canyon Lake Water Service Company

1399 Sattler Rd

New Braunfels, TX 78132

Comal County, Texas

June 2019

WRGS Project No. 042-002-18

The seal appearing on this document was authorized on June 5, 2019 by:

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Appendix A: Well Database

Appendix B: Water Quality Database

Appendix C: Aquifer Test Data and Analyses

Appendix D: Monitoring Network Hydrographs

Section I: Introduction

This groundwater availability report details Canyon Lake Water Service Company's (CLWSC) ability to meet the needs of their existing customers and their capacity to provide for future water users as their system expands. The report will discuss in detail CLWSC's updated groundwater availability as of December 2018 and its capacity to supply groundwater demand over the next twenty years.

I.1. Service Area

Canyon Lake Water Service Company is a state-regulated, investor-owned water utility that provides service to approximately 48,252 people via 16,084 connections in portions of Blanco, Comal, Hays, and Travis counties within its Certificate of Convenience and Necessity (CCN; Figure 1). The CLWSC service area in Comal County alone serves a population of approximately 45,315 people through 15,105 connections. The main portion of the CLWSC service area surrounds Canyon Lake and includes approximately 244 square miles within Comal County and southern Blanco County.

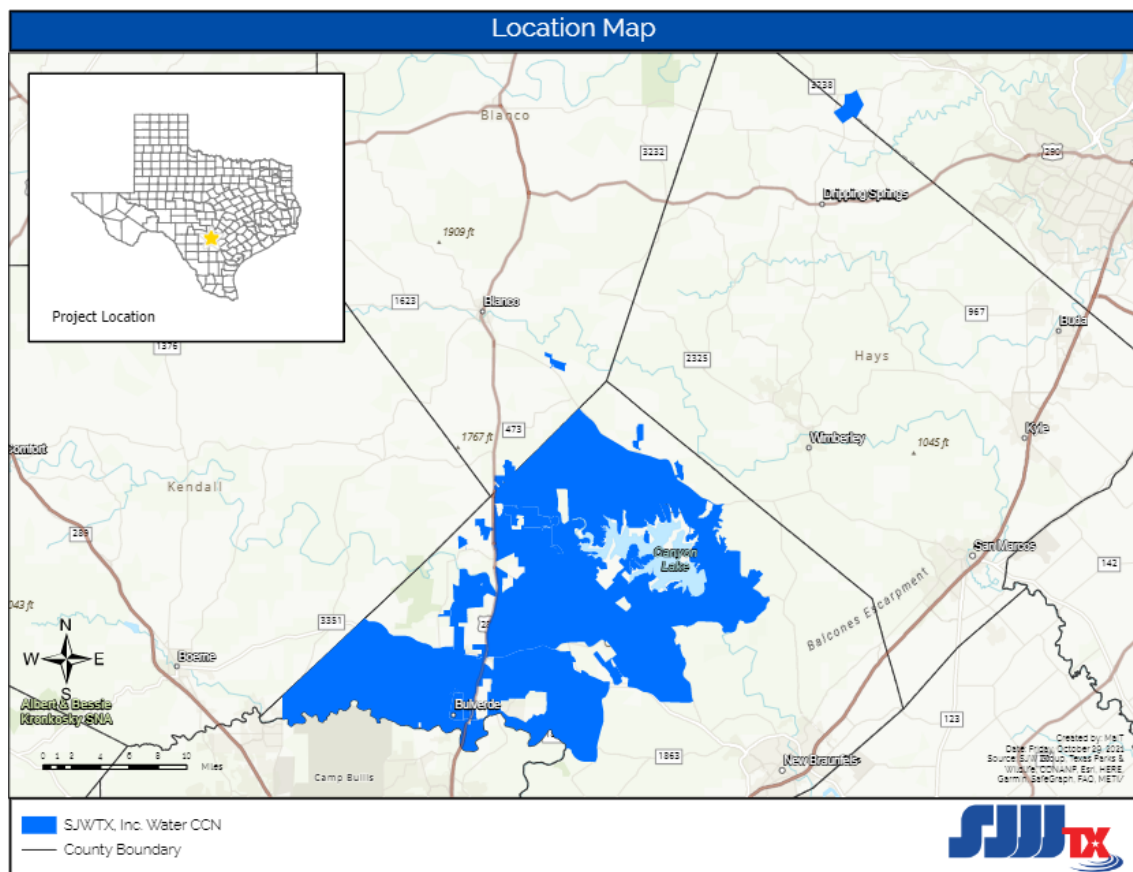


Figure 1: Location map of the CLWSC CCN

Comal County was ranked by the U.S. Census Bureau as the second fastest growing county in the United States in 2017, with a 5.12 percent growth rate (USCB, 2018). Adjacent Hays and Kendall Counties were also ranked in the top 5 fastest growing counties in the United States, at No. 4 (4.96% growth rate) and No. 5 (4.91% growth rate), respectively. The growth is responsible for new building of homes, schools, public parks, and a variety of businesses and services industries.

I.2. Groundwater Infrastructure

On May 31, 2006, the utility became part of the SJW Group / San Jose Water Company family via the purchase of Canyon Lake Water Supply Corporation by SJWTX, Inc., a subsidiary of SJW Group. Since its inception, CLWSC has acquired 17 public water systems (PWS) and has either incorporated, overhauled, or decommissioned their respective infrastructure. In addition, some of these PWS were merged into existing CLWSC water systems. Figure 2 provides a map of the PWS acquisitions since 2006.

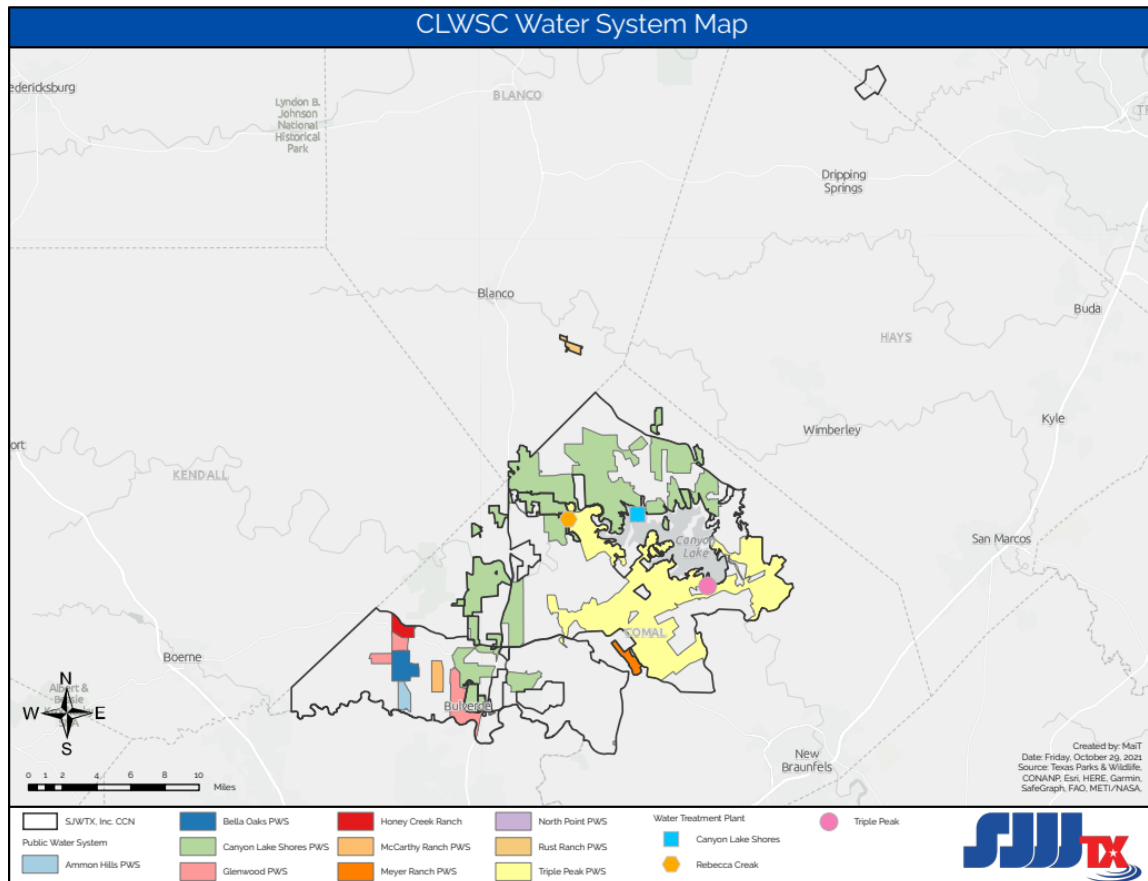


Figure 2: CLWSC public water system acquisition map

CLWSC provides water utility service via surface water (Canyon Lake and Lake Travis) and groundwater (Trinity Aquifer) sources. Specifically, groundwater is available from the Middle Trinity Aquifer at one hundred and nine (109) wells located throughout Comal and Blanco Counties. Appendix A provides a database with all available pertinent information including well location, construction details, and production abilities for the active CLWSC wells. Thirty-nine (39) wells are actively operated and/or maintained by CLWSC; one (1) well is a monitor well; twenty-two (22) wells are inactive and scheduled to be plugged; and at least forty-seven (47) wells are currently plugged. Figure 3 provides a well location map; each active well shown on the location map is labeled with a map identification number corresponding to the map identification field (Appendix A). The majority of CLWSC's wells are completed within the Middle Trinity Aquifer. The wells range in depth, diameter and capacity dependent upon where they are located and when they were completed.

Well Site Map



Figure 4 provides a map that shows the six separate water systems that make up CLWSC. The majority of the CLWSC wells are divided into two main water systems that are not interconnected; 1) Canyon Lake Shores (shown in blue), located on the north side of Canyon Lake; and 2) Triple Peak (shown in purple), located on the south side of the lake. These two water systems correspond to the three Water Treatment Plants (WTP) which provide surface water to these systems (Figure 4). Additional water systems served by wells which are not interconnected are the Rust Ranch, the Glenwood Subdivision, Northpoint Subdivision, and Summit North water systems. The Deer Creek Ranch Water System serves a portion of Hays and Travis counties, but does not utilize groundwater (Figure 4).

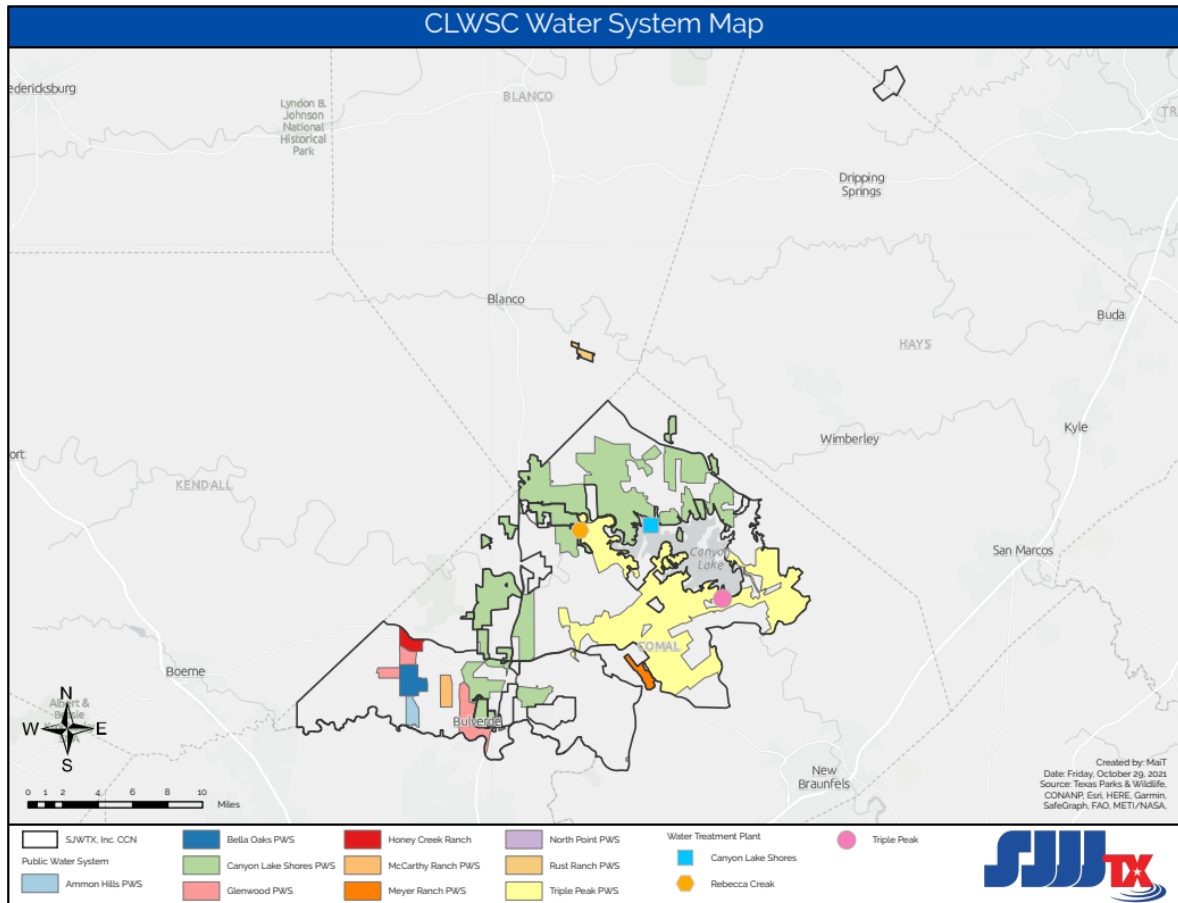


Figure 4: Canyon Lake WSC water systems

Section II: Geology

II.1. Introduction

The two major aquifers located within Comal County are the Edwards Aquifer and the Trinity Aquifer. These two aquifers make up a thick and regionally extensive aquifer system composed of Lower Cretaceous carbonates that were deposited across central Texas. On the Edwards Plateau in northwestern Comal County, the regional dip of the Cretaceous rocks is generally about 70 feet per mile to the southeast, which is the approximate gulfward slope of the land surface. Southeast of the Balcones Fault Zone (BFZ), the dip is progressively greater toward the Gulf, approaching 100 feet per mile in eastern Comal County (DeCook, 1963).

The lower of the two aquifer systems, the Trinity Aquifer is composed of three distinct hydrogeologic units: the Upper, Middle, and Lower Trinity Aquifers. The Upper Trinity Aquifer, composed of the Upper Glen Rose Limestone, crops out in the western portion of the county and is overlain by the limestone and dolomite of the Edwards Aquifer located at the surface in the eastern portion of the county.

II.2. Stratigraphy and Geologic History

The CLWSC service area is mostly in Comal County, but spans across central Texas where the BFZ dominates the regional geologic and hydrogeologic properties. The BFZ is a series of normal enechelon faults that trend in a general northeast-to-southwest direction extending from Williamson County in the northeast to Kinney County in the west. Faulting in the area associated with the BFZ has caused some rock units to be upthrown against others, creating both barriers to flow and conduits for water to pass through. Figure 5 illustrates the regional geologic and hydrogeologic units encountered within and in the vicinity of the service area.

The Trinity Aquifer as its name implies is divided into three aquifers from oldest to youngest: the Lower, Middle, and Upper Trinity Aquifers. Formations comprising the Lower Trinity Aquifer include, from oldest to youngest, the Hosston Sand Member and Sligo Limestone Member of the Travis Peak Formation (Figure 5). The Hosston consists of a conglomerate of gravel, sand and clay cemented by both calcite and quartz. The Hosston also contains sections of sandstone, siltstone, claystone, dolomite, limestone and shale. The Sligo Limestone consists of clastic sediment in the area near the CLWSC service area, and becomes dominantly limestone and dolomite to the east. Surface outcrops are referred to in the literature as Sycamore; Hosston and Sligo are the subsurface equivalents.

Located stratigraphically above the Hosston Sand is the Hammett Clay Member or also known by some as the Pine Island Shale. The Hammett is a transgressive “shale” deposit that onlaps Lower Trinity Sligo and Hosston formations. The interval averages 50 feet in thickness in the Comal County area (Lozo and Strickland, 1956). The unit is primarily a clay rich, gray-green sticky, dolomitic shale/claystone with siltstone and dolomite lenses. Color can be dark gray to black, blue, greenish gray and gray. The Hammett is a confining bed separating the Lower Trinity Aquifer from the Middle Trinity Aquifer (Figure 5).

Above the Hammett Clay lies the Middle Trinity Aquifer composed of the Cow Creek Limestone and the Bexar Shale members of the Travis Peak Formation and the Lower Glen Rose Limestone member of the Glen Rose Formation (Figure 5). The Cow Creek Limestone is a massive, fossiliferous limestone and dolomite ranging up to 100 feet in thickness and may contain some interbedded sand, clay, and evaporite minerals such as gypsum and anhydrite (Ashworth, 1983; Preston et. al, 1996; Wierman et al., 2010). The formation was subaerially exposed and subjected to meteoric water infiltration during early Hensel time, which resulted in widespread vuggy porosity (Loucks, 1977). In some areas, the Cow Creek is heavily fractured and capable of producing large well yields.

Overlying the Cow Creek is the Hensell Sand Member (Figure 5), which in the outcrop, is composed of loose sand and grades into thick continental deposits of red clay, silt, sand, and conglomerate with limestone beds in the subsurface. Down dip, the Hensell grades into marine deposits of silty dolomite, marl, calcareous shale, and shaley limestone known as the Bexar Shale Member (Ashworth, 1983). Down dip, the Bexar Shale acts as a confining unit for the Cow Creek (Wierman et al., 2010).

Stratigraphically above the Hensell Sand/Bexar Shale, the Glen Rose Limestone Formation is divided into a Lower and Upper Member. The Glen Rose along with the Hensell Sand represents a wedge of sediments deposited in a transgressing sea. George (1952) separated the Glen Rose into upper and lower members. The boundary between the two members is identified by a thin, heavily fossiliferous limestone bed containing *Corbula martinae* that persists throughout the project location except where erosion has lowered the land surface below the bed (Whitney, 1952; Ashworth, 1983). The separation between the two units is also distinguishable on geophysical logs where two distinct evaporite zones are found within the Upper Glen Rose; one midway through the Upper Glen Rose and another near the base shown by resistivity spikes on the log. The lower member of the Glen Rose Limestone consists of a massive, fossiliferous limestone at the base grading upward into thin beds of limestone, dolomite, marl, and shale. The top 15 to 20 feet of the lower member, designated the *Salenia texana* zone, is a highly fossiliferous, nodular marl and limestone which is capped by the Corbula bed (Ashworth, 1983). Near the top of the Lower Glen Rose, in some locations, is a reef deposit that is cavernous, heavily fractured, and can range in thickness. Where the reef deposit is encountered, the Lower Glen Rose can provide high yielding wells.

The Upper Member of the Glen Rose Formation, comprising the Upper Trinity Aquifer, consists of alternating beds of limestone and dolomite with marly sections that act as aquitards and restrict downward migration of groundwater to the Middle and Lower Trinity Aquifers (Wierman et al., 2010). The Upper Glen Rose also contains two distinct evaporite beds of gypsum or anhydrite that are easily distinguishable on geophysical logs due to high resistivity values. The lower evaporite zone occurs at the base of the Upper Glen Rose, which Ashworth (1983) describes as a “convenient correlation marker” between the Upper and Lower Glen Rose. The evaporite beds in some cases are the source of elevated sulfate concentrations in groundwater. Where present, the Upper Trinity Aquifer can yield small amounts of water to shallow wells which are often utilized for livestock and domestic use.

The Edwards Aquifer is comprised of three geologic formations, from oldest to youngest: The Kainer and Person formations (Edwards Group), and the Georgetown Formation (Washita Group). These formations were formed during the Cretaceous period during which the San Marcos Platform depositional environment varied from open marine to supratidal flats, where significant exposure and inundation of the sediments took place (Rose, 1972). At the base of the Edwards Group lies the Kainer Formation, which is comprised of the basal nodular bed, dolomitic, and grainstone members. The basal nodular member

(Walnut Clay equivalent) is a marine deposit consisting of massive, nodular wackestones and has a low permeability. The dolomitic member consists mostly of intertidal and tidal, burrowed and dolomitized wackestones with significant permeability. The upper part of the dolomitic member contains leached evaporitic deposits of the Kirschberg evaporite. The uppermost member of the Kainer Formation is the grainstone member, which is a shallow marine deposit that marks the beginning of another cycle of sedimentation started by a transgressing sea. This member consists of well-cemented, miliolid grainstones with lesser quantities of mudstone (Maclay and Small, 1986). The upper stratigraphic unit of the Edwards Group is the Person Formation, which consists of the regional dense, collapsed, leached, and marine members (Rose, 1972). The basal member is a laterally extensive marine deposit consisting of dense, shaley mudstone known as the regional dense member. The overlying members, the collapsed member and leached member, consist of intertidal to supratidal deposits containing permeable units formed by collapse breccias and by dolomitized and burrowed wackestones. The uppermost member is the marine member, which consists of rudist-bearing wackestones and packstones and shell-fragment grainstone (Maclay and Small, 1986). Overlying the Edwards Group, the Georgetown Limestone Formation of the Washita Group is composed of stratigraphically distinct limestone and is generally of lower porosity than the Edwards, but is included in the Edwards Aquifer because there is no barrier preventing communication between the Edwards Group and the Georgetown and the Georgetown expresses similar karstic characteristics as the Edwards (Scanlon et al., 2002; Lindgren et al., 2004).

Most of the major faulting associated with the Balcones Fault Zone within the CLWSC service area is located in the southern and southeastern portion of the CLWSC CCN (Figure 5). The majority of the CLWSC service overlies the Upper and Lower Glen Rose Formations, with portions overlying the Edwards Group to the south and east (Figure 5).

Section III: Hydrogeology

III.1. Introduction

The Trinity Aquifer in the Hill Country area spans as far north as Gillespie County and as far south as Bexar, Comal, and Hays County where fresh water can be produced. As the name suggests, the Trinity is composed of three aquifers: the Upper, Middle, and Lower Trinity Aquifers. Figure 6 shows the location of the Trinity Aquifer with respect to other major aquifers in the area, including the Edwards Aquifer. The solid green portion reflects the unconfined zone of the Trinity Aquifer where recharge occurs. The green diagonal hatched region reflects the confined zone of the aquifer where the formations that make up the Trinity Aquifer are located beneath the ground surface.

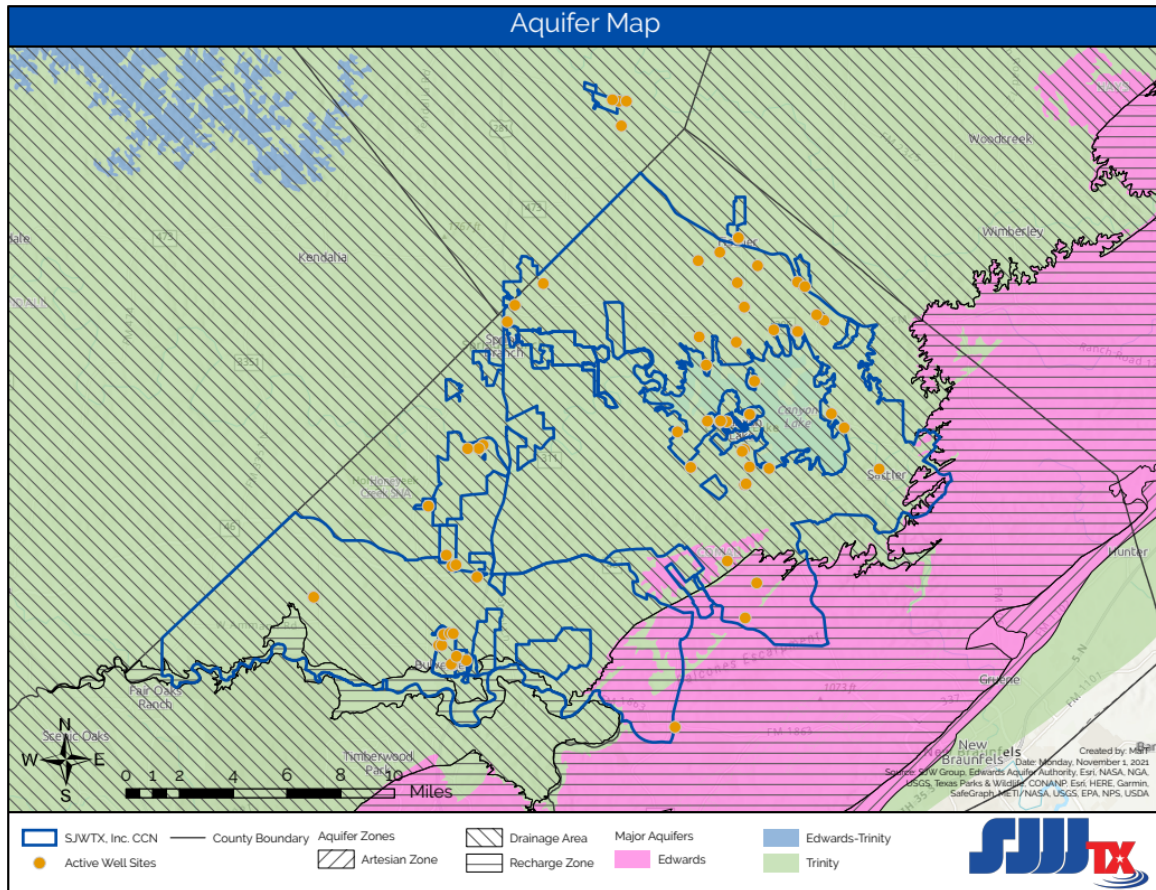


Figure 6: Aquifer map

Typically, the highest yielding aquifer of the Trinity Aquifers is the Middle Trinity, specifically the Cow Creek Limestone Member of the Travis Peak Formation and the reef section of the Lower Glen Rose. These formations are, in some localities, heavily fractured limestones, making them more productive because of their enhanced ability to transmit groundwater. Generally, the best producing wells are located farther downdip within the confined zone or on the edge of the recharge zone near the confined zone. These deeper Middle Trinity wells have more stable water levels and are capable of sustaining greater pumping rates. Within Comal County, most of the Upper Trinity Aquifer is unsaturated and produces small amounts of poor quality water. The Lower Trinity Aquifer is composed of conglomerates, and sandstones that are cemented together. The degree of cementing of these sediments controls the ability of water to move through the aquifer and thereby limiting the ability to produce large yielding wells. In localized areas, the

Lower Trinity Aquifer can produce wells with moderate yields.

Groundwater within the Trinity Aquifer flows from the recharge zone under gradient south and southeast towards the confined zone and generally follows the topography. The groundwater flows from areas of higher head to lower head and can vary considerably on a localized scale dependent upon fracture orientation and connectivity. Over the short term, the water level in the wells will rise and fall dependent upon the amount of precipitation occurring. This is more apparent in wells located farther up dip in the Middle Trinity, due to a smaller saturated thickness within the aquifer.

III.2. Recharge

The primary sources of recharge to the Trinity Aquifer are precipitation on the unconfined portion of the aquifer and stream and lake losses to the aquifer (Ashworth, 1983). The karst nature and open fractures of the rock units that compose the Trinity Aquifer allow for rapid recharge in some areas. In this respect, the Trinity Aquifer is similar to the Edwards Aquifer in that recharge from large precipitation events can refill the aquifer quickly. In Bexar, Comal, and Hays Counties, recharge to the Trinity Aquifer occurs in the northern to northwest portions of the counties where the Trinity formations are located at the surface.

Recharge is a major factor in determining what the effects that pumping will have on an aquifer. The majority of recharge estimates for the Trinity Aquifer in the Hill Country have incorporated stream baseflow and have been reported with respect to percent of mean annual precipitation. This relationship of recharge to stream baseflow is appropriate, because most of the rivers and streams in the study area gain water from the Hill Country portion of the Trinity Aquifer (Ashworth, 1983; Slade et al., 2002) and are hydraulically connected to the regional flow system (Kuniansky, 1990). These streams receive groundwater that discharge through seeps and springs that occur along the tops of impermeable units where they appear at the land surface (Barker and Ardis, 1996).

Estimates for recharge in the Hill Country portion of the Trinity Aquifer have ranged from 1.5 percent of mean annual precipitation (Muller and Price, 1979) up to 11 percent of mean annual precipitation (Kuniansky, 1989). Ashworth (1983) estimated recharge to the Trinity Aquifer to be 4 percent of mean annual precipitation by analyzing baseflow in the Guadalupe River basin between the Comfort and Spring Branch stream gages from 1940 to 1960. Mace and others (2000) used a similar approach to Ashworth's (1983) by employing an automated digital hydrograph-separation technique derived from Nathan and McMahon (1990) and Arnold et al. (1995) to estimate a recharge rate of 6.6 percent of mean annual precipitation. That estimated recharge rate was later reduced to 4 percent in order to calibrate the Trinity (Hill Country) Groundwater Availability Model (Trinity GAM). Within portions of Comal County, Mace et al. (2000) estimate a recharge rate of approximately 4 to 13 inches per year to the Trinity Aquifer. The higher value is associated with rapid recharge rates observed near Cibolo Creek. Wet Rock Groundwater Services, LLC (WRGS, 2008) also employed a recursive digital hydrograph-separation technique in the Guadalupe River basin (after Ashworth, 1983) and estimated a recharge rate of 9.45 percent of mean annual precipitation.

Ockerman (2007) developed a thorough watershed model to simulate streamflow and estimate recharge in the Upper Cibolo Creek watershed from 1992 to 2004. This study by the United States Geological Survey (USGS) was the most comprehensive study on recharge to the Trinity Aquifer. The Cibolo Creek watershed is approximately 175,096 acres spanning across the Kendall, Bexar, and Comal

County borders within the Trinity Aquifer recharge zone and encompasses the southwestern portion of the CLWSC CCN (Figure 7). The model combines a variety of inputs to accurately simulate water budgets and ultimately recharge. Ockerman estimated that approximately 79,800 acre-ft./year (~15% of mean annual precipitation) of recharge was attributed to the Upper Cibolo Creek Watershed on average which is greater than the 6.6 percent estimated by Mace and others (2000) and the 4 percent used in the Trinity (Hill Country) GAM. Of the 79,800 acre-ft./year, approximately 61,500 acre-ft./year (10.15% of mean annual precipitation) was recharge to the Trinity Aquifer. Upon further analysis, Ockerman found that precipitation on the Upper Glen Rose Limestone outcrop contributed approximately 15,200 acre-ft./year (6.5% of mean annual precipitation) of recharge, while precipitation on the Lower Glen Rose Limestone outcrop contributed approximately 46,300 acre-ft./year (20.33% of mean annual precipitation) of recharge. Figure 7 provides a map showing the Guadalupe Basin and the Upper Cibolo Creek Basin within Comal County.

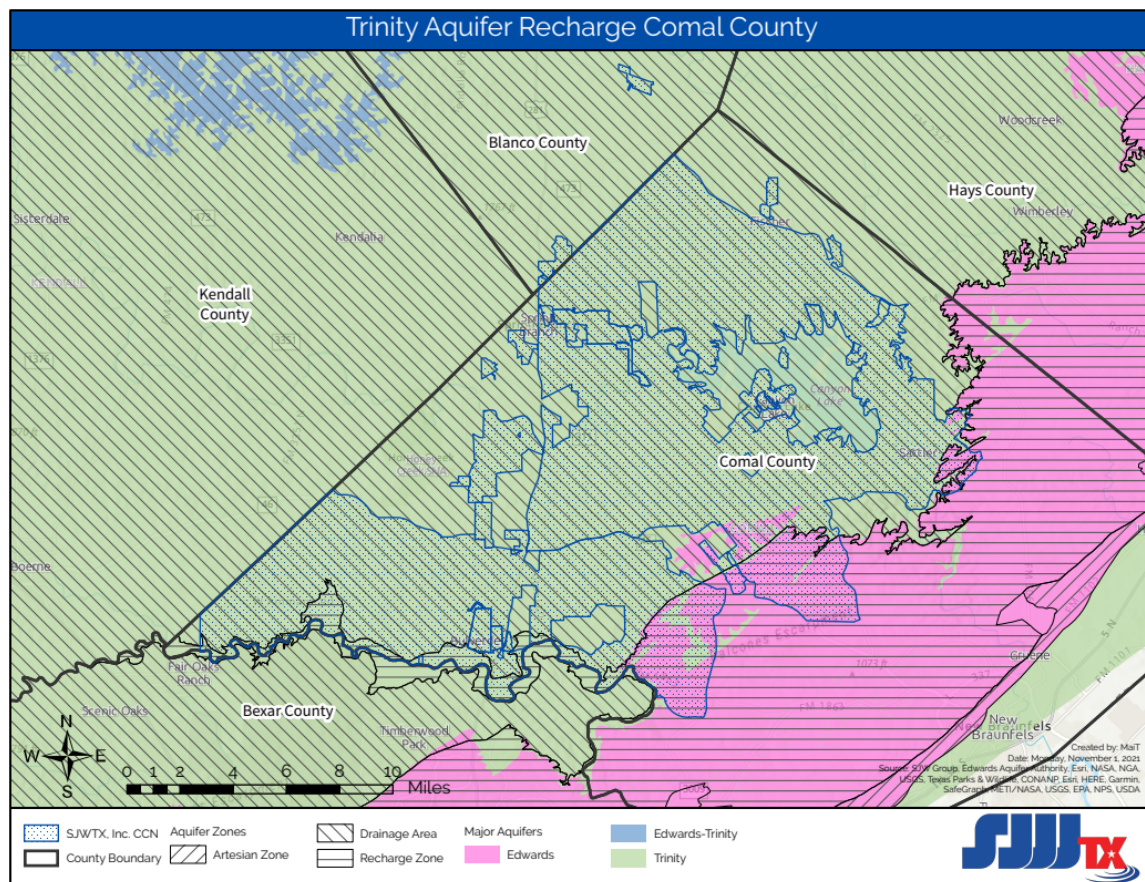


Figure 7: Trinity Aquifer Recharge - Comal County

Water levels within the Trinity Aquifer follow a short term cycle of decreasing water level during times of low precipitation and higher well production followed by a recovery of water level during precipitation events. The heterogeneity within the Middle Trinity Aquifer affects water level responses to recharge and discharge events differently throughout the region, as shown by the hydrograph from CLWSC Canyon Lake Shores Well No. 1. in Figure 8 (Map ID 41 in Figure 3). The well is completed within confined portions of the Middle Trinity Aquifer. The hydrograph shows a cyclical water level fluctuation due to seasonal demand as well as quick responses to rainfall events.

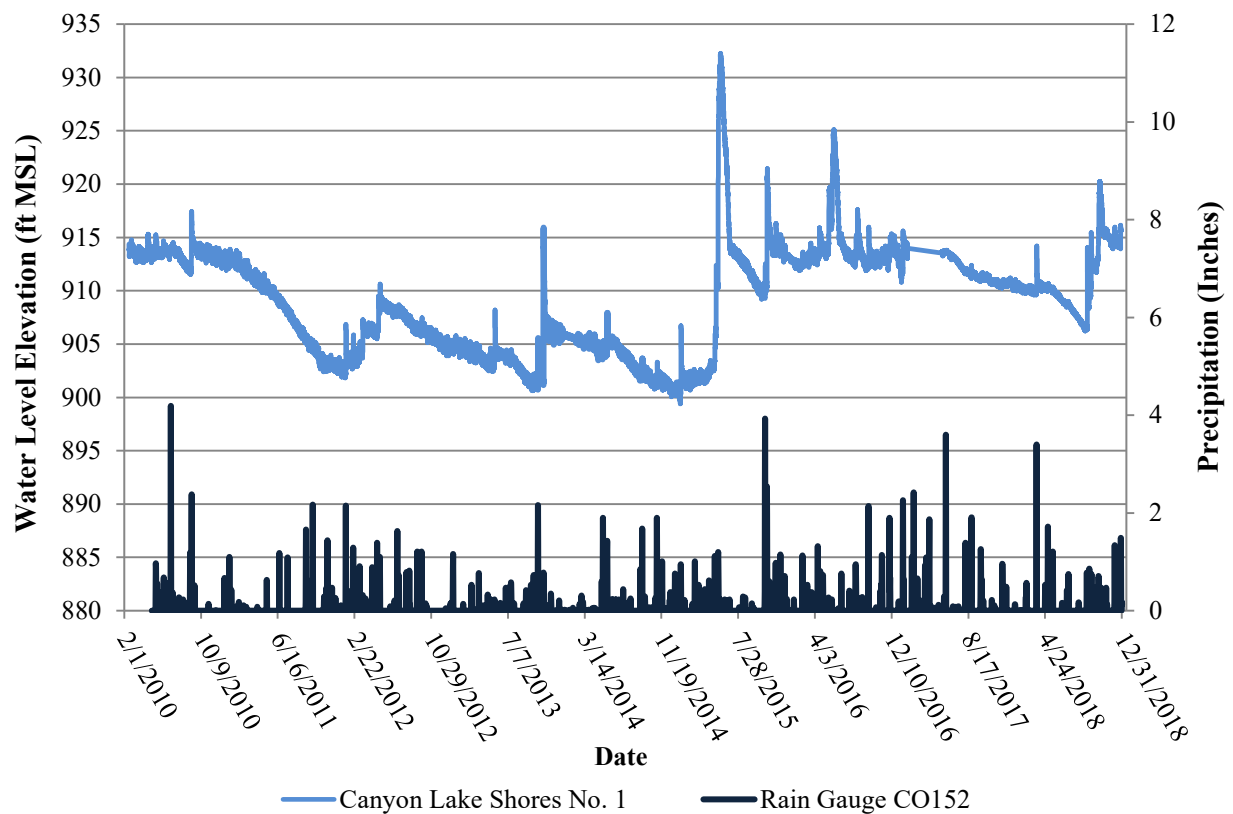


Figure 8: Hydrograph of CLWSC Canyon Lake Shores Well No. 1

Recharge to the Trinity Aquifer for the years 1992 to 2004 in Comal County was estimated using the recharge rates developed from WRGS (2008) and Ockerman (2007) for the Guadalupe and Upper Cibolo Creek Basins respectively (Table 1). Annual recharge rates and precipitation for the Guadalupe and Upper Cibolo Creek Basins were applied to each basins area to estimate total recharge for the county. For the years 1992 to 2004 average recharge to the Trinity Aquifer within the Guadalupe and Upper Cibolo Creek Basins was 61,201 acre-ft/yr and 17,994 acre-ft/yr respectively; total recharge averaged 79,194 acre-ft/yr. Recharge was dependent upon precipitation with dry years yielding very little recharge to the aquifer. Recharge to the Trinity Aquifer between 1992 and 2004 ranged from 8,095 acre-ft in 1996 when total precipitation was 24.19 inches up to 220,434 acre-ft in 1992 when precipitation was 54.24 inches (Table 1).

Table 1: Trinity Aquifer recharge estimates: Comal County

Year	Precipitation (inches) ¹	Recharge Rate Guadalupe Basin (% of Mean Annual Precipitation) ²	Recharge Rate Upper Cibolo Creek Basin (% of Mean Annual Precipitation) ³	Comal County Recharge: Guadalupe Basin (acre-ft) ⁴	Comal County Recharge: Upper Cibolo Creek Basin (acre-ft) ⁵	Total Trinity Aquifer Recharge: Comal County (acre-ft)
1992	54.24	25.31	19.07	176,225	44,209	220,434
1993	28.02	12.62	8.60	45,388	10,303	55,691
1994	36.01	4.81	7.25	22,221	11,159	33,380
1995	28.68	6.66	6.12	24,529	7,505	32,035
1996	24.19	1.47	3.41	4,573	3,522	8,095
1997	48.70	15.31	10.18	95,687	21,199	116,886
1998	48.88	11.03	12.85	69,217	26,861	96,078
1999	15.83	5.12	4.82	10,402	3,259	13,661
2000	34.38	3.50	10.26	15,465	15,077	30,542
2001	44.49	12.07	14.83	68,955	28,211	97,165
2002	49.45	15.33	13.28	97,340	28,079	125,419
2003	26.92	13.50	9.41	46,638	10,830	57,468
2004	46.69	19.85	11.87	118,968	23,701	142,670
Avg: 1992 - 2004	37.42	11.28	10.15	61,201	17,994	79,194
1 From USGS Scientific Investigations Report: 2007-5202						
2 From Wet Rock Groundwater Services, LLC, 2008 "An Evaluation of the Trinity Aquifer Within Kendall County and Analysis of the Trinity (Hill Country) GAM"						
3 From USGS Scientific Investigations Report: 2007-5202						
4 Basin Area within Trinity Aquifer Recharge Zone in Comal County = 154,043 acres						
5 Basin Area within Trinity Aquifer Recharge Zone in Comal County = 51,301 acres						

Not only does the total annual precipitation amount play a major role in recharge, but when each precipitation event occurs and how much precipitation a given event produces, is even more important. Water levels rise with moderate to significant precipitation events (greater than 1 inch) and maintain the higher water levels for a period of time until the aquifer reaches a new equilibrium. The rise and the length of time it takes for the aquifer to reach steady state is dependent upon the amount of precipitation and the amount of pumping occurring. It is difficult to quantify how much each of these factors play, however there is no indication that a change in the duration of recovery is occurring over time. The rise in water level and the magnitude of that rise is dependent upon precipitation intensity and location. For example, an intense rainstorm across an area with numerous recharge features such as fractures, sinkholes, and faults would result in more a more rapid and substantial influx of water into the aquifer than a gradual precipitation event over a less permeable landscape.

III.3. Discharge

Groundwater production within Comal County is mostly from the Edwards BFZ Aquifer and to a lesser extent, the Trinity Aquifer. Table 2 provides a summary of groundwater production within Comal County from the Texas Water Development Board's (TWDB) Water Use Survey. Between 1980 and 2016

(most recent year of data available), the Edwards BFZ Aquifer averaged a total pumpage of 14,400 acre-ft/yr while the Trinity Aquifer averaged 3,542 acre-ft/yr (Table 2). The majority of the production within the Trinity Aquifer is due to municipal usage, which accounts for approximately 90% of the total pumpage. Livestock and irrigation usage account for the remaining pumpage in the Trinity Aquifer within the county. Groundwater production from the Edwards Aquifer has declined between 2009 and 2015, despite record drought in 2011 and 2012 (Figure 9). Conversely, groundwater production from the Trinity Aquifer has shown an increasing trend since 2002. The Water Use Survey also indicated that groundwater from the Edwards-Trinity High Plains Aquifer, “Other,” and “Unknown” sources were utilized within the county; however, the Edwards-Trinity High Plains Aquifer is not delineated within Comal County, therefore the quantities that were reported for that aquifer were grouped in with Edwards BFZ Aquifer production quantities (Figure 9).

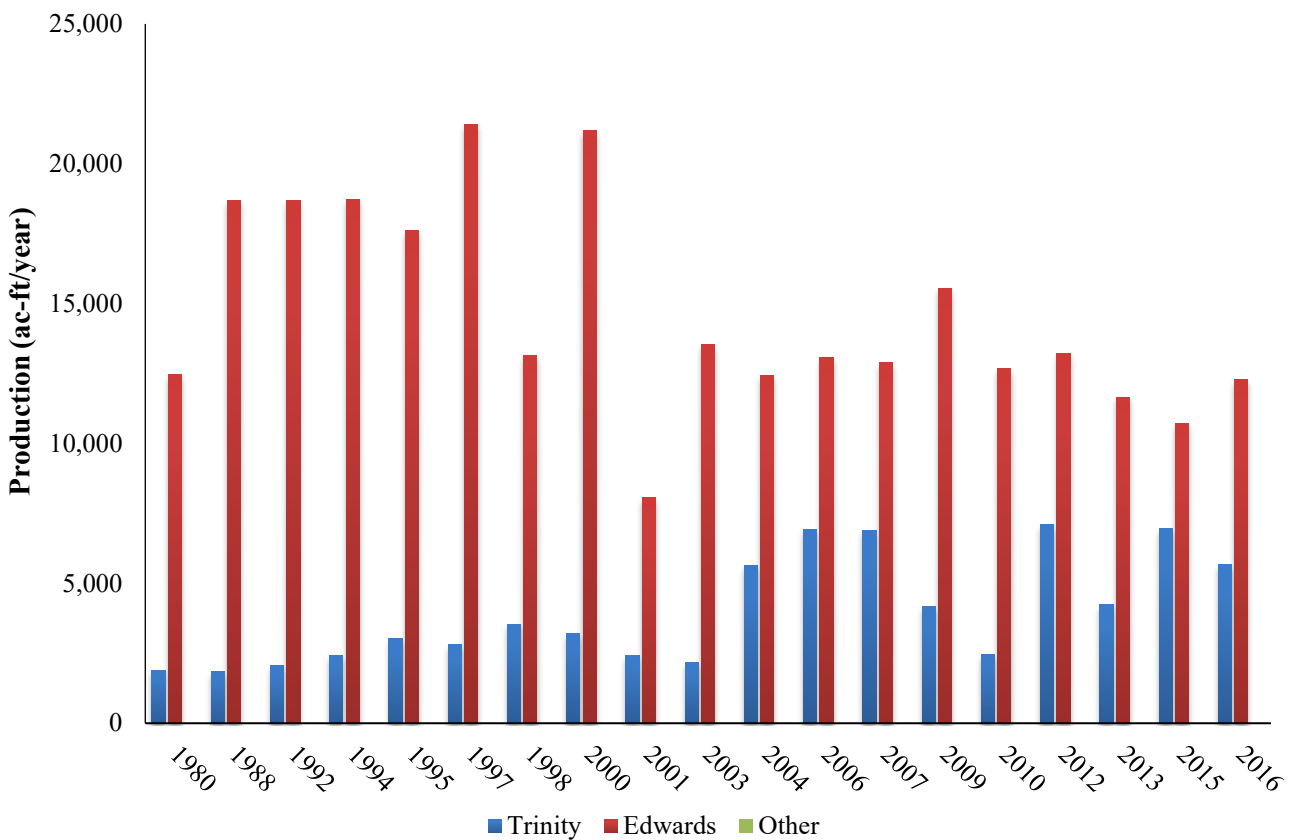


Figure 9: Groundwater production in Comal County (1998 - 2016)

Table 2: Historical groundwater pumpage in Comal County (1980 – 2016)

Year	Aquifer	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
1980	Edwards (BFZ)	11,165	996	82	0	133	82	12,458
	Trinity	1,318	0	0	0	368	210	1,896
1984	Edwards (BFZ)	9,578	527	889	0	187	44	11,225
	Trinity	1,154	0	0	0	12	232	1,398
1985	Edwards (BFZ)	10,683	1,055	961	0	0	1	12,700
	Trinity	1,184	0	0	0	0	221	1,405
1986	Edwards (BFZ)	11,718	981	946	0	385	1	14,031
	Trinity	1,363	0	0	0	0	221	1,584
1987	Edwards (BFZ)	11,440	1,013	5,831	0	385	1	18,670
	Trinity	1,480	0	0	0	0	232	1,712
1988	Edwards (BFZ)	10,586	899	5,864	0	385	1	17,735
	Trinity	1,583	0	0	0	0	257	1,840
1989	Edwards (BFZ)	10,908	1,085	946	0	481	1	13,421
	Trinity	1,771	0	0	0	0	255	2,026
1990	Edwards (BFZ)	9,764	1,019	946	0	469	1	12,199
	Trinity	1,549	0	0	0	0	252	1,801
1991	Edwards (BFZ)	8,691	5,785	2,985	0	403	1	17,865
	Trinity	1,615	0	0	0	0	258	1,873
1992	Edwards (BFZ)	3,110	6,172	9,006	0	403	1	18,692
	Trinity	1,791	0	0	0	0	284	2,075
1993	Edwards (BFZ)	3,127	5,971	9,623	0	17	1	18,739
	Trinity	1,960	0	0	0	0	282	2,242
1994	Edwards (BFZ)	2,938	5,826	10,080	0	15	1	18,860
	Trinity	2,131	0	0	0	10	284	2,425
1995	Edwards (BFZ)	2,759	5,918	8,909	0	12	1	17,599
	Trinity	2,724	0	0	0	9	296	3,029
1996	Edwards (BFZ)	3,197	9,301	8,909	0	14	1	21,422
	Trinity	2,040	0	0	0	10	243	2,293
1997	Edwards (BFZ)	3,757	5,985	7,657	0	12	1	17,412

	Trinity	2,550	0	0	0	9	243	2,802
1998	Edwards (BFZ)	4,871	6,031	2,224	0	14	1	13,141
	Trinity	3,305	0	0	0	11	227	3,543
1999	Edwards (BFZ)	5,806	7,467	7,911	0	13	1	21,198
	Trinity	3,940	0	0	0	9	246	4,195
2000	Edwards (BFZ)	4,348	5,942	2,224	0	17	1	12,532
	Trinity	2,951	0	0	0	13	237	3,201
2001	Edwards (BFZ)	4,066	1,753	2,224	0	18	1	8,062
	Trinity	2,233	0	0	0	14	175	2,422
2002	Edwards (BFZ)	4,967	449	8,102	0	24	4	13,546
	Trinity	2,041	0	0	0	21	167	2,229
2003	Edwards (BFZ)	4,245	364	8,025	0	56	51	12,741
	Trinity	2,014	0	0	0	44	111	2,169
2004	Edwards (BFZ)	4,225	384	7,692	0	92	48	12,441
	Trinity	5,477	0	0	0	61	104	5,642
2005	Edwards (BFZ)	5,929	458	6,630	0	36	23	13,076
	Trinity	5,330	0	0	0	24	50	5,404
2006	Edwards (BFZ)	6,455	496	6,651	0	442	22	14,066
	Other	8	0	0	0	0	0	8
	Trinity	6,577	0	0	0	293	46	6,916
2007	Edwards (BFZ)	5,690	387	6,639	0	152	26	12,894
	Other	7	0	0	0	0	0	7
	Trinity	6,739	0	0	0	100	57	6,896
2008	Edwards (BFZ)	8,011	385	7,114	0	0	45	15,555
	Other	8	0	0	0	0	0	8
	Trinity	4,235	0	0	0	0	35	4,270
	Unknown	0	0	3,221	0	0	0	3,221
2009	Edwards (BFZ)	8,224	336	6,227	0	286	48	15,121
	Other	12	0	0	0	0	0	12
	Trinity	3,891	0	0	0	238	37	4,166
	Unknown	0	0	3,345	0	0	0	3,345
2010	Edwards (BFZ)	7,784	2,111	2,630	0	123	24	12,672
	Other	16	0	0	0	0	0	16
	Trinity	2,308	4	0	0	98	48	2,458
	Unknown	0	0	3,469	0	0	0	3,469

2011	Edwards (BFZ)	3,396	1,169	2,608	0	235	26	7,434
	Edwards Trinity High Plains	5,800	0	0	0	0	0	5,800
	Other	18	0	0	0	0	0	18
	Trinity	4,425	14	0	0	189	51	4,679
	Unknown	0	0	177	0	0	0	177
2012	Edwards (BFZ)	2,647	678	2,669	0	158	21	6,173
	Edwards Trinity High Plains	4,550	570	0	0	0	0	5,120
	Other	13	0	0	0	0	0	13
	Trinity	4,797	2,153	0	0	127	43	7,120
2013	Edwards (BFZ)	2,050	607	2,803	0	125	23	5,608
	Edwards Trinity High Plains	4,108	1,938	0	0	0	0	6,046
	Other	5	0	0	0	0	0	5
	Trinity	4,085	9	0	0	100	46	4,240
2014	Edwards (BFZ)	1,986	448	2,831	0	88	24	5,377
	Edwards Trinity High Plains	4,000	1,338	0	0	0	0	5,338
	Other	2	0	0	0	0	0	2
	Trinity	4,708	3,016	0	0	71	49	7,844
2015	Edwards (BFZ)	2,199	377	2,558	0	129	25	5,288
	Edwards Trinity High Plains	4,321	732	0	0	0	0	5,053
	Other	5	0	0	0	0	0	5
	Trinity	5,097	1,715	0	0	103	49	6,964
2016	Edwards (BFZ)	1,927	307	2,881	0	196	25	5,336
	Edwards Trinity High Plains	4,605	0	2,355	0	0	0	6,960
	Other	3	0	0	0	0	0	3
	Trinity	4,764	12	700	0	157	50	5,683
Data collected from TWDB Water Use Survey Groundwater Pumpage Estimates (Accessed January 24, 2019); All data expressed in Acre-Feet								

III.4. Water Quality of the Trinity Aquifer

The geochemistry of groundwater generally reflects the chemical composition of the sediments through which the water has traveled. This chemical characteristic is often referred to as the groundwater facies. The Middle Trinity Aquifer, which is composed of calcium and magnesium-rich carbonate rocks, produces water that typically has a calcium-carbonate and magnesium-carbonate type groundwater facies with evidence of sulfate-dominated characteristics in some areas (Musick and Hunt, 2010). In areas where groundwater has traveled through more easily dissolvable sediment such as gypsum and anhydrite beds, total dissolved solids (TDS) increases, diminishing water quality. Wells that are producing from zones containing gypsum and anhydrite, or wells located far downdip in the aquifer are more likely to contain poor quality water.

Overall, water quality within the Middle Trinity Aquifer is good and meets all Texas Commission on Environmental Quality (TCEQ) Maximum Contaminant Levels and Secondary Constituent Levels (MCLs and SCLs). In some areas, groundwater does not meet drinking water requirements due to elevated sulfate concentrations which subsequently causes elevated TDS. The sulfates in the groundwater originate from the dissolution of anhydrite beds interbedded in the limestone formations. The Upper Glen Rose Formation contains two specific zones of gypsum or anhydrite which characterize the high sulfate water typically found within the Upper Trinity Aquifer. The use of electric logs during well construction and the casing off of these layers is an important part of proper well design within the Trinity Aquifer. TCEQ's SCL for sulfate and TDS is 300 mg/L and 1,000 mg/L respectively.

Appendix B provides a water quality database containing all available water quality information for the active and historical CLWSC wells. In general, the water quality of CLWSC's groundwater meets TCEQ drinking water standards.

Section IV: CLWSC – Groundwater Overview

IV.1. CLWSC Capacity and Aquifer Testing

Beginning in 2008, CLWSC contracted with WRGS to begin evaluating their existing well capacity which included first cataloging each well, determining the location of each well, and acquiring available well construction information. After cataloging the wells, pumping tests were conducted to determine the maximum production capacity of selected wells in various locations throughout the water system (Wet Rock Groundwater Services, 2016). In wells that were not tested, pumping rates reported by the TCEQ were used as maximum production capacities. In many cases, the calculated maximum production capacity of the wells determined after aquifer tests were conducted was much higher, in large part because it was unknown what each of the wells was actually capable of producing. Most of CLWSC's wells are older wells that were either never properly tested or were designed in a manner that made them unable to produce at the maximum rate that the aquifer would allow. For example, some wells were constructed in areas of the aquifer that are prolific but the casing size of the well was too small for a large enough pump to produce the maximum allowable flow rates.

One aquifer test has been conducted since the previous groundwater availability report in 2016 (Wet Rock Groundwater Services, 2016). Appendix C contains its associated analysis and maximum production capacity calculation; previous aquifer tests and analyses have been reported in the 2016 groundwater availability report. Maximum production capacities for all the active CLWSC wells ranged from 11 gpm to 800 gpm. Figure 10 provides a location map of the active CLWSC wells with their calculated and/or estimated maximum production capacities as determined by WRGS. The maximum capacities are represented by graduated symbols, consisting of yellow (11 – 50 gpm), orange (51 – 100 gpm), green (101 – 250 gpm), blue (251 – 400 gpm), and pink circles (401 – 800 gpm; Figure 10). Appendix A provides a wells database with maximum production capacities determined for each active well. In the column entitled "Maximum Production Capacity (gpm)," the rows are color-coded in correspondence to the method used to determine the maximum production capacity. Wells that were tested by WRGS are colored blue; wells that have TCEQ flow ratings are colored green; and wells that have not been tested by WRGS or the TCEQ but were tested by the initial driller are colored orange. All maximum production capacity estimations are based upon actual pumping results.

Based upon the calculated and estimated maximum production capacities of all wells, both active and inactive, CLWSC is able to prove up a total of 8,360 gpm of groundwater capacity or 8,989.87 acre-ft/yr. Thirty-nine (39) active wells are capable of producing 7,390 gpm of groundwater capacity or 7,946.75 acre-ft/yr.; twenty-two (22) inactive wells (not yet plugged) are capable of producing 970 gpm of groundwater capacity or 1,043.08 acre-ft/yr.

CLWSC operates thirty-six (36) active wells and twenty-one (21) inactive wells in Comal County, with three (3) active wells and one (1) inactive well in Blanco County; the Deer Creek Ranch Water System that was acquired in December of 2018 has no operable wells and provides water resources via West Travis County Public Utility Agency (surface water from Lake Travis). The active wells within Comal County have a total capacity of 7,257 gpm or 7,803.73 acre-ft/yr.; the inactive wells within Comal County have a total capacity of 916 gpm or 861.88 acre-ft/yr.; the three active (3) wells within Blanco County have a total capacity of 133 gpm or 143.02 acre-ft/yr. The capacity calculations assumed each well pumping for 16 hours/day for 365 days. Total capacity was determined using the updated capacity of the well by WRGS where available, and the TCEQ well capacity ratings (Appendix C).

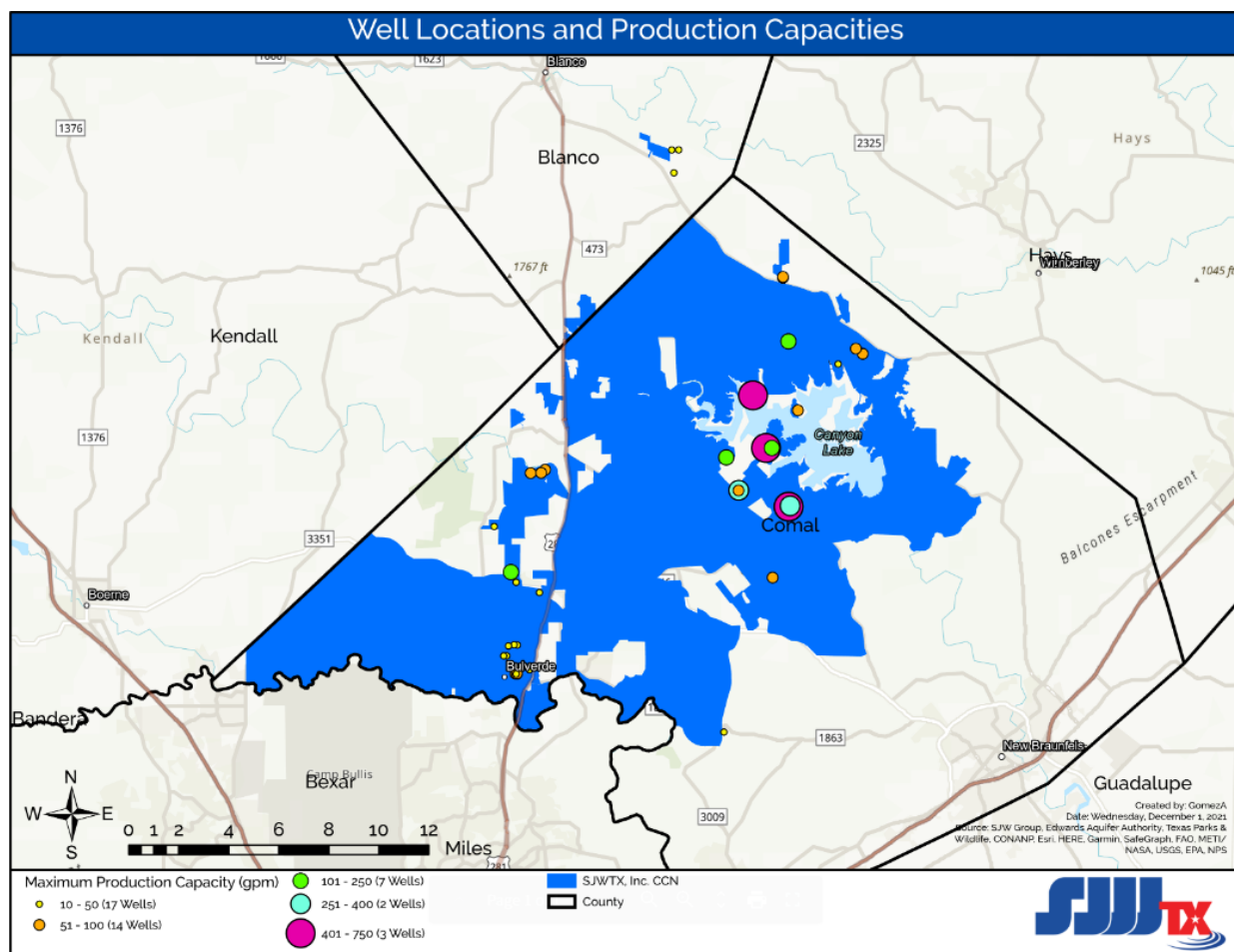


Figure 10: Map showing CLWSC well locations and maximum production capacities

Transmissivities calculated from the aquifer tests ranged from 32 ft²/day up to 66,300 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 9,306.85 ft²/day (Appendix C). Based upon the well testing and analysis of CLWSC’s wells, it is evident that most of the wells in the CLWSC system produce substantial amounts of water on a consistent basis at sustainable rates. The aquifer tests allowed CLWSC to identify areas of the Trinity Aquifer which are more prolific than others thereby providing the ability to better plan where to drill future production wells. CLWSC will continue to evaluate its well production needs and may replace some existing wells with new wells in order to improve water quality and operational efficiency.

Based upon recharge estimates provided, the projected withdrawal of water from wells within the Trinity Aquifer for the next twenty years by CLWSC is sustainable and substantially less than the average recharge to the aquifer between 1992 and 2004 of 79,194 ac-ft/yr (Table 1). In fact, the projected withdrawal by CLWSC is close to the two lowest recharge estimates shown in Table 2 for the years 1996 (8,095 ac-ft) and 1999 (13,661 ac-ft).

IV.2. Monitoring Well Network

During 2011, CLWSC established a monitoring network to monitor the water level of the Trinity Aquifer within CLWSC's service area. The monitoring network consists of five wells within the Trinity Aquifer (Canyon Lake Shores No. 1, Cypress Springs No. 1, State Well No. 6804312, State Well No. 6807407, and State Well No. 6815211). Four of the five wells are owned by CLWSC: Canyon Lake Shores

No. 1, Cypress Springs No. 1, State Well No. 6807407, and State Well No. 6815211. CLWSC voluntarily allowed the Texas Water Development Board (TWDB) to monitor State Well No. 6807407 and State Well No. 6815211 as part of the TWDB Daily Water Level Network. State Well No. 6804312 is privately owned and is also part of the TWDB Daily Water Level Network. Wells removed from the monitoring network include Vintage Oaks Well No. 2 and Cypress Springs No. 1 in August 2013 and April 2016, along with Glenwood Well No. 3 on October 5, 2017 respectively. However, Cypress Springs Well No. 1 was reinstated to the monitoring network during the fourth quarter of 2018. Figure 11 provides a map showing the monitoring network in relation to the Trinity and Edwards Aquifers. Table 3 provides a summary of well completion with water levels.

A Level TROLL 500 pressure transducer programmed to measure the water level and temperature at one hour intervals was set in each of the CLWSC wells. The majority of the transducers were placed in the CLWSC Wells during the fall of 2011. Since then, some of the transducers had to be removed for repair or were replaced. Table 4 provides a log of the repairs and actions performed with regards to the CLWSC transducers.

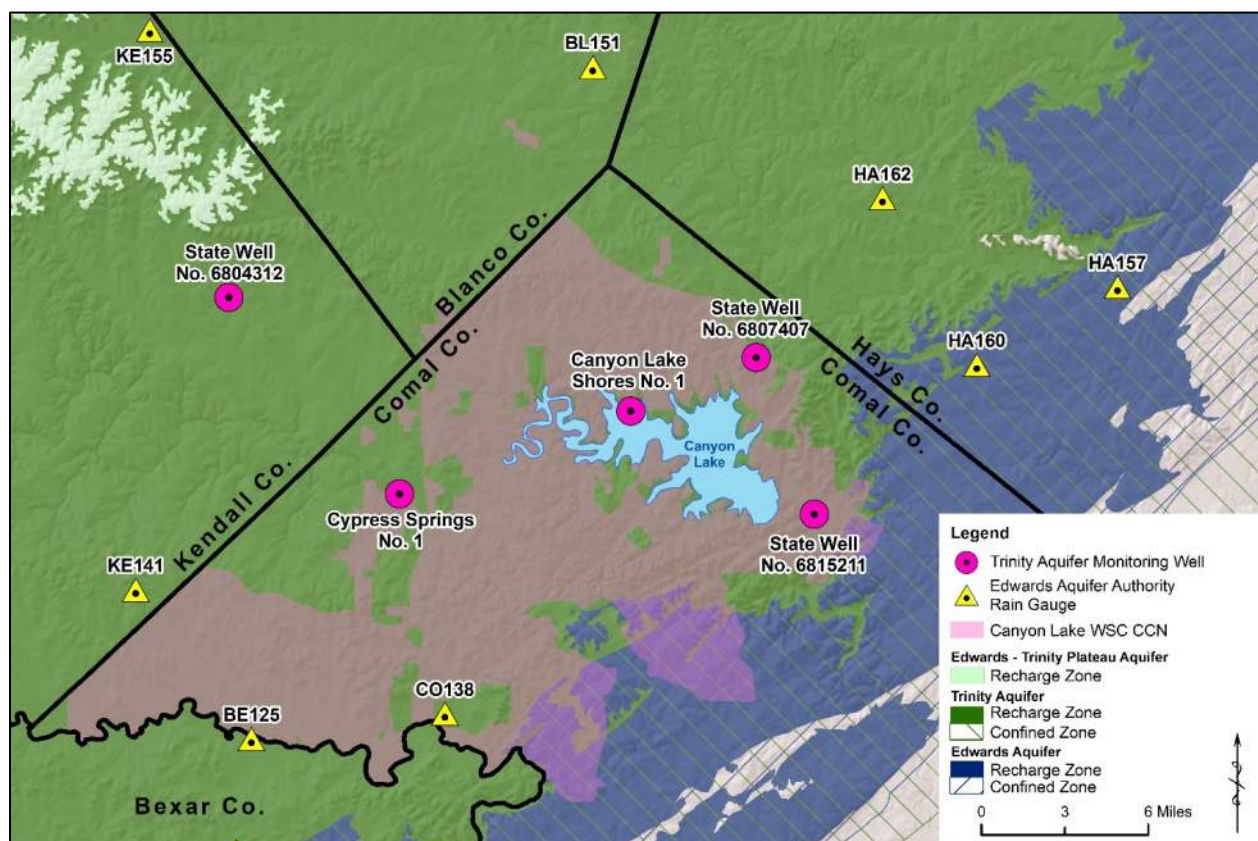


Figure 11: Trinity Aquifer monitoring network

The three TWDB Daily Water Level Network wells are part of a state wide network of wells that are equipped with measurement devices and satellite telemetry set to take hourly water level measurements. According to the TWDB, the sites typically consist of a datalogger attached to water level recording devices, such as transducers or floats and pulleys; satellite transmitters; power sources, including solar panels;

antennae; and equipment shelters (TWDB, 2019). The data from the wells are uploaded on a near real time basis and are available for download from the TWDB website.

Table 3: Well completion summary of CLWSC Monitoring Network

Well	Hole Diameter (inches)	From (ft)	To (ft)	Casing Type	Casing Diameter (inches)	From (ft)	To (ft)	Starting Static Water Level (ft MSL)	Starting Static Water Level 2018 (ft MSL)	Ending Static Water Level 4th Qtr 2018 (ft MSL)
Canyon Lake Shores No. 1	n/a	n/a	n/a	Steel	6	n/a	n/a	914.38	911.06	915.56
	n/a	0	396	n/a	n/a	0	396	(2/16/2010)	(1/1/2018)	(12/28/2018)
St. Well No. 6804312	8 1/2	0	310	PVC	5 1/2	0	246	1,248.04	1,247.91	1,254.92
	8 1/2	0	310	Open Hole	8 1/2	246	310	(12/20/2008)	(1/1/2018)	(12/30/2018)
St. Well No. 6807407	n/a	0	575	n/a	n/a	n/a	n/a	912.58	868.47	870.19
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(9/14/1998)	(1/1/2018)	(12/18/2018)
St. Well No. 6815211	n/a	0	249	n/a	n/a	n/a	n/a	751.86	747.09	751.54
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(7/20/2010)	(1/1/2018)	(12/30/2018)
Cypress Springs No. 1	12	0	100	Steel	8 5/8	0	100	878.35	875.03	882.46
	7 7/8	100	390	Open Hole	5	100	390	(9/20/2013)	(10/22/2018)	(12/28/2018)
Cypress Springs No. 2	8	0	390	Steel	5	0	220	885.81	854.087	847.289
								(4/1/2016)	(1/1/2018)	(8/6/2018)

ft = feet; MSL = mean sea level; n/a = not available

Table 4: Transducer repair/replacement log

Date	Well	RMA	Transducer S/N	Cable S/N	Reason for repair
4/1/2016	Cypress Springs 1		324524	223916	Cypress Springs 1 removed from monitoring network
4/1/2016	Cypress Springs 2		324524	223916	Cypress Springs 2 added to monitoring network
4/4/2017	Canyon Lake Shores 1	81660	151766	223917	Pulled for repair, no response from the unit
5/22/2017	Canyon Lake Shores 1		151766	223917	Redeployed in well
9/26/2017	Cypress Springs 2	84061	324524	223916	Pulled for repair, no response from the unit, removed from network
10/22/2017	Cypress Springs 1		324524	223916	Added back on the monitoring network and deployed in Cypress Springs 1

Notes: S/N = Serial Number; * Unknown; RMA = Return Merchandise Authorization

Appendix D provides hydrographs and a map of the five wells within the CLWSC monitoring network. Each hydrograph shows the water levels from the well accompanied by rain gauge data from nearby Edwards Aquifer Authority (EAA) rain gauges. The hydrograph map uses the same scales for easy comparison between locations and provides an overview of water levels in the Trinity Aquifer from October 27, 2011 to December 28, 2018. The individual hydrographs provide a more detailed look at each individual

well and include historic data where available. Groundwater in the Trinity Aquifer generally flows in a southeast direction; overall, the hydrographs show relatively stable water level elevations with fluctuations in the short term.

Water levels within the Trinity Aquifer follow a short term cycle of decreasing water level during times of low precipitation and higher well production followed by a recovery of water level during precipitation events. This cyclic pattern can be seen in all of the monitoring wells. Overall, the long term trend of water levels within the monitoring wells show a stable level maintained. Within the last ten years, the Central Texas Area has experienced both historic drought and wet conditions which have resulted in highly variable water levels. Table 5 provides a summary of precipitation from 2006 through December 31, 2018 from Edwards Aquifer Authority rain gauges located near the Canyon Lake area and a rain gauge at the San Antonio International Airport. These precipitation totals illustrate the historic drought experienced in the area. Based upon the available data, there have been multiple years over the past ten years with annual precipitation being less than or more than the NOAA reported precipitation average of 32 inches per year.

Table 5: Area rain gauge precipitation summary (2006 – 2018)

Rain Gauge ID	Precipitation Totals												
	2006 (inches)	2007 (inches)	2008 (inches)	2009 (inches)	2010 (inches)	2011 (inches)	2012 (inches)	2013 (inches)	2014 (inches)	2015 (inches)	2016 (inches)	2017* (inches)	2018* (inches)
EAA HA160	25.88	51.97	12.14	26.5	27.27	14.91	20.63	25.97	12.4 ¹	37.05*	17.02	*	*
EAA HA162	15.07	20.1*	10.04	31.57	24.64	15.11	23.19	26.84	17.66	3.26 ²	18.61	22.33	18.26
EAA BL151	14.77	16.89*	9.74*	16.86*	20.08*	12.96	19.05	20.86	19.16*	36.86	30.77	18.09	22.51
EAA KE155	15.27	39.39*	11.69	18.61*	32.03	12.22*	22.68	26.36	11.7 ³	-	14.3	18.5	22.39
EAA KE141	18.99	46.46	12.76	20.02*	20.8	14.54	24.23	22.4	23.1	34.55	24.5	13.02	32.1
EAA BE 125	14.59*	34.39*	8.17*	28.18*	25.73	13.96	26.48	25.41*	21.18*	35.87	31.9	24.1	27.85
EAA CO138	6.19*	16.3*	7.72*	26.74	27.64	13.95	21.19	22.23	25.91	40.82*	25	19.95	30.36
San Antonio International Airport	21.27	47.25	13.76	30.69	37.39	17.58	39.4	31.59	28.2	44.22	43.9	32.27	41.2
Notes: The yearly precipitation average for the region is 32 inches (NOAA 1981-2010) 1. EAA Rain Gauge HA160 started logging data 3/1/2016; 2. EAA Rain Gauge HA 162 stopped logging data 2/29/2016 and resumed 6/1/2016; 3. EAA Rain Gauge KE 155 stopped logging data 8/31/2014 and resumed 6/1/2016; 4. EAA Rain Gauge HA 162 did not record data in December 2018* Indicates incomplete data set													

In many areas across Texas, the drought conditions have been mitigated by heavy rainfall in 2014, 2015, 2016, and 2018 (Appendix D). The water levels within the observation wells maintained similar cyclical trends until the spring of 2015 when much of Texas received record rainfalls. The rainfall had significant impact within the Edwards and Trinity Aquifers, especially in Central Texas. After the spring rainfalls, normal dry conditions continued through the summer, causing water levels to stabilize. Heavy rainfall returned to Central Texas in the fall of 2015, causing water levels to once again rise. As a result, many of the monitoring wells which were experiencing lower than normal water levels underwent a rapid increase in water levels not observed since the drought that began in 2011. Even with the relatively short duration of the high-intensity rainfall, prolonged recovery within the aquifers is evident.

2016

2016 precipitation totals were spatially variable, with sparse rainfall events between December 2015 and April 2016 and also between August and October 2016. Heavy rainfall events were experienced in late May - early June 2016 and between November and December 2016. Between January 1, 2016 and December 31, 2016, every well within the monitoring network experienced little change in water levels, with the exception of Glenwood No. 3, State Well No. 6807407, and Cypress Springs No. 2. The largest water level increase was recorded within the Glenwood No. 3, with an increase of approximately 13 feet over the course of 2016; State Well No. 6807407 and Cypress Springs No. 2 have both experienced water level declines of nearly 20 feet. The water levels within the remaining monitoring wells had minor increases and declines that ranged from less than 3 feet during the same time.

2017

Beginning in 2017, precipitation totals were near the annual average in the area near the monitoring network, and water levels remained relatively constant. The water levels within the monitor wells fluctuated with rainfall events, but moved no more than 4 feet (State Well No. 6807407). All monitor wells experienced a drop in water levels from April 2017 and have returned to the water levels they started 2017 with. In the remainder of the 2017 year water levels have slightly decreased with few fluctuations due to periodical precipitation events.

2018

Precipitation values varied from quarter to quarter in 2018 beginning with a moderately dry first and second quarter, causing water levels to decline for all the monitoring wells in the region. However, due to intense precipitation events in September and October, the water levels quickly increased throughout the monitoring network. The water level within State Well No. 6804312 increased the most, by approximately 20 feet; the other monitoring wells also increased by approximately 15 feet within the last 60 days of 2018 (Appendix D). The rainfall events from the late fall coupled with an implied reduction in regional water demand led to higher, more stable water levels at the end of 2018. All monitor wells have risen from their 2018 starting static water levels (Table 3).

It is common for water levels to be lower in summer months due to less precipitation and increased water use in the area. Since the decrease in water levels from the extreme drought from 2010 - 2014, all of the water levels within the monitoring network have experienced an upward trend beginning in 2015 and began a slightly downward trend in 2016; however, that downward trend appears to be reversing from the 2018 data (Appendix D). Water levels rise with moderate to significant precipitation events (greater than 1 inch) and maintain the higher water levels for a period of time until the aquifer reaches a new equilibrium. The rise and the length of time it takes for the aquifer to reach steady state is dependent upon the amount of precipitation and the amount of pumping occurring. It is difficult to quantify how much each of these factors play, however there is no indication that a change in the duration of recovery is occurring over time. The rise in water level and the magnitude of that rise is dependent upon precipitation intensity and location. For example, an intense rainstorm across an area with numerous recharge features such as fractures, sinkholes, and faults would result in more a more rapid and substantial influx of water into the aquifer than a gradual precipitation event over a less permeable landscape. Figure 12 provides a hydrograph for the State Well No. 6804312 which exemplifies the stable water levels within the Middle Trinity Aquifer until mid-2015, and again in late 2018 when heavy rainfall occurred within Central Texas.

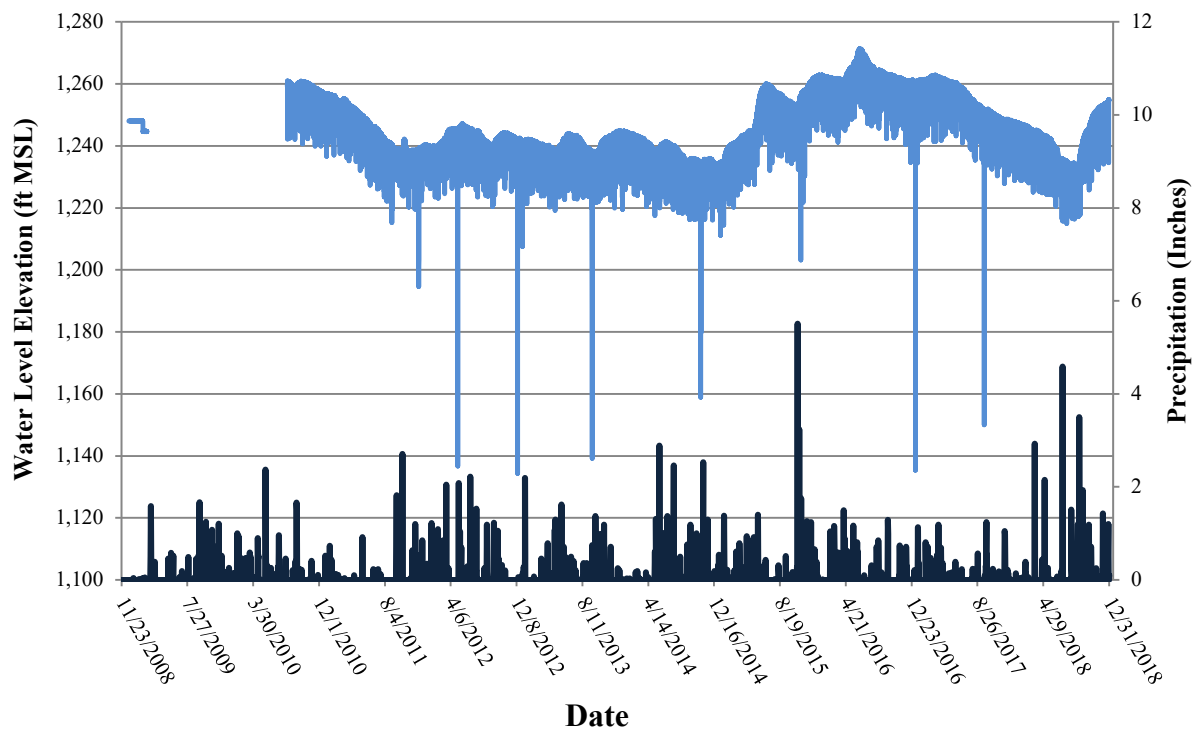


Figure 12: Hydrograph of State Well No. 6804312

Section V: Conclusions

This groundwater availability report details Canyon Lake Water Service Company's ability to meet the needs of their existing customers and their capacity to provide for future water users as their system expands. Based upon the information provided in the report, the following conclusions were found:

- CLWSC provides water utility service to a large portion of central Texas in Blanco, Comal, Hays, and Travis counties via surface water (Canyon Lake and Lake Travis) and groundwater (Trinity Aquifer). CLWSC has thirty-six active Trinity Aquifer wells spread throughout the system;
- Groundwater is produced mainly from the Middle Trinity Aquifer within the Lower Glen Rose and Cow Creek Formations. Recharge to the Trinity Aquifer is increased due to localized faulting and flow from Cibolo Creek and the Guadalupe River. Recharge to the Trinity Aquifer for the years 1992 to 2004 in Comal County was estimated using the recharge rates developed from WRGS (2008) and Ockerman (2007) for the Guadalupe and Upper Cibolo Creek Basins respectively. For the years 1992 to 2004 average recharge to the Trinity Aquifer within the Guadalupe and Upper Cibolo Creek Basins was 61,201 acre-ft/yr and 17,994 acre-ft/yr respectively; total recharge averaged 79,194 acre-ft/yr. Not only does the total annual precipitation amount play a major role in recharge, but when each precipitation event occurs and how much precipitation a given event produces is even more important;
- Based upon the calculated and estimated maximum production capacities of all wells, both active and inactive, CLWSC is able to prove up a total of 8,360 gpm of groundwater capacity or 8,989.87 acre-ft/yr. Thirty-nine (39) active wells are capable of producing 7,390 gpm of groundwater capacity or 7,946.75 acre-ft/yr.; twenty-two (22) inactive wells (not yet plugged) are capable of producing 970 gpm of groundwater capacity or 1,043.08 acre-ft/yr.;
- CLWSC operates thirty-six (36) active wells and twenty-one (21) inactive wells in Comal County, with three (3) active wells and one (1) inactive well in Blanco County; the Deer Creek Ranch Water System that was acquired in December of 2018 has no operable wells and provides water resources via West Travis County Public Utility Agency (surface water from Lake Travis). The active wells within Comal County have a total capacity of 7,257 gpm or 7,803.73 acre-ft/yr.; the inactive wells within Comal County have a total capacity of 916 gpm or 861.88 acre-ft/yr.; the three active (3) wells within Blanco County have a total capacity of 133 gpm or 143.02 acre-ft/yr. The capacity calculations assumed each well pumping for 16 hours/day for 365 days. Total capacity was determined using the updated capacity of the well by WRGS where available, and the TCEQ well capacity ratings;
- Transmissivities calculated from the aquifer tests ranged from 32 ft²/day up to 66,300 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 9,306.85 ft²/day;
- To ensure that groundwater is produced at a sustainable rate and volume, CLWSC has installed a monitoring well network equipped with continuous data recorders. Based upon water level data taken since 2011, the Trinity Aquifer in the Canyon Lake area has experienced stable water levels over the long term. There are shorter duration cycles of lower water level during times of increased pumping and drought coupled by a recovery of water level during precipitation events; and
- Based upon recharge estimates and the long term groundwater monitoring data, the projected withdrawal of water from wells within the Trinity Aquifer for the next twenty years by CLWSC is sustainable and substantially less than the average recharge to the aquifer between 1992 and 2004.

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Appendix A – Well Database

Well Name and Location						State Information				Well Construction														Production					Aquifer Properties							
Well Name	Water System	Map ID	Site Address	County	Latitude	Longitude	State Well No.	TCEQ Source Number	TWDB Aquifer	Elev (ft)	Depth (ft, bgs)	Well Completion Date	Driller	Casing Diameter (in)	Casing Type	Casing Depth (ft)	Concrete Method	Concrete Depth	Production Interval Diameter	Production Interval Type	Production Interval (ft)	Column Pipe Diameter (in)	Column Pipe Type	Pump Setting (ft)	Pump Installer	Driller Test Rate (gpm)	TCEQ Tested (gpm)	Aquifer Test Rate (gpm)	Specific Capacity (gpm/ft)	Maximum Production Capacity (gpm)	Date	Static Water Level (ft, bgs) and date	Hydraulic Conductivity (ft/day)	Transmissivity (ft ² /day)		
Astro Hills Well No. 1	Triple Peak	1	339 Glen Drive	Comal	29.879721	-98.27611	6806919	G046012W	U. Glen Rose	1076	396														93	90			90.00	Dec-18						
Astro Hills Well No. 2	Triple Peak	2	339 Glen Drive	Comal	29.879449	-98.276388	6806907	G046012X	Glen Rose	1086	390	9/3/1993	RRR Pump Sales /	8	Steel	212	Pressure	210	8	Open	212-390		3	Steel	357		95	225	205	53.8	600.00	May-09	177.03	***	31.8	6,740.00
Canyon Lake Forest Well No. 1	Triple Peak	3	2750 Fairview Drive	Comal	29.844864	-98.261666	6814306	G046012S	U. Glen Rose	1110	476														190	100			100.00	Dec-18						
Canyon Lake Forest Well No. 2	Triple Peak	4	1671 Ridge Wind	Comal	29.843333	-98.263055	6814311	G046012T	Glen Rose, Hazell & Cow Creek	1070	520			8.625	Steel									415		120	181	119	2.17	384.00	Jan-09	211.7	39940	653.00		
Canyon Lake Hills Hampton	Triple Peak	5	Hampton St.	Comal	29.843889	-98.261944	6814305	G046012AJ	Glen Rose, Hazell & Cow Creek	1120	540	1/4/1971	Ketcher	8.625	Steel	40	Pressure	40	8	Open	40-540					25	150			150.00	Dec-18					
Canyon Lake Island	Canyon Lake Shores	6	897 Missills Drive	Comal	29.901111	-98.255	6806916	G0460019C	Glen Rose	990	250			6	Steel										70	150	100	4.26	298.00	Nov-08	90.33	***	4.37	903.00		
Canyon Lake Villas	Canyon Lake Shores	7	1037 Parkway Drive	Comal	29.903998	-98.215934	6807710	G0460104A	Glen Rose	1008	220	00/00/1973																	250.00							
Clear Water Estates No. 1	Clear Water Estates	8	334 McCartney	Comal	29.833611	-98.205	6807801	G0460193A	Glen Rose	979	250	3/18/1980		7	Steel														300.00							
Clear Water Estates No. 2	Clear Water Estates	9	334 McCartney	Comal	29.833611	-98.205	6807802	G0460193B	Glen Rose	979	250	3/18/1980		7	Steel														300.00							
Cypress Springs Well No. 2	Canyon Lake Shores	10	193 Whispering Oaks	Comal	29.847499	-98.42361	6813203	G0460019T	Hazell Sand and Cow Creek	1105	390	12/19/1994	Central Texas Drilling	9	Steel	100	Pressure	100	5	PVC	340-390		2	Steel	340	Whisenat & Lyle	32		65	2.43	65.00	Mar-09	192.9	***	2.02	
Fir Well	Canyon Lake Shores	11	Fir Lane	Comal	29.936611	-98.252777	6806302	G0460019AC	Cow Creek	1155	431		Hill Country Water	7	Steel	100	Pressure	100	7	Open	100-431		3	Steel	200	Whisenat & Lyle	200	15	53	58.56	400.00	Dec-15	192.48	****	11.6	38,360.00
Hawcock Oak Hills	Canyon Lake Shores	12	445 Mountain Wood	Comal	29.823889	-98.237221	6807401	G0460019AX	L. Glen Rose	1081	395	5/30/1905	Owens	6	Steel				6				1.25	Steel	335	Whisenat & Lyle		38	32	0.26	37.00	Dec-15	168.6	42346	0.735	147.00
HEB Well	Canyon Lake Shores	13	400 Old Boerns Rd	Comal	29.79611	-98.427777	6813511	G0460019AD	Cow Creek	1207	440	12/1/1999	Davenport Drilling	6	Steel	370	Pressure	370	8.75	Open	370-440					28	11			11.00	Dec-18					
Hillcrest Well	Canyon Lake Shores	14	1050 Hurlings Hill	Comal	29.833889	-98.216666	6807406	G0460019H	L. Glen Rose	1170	575	9/19/1980												415		80	40	60	0.33	36.00	Oct-08	239.6	***	0.298	99.80	
Lakeridge Park Well No. 1	Triple Peak	15	445 Rumbling Drive	Comal	29.874166	-98.302777	6814206	G046012P	L. Glen Rose	1120	335	25051	ER Over Water Well	8	Steel	96	Pressure	96								215	203			203.00	Dec-18					
Netherhill Well	Triple Peak	16	695 Brock Street	Comal	29.853333	-98.178054	6815207	G0460122A	U. Glen Rose	800	555	30082	Patton Enterprises	8.625	Steel	200	Pressure	200	8	open	200-555					180	76			76.00	Dec-18	180	****			
North Point Well No. 1	Northpoint	17	3114 Ozark Terrace	Comal	29.714444	-98.305555	6822202	G0460235A	L. Glen Rose	1093	925			7	Steel	638	Pressure	160		Open			2	Steel	803		20	19	42	0.12	36.00	Jan-09	445.5	***		
North Point Well No. 2	Northpoint	18	3114 Ozark Terrace	Comal	29.714667	-98.305556	3288907	G0460235B	L. Glen Rose	1100	930	6/17/2013	Davenport Drilling	6	Steel	610	Pressure	610	6	Open	610-930		2	Steel	830	Davenport Drilling	9	12	7	0.04	11.00	Jul-13	431.6	****		
Oakland Estates - Whitebrook	Canyon Lake Shores	19	708 White Brook Trail	Comal	29.79611	-98.427777	6813514	G0460019AV	Glen Rose	1250	650	2/6/1986		7	Steel	416			8 and 6	open	8 in (416 - 422), 6 in (422 -		3	Steel	609	Whisenat & Lyle	38	24			60.00	May-15	350	****		
Oakland Estates Rancher's Circle	Canyon Lake Shores	20	120 Ranchers Circle	Comal	29.822222	-98.443333	6813502	G046019AV	Glen Rose	1300	500			7	Steel	163							2	Steel	420	Whisenat & Lyle	50	37	0.41	50.00	Dec-18	509.16	*****	1.17	244.00	
Rivers	Triple Peak	21	1537 Rivers Drive	Comal	29.843884	-98.250055	6806905	G046012Y	L. Glen Rose	1030	396	7/8/1970	Ketcher	8	Steel								3	Steel	272	Whisenat & Lyle	229	245	5.9	600.00	Dec-15	122.22	****	35.1	64,360.00	
Rolling Hills Well No. 1	Triple Peak	22	1555 Hidden Fawn	Comal	29.855	-98.294999	6814204	G046012Q	L. Glen Rose	1130	475	5/2/1972	Ketcher	8.625	Steel	48	Pressure	48	8	open	48-475					25	150	170	1.28	400.00	Sep-08	210.5	***	123	43,760.00	
Rolling Hills Well No. 2	Triple Peak	23	1555 Hidden Fawn	Comal	29.854722	-98.294999	6814207	G046012R	L. Glen Rose, Pearcall, Slick & Pearcall	1138	450	8/31/1981	Huskin Pump Service	6	steel	183	Pressure	183	6	open	183-450		2	Steel	399	Whisenat & Lyle	125	310	113	132.94	400.00	Nov-15	207.25	42393	163	42,400.00
Saddleridge #1-Box Canyon	Canyon Lake Shores	24	2901 Box Canyon	Comal	29.753333	-98.440833	6813818	G0460019BA	Glen Rose & Pearcall	1184	568	Nov-96	Courtesy Drilling	7	Steel	240	Pressure Cemented	240		Open	240-568					50	34		0.48	34.00	Jan-18	318	38904			
Saddleridge #3-Block/Gold	Canyon Lake Shores	25	2901 Box Canyon	Comal	29.751111	-98.434999	6813820	G0460019BC	Glen Rose & Pearcall	1173	580	6/16/1998	Wellpellers Inc.	7	Steel	380	Pressure Cemented	380		Open	380-580					50	42		0.29	42.00		338	*****			
Scenic Terrace Lake Bluff	Canyon Lake Shores	26	154 Scenic Terrace Drive	Comal	29.828884	-98.228888	6807404	G0460019G	L. Glen Rose	1025	250	5/23/1905		6	PVC	20			6	Open	20-335		2	Steel	260		30	81	40	1.75	110.00	Feb-12	146.2	*****	1.68	342.00
Scenic Terrace Well	Canyon Lake Shores	27	154 Scenic Terrace Drive	Comal	29.827777	-98.228054	6807405	G0460019F	L. Glen Rose	1023	349			6	Steel	147			6	Open	147-349					45	96	40	5.47	180.00	Jan-11	130.9	40724	5.74	1,040.00	
Spence Well	Canyon Lake Shores	28	1824 Spence Ln.	Comal	29.848884	-98.2525	6806304	G0460019AB	L. Glen Rose	1225	525	3/2/52		6	Steel				6				2	Steel	462	Whisenat & Lyle	15	66	34.74	400.00	Dec-15	276	****	23	8,050.00	
Stallion Springs No. 1	Canyon Lake Shores	29	2123 Stallion Springs Drive	Comal	29.954449	-98.227777	6807408		L. Glen Rose																	28			70.00	Dec-18						
Stallion Springs No. 2	Canyon Lake Shores	30	2123 Stallion Springs Drive	Comal	29.954444	-98.227777	6807408	G0460019AF	L. Glen Rose	1180	485	7/25/1983	Hill Country Water	6	PVC	150	Grout	150	6	Open	150-485						28			28.00	Dec-18					
Summit Estates at Fischer Well 1	Canyon Lake Shores	31	105 Lets Roll Drive	Comal	29.87861	-98.264444	6806310	G0460019AY	L. Glen Rose	1150	370	3/7/04	TR Drilling	5	PVC	290	Grout	290	8	Open	290-370					46	70			70.00	Dec-18					
Summit Estates at Fischer Well 2	Canyon Lake Shores	32	105 Lets Roll Drive	Comal	29.878889	-98.263611	6806311	G0460019AZ	L. Glen Rose	1150	370	3/23/2003	TR Drilling	8.625	Steel	285	Pressure	285	8	Open	285-338					160	518	420	68.07	600.00	Aug-08	190	***	44.8	2,410.00	
Summit North No. 1	Summit North	33	338 Primrose path	Comal	29.971111	-98.276111	6806305	G0460220A	L. Glen Rose	1300	500	1/3/1998	Central Texas Drilling	6.625	Steel	435	Pressure	435	6	open	435-500			430		32	84			32.00	Dec-18	332.5	*****			
Tamarack Well	Canyon Lake Shores	34	1479 Live Oak Dr	Comal	29.82885	-98.24301	6807402		L. Glen Rose	1088	300	9/10/1987	Agatech Drilling																95.00							
The Point Well	Canyon Lake Shores	35	398 Monarch	Comal	29.824444	-98.216111</																														

Appendix B – Water Quality Database

Canyon Lake Water Service Company - Water Quality Summary

Well Name	State Well No.	Water System	TWDB Aquifer	Depth (ft)	Date	pH	Units in mg/L														% Na	SAR
							TDS	Cl	F	Ca	Mg	Fe	Na	CO3	HCO3	SO4	N	Si	Alk	Hardness		
Cypress Springs Well No. 1	6813203	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995	7.8	970	268	2.4	61	50		231	0	341.7	190	0.04		280	357	58	5.31
Cypress Springs Well No. 2	6813204	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995	7.9	971	269	2.4	60	51		230	0	339.26	192	0.13		278	359	58	5.28
Cypress Springs Well No. 3	6813207	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995	7.7	944	247	2	69	52		203	0	322.17	213	0.04		264	385	53	4.49
Cypress Springs Well No. 4	6813205	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995	7.7	976	263	2.2	68	55		216	0	338.04	206	0.04		277	395	54	4.72
Fir Well	6806302	Canyon Lake Shores	Middle Trinity	431	12/21/2015	7.1	340	11	0.4			0.068				18	<0.2					
FM 32	6807409	Canyon Lake Shores	L. Glen Rose	525	5/14/1997	7.6	345	28	1	54	34		24	0	324.61	44	0.4		266	274	15	0.63
Hillcrest Well	6807406	Canyon Lake Shores	L. Glen Rose	575	8/21/1995	8	313	14	1.1	62	34		12	0	331.93	26	0.75		272	294	8	0.3
					10/24/2003	6.99	316	12.2	0.99	58.5	34.2		9.75	0	323.39	22.5	0.51	14.1	265	288	6	0.25
Hancock Well	6807404	Canyon Lake Shores	L. Glen Rose	250	1/11/1980	8.1	318	12	0.4	77	29		7	0	351.46	15	5.18		288	311	4	0.17
Rancher's Circle	6813502	Canyon Lake Shores	L. Glen Rose	500	6/17/2015	6.9	348	17	0.24			0.014				22	<1					
Stallion Estates No. 2		Canyon Lake Shores	Middle Trinity		12/18/2015	7.2	576	23	2.28			0.022				157	<0.2					
Stallion Spring RD	6807408	Canyon Lake Shores	L. Glen Rose	485	8/21/1995	8	340	19	1.3	58	36		21	0	338.04	38	0.84		277	292	13	0.53
Tamarack Well	6807402	Canyon Lake Shores	L. Glen Rose	425	6/26/1979	7.9	312	14	0.6	65	31		15	0	329.49	25	0.04		270	289	10	0.38
					6/30/1980	7.5	306	14	0.7	62	34		10	0	329.49	24	0.04		270	294	6	0.25
					9/20/1976	7.5	306	13	0.6	66	31		11	0	328.27	23	0.4		269	292	7	0.28
Whitebrook Well	6813514	Canyon Lake Shores	Middle Trinity	650	2/26/2015	7.6	296	12	0.28			0.019				19	<0.1					
Woodlands No. 1	397020	Canyon Lake Shores	Middle Trinity	560	6/10/2015	7.2	860	18	1.88			0.013				339						
Woodlands No. 2	396956	Canyon Lake Shores	Middle Trinity	560	6/5/2015	7	678	10	2.65			0.05				320						
Woods at Spring Branch	6813209	Canyon Lake Shores	Glen Rose	487	3/29/2012	7.5	660	116	2.31		0.023		N/A	N/A	N/A	114	<0.005		N/A	N/A		
Astro Hills Well No. 1	6806907	Triple Peak	U. Glen Rose	380	6/28/1994	7.28	315	16	0.32	74	26		7.2	0	318.51	17	5.18	11	261	292	5	0.18
Canyon Lake Forest Well No. 1	6814306	Triple Peak	U. Glen Rose	476	4/2/1981	8.5	285	13	0.7	68	26		8	4.8	290.44	22	0.04		246	276	5	0.21
					7/12/1963	7.4	305	13	1	65	32		7	0	309.97	35	0.5		254	293	4	0.18
					7/31/1972	8.1	271	13	0.7	53	31		8	0	274.58	30	0.4		225	259	6	0.22
					10/15/1969	7.6	295	11	0.8	62	31		9	0	300.21	34	0.4		246	282	6	0.23
					10/24/2003	7.08	286	13.7	0.64	60.1	26.7		8.72	0	290.44	17.7	0.27	11.9	238	261	6	0.24

Canyon Lake Water Service Company - Water Quality Summary

Well Name	State Well No.	Water System	TWDB Aquifer	Depth (ft)	Date	pH	Units in mg/L														% Na	SAR
							TDS	Cl	F	Ca	Mg	Fe	Na	CO3	HCO3	SO4	N	Si	Alk	Hardness		
Canyon Lake Forest Well No. 2	6814311	Triple Peak	Glen Rose, Hensell & Cow Creek	520	8/21/1986	8.2	506	12	2	92	52		10	0	358.78	162	0.09		294	443	4	0.21
Canyon Lake Village Well No. 2	6815114	Triple Peak	L. Glen Rose	700	9/9/1980	8	340	25	0.2	105	9		12	0	317.29	25	8.15		260	299	8	0.3
Crystal Heights	6807805	Triple Peak	Middle Trinity	520	12/17/2015	7.2	388	21	3.1			0.076				71	>0.2					
Lakeview Park Well No. 1	6814206	Triple Peak	L. Glen Rose	340	2/10/1977	7.7	282	15	0.4	77	17		8	0	289.22	17	5.58		237	261	6	0.21
					4/1/1981	8.5	285	15	0.3	79	17		8	4.8	283.12	17	5.09		240	266	6	0.21
					4/11/1976	7.9	285	15	0.4	80	15		8	0	289.22	20	4.9		237	261	6	0.22
					4/18/1985	8.1	287	14	0.3	78	17		8	0	297.76	19	4.3		244	264	6	0.21
					7/30/1974	8.3	285	18	0.4	78	17		8	0	283.12	19	5.5		232	264	6	0.21
					7/31/1972	8.3	287	15	0.4	86	12		8	0	288	19	5		236	264	6	0.21
Netherhill Well	6815207	Triple Peak	U. Glen Rose	430	6/27/1994	7.01	400	12	1.64	67	42		5.9	0	327.05	90	0.04	12	268	344	3	0.14
The Oaks Well No. 2	6815109	Triple Peak	U. Glen Rose	345	8/7/1965	7.9	337	12	0.7	61	43		6	0	340.48	44	3		279	329	3	0.14
Rolling Hills Well No. 1	6814204	Triple Peak	L. Glen Rose	475	2/10/1977	7.7	275	11	0.3	78	17		6	0	295.32	14	4.12		242	264	4	0.16
					4/1/1981	8.5	281	13	0.3	85	14		6	7.2	281.9	13	4.29		243	269	4	0.16
					4/11/1976	7.9	283	12	0.4	82	15		6	0	301.43	16	4.2		247	266	4	0.16
					7/30/1974		280	15	0.4	77	19		6	0	292.88	15	3.9		240	270	4	0.16
Village West Well No. 1	6815113	Triple Peak	L. Glen Rose	180	1/15/1975	8.1	310	21	0.2	96	13		8	0	312.41	13	5.3		256	292	5	0.2
					4/25/1977	7.5	322	14	0.2	100	14		7	0	353.9	13	0.66		290	307	4	0.17
					9/14/1976	7.5	336	21	0.2	105	11		11	0	335.6	18	5.3		275	307	7	0.27
					11/4/1998	6.79	402	38.5	0.12	109	14.5		22.9	0	351.46	21	9.12	12.72	288	331	13	0.55
Village West Well No. 2	6815114	Triple Peak	L. Glen Rose	180	9/9/1980	8	340	25	0.2	105	9		12	0	317.29	25	8.15		260	299	8	0.3
Vintage Oaks Well No. 1	6814905	Triple Peak	Cow Creek	1000	7/7/2007	7.66	637	11.3	1.78	64.1	71.2	0.0686	13.7			283			236			
Vintage Oaks Well No. 2	176593	Triple Peak	Cow Creek	1,080	3/6/2015	7.2	836	29	3.61			0.263				484						
Vintage Oaks Well No. 3	396664	Triple Peak	Cow Creek	1,040	6/2/2015	7.1	552	23	2.38			0.091				191						
Rust Ranch Well No. 3		Rust Ranch	Cow Creek	295	6/21/2010	7.4	552	13	0.66	77.1	39.6	0.021	8.92			132						
Rust Ranch Well No. 4		Rust Ranch	Cow Creek	310	6/21/2010	7.4	472	23	0.62	63.4	30.1	0.021	10.8			62						
Ramble Ridge Well No. 3			Middle Trinity	920	10/29/2010	7.4	560	20	1.28			0.375				201						
Lakeside Well	196326		Glen Rose	126	11/3/2010	7.4	392	30	0			<0.01				11.6						
North Point Well No. 1	6822202	North Point	Middle Trinity	925	8/19/2010	7.5	880	27.2	1.67			1.35				404						
					8/24/2010	7.5	812	25	1.4			3.5				311						
					8/27/2010	7.4	896	33	1.93			0.319				393						
North Point Well No. 2	328807	North Point	Middle Trinity	930	7/29/2013	7.6	548	20	1.35			0.081				197						

Appendix C – Aquifer Test Data and Analyses

Mr. Larry Bittle
Canyon Lake Water Service Company
1399 Sattler Road
New Braunfels, Texas 78132

May 2, 2018

RE: Rust Ranch Well No. 2 – Aquifer Test (April 25, 2018)

Dear Mr. Bittle:

An aquifer test was conducted at the Rust Ranch Well No. 2 to assess the site specific hydrogeologic properties of the Middle Trinity Aquifer and to estimate the maximum production capacity of the well. The well is located within the Rust Ranch service area within Blanco County. Figure 1 provides a location map of Well No. 2 within the Certificate of Convenience and Necessity (CCN). Historically, the production rate of Rust Ranch Well No. 2 was between 15 and 20 gallons per minute (gpm) according to State Well Report from the Texas Water Development Board (TWDB). However, due to increased water demand in the area, Canyon Lake Water Service Company (CLWSC) staff wanted to assess the potential production rate of the well without making any major construction alterations.

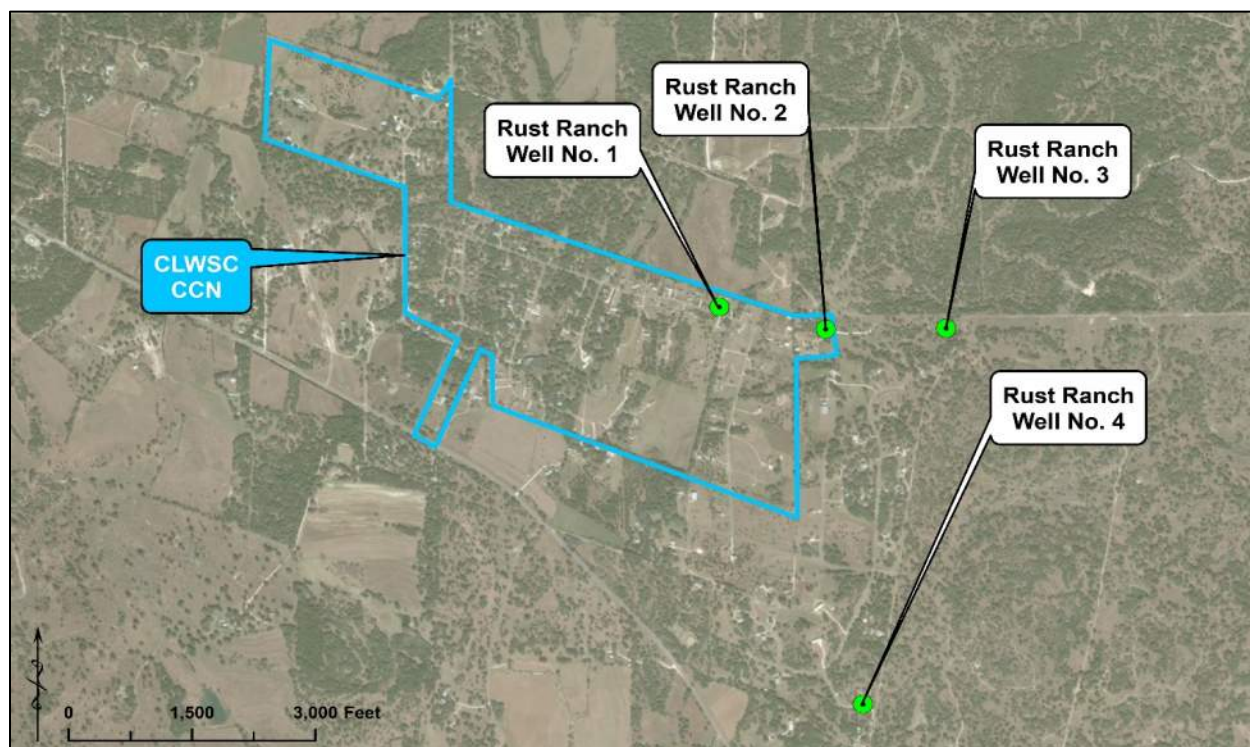


Figure 1: Location map of Rust Ranch Well No. 2

Well Details

The water system has four PWS wells completed within the Middle Trinity Aquifer at depths near 300 feet below ground surface (ft. bgs). Table 1 summarizes the construction for Well No. 2; Figure 2 provides a well construction profile for the well. Well No. 2 was constructed to a total depth of 295 ft. bgs and completed with 7-inch steel casing from 0 to 73 ft. bgs and 7-inch open hole from 73 to 295 ft. bgs. Prior to the aquifer test, it was assessed that a pump setting below 230 ft. bgs was not possible due to an obstruction in the well. As the pump was being set to a deeper level (below 230 ft. bgs) the pump crew, Advanced Water Well Technologies could not exceed this depth.

Table 1: Well construction summary

Well ID	Latitude	Longitude	Elevation (ft MSL)	Date Completed	Well Depth (ft bgs)	Static Water Level (Date; ft bgs)	Casing Type (Interval; ft. bgs)	Completion Type
Well No. 2	30.05306° N	98.33806° W	1,287	11/20/1987	295	212.07 (4-25-18)	7" Steel (0' - 73')	7" Open Hole (73' - 295')

ft = feet; bgs = below ground surface; MSL = Mean Sea Level

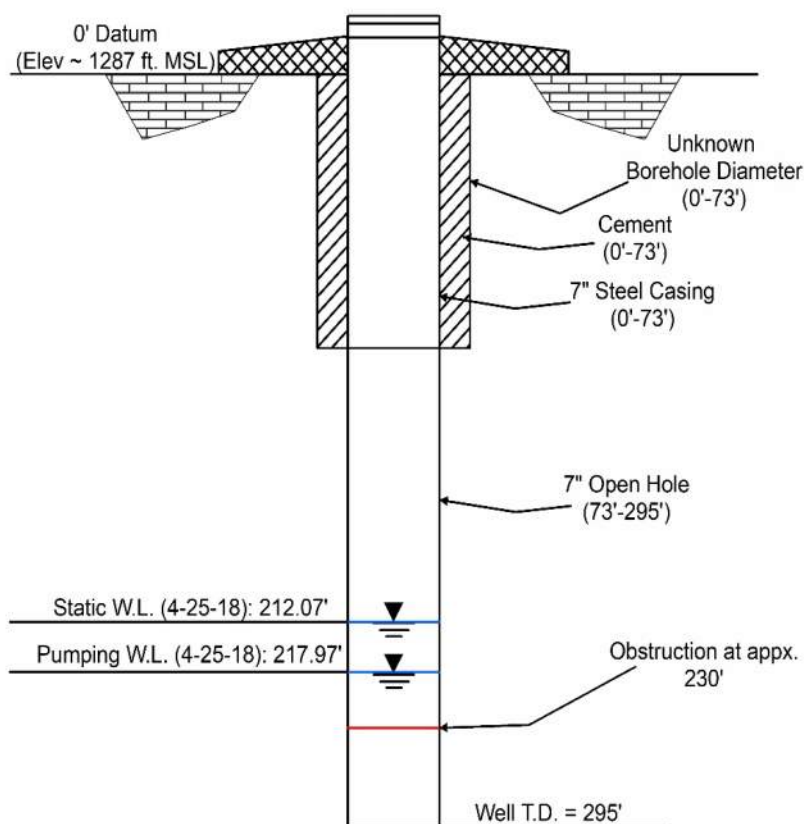


Figure 2: Well profile for Rust Ranch Well No. 2

A submersible pump powered with a 7.5 horsepower motor was set in Well No. 2 to a depth of 230 feet by Advanced Water Well Technologies. A transducer capable of measuring water level and temperature at one-minute intervals was set on the final joint of 1 ¼-inch column pipe near the submersible pump prior to starting the aquifer testing. The pump was started on April 25, 2018 and ran for 23.05 hours with a final pump rate of 37 gpm. Water levels in the pumping well were monitored for the duration of the pumping phase of the test, and for 26 hours after the pump was stopped. The discharge rate was monitored using a propeller type digital flow meter. Prior to the pumping phase of the aquifer test, the static water level was measured at 212.07 ft. bgs. A tabulated summary and analyses of the aquifer test results are also attached to this document.

During the pump test water quality parameters of pH and electrical conductivity (EC) were taken periodically from 15 minutes to 4 hours. The pH of the water ranged from 7.19 to 7.35 with a final reading of 7.26 at the 4 hour interval. The EC ranged from 1.11 to 0.75 mS/cm with the highest value of 1.11 recorded within 15 minutes of the pump test in contrast to 0.77 mS/cm at the 4 hour interval. Readings of both pH and EC taken later during the pump test can give a better representation of the water quality within the aquifer.

The aquifer test data were analyzed using the Cooper Jacob Method to calculate transmissivity and hydraulic conductivity; the storativity for the pumping well could not be calculated due to a lack of an observation well. The analyses resulted in a transmissivity of 9,542.30 ft²/day and a hydraulic conductivity of 119.28 ft/day for Well No. 2. A summary of the aquifer test results is provided in Table 2.

Table 2: Summary of aquifer test results

Aquifer Test	Date	Final Pump Rate (gpm)	Drawdown (ft)	Specific Capacity (gpm/ft)	Transmissivity (ft ² /d)	Storativity	Hydraulic Conductivity (ft/d)	Aquifer Thickness (ft)
Well No. 2	4/25/2018	37	5.9	9.68	9,542.30	-	119.28	80
Note: ft. = feet; bgs = below grounds surface; msl = mean sea level; gpm = gallons per minute; d = day sea level; gpm = gallons per minute; d = day								

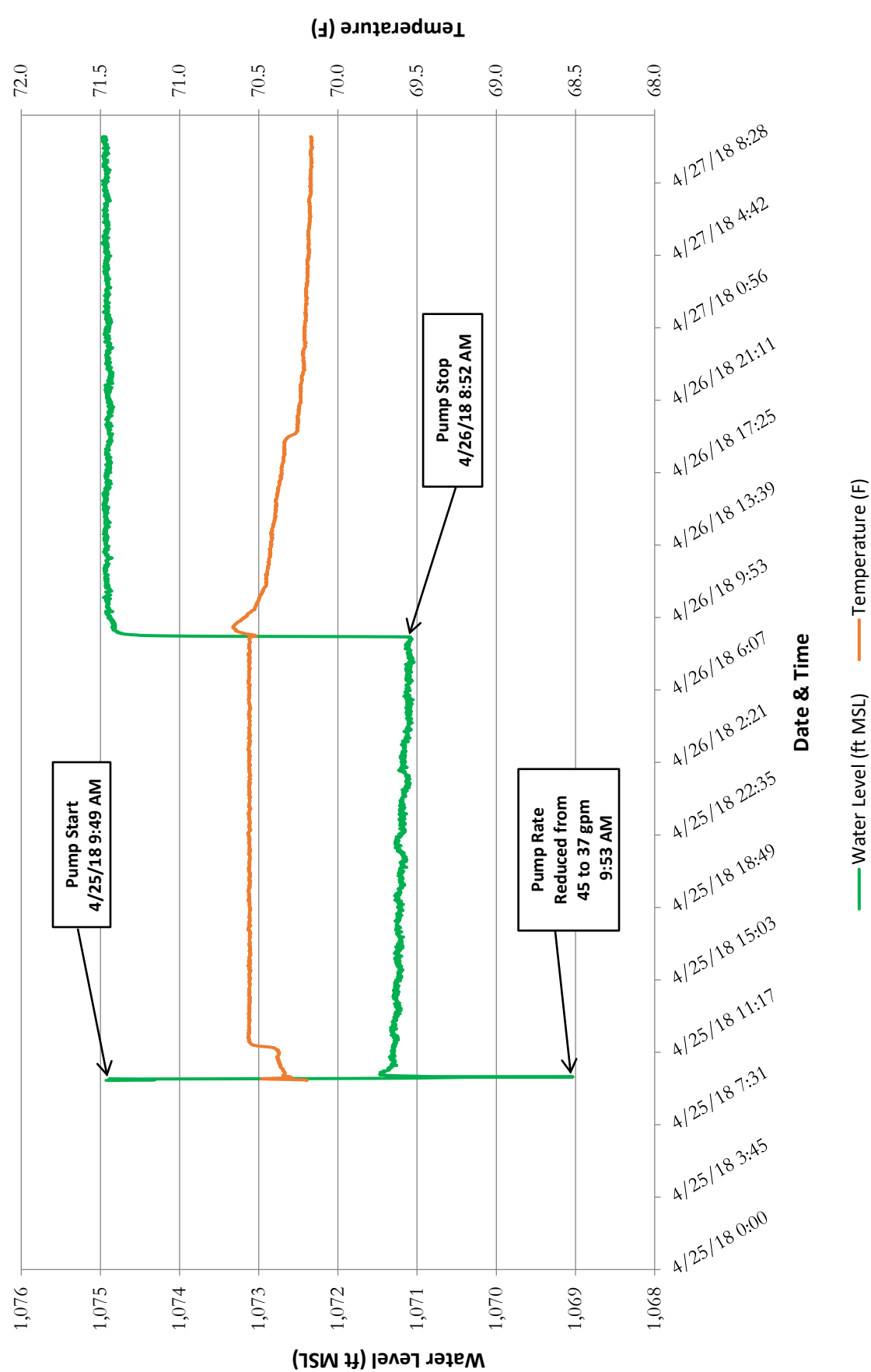


Figure 3: Aquifer test hydrograph of Well No. 2 (April 25, 2018)

Conclusions and Recommendations

Prior to this aquifer test, the well was outfitted with a pump that was capable of producing a maximum of 15 to 20 gpm. In order to meet the increased demand, the well would need a larger pump with a higher capacity such as the pump utilized in the aquifer test. From the results of the aquifer test, the well appears to be capable of producing up to 37 gpm for up to 24 hours with minimal drawdown in its current condition.

The obstruction within the bottom 60 feet of the well may hinder the well's ability to produce more water. A downhole video survey may be conducted to assess what is causing the obstruction at 230 ft. bgs. Subsequent rehabilitation may also be performed, which can allow a pump to be set deeper and potentially increase the overall production capacity of the well. Until then, the maximum production capacity of Well No. 2 with the current aquifer conditions and well construction is approximately 37 gpm. During drought, static water level will decrease limiting available drawdown in the well which may likely decrease the production rate.

If you have any questions, please feel free to call me at 512-773-3226.

Respectfully,

Wet Rock Groundwater Services, L.L.C.

A handwritten signature in black ink, appearing to read "Kaveh Khorzad". The signature is fluid and cursive, with the first name "Kaveh" and last name "Khorzad" clearly distinguishable.

Kaveh Khorzad, P.G.
President/ Senior Hydrogeologist

The seal appearing on this document was authorized by Kaveh Khorzad, P.G. License No. 1126 on May 2, 2018.

Rust Ranch Well No. 2 - Aquifer Test (April 25, 2017)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	Temperature (F)	Water Level (ft. bgs)	Water Level (ft MSL)	Drawdown (ft)	Pump Rate (gpm)	Specific Capacity (gpm/ft)	pH/EC	Comments
4/25/18 9:49 AM	0		70.20	212.07	1074.93	0.00				Pump Start
4/25/18 9:50 AM	1		70.20	212.55	1074.45	0.48	45	92.98		3,893,119.75 Gallons
4/25/18 9:51 AM	2		70.24	212.69	1074.31	0.62	43	69.58		
4/25/18 9:52 AM	3		70.34	212.31	1074.69	0.25	43	175.51		
4/25/18 9:53 AM	4		70.44	212.11	1074.89	0.04	40	N/A		
4/25/18 9:54 AM	5		70.49	213.76	1073.24	1.70	35	20.65		
4/25/18 9:55 AM	6		70.42	215.16	1071.84	3.09	30	9.72		
4/25/18 9:56 AM	7		70.37	215.87	1071.13	3.80	36	9.48		
4/25/18 9:57 AM	8		70.32	216.19	1070.81	4.12	37	8.98		
4/25/18 9:58 AM	9		70.31	216.47	1070.53	4.40	36	8.19		
4/25/18 9:59 AM	10		70.29	216.69	1070.31	4.62	36	7.80		
4/25/18 10:00 AM	11		70.30	217.97	1069.03	5.90	36	6.10		
4/25/18 10:01 AM	12		70.31	216.14	1070.86	4.07	37	9.09		
4/25/18 10:02 AM	13		70.32	216.02	1070.98	3.95	36	9.12		
4/25/18 10:03 AM	14		70.34	215.80	1071.20	3.73	37	9.93		
4/25/18 10:04 AM	15		70.34	215.68	1071.32	3.61	36	9.97	7.35/1.11	
4/25/18 10:09 AM	20		70.34	215.54	1071.46	3.47	36	10.38	7.22/0.83	
4/25/18 10:14 AM	25		70.34	215.53	1071.47	3.46	36	10.40	7.22/0.81	
4/25/18 10:19 AM	30		70.35	215.60	1071.40	3.54	36	10.18	7.22/0.81	
4/25/18 10:34 AM	45		70.36	215.67	1071.33	3.60	36	10.01	7.32/0.80	
4/25/18 10:49 AM	60		70.38	215.73	1071.27	3.66	37	10.12	7.30/0.79	
4/25/18 11:04 AM	75		70.38	215.70	1071.30	3.64	37	10.18	7.26/0.79	
4/25/18 11:19 AM	90		70.38	215.71	1071.29	3.65	36	9.88	7.26/0.77	
4/25/18 11:34 AM	105		70.46	215.70	1071.30	3.63	37	10.20	7.26/0.79	
4/25/18 11:49 AM	120		70.56	215.74	1071.26	3.67	37	10.08	7.25/0.79	
4/25/18 12:19 PM	150		70.56	215.67	1071.33	3.61	37	10.26	7.31/0.78	
4/25/18 12:49 PM	180		70.56	215.70	1071.30	3.63	37	10.20	7.19/0.75	
4/25/18 1:19 PM	210		70.56	215.74	1071.26	3.67	37	10.08	7.20/0.75	
4/25/18 1:49 PM	240		70.56	215.76	1071.24	3.69	37	10.02	7.26/0.77	
4/25/18 2:49 PM	300		70.56	215.72	1071.28	3.65				
4/25/18 3:49 PM	360		70.56	215.79	1071.21	3.72				
4/25/18 4:49 PM	420		70.56	215.82	1071.18	3.75				
4/25/18 5:49 PM	480		70.56	215.78	1071.22	3.71				
4/25/18 6:49 PM	540		70.56	215.75	1071.25	3.68				
4/25/18 7:49 PM	600		70.56	215.80	1071.20	3.74				
4/25/18 8:49 PM	660		70.56	215.78	1071.22	3.71				

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4-inch, 200 ft, 2-inch 20 ft, 10 ft connector Motor: 7.5 HP
MSL = Mean Sea Level Pump Setting = 230 ft. EC = Electrical conductivity (mS/cm)

Rust Ranch Well No. 2 - Aquifer Test (April 25, 2017)

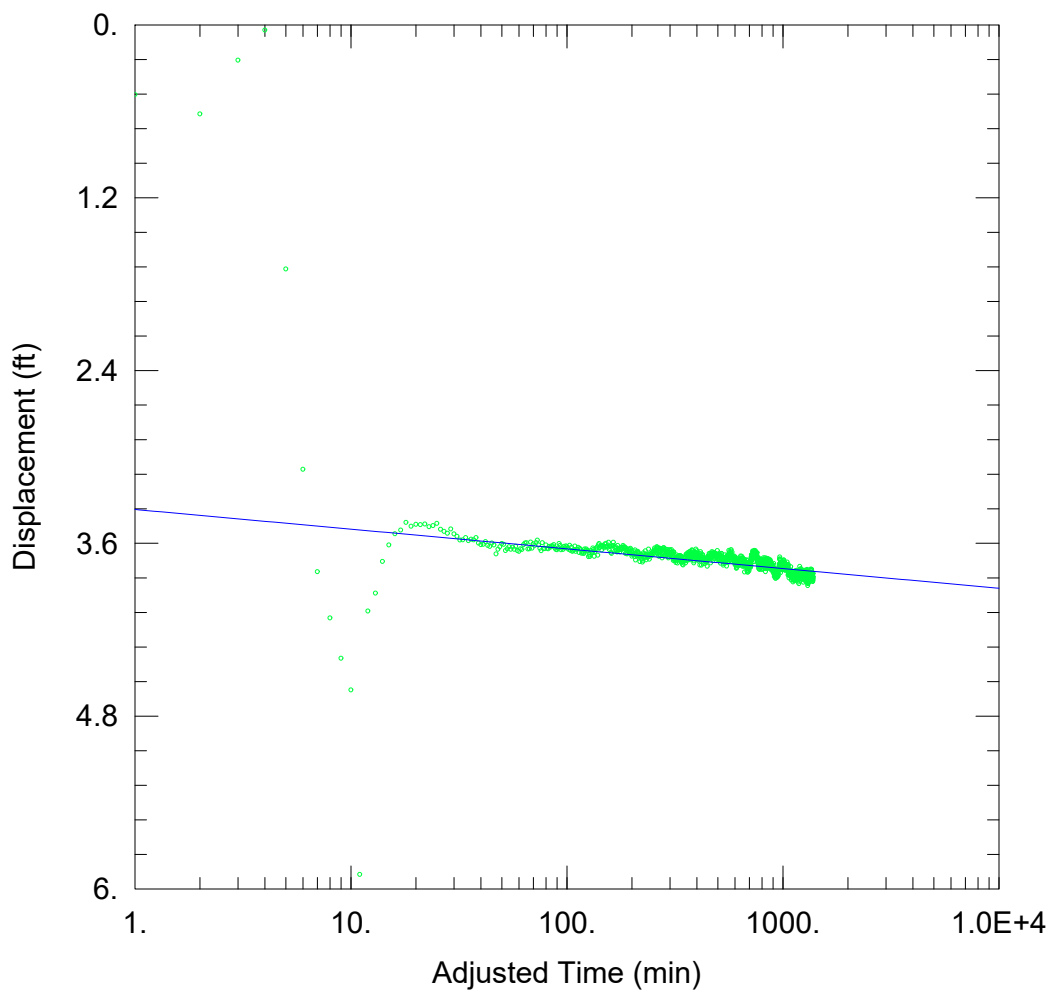
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	Temperature (F)	Water Level (ft. bgs)	Water Level (ft MSL)	Drawdown (ft)	Pump Rate (gpm)	Specific Capacity (gpm/ft)	pH/EC	Comments
4/25/18 9:49 PM	720		70.56	215.77	1071.23	3.70				
4/25/18 10:49 PM	780		70.56	215.82	1071.18	3.75				
4/25/18 11:49 PM	840		70.56	215.78	1071.22	3.71				
4/26/18 12:49 AM	900		70.56	215.83	1071.17	3.76				
4/26/18 1:49 AM	960		70.56	215.84	1071.16	3.77				
4/26/18 2:49 AM	1,020		70.56	215.80	1071.20	3.74				
4/26/18 3:49 AM	1,080		70.56	215.88	1071.12	3.81				
4/26/18 4:49 AM	1,140		70.57	215.87	1071.13	3.80				
4/26/18 5:49 AM	1,200		70.56	215.89	1071.11	3.82				
4/26/18 6:49 AM	1,260		70.56	215.90	1071.10	3.83				
4/26/18 7:49 AM	1,320		70.56	215.89	1071.11	3.82				
4/26/18 8:49 AM	1,380		70.56	215.91	1071.09	3.85				
4/26/18 8:52 AM	1,383	0	70.56	215.92	1071.08	3.85	37	9.62		Pump Stop
4/26/18 8:53 AM	1,384	1	70.55	215.16	1071.84	3.09				3,943,798.73 Gallons
4/26/18 8:54 AM	1,385	2	70.53	213.47	1073.53	1.40				
4/26/18 8:55 AM	1,386	3	70.52	212.93	1074.07	0.86				
4/26/18 8:56 AM	1,387	4	70.52	212.64	1074.36	0.58				
4/26/18 8:57 AM	1,388	5	70.52	212.49	1074.51	0.42				
4/26/18 8:58 AM	1,389	6	70.54	212.46	1074.54	0.39				
4/26/18 8:59 AM	1,390	7	70.55	212.38	1074.62	0.31				
4/26/18 9:00 AM	1,391	8	70.56	212.34	1074.66	0.27				
4/26/18 9:01 AM	1,392	9	70.58	212.30	1074.70	0.23				
4/26/18 9:02 AM	1,393	10	70.59	212.28	1074.72	0.21				
4/26/18 9:03 AM	1,394	11	70.59	212.25	1074.75	0.18				
4/26/18 9:04 AM	1,395	12	70.60	212.26	1074.74	0.19				
4/26/18 9:05 AM	1,396	13	70.61	212.23	1074.77	0.16				
4/26/18 9:06 AM	1,397	14	70.62	212.21	1074.79	0.14				
4/26/18 9:07 AM	1,398	15	70.62	212.21	1074.79	0.14				
4/26/18 9:12 AM	1,403	20	70.65	212.19	1074.81	0.12				
4/26/18 9:17 AM	1,408	25	70.65	212.16	1074.84	0.09				
4/26/18 9:22 AM	1,413	30	70.66	212.19	1074.81	0.12				
4/26/18 9:37 AM	1,428	45	70.64	212.16	1074.84	0.09				
4/26/18 9:52 AM	1,443	60	70.60	212.14	1074.86	0.07				
4/26/18 10:07 AM	1,458	75	70.56	212.10	1074.90	0.03				
4/26/18 10:22 AM	1,473	90	70.53	212.12	1074.88	0.05				
4/26/18 10:37 AM	1,488	105	70.51	212.09	1074.91	0.02				

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4-inch, 200 ft, 2-inch 20 ft, 10 ft connector Motor: 7.5 HP
MSL = Mean Sea Level Pump Setting = 230 ft. EC = Electrical conductivity (mS/cm)

Rust Ranch Well No. 2 - Aquifer Test (April 25, 2017)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	Temperature (F)	Water Level (ft. bgs)	Water Level (ft MSL)	Drawdown (ft)	Pump Rate (gpm)	Specific Capacity (gpm/ft)	pH/EC	Comments
4/26/18 10:52 AM	1,503	120	70.50	212.07	1074.93	0.00				
4/26/18 11:22 AM	1,533	150	70.47	212.12	1074.88	0.05				
4/26/18 11:52 AM	1,563	180	70.45	212.06	1074.94	-0.01				
4/26/18 12:22 PM	1,593	210	70.45	212.07	1074.93	0.00				
4/26/18 12:52 PM	1,623	240	70.44	212.10	1074.90	0.03				
4/26/18 1:52 PM	1,683	300	70.42	212.09	1074.91	0.02				
4/26/18 2:52 PM	1,743	360	70.40	212.08	1074.92	0.01				
4/26/18 3:52 PM	1,803	420	70.39	212.06	1074.94	-0.01				
4/26/18 4:52 PM	1,863	480	70.37	212.11	1074.89	0.04				
4/26/18 5:52 PM	1,923	540	70.35	212.13	1074.87	0.06				
4/26/18 6:52 PM	1,983	600	70.34	212.13	1074.87	0.06				
4/26/18 7:52 PM	2,043	660	70.25	212.07	1074.93	0.01				
4/26/18 8:52 PM	2,103	720	70.25	212.14	1074.86	0.07				
4/26/18 9:52 PM	2,163	780	70.24	212.08	1074.92	0.01				
4/26/18 10:52 PM	2,223	840	70.22	212.14	1074.86	0.07				
4/26/18 11:52 PM	2,283	900	70.21	212.15	1074.85	0.08				
4/27/18 12:52 AM	2,343	960	70.21	212.12	1074.88	0.05				
4/27/18 1:52 AM	2,403	1,020	70.20	212.06	1074.94	-0.01				
4/27/18 2:52 AM	2,463	1,080	70.20	212.06	1074.94	-0.01				
4/27/18 3:52 AM	2,523	1,140	70.19	212.04	1074.96	-0.03				
4/27/18 4:52 AM	2,583	1,200	70.18	212.05	1074.95	-0.02				
4/27/18 5:52 AM	2,643	1,260	70.19	212.09	1074.91	0.02				
4/27/18 6:52 AM	2,703	1,320	70.18	212.05	1074.95	-0.02				
4/27/18 7:52 AM	2,763	1,380	70.17	212.09	1074.91	0.02				
4/27/18 8:52 AM	2,823	1,440	70.17	212.07	1074.93	0.00				
4/27/18 9:52 AM	2,883	1,500	70.17	212.08	1074.92	0.01				
4/27/18 10:52 AM	2,943	1,560	70.17	212.03	1074.97	-0.04				

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4-inch, 200 ft, 2-inch 20 ft, 10 ft connector Motor: 7.5 HP
 MSL = Mean Sea Level Pump Setting = 230 ft. EC = Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\Rust Ranch Well No. 2.aqt

Date: 04/30/18

Time: 16:31:17

PROJECT INFORMATION

Company: WRGS

Client: CLWSC

Project: 042-005-10

Location: Blanco County, TX

Test Well: Well No. 2

Test Date: 4/25/18

AQUIFER DATA

Saturated Thickness: 80. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 2	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 2	0	0

SOLUTION

Aquifer Model: Confined

Solution Method: Cooper-Jacob

T = 9542.3 ft²/day

K = 119.28 ft/day

Appendix D – Monitoring Network Hydrographs

Legend

- Trinity Aquifer Monitoring Well
- EAA Rain Gauge
- Edwards-Trinity Plateau Aquifer
- Recharge Zone
- Edwards Aquifer
- Recharge Zone
- Confined Zone
- Trinity Aquifer
- Recharge Zone
- Confined Zone

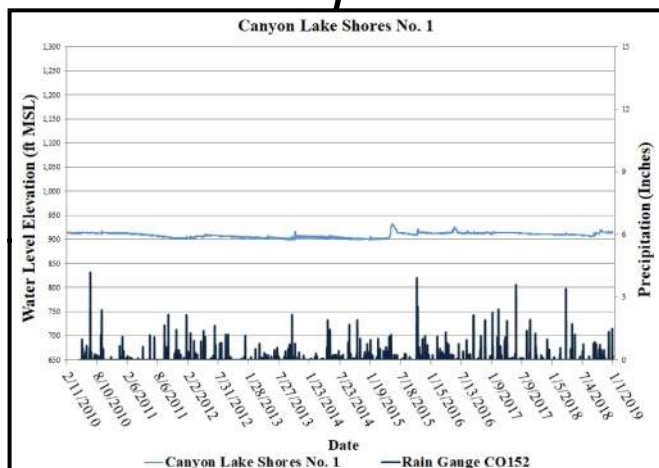
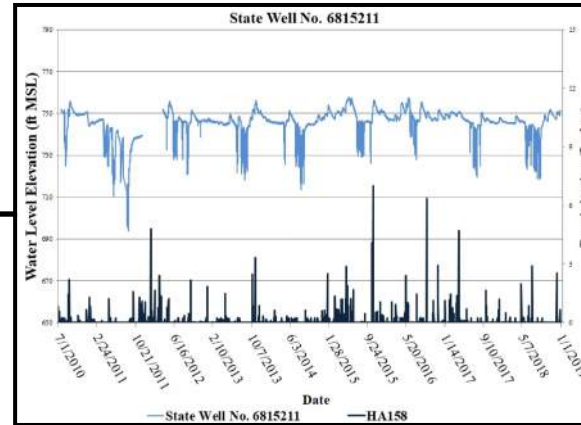
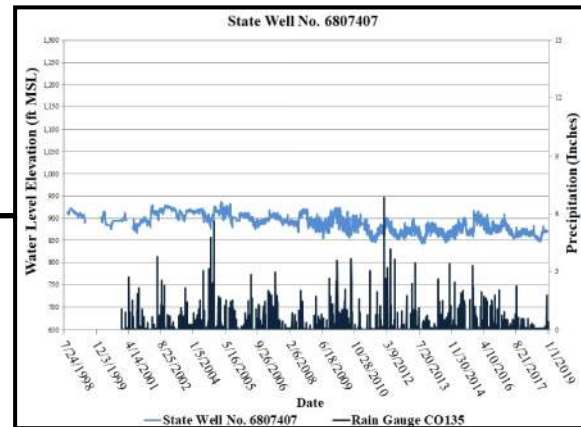
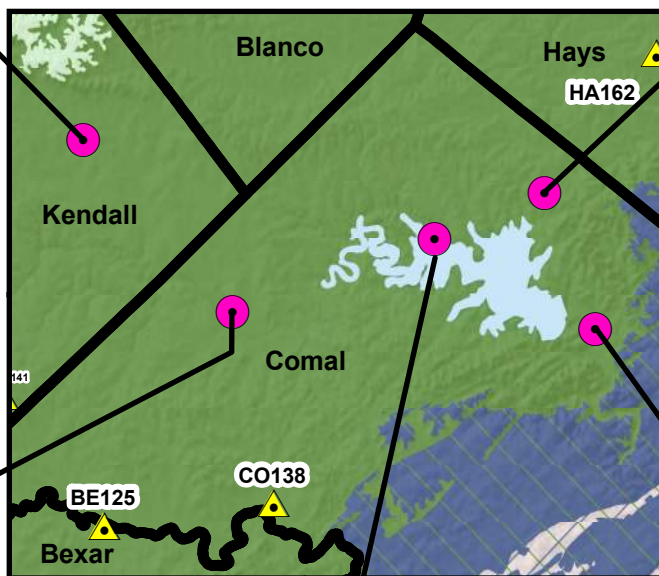
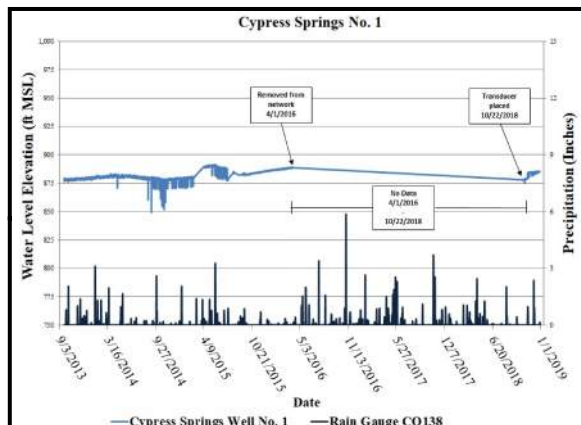
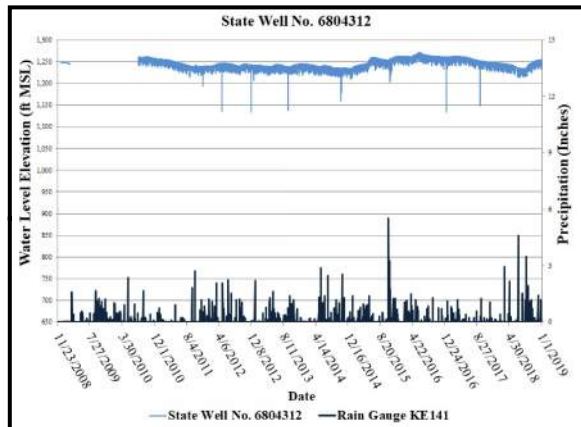


Projection: UTM NAD83
TIME ZONE 14

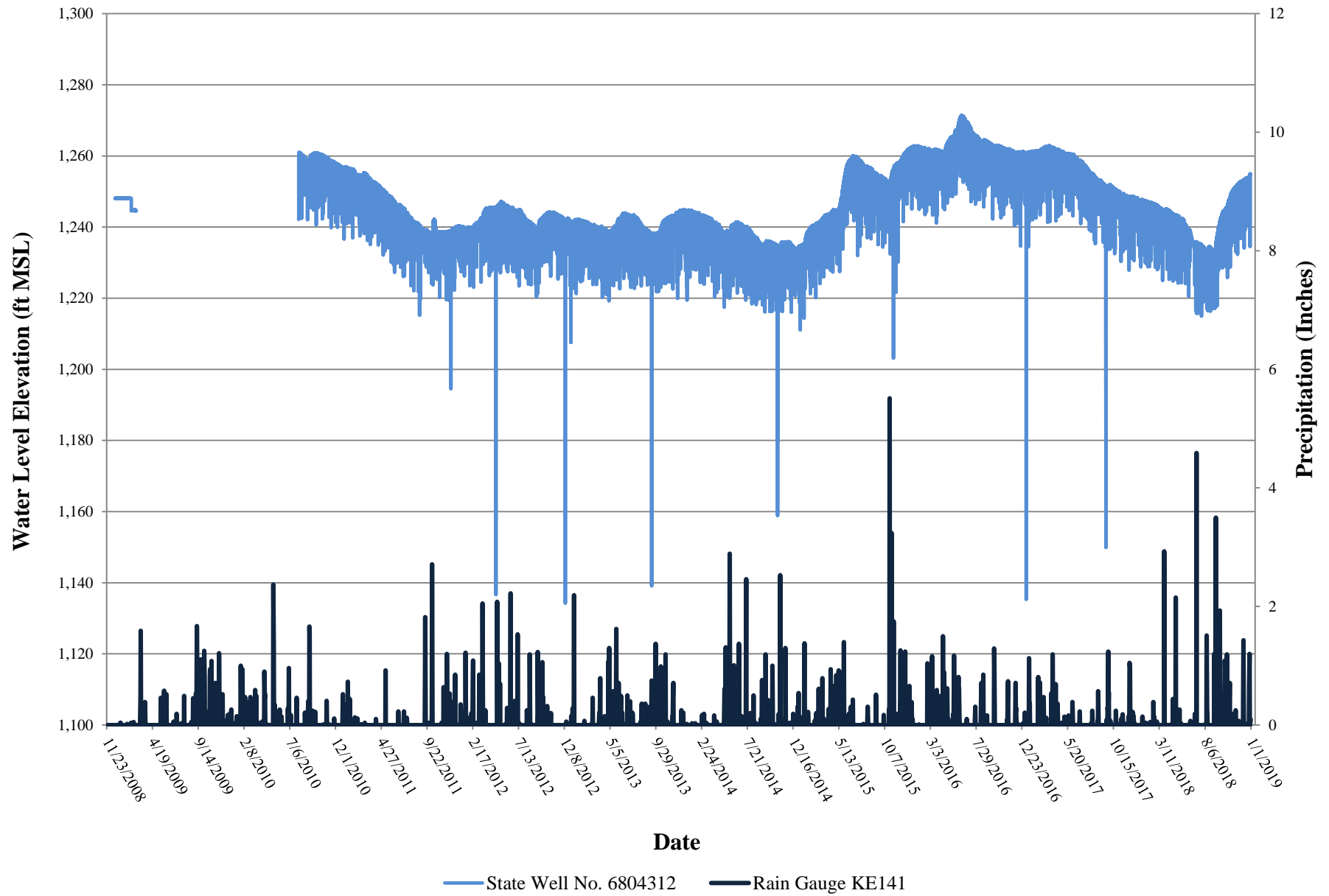
0 4 8 Miles

Canyon Lake WSC Monitoring Network Hydrographs: 4th Quarter 2018

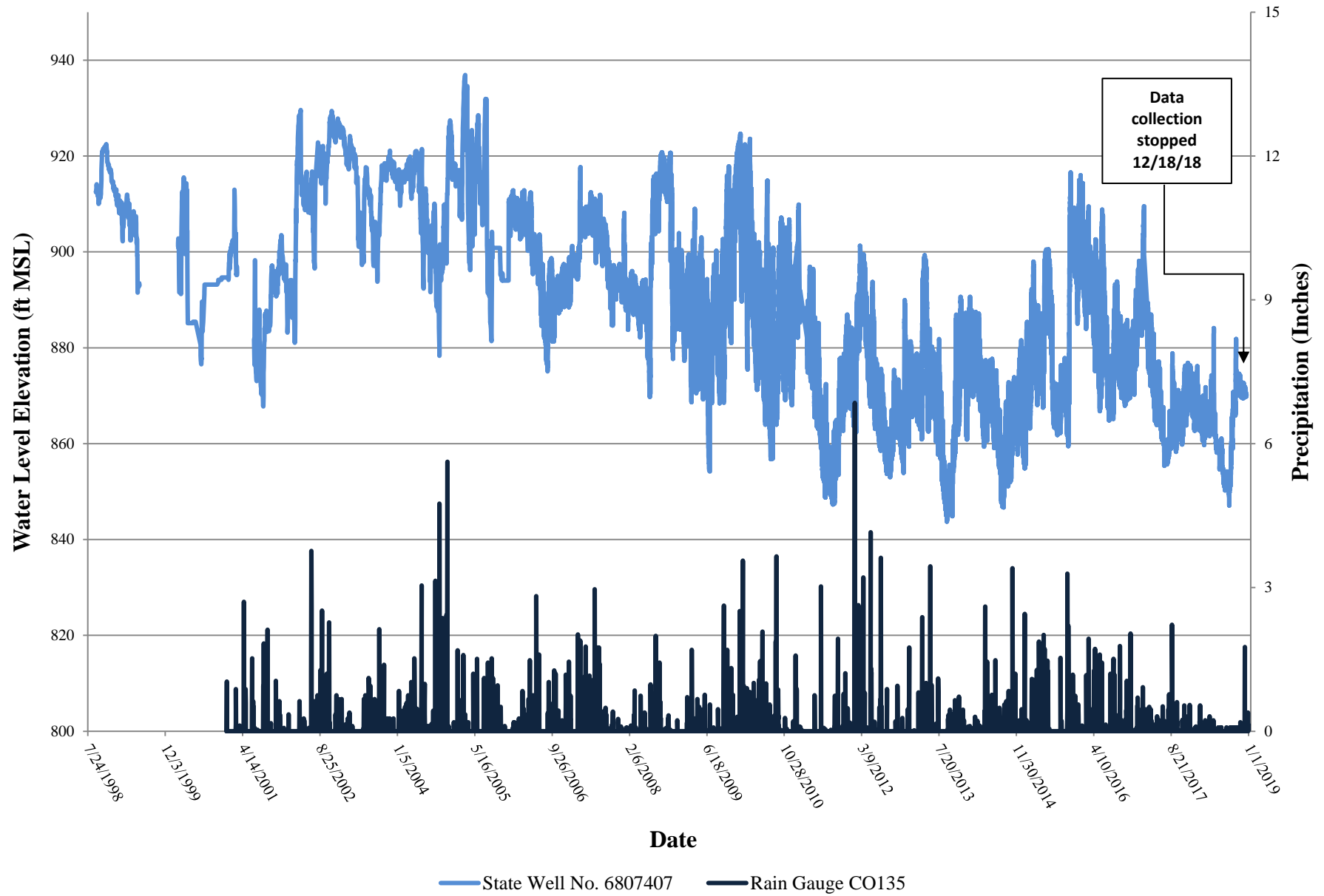
Drawn By: NC Date: 1-7-19



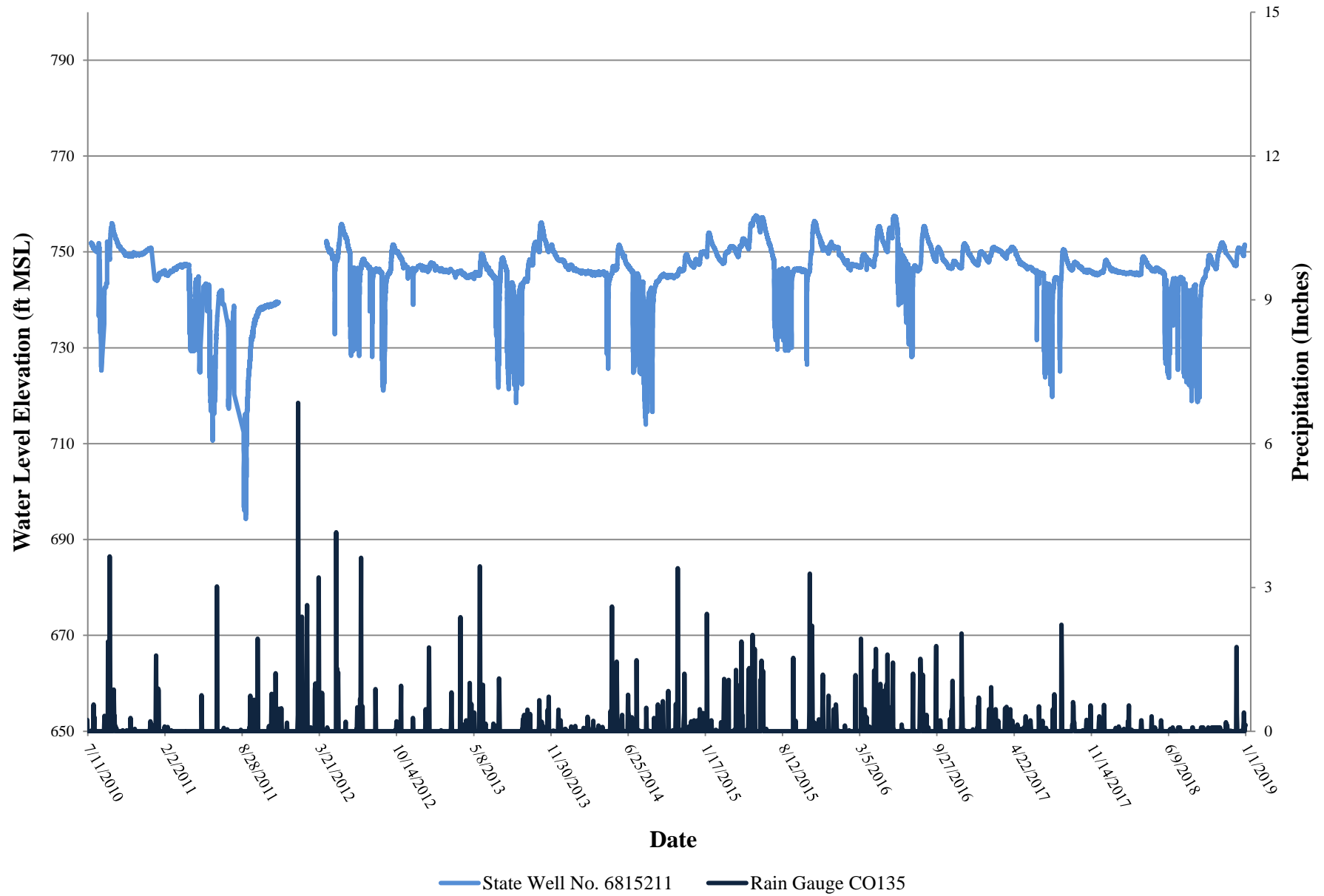
State Well No. 6804312



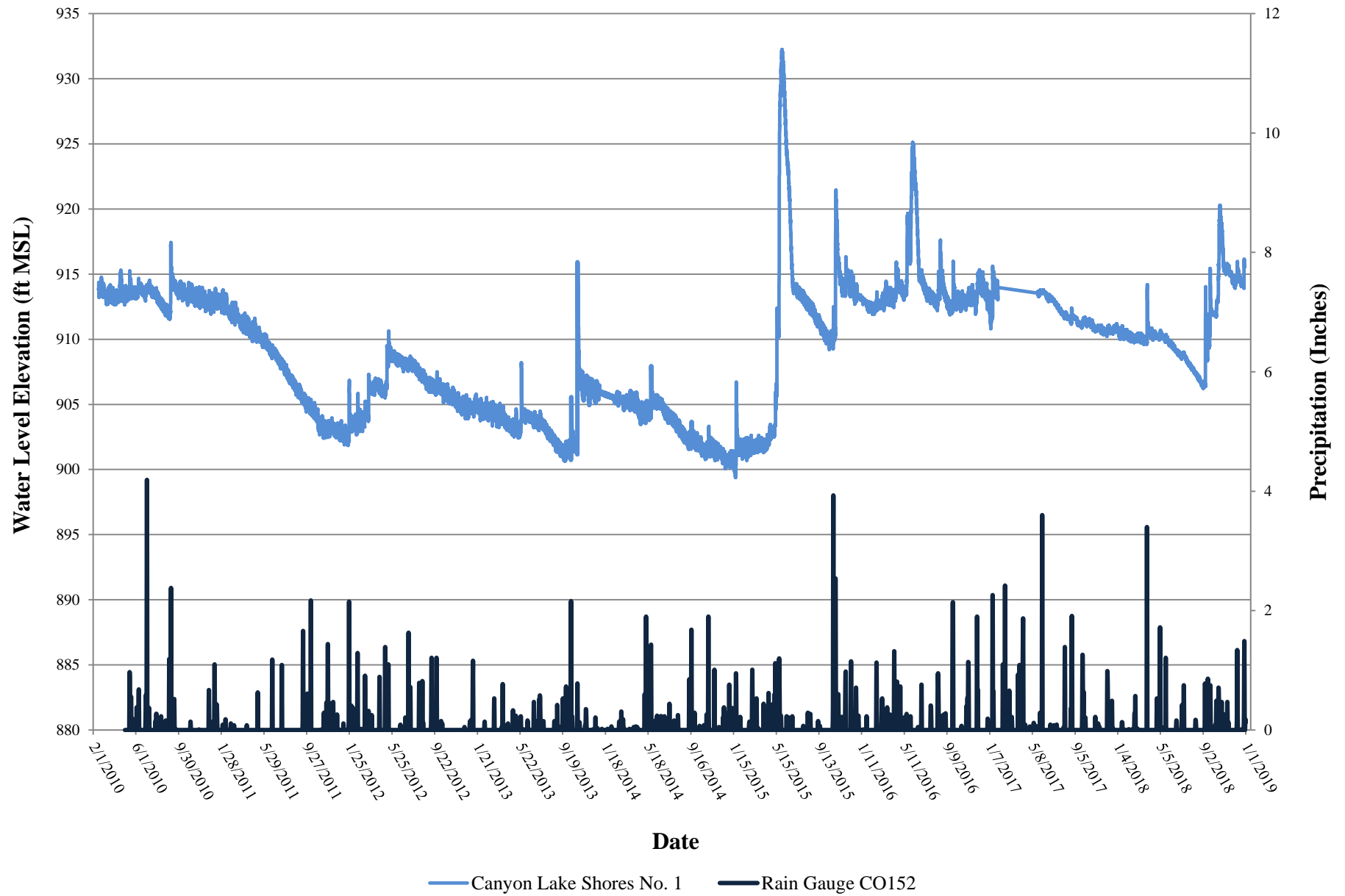
State Well No. 6807407



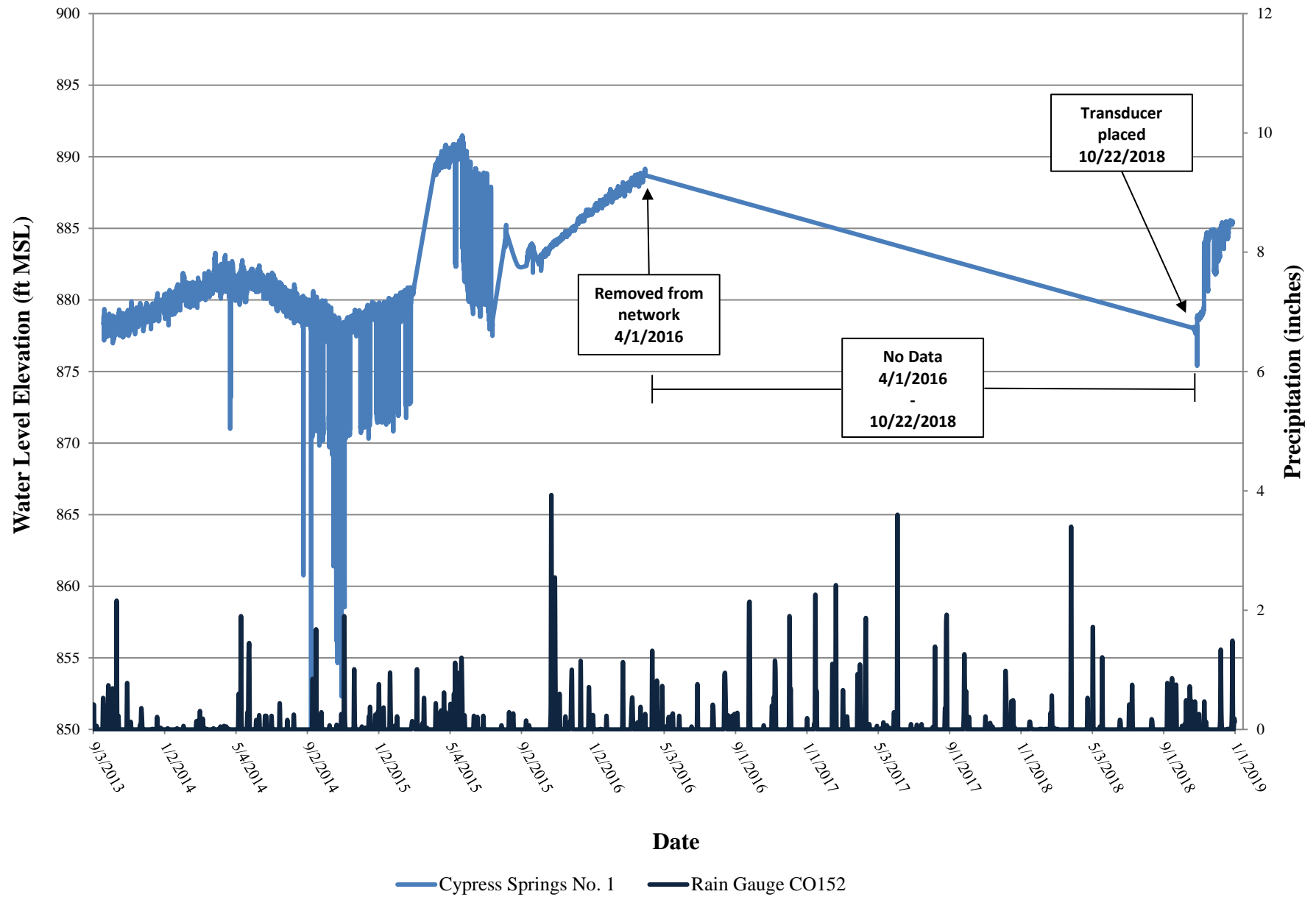
State Well No. 6815211



Canyon Lake Shores No. 1



Cypress Springs No. 1





Appendix D

Summary and Copies of CLWSC Surface Water Contracts

(Appendix revised per Comal County Engineer request November 2019)



Canyon Lake Water Service Company Summary of Surface Water Contracts¹

Contract ID	Contract Date	Contract Expires	Source	Allocation (Acre-Feet)	Time Remaining	Originating Contract	Assignments
A	10/01/1994	10/31/2044	Canyon Lake Raw Water	560	25	Canyon Lake Water Supply Corporation	1 st - SJWTX, dba Canyon Lake Water Service Company
A (1 st Amend.)	04/30/1997	12/31/2044	Canyon Lake Raw Water	440	25	Canyon Lake Water Supply Corporation	1 st - SJWTX, dba Canyon Lake Water Service Company
A (2 nd Amend.)	11/03/1999	12/31/2044	Canyon Lake Raw Water	1,000	25	Canyon Lake Water Supply Corporation	1 st - SJWTX, dba Canyon Lake Water Service Company
F	04/21/1996	12/31/2037	Canyon Lake Raw Water	130	18	Comal County Freshwater District	1st - Rebecca Creek MUD 2nd - SJWTX, dba Canyon Lake Water Service Company
B	08/27/2001	12/31/2050	Canyon Lake Raw Water	2,000	31	Canyon Lake Water Supply Corporation	1st - SJWTX, dba Canyon Lake Water Service Company
C	09/29/2006	12/31/2050	Canyon Lake Raw Water	2,000	31	SJWTX, dba Canyon Lake Water Service Company	
Subtotal, Raw Water				6,130	acre-feet		
D	02/06/2009	12/31/2040	Western Canyon Pipeline	400	21	City of Bulverde	1 st - SJWTX, dba Canyon Lake Water Service Company
E	03/24/2009	12/31/2040	Western Canyon Pipeline	322	21	Park Village	1 st - SJWTX, dba Canyon Lake Water Service Company
Subtotal, Treated Water				722	acre-feet		
Total Surface Water				6,852	acre-feet		

¹ Rev.1 - Clarified contracts and amendments

Contract A¹

**CLWSC Surface Water Contract
Dated 10/1/1994**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

CONTRACT FOR RAW WATER SERVICE

This Contract for Raw Water Service is entered into as of October 1, 1994, between Guadalupe-Blanco River Authority, a conservation district and political subdivision of the State of Texas ("GBRA"), and Canyon Lake Water Supply Corporation, a non-profit corporation organized under Article 1434a, Vernon's Civil Statutes, as amended ("Purchaser").

For and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and Purchaser agree as follows:

1. **QUANTITY.** GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, as amended, in such quantity as may be required by Purchaser, not to exceed 560 acre-feet per year (the "Annual Commitment").
2. **POINT OF DIVERSION.** The water will be furnished at a point on the perimeter of Canyon Lake (the "Point of Diversion") as shown on Exhibit "A" attached hereto. The maximum rate of diversion at the Point of Diversion shall not exceed 350 gallons per minute (43.63 cubic feet/second).
3. **PURPOSE OF USE.** Water supplied hereunder may be used only for municipal use as defined by the Texas Natural Resource Conservation Commission in its rules at 31 TAC §297.1.
4. **PLACE OF USE.** Water supplied hereunder may be used only within Purchaser's service area as shown on Exhibit "B" attached hereto (the "Service Area").
5. **MONTHLY PAYMENTS.** Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, upon execution of this contract by Purchaser, and thereafter not later than the twentieth (20th) day of each month during the term of this contract, an amount of money equal to one-twelfth of the Annual Commitment multiplied by the then applicable rate for water supplied from conservation storage in Canyon Reservoir (the "Raw Water Rate"). The payment due upon execution of this contract shall be \$2,474.73, based upon the current Raw Water Rate of \$53.03 per acre-foot per year.
6. **ANNUAL ADJUSTMENT.** Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in

writing, not later than the twentieth (20th) day of January of each year, a dollar amount equal to the Raw Water Rate times the number of acre-feet by which the total amount of water diverted at the Point of Diversion in the previous calendar year exceeds the Annual Commitment, provided, however, that nothing in this section shall be construed as obligating GBRA to supply in any year more water than the Annual Commitment.

7. **ADJUSTMENT OF RAW WATER RATE.** The Raw Water Rate may be adjusted by GBRA at any time and from time to time. If GBRA desires to adjust the Raw Water Rate, it shall, at least sixty (60) days prior to the first day on which the adjustment is proposed to become effective, give written notice of the proposed adjustment to Purchaser.

6. **METERING.** Purchaser shall furnish, install, operate and maintain at its own expense at the Point of Diversion a measuring device or devices to measure the quantity of water diverted by Purchaser within five percent (5%) above or below the amount actually diverted. All measuring devices shall be subject at all reasonable times to inspection, examination and testing by an employee or agent of GBRA. Any measuring device which fails to function or which functions incorrectly shall, at Purchaser's expense, promptly be adjusted, repaired or replaced by a like device having the required accuracy. GBRA may, at its expense, install and maintain such measuring devices as it deems appropriate to measure the quantity of water diverted by Purchaser at the Point of Diversion, in which case measurement of water shall be made by GBRA's measuring devices. Purchaser shall read the metering equipment monthly at or near the first day of each month, and shall maintain records of such readings. Purchaser shall furnish GBRA on the first day of each month with a tabulation indicating the total amount of water diverted during the previous month, as well as an estimate of the amount of water to be diverted during the coming month. GBRA agrees to complete and file with the Texas Natural Resource Conservation Commission (or its successor) all reports of water used by Purchaser.

9. **QUALITY.** The water to be supplied hereunder shall be untreated water as it occurs in Canyon Lake at the Point of Diversion. GBRA makes no representations, and shall have no duty or responsibility, with respect to the quality of the water furnished by GBRA, or the suitability of the water provided by GBRA for Purchaser's purposes.

10. **REGULATORY AGENCIES.** The effectiveness of the contract is dependent upon compliance with the applicable provisions of Certificate of Adjudication 18-2074C and the Texas Natural Resource Conservation Commission, including those found at 31 TAC §§295 and 297.

11. **ASSIGNMENT.** Except as specifically provided otherwise below, Purchaser may not assign this contract without the prior written consent of GBRA. Without obtaining GBRA's consent, Purchaser may assign this contract to the National Bank for Cooperatives; provided, however, that Purchaser shall under no circumstances be relieved of any of its duties or liabilities under this contract unless Purchaser obtains the consent of GBRA. Any successor or assign of GBRA shall succeed to the rights and obligations of GBRA hereunder.

12. **CAPTIONS.** All titles of the sections of this contract have been inserted for convenience of reference only and are not considered a part of this contract and in no way shall they affect the interpretation of any provisions of this contract.

13. **TERMINATION.** Purchaser may terminate this contract at any time for any reason by giving GBRA written notice of termination thirty (30) days prior to the date of termination. If Purchaser fails to pay any amounts payable under this contract when due and payable, GBRA may give written notice of such delinquency to Purchaser, and if all amounts due and unpaid, including interest thereon from the date payment was due at maximum legal rates, are not paid by or on behalf of Purchaser within thirty days after delivery of such notice, then GBRA may, at its option, institute suit for the collection thereof and utilize such other remedies as may exist to collect any amounts due and unpaid, together with interest thereon at the maximum legal rate and attorney's fees. In addition to all other remedies, GBRA may, at its option, if such amounts are not paid by or on behalf of Purchaser within said thirty-day period, terminate this contract without recourse.

14. **TERM.** This contract shall terminate on December 31, 2044, unless it is terminated earlier pursuant to the provisions hereof.

15. **ENTIRE AGREEMENT.** This contract constitutes the entire agreement and supersedes all prior agreements and understandings, both written and oral, between GBRA and Purchaser with respect to the subject matter hereof.

16. **GOVERNING LAW.** This contract shall be governed in all respects, including validity, interpretation and effect, by and shall be enforceable in accordance with the laws of the State of Texas.

17. **NO THIRD-PARTY BENEFICIARY.** This contract shall not be construed as a contract for the benefit of a third party.

18. **NO WAIVER.** Each party may specifically, but only in writing, waive any breach of this contract by the other party, but no such waiver shall be deemed to constitute a waiver of similar or other breaches by such other party.

19. **NOTICES.** All notices specified to be given hereunder shall be given in writing unless other means are specifically permitted and shall be given by hand delivery to the person or persons designated to receive notices for each party as indicated below, or by U.S. mail addressed to such person or persons as indicated below and with postage prepaid. Any notice shall be deemed to be effective only if and when received by all persons required to be notified. For the purpose of notices and payments of sums due, the mailing addresses of the person or persons designated to receive such notices and payments for each party shall, until changed as hereinafter provided, be as follows:

as to GBRA:

General Manager
Guadalupe-Blanco River Authority
933 E. Court Street
Seguin, Texas 78155

as to Purchaser:

President
Canyon Lake Water Supply Corporatin
P. O. Box 1742
Canyon Lake, Texas 78130

and

Todd Kern
National Bank for Cooperatives

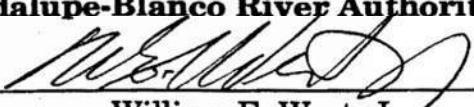
5500 South Durbee St.
Englewood, Colorado, 8011

Each party shall have the right from time-to-time and at any time to add additional persons designated to receive notices for that party, or change the name or address of any person designated to receive notice for that party, by giving at least ten (10) days' written notice of such addition or change to the other party.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be duly executed in multiple counterparts, each of which shall constitute an original.

Guadalupe-Blanco River Authority

By

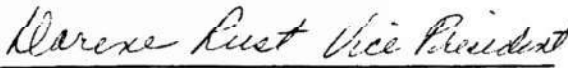

William E. West, Jr.
General Manager

Attest:


Cheryl L. Dutton

Canyon Lake Water Supply Corp.

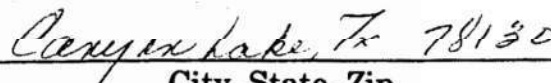
By


Dorene Rust, Vice-President

Dorene Rust, Vice-President


P.O. Box 1742

Address

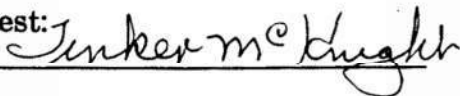

Canyon Lake, Tx 78130

City, State, Zip


210-899-4603

Telephone No.

Attest:


Jenker McHugh

THE STATE OF TEXAS §

COUNTY OF GUADALUPE §

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared W. E. WEST, JR., known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision, and that he executed the same as the act of such conservation district and political subdivision for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 30th day of September, 1994



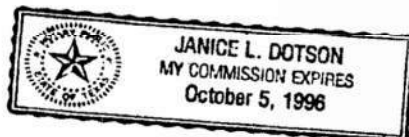
[Signature]
Notary Public
The State of Texas

THE STATE OF TEXAS §

COUNTY OF Comal §

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared DORENE RUST, VICE-PRESIDENT, CANYON LAKE WATER SUPPLY CORPORATION, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 30th day of September, 1994.



[Signature]
Notary Public
The State of Texas

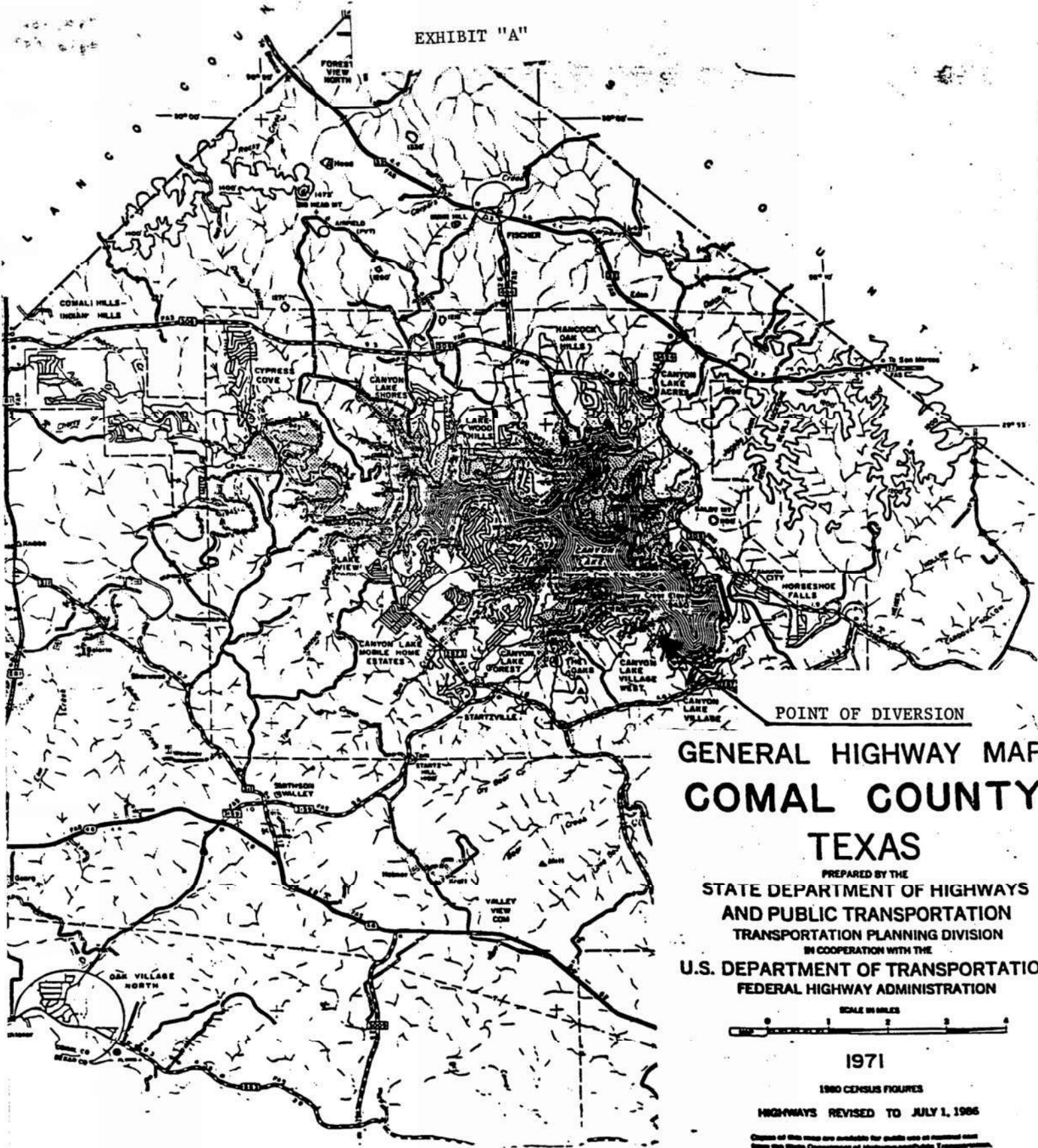
EXHIBIT 'A'
POINT OF DIVERSION
LEGAL DESCRIPTION

From the easternmost corner of the William G. Smith Survey, A-542, traveling north a distance of 58°, west 3,000 feet to the southernmost shore of Canyon Reservoir.

E X H I B I T B

The Canyon Lake Water Supply Corporation's service area is all portions of the Western part of Comal County covered under Texas Natural Resources Conservation Commission's Certificate of Convenience and Necessity number 10692.

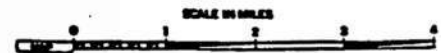
EXHIBIT "A"



POINT OF DIVERSION

GENERAL HIGHWAY MAP COMAL COUNTY TEXAS

PREPARED BY THE
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
TRANSPORTATION PLANNING DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION



1971

1980 CENSUS FIGURES

HIGHWAYS REVISED TO JULY 1, 1986

Copies of this map are available for public use at nominal cost
from the State Department of Highways and Public Transportation,
P.O. Box 6061, Austin, Texas 78763

POLYCONIC PROJECTION NORTH AMERICAN DATUM
CONTROL: U.S. COAST AND GEODETIC SURVEY AND U.S. GEOLOGICAL SURVEY

NOTICE

This map has been prepared for general informational use and
has no official status. Accuracy limited to quality of available
data as of the date shown

Sheet 1 of 1 base sheet and 3 supplements

COMAL COUNTY



GUADALUPE-BLANCO RIVER AUTHORITY

September 29, 1994

File: 20-041-01-0104

Tom Weber
Section Manager, Permitting Section
Texas Natural Resources Conservation Commission
P. O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Re: Water Purchase Contract for Raw Water Service between Guadalupe-Blanco River Authority and Canyon Lake Water Supply Corporation

Dear Sir:

In accordance with Rule 31 Texas Administrative Code, Sections 295.101 and 295.111, and Subchapter J of TAC Chapter 297, we hereby submit for filing the enclosed copy of the Contract for Raw Water Service dated October 1, 1994, between the Guadalupe-Blanco River Authority and Canyon Lake Water Supply Corporation. This contract is for municipal purposes and will divert 560 acre-feet in Comal County. Please note that it expires on December 31, 2044.

Thank you for your attention to this matter. Please do not hesitate to contact me, if you have any questions.

Sincerely,

Fred M. Blumberg
Operations Manager

FMB:sb

cc: Mr. Lee R. Roper, President, Canyon Lake WSC
Mr. Roger Nevola, Vinson & Elkins
Mr. P. Toby Cisneroz, South Texas Watermaster

Contract A¹
(1st Amendment)

CLWSC Surface Water Contract
Dated 4/30/1997


¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

**FIRST AMENDMENT TO WATER PURCHASE CONTRACT
BETWEEN
GUADALUPE-BLANCO RIVER AUTHORITY
AND CANYON LAKE WATER SUPPLY CORPORATION**

This agreement (hereinafter called the "First Amendment"), entered into as of the 30th day of April, 1997, between the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision of the State of Texas (hereinafter called "GBRA"), and CANYON LAKE WATER SUPPLY CORPORATION, a non-profit corporation organized under Article 1434a, Vernon's Civil Statutes, as amended ("Purchaser"), shall constitute an amendment to that certain contract (TNRCC Water Contract No. 1978) between the parties, dated as of October 1, 1994, entitled "Contract for Raw Water Service" (such contract as amended, hereinafter called the "Contract");

WITNESSETH:

Recitals

- A. Pursuant to the terms of the Contract, GBRA has agreed to supply CLWSC in any calendar year not to exceed 560 acre-feet of untreated water from storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, to be used in the
Guadalupe River Basin.
- 

B. Pursuant to the terms of the Contract, CLWSC has agreed to purchase untreated water from GBRA and to pay for such water at the then current rate, as established by the GBRA Board of Directors.

Agreement

NOW, THEREFORE, for and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and CLWSC agree to amend, modify and change certain sections of the Contract, as amended, as follows:

Section 1, shall be amended in its entirety to read as follows:

1. **Quantity.** GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, as amended, in such quantity as may be required by Purchaser, not to exceed 1000 acre-feet per year (the "Annual Commitment").

Section 2, shall be amended in its entirety to read as follows:

2. **Point of Diversion.** The water will be diverted at the following point(s):
A water treatment plant located adjacent to Canyon Reservoir in Comal County, Texas, as set forth in Exhibit "A" hereto. A second point of diversion will be at a proposed water treatment plant on the North shore of Canyon Reservoir in Comal County, Texas as shown in Exhibit "B" hereto. The maximum diversion rate shall be 1400 gallons per minute (3.12 cubic feet/second).

IN WITNESS WHEREOF, the parties hereto, acting under the authority of their respective governing bodies, have caused the First Amendment to

be duly executed in three (3) counterparts, each of which shall constitute an original.

GUADALUPE-BLANCO RIVER AUTHORITY

By


General Manager

ATTEST:

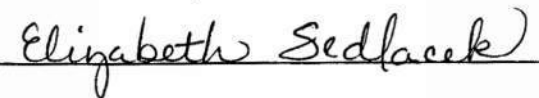


CANYON LAKE WATER SUPPLY CORPORATION

By



ATTEST:



§ THE STATE OF TEXAS

§ COUNTY OF GUADALUPE

BEFORE ME, the undersigned authority, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument as General Manager of the Guadalupe-Blanco River Authority, a conservation and reclamation district, a governmental agency and a body politic and corporate, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30th day of April, 1997.

Clara Sue Brewster

Notary Public in and for

The State of Texas

My Commission Expires: 10-15-97

§ THE STATE OF TEXAS

§ COUNTY OF COMAL

BEFORE ME, the undersigned authority, on this day personally appeared Dale R. Yates of CANYON LAKE WATER SUPPLY CORPORATION, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity therein stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30th day of April, 1997.

Clara Sue Brewster

Notary Public in and for

The State of Texas

My Commission Expires: 10-15-97

Exhibit "A"

Point of Diversion I Legal Description Comal County, Texas

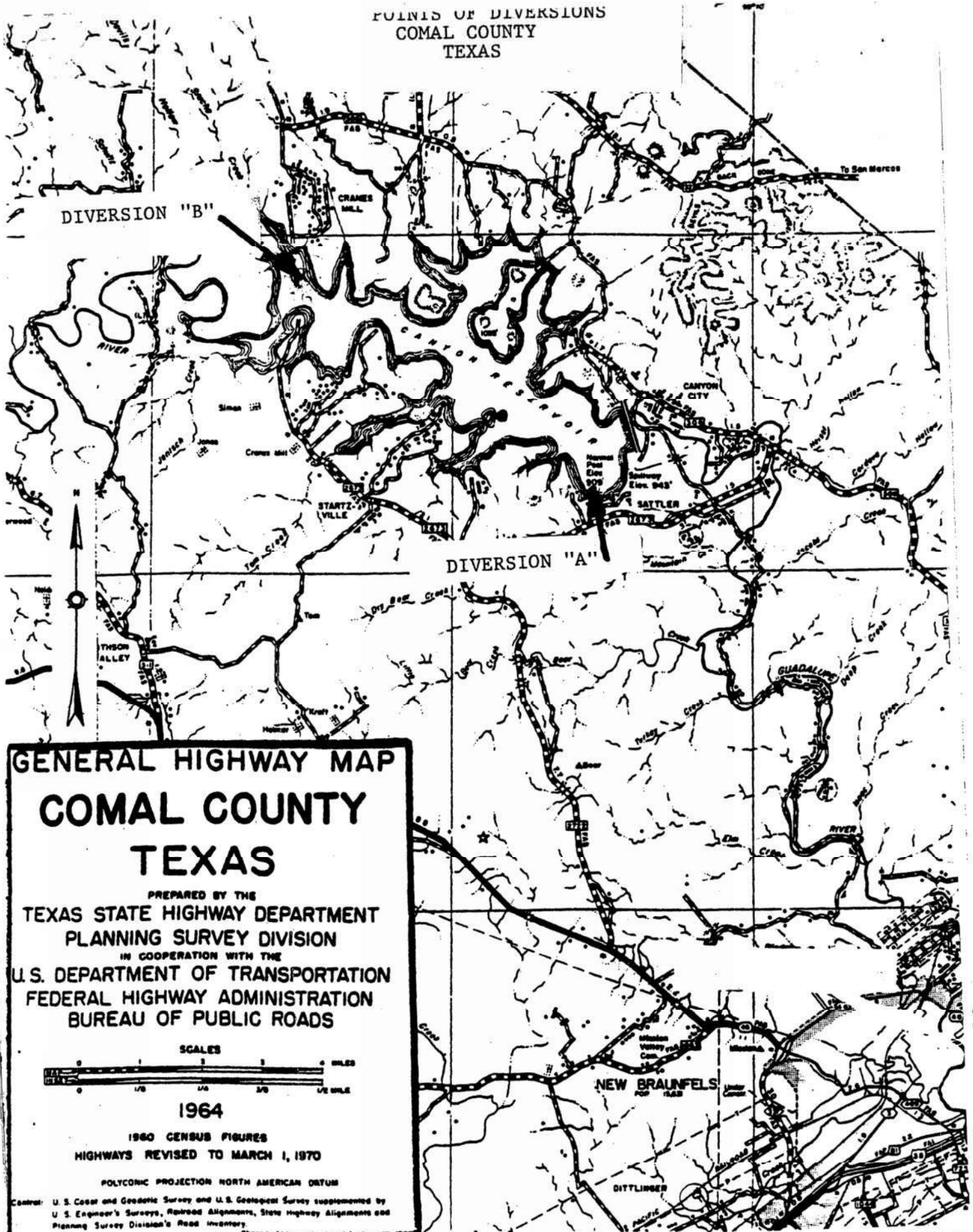
From the easternmost corner of the William G. Smith Survey, A-542, traveling North a distance of 58°, west 3,000 feet to the southernmost shore of Canyon Reservoir.

Exhibit "B"

Point of Diversion II Legal Description Comal County, Texas

On the North bank of the Guadalupe River in the A.S. Cunning Survey No. 701, Abstract No. 102, Comal County, Texas, Southwest 62°. 50 feet from the South corner of lot 77, Canyon Lake Shores Subdivision and is at North Latitude of 29° 17'09.6" (WSG 894).

POINTS OF DIVERSIONS
COMAL COUNTY
TEXAS



Contract A¹
(2nd Amendment)

CLWSC Surface Water Contract
Dated 11/3/1999

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

**SECOND AMENDMENT
TO CONTRACT FOR RAW WATER SERVICE
BETWEEN
GUADALUPE-BLANCO RIVER AUTHORITY
AND CANYON LAKE WATER SUPPLY CORPORATION**

This agreement (hereinafter called this "Second Amendment"), entered into as of the 3rd day of November, 1999, between the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision of the State of Texas (hereinafter called "GBRA"), and CANYON LAKE WATER SUPPLY CORPORATION, a non-profit corporation organized under Article 1434a, Vernon's Civil Statutes, as amended ("Purchaser"), shall constitute an amendment to that certain contract (TNRCC Water Contract No. 1978) between the parties, dated as of October 1, 1994, and first amended on April 30, 1997, entitled "Contract for Raw Water Service" (such contract as amended is hereinafter called the "Contract");

WITNESSETH:

Recitals

Pursuant to the terms of the Contract, GBRA has agreed to supply Purchaser in any calendar year not to exceed 1,000 acre-feet of untreated water from storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, to be used in the Guadalupe River Basin.

Purchaser now desires that the amount of stored water from Canyon Reservoir to be supplied by GBRA be increased to not to exceed 2,000 acre-feet per year.

GBRA has filed with the Texas Natural Resource Conservation Commission (TNRCC) an application for various amendments to Certificate of Adjudication No. 18-2074, as amended, (hereinafter referred to as GBRA's Application to Amend the Canyon Certificate). GBRA's Application to Amend the Canyon Certificate remains pending before the TNRCC on the date of this Second Amendment set forth above. Approval of GBRA's Application to Amend the Canyon Certificate will substantially increase the amount of stored water available for supply by GBRA.

GBRA is willing to agree to increase the amount of stored water from Canyon Reservoir to be supplied by GBRA as requested by Purchaser, because GBRA anticipates timely approval by the TNRCC of GBRA's Application to Amend the Canyon Certificate. Purchaser has agreed to pay for GBRA's commitment to supply the additional water at the rate established pursuant to the terms of the Contract.

Agreement

NOW, THEREFORE, for and in consideration of the foregoing and the mutual promises, obligations, and benefits hereinafter set forth, GBRA and Purchaser agree as follows:

1. Sections 1 and 2 of the Contract shall be amended in their entirety, and new Sections 20 and 21 shall be added, to read as follows:

1. **Quantity.** GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, as amended, in such quantity as may be required by Purchaser, not to exceed 2,000 acre-feet per year (the "Annual Commitment").

2. **Point of Diversion.** The water will be diverted at the following point(s): A water treatment plant located adjacent to Canyon Reservoir in Comal County, Texas, as set forth in Exhibit "A" hereto. A second point of diversion will be at a proposed water treatment plant on the North shore of Canyon Reservoir in Comal County, Texas as shown in Exhibit "B" hereto. The maximum combined diversion rate shall be 4,200 gallons per minute (9.85 cubic feet/second).

20. **Allocation During Drought.** During drought conditions or in any other condition when water cannot be supplied to meet the demands of all customers, the water to be distributed shall be divided among all customers of stored water from Canyon Reservoir pro rata, according to the amount each may be entitled to, subject to reasonable conservation and drought management plans and requirements based on particular purposes of use of the water, so that preference is given to no one and everyone suffers alike.

21. **Conservation and Drought Management Plans.** Purchaser shall develop and implement a water conservation and drought management plan applicable to the use of all water supplied under this Agreement, if required at any time by applicable law or regulation or by GBRA. Any such plan shall at all times meet all requirements of all applicable laws and regulations, and all reasonable requirements of GBRA.

2. Purchaser shall commence paying for the Annual Commitment of 2,000 acre-feet per year of stored water pursuant to the terms of the Contract, as amended by this Second Amendment, commencing as of the date of this Second Amendment set forth above.

3. Purchaser expressly agrees to support the granting, in whole, of GBRA's Application to Amend the Canyon Certificate.

IN WITNESS WHEREOF, the parties hereto, acting under the authority of their respective governing bodies, have caused the Second Amendment to be duly executed in three (3) counterparts, each of which shall constitute an original.

GUADALUPE-BLANCO RIVER AUTHORITY

By


General Manager

ATTEST:

Renee Gupte

CANYON LAKE WATER SUPPLY

By Jeff Branecky
Jeff Branecky, President

ATTEST:

William K. Holmes
William K. Holmes, Secretary

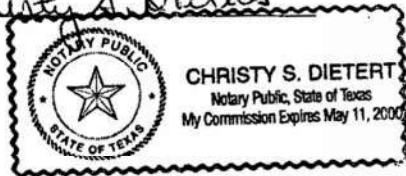
THE STATE OF TEXAS

COUNTY OF GUADALUPE

BEFORE ME, the undersigned authority, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument as General Manager of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation and reclamation district, a governmental agency and a body politic and corporate, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 3rd day of November, 1999.

Christy S. Dietert



Notary Public in and for
The State of Texas

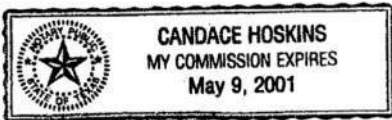
My Commission Expires: May 11, 2000

THE STATE OF TEXAS

COUNTY OF COMAL

BEFORE ME, the undersigned authority, on this day personally appeared Jeff Branecky of the CANYON LAKE WATER SUPPLY CORPORATION, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity therein stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 11th day of NOVEMBER, 1999.



Candace Hoskins

Notary Public in and for
The State of Texas

My Commission Expires: 09 MAY 2001

Exhibit "A"

Point of Diversion I Legal Description Comal County, Texas

From the easternmost corner of the William G. Smith Survey, A-542, traveling North a distance of 58E, west 3,000 feet to the southernmost shore of Canyon Reservoir.

Exhibit "B"

Point of Diversion II Legal Description Comal County, Texas

On the North bank of the Guadalupe River in the A.S. Cuning Survey No. 701, Abstract No. 102, Comal County, Texas, Southwest 62E. 50 feet from the South corner of lot 77, Canyon Lake Shores Subdivision and is at North Latitude of 29E 17' 09.6" (WSG 894).

Contract B¹

**CLWSC Surface Water Contract
Dated 4/21/1996**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

#11A 041033

CONTRACT FOR RAW WATER SERVICE

This Contract for Raw Water Service is entered into as of April 29, 1996, 1996 between Guadalupe-Blanco River Authority, a conservation district and political subdivision of the State of Texas ("GBRA"), and Comal County Freshwater District No. 1 ("Purchaser").

For and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and Purchaser agree as follows:

1. QUANTITY. GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074C, as amended, in such quantity as may be required by Purchaser, not to exceed 130 acre-feet per year (the "Annual Commitment"), to be used for Municipal purposes.

2. POINT OF DIVERSION. The water will be furnished at a point in Comal County (the "Point of Diversion") as follows: Beginning at Corps of Engineer's Canyon Reservoir Survey Monument 607-02, thence S 38 1/2° E 224 feet to point on north bank of Guadalupe River, Charles Murhardt Survey, Abstract 405, Comal County, Texas.

The maximum rate of diversion at the Point of Diversion shall not exceed 600 gallons per minute (cubic feet/second). The vicinity map attached hereto as Exhibit "A" shows the Point of Diversion and place of use. Certificate of Adjudication 18-2074C authorizes GBRA to use the bed and banks of the Guadalupe River to convey water released from Canyon Reservoir to the Point of Diversion.

3. ANNUAL PAYMENTS. Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, upon execution of this contract by Purchaser, and thereafter not later than the fifteenth day of each month during the term of this contract, an amount of money equal to the Annual Commitment multiplied by the then applicable rate for water supplied from conservation storage in Canyon Reservoir (the "Raw Water Rate") divided by twelve. The payment due upon execution of this contract shall be \$ 574.49 monthly, based upon the current Raw Water Rate of \$ 53.03 per acre-foot per year. GBRA shall submit to Purchaser not later than the first day of each month during the term of this contract an invoice for the payment due the fifteenth day of each month.

4. ANNUAL ADJUSTMENT. Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, not later than the thirty-first day of January of each year, a dollar amount equal to the Raw Water Rate times the number of acre-feet by which the total amount of

water diverted at the Point of Diversion in the previous calendar year exceeds the Annual Commitment, provided, however, that nothing in this section shall be construed as obligating GBRA to supply in any year more water than the Annual Commitment.

5. ADJUSTMENT OF RAW WATER RATE. The Raw Water Rate may be adjusted by GBRA at any time and from time to time. If GBRA desires to adjust the Raw Water Rate, it shall, at least sixty (60) days prior to the first day on which the adjustment is proposed to become effective, give written notice of the proposed adjustment to Purchaser.

6. METERING. Purchaser shall furnish, install, operate and maintain at its own expense at the Point of Diversion a measuring device or devices to measure the quantity of water diverted by Purchaser within five percent (5%) above or below the amount actually diverted. All measuring devices shall be subject at all reasonable times to inspection, examination and testing by an employee or agent of GBRA. Any measuring device which fails to function or which functions incorrectly shall, at Purchaser's expense, promptly be adjusted, repaired or replaced by a like device having the required accuracy. GBRA may, at its expense, install and maintain such measuring devices as it deems appropriate to measure the quantity of water diverted by Purchaser at the Point of Diversion, in which case measurement of water shall be made by GBRA's measuring devices. Purchaser shall read the metering equipment weekly at or near the first day of each week, and shall maintain records of such readings. When meters are judged to be unnecessary by GBRA, an alternative method of measurement may be authorized provided accurate records of actual water use are maintained. Purchaser shall furnish GBRA by the fifteenth day of January of each year with a tabulation indicating the total amount of water diverted each week during the previous year. GBRA agrees to complete and file with the Texas Natural Resource Conservation Commission (or its successor) all reports of water used by Purchaser.

7. QUALITY. The water to be supplied hereunder shall be untreated water as it occurs in the Guadalupe River at the Point of Diversion.

8. REGULATORY AGENCIES. The effectiveness of this contract is dependent upon compliance with the applicable provisions, if any, of 31 TAC 295 and 297, Subchapter J of the Texas Natural Resource Conservation Commission.

9. ASSIGNMENT. Purchaser may not assign this contract without the prior written consent of GBRA. Any successor or assign of GBRA shall succeed to the rights and obligations of GBRA hereunder.

10. CAPTIONS. All titles of the sections of this contract have been inserted for convenience of reference only and are not considered a part of this contract and in no way shall they affect the interpretation of any provisions of this contract.

11. TERMINATION. Purchaser may terminate this contract at any time for any reason by giving GBRA written notice of termination thirty (30) days prior to the

THE STATE OF TEXAS)

COUNTY OF GUADALUPE)

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision, and that he executed the same as the act of such conservation district and political subdivision for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 29th day of May



Clara Sue Bruch
Notary Public
The State of Texas

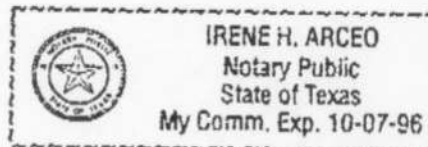
THE STATE OF TEXAS)

COUNTY OF BEXAR)
~~COUNTY~~

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared George R. Legg, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 22nd day of May, 199 6

Irene H. Arceo
Notary Public
The State of Texas



**FIRST AMENDMENT TO CONTRACT FOR RAW WATER SERVICE
BETWEEN
GUADALUPE-BLANCO RIVER AUTHORITY
AND COMAL COUNTY FRESH WATER SUPPLY DISTRICT #1**

THIS AMENDMENT NO. 1 made and entered into as of this 29th day of April, 1997, ("Amendment No. 1") to the Water Purchase Contract made and entered into as of the 29th day of April, 1996, (the "Contract") by and between the GUADALUPE-BLANCO RIVER AUTHORITY, a governmental agency of the State of Texas ("GBRA"), and the COMAL COUNTY FRESH WATER SUPPLY DISTRICT #1 (CCFWSD #1).

WITNESSETH:

Recitals

- A. Pursuant to the terms of the Contract, GBRA has agreed to supply CCFWSD #1 in any calendar year not to exceed 130 acre-feet of untreated water from storage in Canyon Reservoir under Certificate of Adjudication 18-2074C. to be used in the Guadalupe River Basin.
- B. Pursuant to the terms of the Contract, CCFWSD #1 has agreed to purchase untreated water from GBRA and to pay for such water at the then current rate, as established by the GBRA Board of Directors.

Agreement

NOW, THEREFORE, for and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and CCFWSD #1 agree to amend, modify and change certain sections of the Contract, as amended, as follows:

Section 12, shall be amended in its entirety to read as follows:

- 12) TERM. This contract shall terminate on December 31, 2037, unless it is terminated earlier pursuant to the provisions hereof.

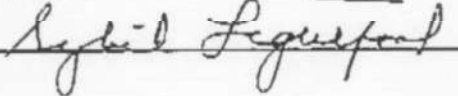
IN WITNESS WHEREOF, the parties hereto, acting under the authority of their respective governing bodies, have caused the First Amendment to be duly executed in three (3) counterparts, each of which shall constitute an original.

GUADALUPE-BLANCO RIVER AUTHORITY

By

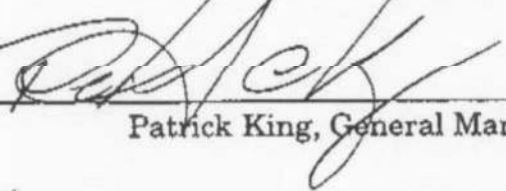

General Manager

ATTEST:

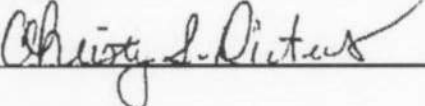


COMAL COUNTY FRESH WATER DISTRICT #1

By


Patrick King, General Manager

ATTEST:



§ THE STATE OF TEXAS

§ COUNTY OF GUADALUPE

BEFORE ME, the undersigned authority, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument as General Manager of the Guadalupe-Blanco River Authority, a conservation and reclamation district, a governmental agency and a body politic and corporate, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 29th day of April, 1997



SEAL

Clara Sue Brush

Notary Public in and for

The State of Texas

My Commission Expires: 10-15-97

§ THE STATE OF TEXAS

§ COUNTY OF COMAL

BEFORE ME, the undersigned authority, on this day personally appeared Patrick King, General Manager of COMAL COUNTY FRESH WATER DISTRICT #1, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, in the capacity therein stated, and as the act and deed of said Authority.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 21st day of April, 1997.

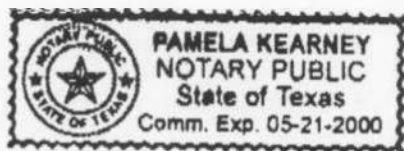
Pamela Kearney

Notary Public in and for

The State of Texas

My Commission Expires: 5-21-2000

SEAL



Contract C¹

**CLWSC Surface Water Contract
Dated 8/27/2001**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

CONTRACT FOR RAW WATER SERVICE

This Contract for Raw Water Service is entered into as of August 27, 2001 between GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision of the State of Texas ("GBRA"), and Canyon Lake Water Supply Corporation, ("Purchaser").

GBRA holds Certificate of Adjudication No. 18-2074D, as amended, ("CA 18-2074D") issued by the Texas Water Commission, now the Texas Natural Resource Conservation Commission ("TNRCC"), based on GBRA's rights under Permit No. 1886, as amended. On August 29, 1997, GBRA applied to the TNRCC for various amendments to CA 18-2074 including an increase in the authorized diversions from Canyon Reservoir ("GBRA's Application to Amend the Canyon Certificate") and expects said application with TNRCC to be approved in the next few months.

For and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and Purchaser agree as follows:

1. QUANTITY. GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074D, as amended, in such quantity as may be required by Purchaser, not to exceed 2000 acre-feet per year (the "Annual Commitment"), to be used for Municipal purposes. GBRA's obligations under this Agreement are expressly conditioned upon the granting, in whole, of GBRA's Application to Amend the Canyon Certificate.

2. POINT OF DIVERSION. The water will be furnished at a point in Comal County (the "Point of Diversion") as follows:
See Exhibit "A"

The maximum rate of diversion at the Point of Diversion shall not exceed 4200 gallons per minute (9.35 cubic feet/second). The vicinity map attached hereto as Exhibit "B" shows the Point of Diversion. Exhibit "C" shows the Place of Use.

3. MONTHLY PAYMENTS. Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, upon execution of this contract by Purchaser, and thereafter not later than the twentieth (20th) day of each month during the term of this contract, an amount of money equal to one-twelfth of the Annual Commitment multiplied by the then applicable rate for water supplied from conservation storage in Canyon Reservoir (the "Raw Water Rate"). The payment due upon execution of this contract shall be \$11,500.00 based upon the current Raw Water Rate of \$ 69.00 per acre-foot per year. However, until GBRA receives the requested amendment to the Canyon Reservoir Certificate of Adjudication, or January 1, 2002, whichever comes first, the calculated payment will be multiplied by a factor of 0.5.

10. ALLOCATION DURING DROUGHT. During drought conditions or in any other condition when water cannot be supplied to meet the demands of all customers, the water to be distributed shall be divided among all customers of stored water from Canyon Reservoir pro rata, according to the amount each may be entitled to, subject to reasonable conservation and drought management plans and requirements based on particular purposes of use of the water, so that preference is given to no one and everyone suffers alike.

10. ASSIGNMENT. Except as specifically provided otherwise below, Purchaser may not assign this contract without the prior written consent of GBRA. Without obtaining GBRA's consent, Purchaser may assign this contract to the U. S. Department of Agriculture-Rural Development. Any successor or assign of GBRA shall succeed to the rights and obligations of GBRA hereunder.

11. CAPTIONS. All titles of the sections of this contract have been inserted for convenience of reference only and are not considered a part of this contract and in no way shall they affect the interpretation of any provisions of this contract.

12. TERMINATION. Purchaser may terminate this contract at any time for any reason by giving GBRA written notice of termination thirty (30) days prior to the date of termination. If Purchaser fails to pay any amounts payable under this contract when due and payable, GBRA may give written notice of such delinquency to Purchaser, and if all amounts due and unpaid, including interest thereon from the date payment was due at maximum legal rates, are not paid within thirty days after delivery of such notice, then GBRA may, at its option, institute suit for the collection thereof and utilize such other remedies as may exist to collect any amounts due and unpaid, together with interest thereon at the maximum legal rate and attorney's fees. In addition to all other remedies, GBRA may, at its option, if such amounts are not paid within said thirty day period, terminate this contract without recourse.

13. AMENDMENTS REQUIRED. Purchaser understands and acknowledges that GBRA's Application to Amend the Canyon Certificate may need to be approved by the TNRCC before GBRA will or may supply, and before Purchaser may divert and use, water pursuant to the terms of this Contract. GBRA's obligations under this Contract are expressly conditioned upon GBRA obtaining all amendments to GBRA's Canyon Reservoir water right, and any other permits, amendments to permits, licenses and other governmental authorizations relating to the supply and use of water under this Contract, that GBRA determines to be necessary or desirable. GBRA will notify Purchaser upon GBRA's obtaining all such amendments and other authorizations, at which time delivery, diversion, and use of water under this Contract may commence. Purchaser agrees to cooperate with GBRA in pursuing all such amendments and other authorizations, to complete and file all required reports, and to comply with all applicable laws, rules, and regulations. Without limiting the generality of the foregoing, Purchaser expressly agrees to support the granting, in whole, GBRA's Application to Amend the Canyon Certificate, as such application may be amended by GBRA.

14. TERM. This contract shall terminate on December 31, 2050 unless it is terminated earlier pursuant to the provisions hereof.

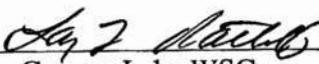
IN WITNESS WHEREOF, the parties hereto have caused this contract to be duly executed in multiple counterparts, each of which shall constitute an original.

Guadalupe-Blanco River Authority

By 
General Manager

Attest: 

Purchaser

By 
Canyon Lake WSC
P. O. Box 1742
Mailing Address
Canyon Lake, Texas 78130
City, State, Zip
830/964-3854
Telephone No.

Attest: 

THE STATE OF TEXAS §

COUNTY OF GUADALUPE §

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision, and that he executed the same as the act of such conservation district and political subdivision for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 27th day of August, 2001.



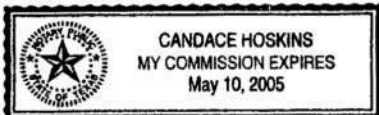
Clara Sue Brush
Notary Public
The State of Texas

THE STATE OF TEXAS §

COUNTY OF COMAL §

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared LARRY L. PATLFF of the Canyon Lake WSC known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 11 day of July, 2001.



Candace Hoskins
Notary Public
The State of Texas

Exhibit "A"

Point of Diversion I Legal Description Comal County, Texas

From the easternmost corner of the William G. Smith Survey, A-542, traveling North a distance of 58E, west 3,000 feet to the southernmost shore of Canyon Reservoir.

Exhibit "A"

Point of Diversion II Legal Description Comal County, Texas

On the North bank of the Guadalupe River in the A.S. Cuning Survey No. 701, Abstract No. 102, Comal County, Texas, Southwest 62E. 50 feet from the South corner of lot 77, Canyon Lake Shores Subdivision and is at North Latitude of 29E 17' 09.6" (WSG 894).

Exhibit "B"

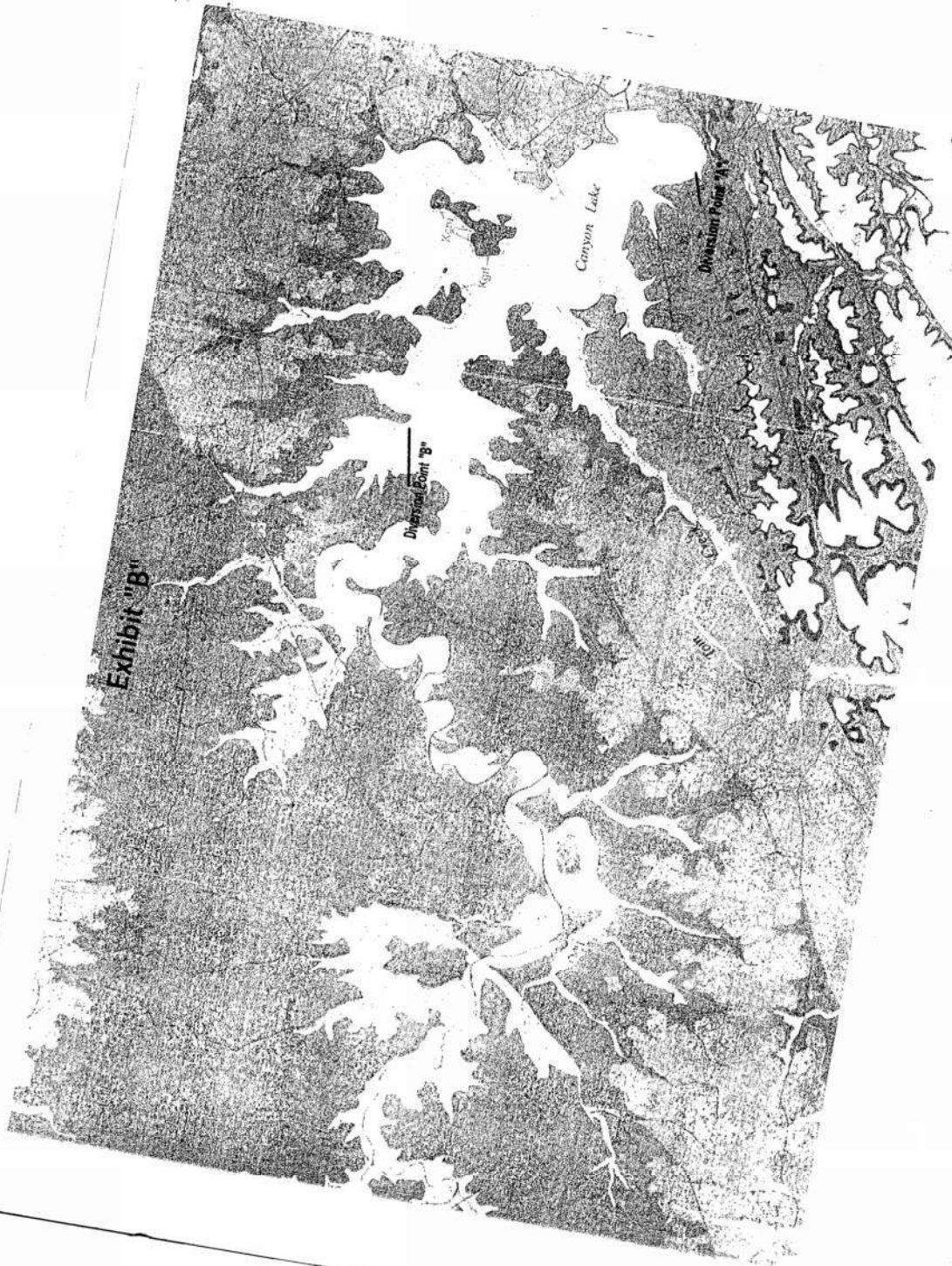


Exhibit "C"

Place of Use

Raw water obtained from Canyon Reservoir will be treated, distributed and used in the Canyon Lake Water Supply Corporation's service area and within the Guadalupe River Basin.



GUADALUPE-BLANCO RIVER AUTHORITY

GENERAL OFFICE
933 East Court Street
Seguin, Texas 78155
Phone: 830-379-5822
Fax: 830-379-9718

COLETO CREEK PARK
AND RESERVOIR
P.O. Box 68
Fannin, Texas 77960
Phone: 361-575-6366
Fax: 361-575-2267

LAKE WOOD
RECREATION AREA
Route 2, Box 158-A
Gonzales, Texas 78629
Phone: 830-672-2779

LOCKHART
WASTEWATER
RECLAMATION
SYSTEM
4435 FM 20 East
Lockhart, Texas 78644
Phone: 512-398-6391
Fax: 512-398-6526

LULING WATER
TREATMENT PLANT
350 Memorial Drive
Luling, Texas 78648
Phone: 830-875-2132
Fax: 830-875-3670

PORT LAVACA
OPERATIONS
P.O. Box 146
Port Lavaca, Texas 77979
Phone: 361-552-9751
Fax: 361-552-6529

SAN MARCOS WATER
TREATMENT PLANT
91 Old Bastrop Road
San Marcos, Texas 78666
Phone: 512-353-3888
Fax: 512-353-3127

VICTORIA REGIONAL
WASTEWATER
RECLAMATION
SYSTEM
P.O. Box 2085
Victoria, Texas 77902-2085
Phone: 361-578-2878
Fax: 361-578-9039

GBRA WEBSITE
<http://www.gbra.org>

June 14, 2001

20-041-04-0108--041008

Ms. Carol Rahmani

Water Rights Permitting - Contracts, MC-160
Texas Natural Resources Conservation Commission
P. O. Box 13087
Austin, Texas 78711

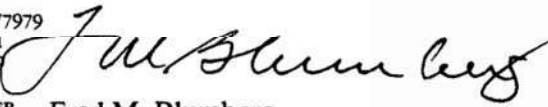
Re: Contract for Raw Water Service between Guadalupe-Blanco River Authority and
Canyon Lake Water Supply Corporation

Dear Ms. Rahmani:

In accordance with Rule 31 Texas Administrative Code, Sections 295.101 and 295.111,
and Subchapter J of TAC Chapter 297, we hereby submit for your records the attached
Contract for Raw Water Service between GBRA and Canyon Lake Water Supply
Corporation for 2000 acre-feet for municipal purposes. The Agreement will expire on
December 31, 2050.

Thank you for your attention to this matter. Please do not hesitate to contact me, if you
have any questions.

Sincerely,


Fred M. Blumberg
Deputy General Manager

FMB:sb

Cc: Mr. Dale Yates, Canyon Lake Water Supply Corporation
Al Segovia, South Texas Watermaster
Roger Nevola, Attorney at Law

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Jeffrey A. Saitas, *Executive Director*



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

October 12, 2001

Guadalupe-Blanco River Authority
Attn: Fred M. Blumberg
933 East Court Street
Sequin, TX 78155

Subject: Filing of Water Sales Contract, TNRCC NO. 2343
Canyon Lake Water Supply Corporation

Dear Mr. Blumberg:

The Water Supply Contract reflecting the subordination agreement between the Guadalupe-Blanco River Authority and Canyon Lake Water Supply Corporation has been accepted for filing. The Agreement meets the filing requirements of 30 Texas Administrative Code Chapters §295.101 and §297 Sub-Chapter J.

Please note that for correspondence and reporting purposes this contract is being identified as Water Supply Contract TNRCC No. 2343.

Term: 49 years, beginning August 27, 2001 and ending December 31, 2050

Use: Municipal; 2,000 acre-feet/annum

Source: Guadalupe River, Canyon Lake

Supplier's Water Right: Certificate No. 18-2074

If you have any questions or comments, please call me at (512) 239-0047.

Sincerely,

A handwritten signature in cursive script that reads "David N. Koinm".

David N. Koinm - MC 160
Water Rights Permitting
Water Quantity Division

cc: Canyon Lake Water Supply Corporation

Contract D¹

**CLWSC Surface Water Contract
Dated 9/29/2006**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

CONTRACT FOR FIRM RAW WATER SERVICE

This Contract for Raw Water Service is entered into as of September 29, 2006 between Guadalupe-Blanco River Authority, a conservation district and political subdivision of the State of Texas ("GBRA"), and SJWTX Water, Inc. doing business as Canyon Lake Water Service Company, ("Purchaser").

For and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, GBRA and Purchaser agree as follows:

1. QUANTITY. GBRA agrees to furnish Purchaser, at the Point of Delivery (hereinafter defined), during the term of this agreement, untreated water from conservation storage in Canyon Reservoir under Certificate of Adjudication 18-2074, as amended, in such quantity as may be required by Purchaser, not to exceed 2,000 acre-feet per year (the "Annual Commitment"), to be used for municipal purposes. GBRA may also furnish untreated water under the terms and conditions of this Contract from any source or combination of sources that may be available to GBRA on a firm-yield basis including without limitation, run-of-river flows of the Guadalupe River under new water rights or amendments to existing water rights, and water obtained from sources other than surface waters of the Guadalupe River Basin. Upon request, Purchaser shall provide to GBRA information reasonably necessary to demonstrate its requirements for the quantities of water to be furnished pursuant to this Contract.

2. POINTS OF DIVERSION AND PLACES OF USE. The water will be furnished at two (2) points in Comal County, Texas (the "Points of Diversion") as described in Exhibit "A."

The maximum rate of diversion at the Point of Diversion shall not exceed 6,945 gallons per minute (15.43 cubic feet/second). The vicinity maps attached hereto as Exhibit "B" show the Points of Diversion and places of use. The water diverted under this Contract may not be leased or resold in any manner by Purchaser, and it may not be used outside of GBRA's ten-county statutory district.

3. MONTHLY PAYMENTS. Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, upon execution of this contract by Purchaser, and thereafter not later than the twentieth (20th) day of each month during the term of this contract, an amount of money equal to one-twelfth of the Annual Commitment multiplied by the then applicable rate for firm water supplied pursuant to this Contract (the "Firm Water Rate"). Purchaser agrees that the Firm Water Rate is a rate charged pursuant to this Contract. The payment due upon execution of this contract shall be \$16,000.00 based upon the current Firm Water Rate of \$96.00 per acre-foot per year.

4. ANNUAL ADJUSTMENT. Purchaser agrees to pay GBRA at its office in Guadalupe County, Texas, or such other place as GBRA may designate in writing, not later than the thirty-first day of January of each year, a dollar amount equal to the Firm Water Rate times the number of acre-feet by which the total amount of water diverted at the Points of Diversion in the previous calendar year exceeds the Annual Commitment, provided, however, that nothing in this section shall be construed as obligating GBRA to supply in any year more water than the Annual Commitment.

5. ADJUSTMENT OF FIRM WATER RATE. The Firm Water Rate may be adjusted by GBRA at any time and from time to time. If GBRA desires to adjust the Firm Water Rate, it shall, at least sixty (60) days prior to the first day on which the adjustment is proposed to become effective, give written notice of the proposed adjustment to Purchaser.

6. METERING. Purchaser shall furnish, install, operate and maintain at its own expense at the Points of Diversion measuring devices to measure the quantity of water diverted by Purchaser within five percent (5%) above or below the amount actually diverted. All measuring devices shall be subject at all reasonable times to inspection, examination and testing by an employee or agent of GBRA. Any measuring device which fails to function or which functions incorrectly shall, at Purchaser's expense, promptly be adjusted, repaired or replaced by a like device having the required accuracy. GBRA may, at its expense, install and maintain such measuring devices as it deems appropriate to measure the quantity of water diverted by Purchaser at the Point of Diversion, in which case measurement of water shall be made by GBRA's measuring devices. Purchaser shall read the metering equipment monthly at or near the first day of each month, and shall maintain records of such readings. Purchaser shall furnish GBRA by the first day of each month with an estimate of the total amount of water to be diverted that month, as well as the amount actually diverted during the previous month. GBRA agrees to complete and file with the Texas Commission on Environmental Quality (or its successor) all reports of water used by Purchaser.

7. QUALITY. The water to be supplied hereunder shall be untreated water as it occurs at the Points of Diversion.

8. REGULATORY REQUIREMENTS. This Contract is subject to all applicable federal, state, and local laws and any applicable ordinances, rules, orders, and regulations of any local, state, or federal governmental authority having jurisdiction. This Contract is specifically subject to all applicable sections of the Texas Water Code and the rules of the Texas Commission on Environmental Quality, or any successor agency.

9. CONSERVATION AND DROUGHT MANAGEMENT PLANS. Purchaser agrees to provide to the maximum extent practicable for the conservation of water. Purchaser further agrees to assist GBRA in implementing water conservation and drought management plans applicable to the use of water from Canyon Reservoir or other sources of supply. Purchaser shall develop and implement a water conservation and drought management plan applicable to its use of all water supplied under this Agreement. Any such plan shall at all times meet all requirements of all applicable laws and regulations, and all reasonable requirements of GBRA, including but not limited to the requirement to implement conservation-oriented water rates. Purchaser shall review and update its conservation and drought management plans not later than May 1, 2009, and every five years thereafter.

10. ALLOCATION DURING DROUGHT. During drought conditions or in any other condition when water cannot be supplied to meet the demands of all customers, the water to be distributed shall be divided by GBRA among all its customers pro rata, according to the amount each may be entitled to, subject to reasonable conservation and drought management plans and requirements based on particular purposes of use of the water, so that preference is given to no one and everyone suffers alike.

11. ASSIGNMENT. Except as specifically provided otherwise below, Purchaser may not assign this contract without the prior written consent of GBRA. Without obtaining GBRA's consent, Purchaser may assign this contract to the U. S. Department of Agriculture-Rural Development. Any successor or assign of GBRA shall succeed to the rights and obligations of GBRA hereunder.

12. CAPTIONS. All titles of the sections of this contract have been inserted for convenience of reference only and are not considered a part of this contract and in no way shall they affect the interpretation of any provisions of this contract.

13. TERMINATION. Purchaser may terminate this contract at any time for any reason by giving GBRA written notice of termination ninety (90) days prior to the date of termination. If Purchaser fails to pay any amounts payable under this contract when due and payable, GBRA may give written notice of such delinquency to Purchaser, and if all amounts due and unpaid, including interest thereon from the date payment was due at maximum legal rates, are not paid within thirty days after delivery of such notice, then GBRA may, at its option, institute suit for the collection thereof and utilize such other remedies as may exist to collect any amounts due and unpaid, together with interest thereon at the maximum legal rate and attorney's fees. In addition to all other remedies, GBRA may, at its option, if such amounts are not paid within said thirty day period, terminate this contract without recourse.

14. TERM. This contract shall terminate on December 31, 2050 unless it is terminated earlier pursuant to the provisions hereof.

15. DUE AUTHORIZATION, BINDING OBLIGATION, NO APPROVALS REQUIRED. This Contract has been duly authorized, executed and delivered by all necessary action of Purchaser, and constitutes a legal, valid and binding obligation of Purchaser, enforceable against Purchaser in accordance with its terms. No further approval, authorization, order or consent of, or declaration, registration or filing is required for the valid execution and delivery of this Contract by Purchaser or for the performance of any payment or other obligation by Purchaser.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be duly executed in multiple counterparts, each of which shall constitute an original.

Guadalupe-Blanco River Authority

By _____
Bill West, General Manager

Attest:

Purchaser

By George Belhumeur 9/22/06
George Belhumeur, Sr. Vice President of Operations

1221 S. Bascom Ave.

Address

San Jose, CA 95128

City, State, Zip

408-279-7805

Telephone No.

Attest:

Candace Hoskins

Candace Hoskins, Executive Assistant to the General Manager

THE STATE OF TEXAS §

COUNTY OF GUADALUPE §

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared William E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision, and that he executed the same as the act of such conservation district and political subdivision for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the _____ day of _____, 2006.

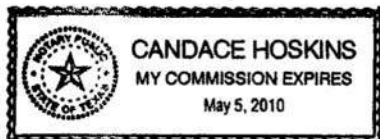
Notary Public
The State of Texas

THE STATE OF TEXAS §

COUNTY OF COMAL §

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared George Belhumeur, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 29 day of September, 2006.



Candace Hoskins
Notary Public
The State of Texas

Exhibit "A"

Point of Diversion I Legal Description Comal County, Texas

From the easternmost corner of the William G. Smith Survey, A-542, traveling North a distance of 58°, west 3000 feet to the southernmost shore of Canyon Reservoir.

Point of Diversion II Legal Description Comal County, Texas

On the North bank of the Guadalupe River in the A.S. Cuning Survey No. 701, Abstract No. 102, Comal County, Texas, Southwest 62°. 50 feet from the South corner of Lot 77, Canyon Lake Shores Subdivision and is at North Latitude of 29° 17'09.6" (WSG 894).

Map No. WSC
Comal County
Canyon Lake WSC
CCN No. 10692
0 1 Mile
Date: 12/16/2005



Contract E¹

**CLWSC Surface Water Contract
Dated 2/6/2009**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

REGIONAL WATER SUPPLY AND SERVICE AREA TRANSFER AGREEMENT

This Regional Water Supply and Service Area Transfer Agreement (the "**Agreement**") is entered into on this 10th day of September, 2008 (the "**Effective Date**") by and between SJWTX, Inc., a Texas corporation d/b/a Canyon Lake Water Service Company, ("**SJWTX**") and the City of Bulverde, Texas, a general law city (the "**City**"). SJWTX and the City may be referred to herein collectively as the "**Parties**" and individually as a "**Party**."

RECITALS

WHEREAS, the City has entered into the following three agreements with the Guadalupe-Blanco River Authority ("**GBRA**") regarding water supply (collectively referred to herein as the "**Existing Agreements**"): 1) that certain Operating Agreement between the City and GBRA dated as of January 11, 2002 (the "**Operating Agreement**"); 2) that certain Agreement between the City and GBRA dated as of December 12, 2001 (the "**Water Supply Agreement**"); and 3) that certain Interlocal Agreement between GBRA and the City dated as of January 15, 2002 (the "**Interlocal Agreement**");

WHEREAS, pursuant to the Interlocal Agreement and the Operating Agreement, the City currently holds, and GBRA has interests in, Certificate of Convenience and Necessity No. 12864 (the "**City's CCN**") issued by the Texas Commission on Environmental Quality (the "**TCEQ**");

WHEREAS, substantial improvements in infrastructure are needed to provide water supply and fire protection within the area included within the City's CCN (the "**Bulverde Service Area**");

WHEREAS, the Parties acknowledge that a critical need for water supply and fire protection exists for the following existing schools located within the Bulverde Service Area: Arlon Saey Elementary School; Bill Brown Elementary School; Bulverde Elementary School; Rahe Primary School; and Spring Branch Middle School (collectively referred to herein as the "**Existing Schools**").

WHEREAS, SJWTX holds Certificate of Convenience and Necessity No. 10692 issued by the TCEQ ("**SJWTX's CCN**") and provides retail water service to approximately 8,600 customers in areas adjacent to the Bulverde Service Area;

WHEREAS, SJWTX desires to create a regional utility system through the consolidation of multiple operators and utility owners within or contiguous to SJWTX's CCN that provides for a redundant water supply capable of meeting potable water and fire protection demands;

WHEREAS, SJWTX has executed a letter of intent with GBRA dated November 12, 2007, which contemplates that SJWTX and GBRA will negotiate to enter into a future agreement whereby SJWTX would provide water service within the Bulverde Service Area; and

WHEREAS, subject to the consent of GBRA and the approval of the TCEQ, SJWTX desires to acquire the City's CCN and the associated rights and obligations to provide retail water service to the Bulverde Service Area.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises expressed herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by the Parties, SJWTX and the City agree as follows:

1. Terms of Regional Water Service by SJWTX. Subject to the satisfaction of the other terms and conditions of this Agreement, SJWTX commits to the following terms for retail water service.

a. Service Obligations of SJWTX. SJWTX affirms that, following the Closing, its service obligations will be subject to, and it will comply with, the statutory obligations of a retail public utility to provide customers continuous and adequate service at rates that are just and reasonable.

b. Initial Rates. The initial water rates charged by SJWTX to customers within the Bulverde Service Area shall not be greater than the current rates charged by GBRA to retail water customers in the Bulverde Service Area, as more particularly set forth in Exhibit "A" hereto.

c. Franchise Fee. SJWTX shall collect from customers located within the corporate limits of the City a franchise fee in an amount equal to the lesser of either the maximum franchise fee then-authorized by law (currently two percent (2%) of gross receipts) or the amount then-authorized to be collected as franchise fee by the City, as the City may determine from time to time. SJWTX shall promptly remit over to the City the monies collected as a franchise fee.

d. Water Service. SJWTX agrees to construct, install, own and operate such additional water transmission lines, distribution lines, tanks, pumps and other infrastructure as necessary to provide retail water service within the Bulverde Service Area.

e. Permits. As to construction, acquisitions and operations undertaken within the jurisdiction of the City, SJWTX agrees to obtain and fully comply with all applicable construction, use, zoning and related permits and approvals, including but not limited to obtaining building permits for all above-ground structures, from the City as necessary to comply with the City's ordinances, as such ordinances are currently in effect or as may be changed or amended from time to time. The City agrees that such permits and approvals shall not be unreasonably withheld, if consistent with City ordinances.

f. Use of City's Public Rights-of-Way: Street Cuts. SJWTX agrees to obtain all necessary permits and approvals from the City as necessary to comply with the City's ordinances, prior to constructing any waterlines or facilities which may use streets or rights-of-way located within the City's corporate limits, as those limits may expand from time to time. SJWTX agrees to comply with the City's ordinances related to street cuts, including the requirement to provide a warranty for repairs to pavement and landscaping. City hereby grants to SJWTX the non-exclusive right and privilege to have, acquire, construct, expand, reconstruct, maintain, use and operate in, along, across, on,

over, through, above and under the public rights of way of the City a water distribution system to provide water service and/or fire protection to users within the Bulverde Service Area. As used herein, the term "public rights of way" means the surface, the air space above the surface, and the area below the surface of any public street, highway, lane, path, alley, sidewalk, boulevard, drive, bridge, tunnel, easement or similar property in which the City holds any property interest or exercises any rights of management or control and which consistent with the purposes of which it was acquired or dedicated, may be used for the installation and maintenance of a water distribution system and/or fire protection.

g. Fire Protection. SJWTX agrees to provide water service capable of providing fireflows to the Existing Schools and to new subdivisions located within the corporate limits of the City.

h. Timeline. The Parties acknowledge and agree that a critical objective of the Parties is to connect the Existing Schools for water service and fireflows in a timely manner. Within ninety (90) days after the Closing, SJWTX agrees to provide to the City a proposed timeline outlining the major steps necessary for providing water service and fireflows to the Existing Schools and the amount of time necessary for completion of each major step.

i. Capital Investment Commitment. To further demonstrate its dedication to providing water service to the Bulverde Service Area, SJWTX agrees to commit to a capital investment within the Bulverde Service Area of at least \$500,000 per year, on average, for the first three (3) years following the Closing (the "Annual Commitment"), including at least \$250,000 per year, on average, spent for improvements located within the corporate limits of the City or directly benefiting customers located within the corporate limits of the City. Within sixty (60) days after the end of each calendar year, for the first three (3) full calendar years after the Effective Date, SJWTX shall provide the City a written summary of the amount of capital investment made by SJWTX within the Bulverde Service Area and corporate limits of the City during the preceding calendar year.

j. Property Taxes. SJWTX owned land shall be subject to City property taxes in the same manner as other tax payers, and SJWTX will receive no abatement or special treatment by the City as to such taxes.

2. Transfer of City's CCN. Subject to the accomplishment of all conditions precedent, the City agrees to transfer to SJWTX the entirety of the City's CCN for the Bulverde Service Area, as more particularly described in Exhibit "B" attached hereto. The City additionally agrees to sell, assign, transfer, grant and convey, free and clear of all liens and encumbrances, to SJWTX at the Closing (hereinafter defined) all of the rights, title, and interest held by the City, if any, in and to any contracts, real property, easements and facilities related to supplying retail water service to the Brumley Subdivision and the Glenwood Subdivision, including all rights of the City in the retail water service agreements related to such subdivisions (the "Service Agreements"). The Parties further agree to cooperate in securing any required or

reasonably necessary third party approvals which may be necessary to implement this Agreement, including any such approvals for the assignment of the Service Agreements.

3. Compensation and Release. In consideration for the City's transfer of the City's CCN for the Bulverde Service Area, SJWTX agrees to compensate the City financially as set forth in this Section by payment of two amounts (the "**Compensation**"), as follows. First, a payment to the City in the amount of \$250,000 (the "**Cash Payment**"). Second, a payment on behalf of the City to GBRA as necessary to settle and pay off the City's financial obligations to GBRA (whether claimed or disputed) under the Existing Agreements with GBRA, including but not limited to the Water Supply Agreement, which amount as of August 1, 2008 was in excess of \$600,000, including any compromise and settlement of such obligations by GBRA as negotiated by SJWTX (the "**Settlement Payment**"). The Compensation shall be placed in escrow prior to Closing (hereinafter defined) in accordance with Section 8a of this Agreement, and at the Closing. GBRA shall deliver a full release signed by GBRA releasing the City of any and all obligations under the Existing Agreements with GBRA.

4. STM Application and Costs. The Parties shall cooperate to promptly file an appropriate application or other documentation with the TCEQ to transfer to SJWTX the City's CCN (the "**STM Application**"). With the City's participation, as contemplated in this Section, SJWTX shall, at SJWTX's own expense, prepare, file, and pursue the STM Application.

a. City Cooperation. The City shall cooperate and provide information and signatures, as necessary, to complete and file the STM Application with the TCEQ. The City shall also assist SJWTX in its efforts to obtain TCEQ approval of the STM Application and shall take no action to oppose the STM Application or to encourage or assist any third party in opposing the STM Application. The City shall execute such consents, approvals and bills of sale and/or transfer as necessary to obtain TCEQ approval. City is not obligated to expend any funds in order to satisfy its obligations under this subsection.

b. GBRA Cooperation. GBRA shall also cooperate and provide information and signatures, as necessary, to complete and file the STM Application with the TCEQ, and shall take no action to oppose the STM Application or to encourage or assist any third party in opposing the STM Application.

c. Timing. If the STM Application is not approved by the TCEQ within eighteen (18) months of the Effective Date, either Party shall have the option at any time to terminate this Agreement. If this Agreement is so terminated, the CCN for the Bulverde Service Area shall remain with the City, and the Parties shall be released from all further obligations hereunder.

d. Service Rights. The Parties agree that, after the TCEQ completes the transfer of the CCN, the City shall have no further obligation or right to provide water service to any existing or future customers located within the Bulverde Service Area, except as may be agreed by the Parties in writing.

5. Transfer of Customers.

a. Notice. SJWTX and the City shall cooperate in providing notice of the transfer to customers located within the Bulverde Service Area. Any such notice shall be provided without cost to the City.

b. Revenues. Any revenues or fees received for water utility service rendered by the City and/or GBRA prior to the Closing shall be distributed in accordance with the Existing Agreements between the City and GBRA, unless otherwise agreed in writing.

c. Prevention of Service Interruption. The Parties shall cooperate with each other as necessary to prevent any interruption of water service to existing retail water customers located within the Bulverde Service Area due to the transfer of such customers as contemplated by this Agreement.

6. Conditions Precedent. The transfer of the City's CCN and payment of the Compensation as set forth in this Agreement are subject to the following conditions precedent:

a. GBRA and SJWTX entering into an agreement to transfer title to the existing Water Distribution System (as defined in the Operating Agreement) to SJWTX, and TCEQ approval of such transfer; and

b. GBRA approval of the assignment by City to SJWTX of the existing Water Supply Agreement or alternatively, at SJWTX's option, the termination of the Water Supply Agreement and a new agreement between GBRA and SJWTX for treated water supply in an amount not less than 400 acre-feet per year; and

c. GBRA approval of the STM Application; and

d. TCEQ approval of the STM Application; and

e. GBRA's full release of the City of any and all obligations under the Existing Agreements with GBRA (the "GBRA Release").

7. Negotiations with GBRA. In order to avoid any conflicts or inconsistencies with the Existing Agreements, the Parties agree to enter into negotiations with GBRA seeking the voluntary termination of the Existing Agreements. Any termination of the Existing Agreements shall require the mutual consent of the City and GBRA. Any termination of the Existing Agreements shall be effective at the Closing, after approval by the TCEQ of the STM Application.

8. Closing. Within sixty (60) days after receiving written notice from the TCEQ that the agency has authorized the parties to the STM Application to close the transaction to transfer the City's CCN to SJWTX, or at such other time agreed to by the City and SJWTX, a Closing shall be held.

a. Before the Closing, SJWTX agrees to place the Compensation in escrow within fifteen (15) days after receiving written notice from the TCEQ that the agency has authorized the parties to the STM Application to close the transaction to transfer the City's CCN to SJWTX. The funds shall be released from escrow to the City and GBRA, as applicable, ten (10) days after the order issued by TCEQ approving the STM Application is final and non-appealable, or at such earlier date as elected by SJWTX in its sole discretion.

b. At the Closing, GBRA shall transfer the Water Distribution System to SJWTX in accordance with the future agreement referenced in Section 6a of this Agreement, and the fully executed GBRA Release shall be delivered to the City.

9. Right of First Refusal. The City shall have a continuing right of first refusal (the "Right of First Refusal") for any subsequent sale by SJWTX of: (a) the certificated water service rights for territory located within the then-existing corporate limits of the City, and (b) the water transmission lines, distribution lines, tanks, pumps, and related infrastructure located within the then-existing corporate limits of the City (collectively the "CCN and Assets"). The Right of First Refusal shall be the right of the City to purchase the CCN and Assets at the same price and on the same terms and conditions as are contained in any proposed sale by SJWTX of the CCN and Assets. The Right of First Refusal may be exercised by the City at anytime within 60 days after the City's receipt notice of the proposed sale. SJWTX shall not sell the CCN and Assets without first giving notice to the City and allowing the City sixty (60) days to exercise the Right of First Refusal. The Right of First Refusal shall not apply to the sale of any surplus facilities, equipment or water lines.

10. GBRA Water Supply Contract. The parties agree that the availability of 400 acre-feet per year, as set forth in the existing Water Supply Agreement, is important to the continuing growth of the City. SJWTX hereby agrees to take by assignment the Water Supply Agreement, or at SJWTX's option, obtain a new water supply agreement from GBRA in the amount of not less than 400 acre-feet per year. SJWTX agrees to maintain and make available for retail sale not less than 400 acre-feet per year of such water for use within the corporate limits of the City.

11. Pro-rata Sharing of Line Extension Costs in Existing Subdivisions. Subject to TCEQ approval of the cost methodology, SJWTX agrees to facilitate the provision of retail water service to existing residential subdivisions, once transmission lines are completed in the area, as follows. Applicants for new service in such subdivisions will be offered the opportunity to connect to water service by paying the applicable tap fees and a pro-rated average extension fee, rather than the full cost of the line extension itself. Subject to TCEQ approval, the extension fee for a particular subdivision will be determined based upon the equivalent of the average costs of extending service to individual customers in the subdivision with SJWTX fronting the capital cost of the extension of the first 200 feet of transmission main. The City, as the regulatory authority with original jurisdiction over SJWTX's rates within the City's corporate limits, approves and accepts the cost methodology described in this section for applicants for service within the City's corporate limits. SJWTX agrees to apply for TCEQ approval of the applicable modification of the SJWTX tariff to include this cost methodology.

12. INDEMNITY. SJWTX AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS THE CITY, ITS OFFICERS, EMPLOYEES, AND AGENTS, FROM AND AGAINST DAMAGES, SUITS, LIABILITY, COSTS AND EXPENSES ARISING FROM ANY THIRD-PARTY CHALLENGE TO THE SALE OR TRANSFER OF THE CITY'S CCN TO SJWTX PURSUANT TO THE TERMS SET FORTH IN THIS AGREEMENT. NOTWITHSTANDING THE FOREGOING, SJWTX'S OBLIGATIONS UNDER THIS INDEMNITY SHALL NOT APPLY TO THE EXTENT THAT ANY DAMAGES, SUITS, LIABILITY, COSTS OR EXPENSES ARE ATTRIBUTABLE TO THE SOLE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE CITY.

13. Miscellaneous.

a. Assignment. This Agreement may not be assigned by either Party without the written consent of the other Party. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective permitted and approved successors and assigns.

b. Entire Agreement. This Agreement contains the entire agreement of the Parties with respect to the matters contained herein and may not be modified or terminated except upon the provisions hereof or by the mutual written agreement of the Parties hereto.

c. Applicable Law. This Agreement shall be construed in accordance with the laws of the State of Texas and shall be performable in Comal County, Texas.

d. Authority. The respective signatories to this Agreement covenant that they are fully authorized to sign and execute this Agreement on behalf of their respective Party, and by such signature each such person represents that they have obtained all the necessary authority and approval, including the actual approval of their Board or Council, to execute the Agreement.

e. Notice. Any notice provided for under the terms of this Agreement by either Party to the other shall be in writing and may be effected by registered or certified mail, return receipt requested, or facsimile transmission with confirmation of delivery, addressed and delivered to the following:

to the City: City Manager/Administrator
 City of Bulverde, Texas
 30360 Cougar Bend
 Bulverde, TX 78163
 Facsimile 830.438.4339

with copy to: Frank Garza
 Davidson & Troilo
 7550 West IH-10, Suite 800
 San Antonio, TX 78229
 Facsimile 210.349.0041

to SJWTX: President
SJWTX, Inc.
P.O. Box 1742
Canyon Lake, TX 78133
Facsimile 830.964.2779

with copy to: Leonard H. Dougal
Jackson Walker L.L.P.
100 Congress Avenue, Suite 1100
Austin, Texas 78701
Facsimile 512.236.2002

Each Party may change the address to which notice may be sent by giving notice of such change to the other Party in accordance with the provisions of this Agreement.

f. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

g. Construction of Agreement. This Agreement shall be deemed drafted equally by both Parties. The language of all parts of this Agreement shall be construed as a whole according to its fair meaning, and any presumption or principle that the language herein is to be construed against any party shall not apply. Headings in this Agreement are for the convenience of the Parties and are not intended to be used in construing this document.

h. Enforceability. The Parties agree that this Agreement constitutes the legal, valid and binding obligation of each Party hereto, enforceable in accordance with its terms.

i. Counterparts. This Agreement may be executed in a number of identical counterparts, each of which shall be deemed an original for all purposes.

j. Corporate Limits. Any reference herein to the corporate limits of the City shall mean the corporate limits of the City as the same may be expanded or otherwise changed from time to time.

k. Term. Sections 1, 5, 9, 10, 11, 12 and 13 of this Agreement shall survive the Closing for a term of thirty (30) years from the date of Closing, and thereafter shall continue in effect automatically for two additional extensions of thirty (30) years each.

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, the Parties have executed this Agreement and caused this Agreement to be effective on the date first written above as reflected by the signatures below.

SJWTX, INC. D/B/A/ CANYON LAKE
WATER SERVICE COMPANY

By: Thomas A. Hodge
Thomas A. Hodge, Vice-President

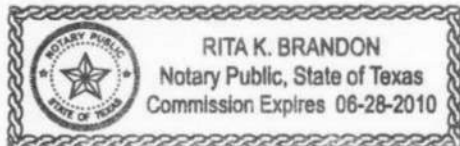
ATTEST:

Title: _____

STATE OF TEXAS §

COUNTY OF BEXAR §

This instrument was acknowledged before me on this 10th day of September, 2008 by Thomas A. Hodge, Vice-President for SJWTX, Inc. a Texas corporation d/b/a Canyon Lake Water Service Company, on behalf of said corporation.



Rita K. Brandon
Notary Public, State of Texas

CITY OF BULVERDE, TEXAS

By: _____

Ray Jeffery, Mayor

ATTEST:

Title: _____

STATE OF TEXAS

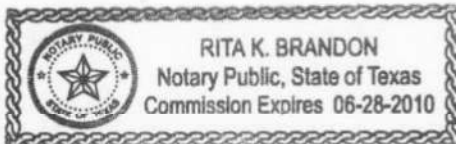
§

COUNTY OF BEXAR

§

§

This instrument was acknowledged before me on this 10th day of September, 2008 by Ray Jeffery, Mayor for the City of Bulverde, Texas, on behalf of said municipality.




Rita K. Brandon

Notary Public, State of Texas

CONSENT

The undersigned, being a party to the Existing Agreements with the City, hereby consents to the execution of this Agreement, and expressly agrees to cooperate in the STM Application in accordance with Section 4b of this Agreement.

GUADALUPE-BLANCO RIVER AUTHORITY

By: 
W.E. West Jr., General Manager

ATTEST:

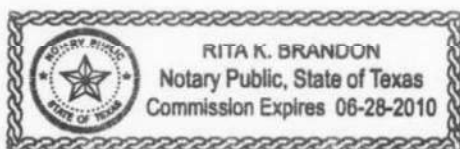
APPROVED

LEGAL bw

Title: _____

THE STATE OF TEXAS §
 §
COUNTY OF BEXAR §

This instrument was acknowledged before me on the 10th day of September, 2008, by W.E. West Jr., General Manager of Guadalupe-Blanco River Authority, on behalf of said authority.



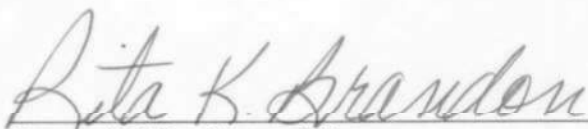

Notary Public, State of Texas

EXHIBIT "A"
(Current GBRA Rates)

Exhibit A

GBRA Rate Schedule for Bulverde CCN 2008 Monthly Rates

5/8" Residential Meter		1" Commercial Meter		1.5" Commercial Meter		2" Commercial Meter	
\$40.00	0 - 1,000 Gal	\$100.00	0 - 4,000 Gal	\$100.00	0 - 8,000 Gal	\$320.00	0 - 16,000 Gal
\$3.60/1,000	2,001 - 10,000 Gal	\$3.60/1,000	4,001 - 10,000 Gal	\$3.60/1,000	8,000 - 12,000 Gal	\$3.60/1,000	16,001 - 20,000 Gal
\$4.60/1,000	10,001 - 25,000 Gal	\$4.60/1,000	10,001 - 25,000 Gal	\$4.60/1,000	12,001 - 25,000 Gal	\$4.60/1,000	20,001 - 25,000 Gal
\$5.60/1,000	25,001 - 50,000 Gal	\$5.60/1,000	25,001 - 50,000 Gal	\$5.60/1,000	25,001 - 50,000 Gal	\$5.60/1,000	25,001 - 50,000 Gal
\$6.60/1,000	50,001 - 75,000 Gal	\$6.60/1,000	50,001 - 75,000 Gal	\$6.60/1,000	50,001 - 75,000 Gal	\$6.60/1,000	50,001 - 75,000 Gal
\$8.60/1,000	75,001 - 100,000 Gal	\$8.60/1,000	75,001 - 100,000 Gal	\$8.60/1,000	75,001 - 100,000 Gal	\$8.60/1,000	75,001 - 100,000 Gal
\$12.00/1,000	100,001 - Excess Gal	\$12.00/1,000	100,001 - Excess Gal	\$12.00/1,000	100,001 - Excess Gal	\$12.00/1,000	100,001 - Excess Gal

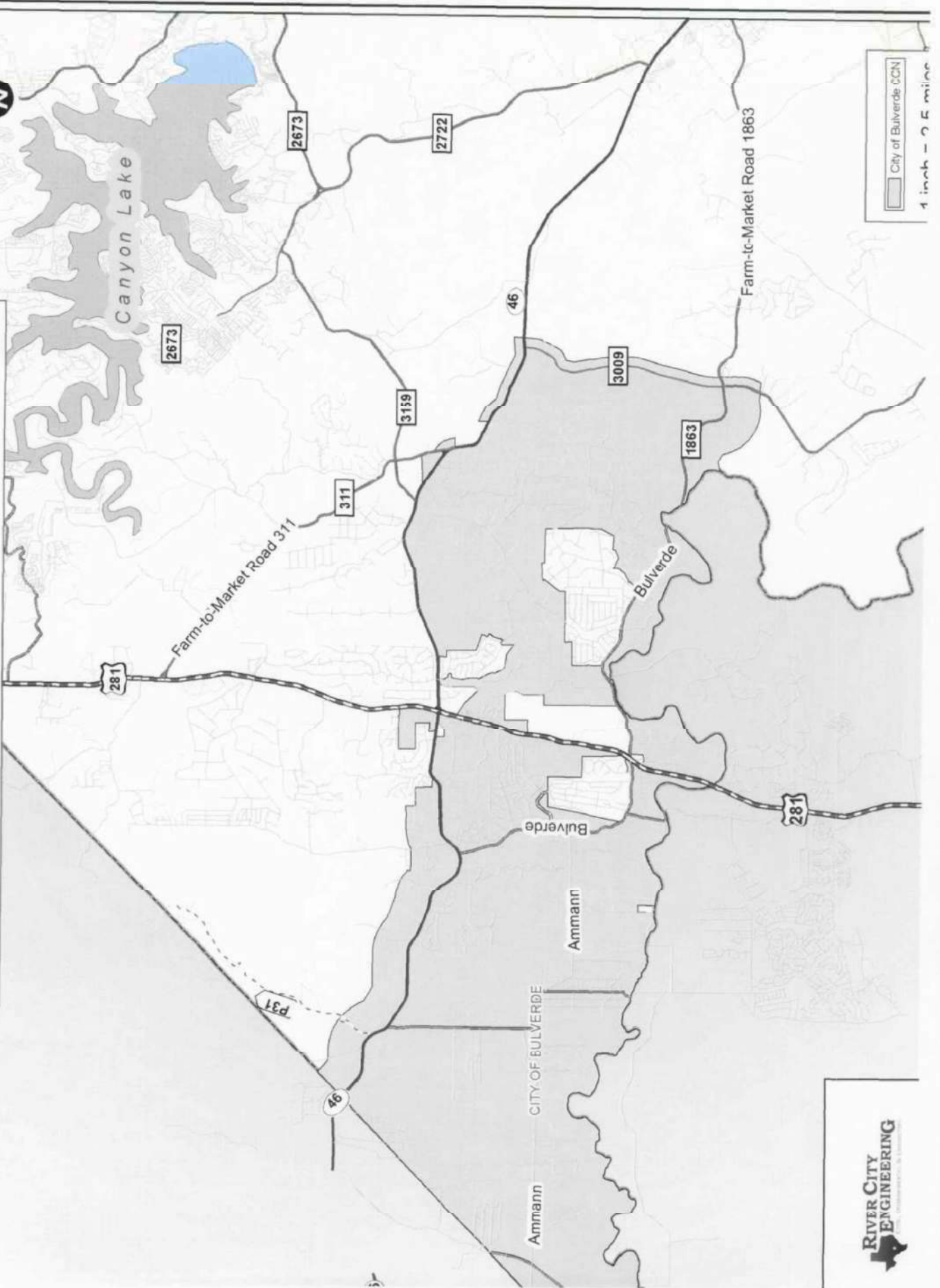
TAPS

Meter Size	Existing Service Line	New Service Line
5/8" Residential	\$450.00	\$1,000.00
1" Commercial	\$530.00	\$1,300.00
1.5" Commercial	\$650.00	\$1,900.00
2" Commercial	\$1,360.00	\$3,000.00

EXHIBIT "B"
(Bulverde Service Area)

5027457v.7

EXHIBIT B: BULVERDE SERVICE AREA



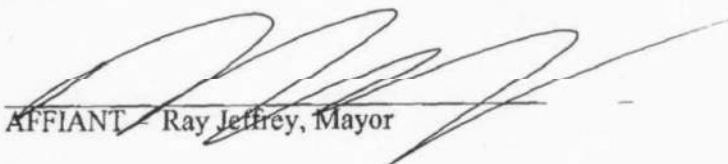
OATH FOR SELLER OR FORMER SERVICE PROVIDER

STATE OF TEXAS

COUNTY OF BEXAR

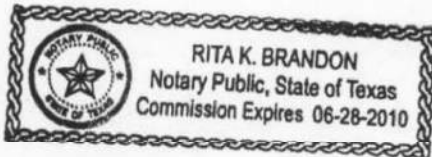
I, Ray Jeffrey, being duly sworn, file this application for sale, lease, rental or merger or consolidation as Mayor of City of Bulverde, a general law city, and in such capacity, I am qualified and authorized to file and verify such application, am personally familiar with the documents filed with this application, and have complied with all the requirements contained in the application; and, that all such statements made and matters set forth therein with respect to applicant are true and correct. Statements about other parties are made on information and belief. I further state that the application is made in good faith and that this application does not duplicate any filing presently before the Commission.


I further state that I have provided to the purchaser or transferee a written disclosure statement about any contributed property as required under Section 13.301(j) and copies of any outstanding Orders of the Commission or Attorney General and have also complied with the notice requirements in Section 13.301(k) of the Water Code.


AFFIANT Ray Jeffrey, Mayor

SUBSCRIBED AND SWORN TO BEFORE ME, a Notary Public in and for the State and County above-named, this 24th day of September, 2008.

SEAL




Notary Public

Contract F¹

**CLWSC Surface Water Contract
Dated 3/24/2009**

¹Rev. 1 - Re-labeled and re-sequenced contracts and amendments for clarity

**WHOLESALE TREATED WATER SUPPLY
AGREEMENT
REGARDING THE
PARK VILLAGE SERVICE AREA
BETWEEN
SJWTX, INC. dba CANYON LAKE WATER SERVICE COMPANY (OWNER),
AND
GUADALUPE-BLANCO RIVER AUTHORITY (GBRA)**

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**WHOLESALE TREATED WATER SUPPLY
AGREEMENT
REGARDING THE
PARK VILLAGE SERVICE AREA
BETWEEN
SJWTX, INC. dba CANYON LAKE WATER SERVICE COMPANY (OWNER),
AND
GUADALUPE-BLANCO RIVER AUTHORITY (GBRA)**

This Agreement Regarding the Park Village Service Area (this "*Agreement*") is made and entered into as of the 24 day of March, 2009 (the "*Effective Date*"), by and between SJWTX, Inc dba Canyon Lake Water Service Company ("*Owner*") a Texas Corporation, and the Guadalupe-Blanco River Authority ("*GBRA*"), a conservation and reclamation district and political subdivision of the State of Texas created pursuant to Article XVI, Section 59 of the Texas Constitution by special act of the Legislature. Owner and GBRA may be referred to herein collectively as the "*Parties*," or individually as a "*Party*."

RECITALS

Owner is the holder of water Certificate of Convenience and Necessity No. 12864 issued by the Texas Commission of Environmental Quality ("*TCEQ*"). The Park Village Service Area is located within the certificated water service area and is shown on the map attached as **Exhibit 1** ("Park Village Service Area or Service Area"). Owner proposes to provide retail water service to the lands within the Service Area for residential and commercial purposes. Owner desires that GBRA supply treated water for use within the Service Area.

The treated water to be provided by GBRA under this Agreement will be supplied from GBRA's Western Canyon Regional Treated Water Supply Project, as such project may be expanded or modified from time to time (the "*Western Canyon Project*").

AGREEMENT

For and in consideration of the mutual promises, covenants, obligations, and benefits described in this Agreement, and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, Owner and GBRA agree as follows:

**ARTICLE I
DEFINITIONS**

Section 1.1 Definitions.

As used in this Agreement, the following terms shall have the meanings set forth in this Section:

"**Acre-Foot**" means that volume defined by an area of one acre, one foot deep. One acre-foot of water equals 325,851 gallons.

"Annual Debt Service Requirement" means the total principal and interest scheduled to come due on all Bonds during each twelve month period ending on August 31 of each year, plus a debt service coverage factor, as determined by GBRA, and provided by the Bond Resolution but not to exceed 10% of such principal and interest unless GBRA and Owner mutually agree upon a greater percentage, less interest to be paid out of Bond proceeds as permitted by the applicable Bond Resolution, if any.

"Annual Operation and Maintenance Requirement" for the Treated Water Supply Project means the total amount budgeted by GBRA for each twelve month period ending on August 31 of each year to pay all estimated Operation and Maintenance Expenses for that project.

"Annual Miscellaneous Bond Requirement" means the total amount determined by GBRA for each twelve-month period ending on August 31 of each year to be required to pay the following:

- (a) the amount of any debt service reserve and contingency funds required to be established and maintained by the provisions of the Bond Resolution for Bonds issued to finance GBRA's construction of the Treated Water Supply Project;
- (h) an amount in addition thereto sufficient to restore any deficiency in any of such funds required to be accumulated and maintained by the provisions of the Bond Resolution;
- (c) any amounts due under a reimbursement agreement between GBRA and any credit facility provider providing a credit facility issued to cause the balance on deposit in any debt service reserve funds to satisfy the requirements of the Bond Resolution; and
- (d) any charges of the bank or banks where the Bonds are payable.

"Bonds" means all bonds and other obligations issued and outstanding from time to time by GBRA to finance or refinance the costs of construction, acquisition, repair, improvement, and upgrading related to the Treated Water Supply Project and any extension, expansion, maintenance, repair, improvement, upgrade or other modification of any such project, including, without limitation of the generality of the foregoing, any costs necessary or desirable to maintain or increase the capacity of any such project and comply with applicable laws, rules and regulations.

"Bond Resolution" means the resolution or resolutions approved by the Board of Directors of GBRA, which authorize the issuance of each series of Bonds related to the Treated Water Supply Project.

"District-Wide Firm Water Rate" at any time means the rate charged by GBRA at that time pursuant to written contracts for the reservation or supply of firm raw water from Canyon Reservoir or other sources for use within GBRA's ten-county statutory district. The present rate is \$105.00 per acre-foot per year.

"Operation and Maintenance Expenses" means all costs and expenses of operation and maintenance of such project, including (for greater certainty, but without limiting the generality of the foregoing) repairs and replacements, which are not paid from a special fund created in the Bond Resolutions or other project debt instruments, employee salaries, benefits and other expenses, the cost of utilities, the costs of supervision, engineering, accounting, auditing, legal services, other services, supplies, chemicals, insurance, charges by GBRA for administrative and general expenses, and equipment necessary for proper operation and maintenance of such project. Operation and Maintenance Expenses shall not include any depreciation expense.

"Other Customer" means any customer of GBRA's for the supply of treated water from the Treated Water Supply Project other than Users, regardless of when GBRA and the customer enter into the contract for such treated water supply.

"Owner's Debt Service Component" means the component of the price for treated water to be paid by Owner as determined and described in Section 5.3 of this Agreement.

"Owner's Debt Service Percentage" for any month means the quotient, expressed as a percentage, equal to the Owner's Required Monthly Treated Water Purchase for that month, divided by the Water Plant Current Monthly Capacity for that month.

"Owner's Miscellaneous Bond Requirements Component" means the component of the price for treated water to be paid by the Owner as determined and described in Section 5.5 of this Agreement.

"Owner's Operation and Maintenance Component" means the component of the price for treated water to be paid by the Owner as determined and described in Section 5.4 of this Agreement.

"Owner's Operation and Maintenance Percentage" for any month means the quotient, expressed as a percentage, equal to the amount of water actually treated for Owner during that month for use within the Service Area, divided by the Water Plant Current Monthly Capacity for that month.

"Owner's Raw Water Component" means the component for the charge for raw water to be paid by Owner as determined and described in Section 5.6 of this Agreement.

"Owner's Required Monthly Raw Water Purchase" means for any month the amount of raw water that Owner is obligated to pay for that month, as specified in Section 5.1 of this Agreement.

"Owner's Required Monthly Treated Water Purchase" means for any month the amount of treated water that Owner is obligated to pay for that month, as specified in Section 5.1 of this Agreement.

"Park Village Service Area" or "Service Area" means those certain lands located in Comal County, Texas, shown on the map in Exhibit 1.

"Raw Water Reservation" means the maximum amount of raw water that GBRA shall be obligated to reserve for diversion, treatment and delivery for use within the Service Area in any calendar year as specified in Section 3.3 of this Agreement.

"Termination Date" means the expiration date of the term of this Agreement, as defined in Section 7.1 of this Agreement.

"TCEQ" means the Texas Commission on Environmental Quality, or any successor agency.

"Treated Water Point of Delivery" means the point at which treated water is delivered from the Treated Water Supply Project to the Owner by GBRA for use within the Service Area, as such point is identified on the map attached as Exhibit 1. The location of the Treated Water Point of Delivery may be changed by mutual agreement of the Parties.

"Treated Water Supply Project" means the Western Canyon Project and is described in Section 2.1 of this Agreement.

"User" means any person or entity within the Service Area to which treated water is supplied for use within the Service Area. Owner may be a User.

"Water Extension Facilities" means all facilities to be constructed by Owner necessary to convey the treated water supplied by GBRA to the Treated Water Point of Delivery pursuant to this Agreement and convey such treated water within the Service Area. The Water Extension Facilities may include all or portions of storage facilities, pump stations, hydro-pneumatic tanks, pipelines, monitoring and control equipment, and other ancillary equipment.

"Water Plant" means the water treatment plant that is part of the Treated Water Supply Project.

"Water Plant Current Monthly Capacity" for any month means the Water Plant Daily Capacity during that month, times the number of days during that month.

"Water Plant Daily Capacity" at any time means the amount of water which the Plant can treat on an average daily basis, based on standards that exist at that time, expressed in terms of million gallons per day, as certified by the General Manager of GBRA and provided in writing to Owner or, if GBRA determines that the entire amount should not be committed, the portion of such amount that GBRA determines should be committed.

ARTICLE II

TREATED WATER SUPPLY PROJECT

Section 2.1 Description of the Treated Water Supply Project.

(a) The Treated Water Supply Project, also known as the Western Canyon Project, consists of facilities for the diversion of raw water from Canyon Reservoir, a water treatment plant (the "*Water Plant*"), facilities to convey the raw water after diversion from Canyon Reservoir to the Water Plant, and facilities to convey treated water from the Water Plant for

use in areas within portions of Comal, Kendall and Bexar Counties, including the Service Area. The Treated Water Supply Project may also include storage and other facilities necessary or desirable for the supply of treated water to GBRA's customers. The Treated Water Supply Project also includes all lands and interests in lands necessary or desirable for the construction, operation and maintenance of Treated Water Supply Project facilities.

(b) The Treated Water Supply Project is further described on the map and facility plan attached as Exhibit 2 showing the general location of the point of diversion from Canyon Reservoir, the Water Plant, the general routings of raw and treated water conveyance facilities to and from the Water Plant, and the Treated Water Point of Delivery.

Section 2.2 GBRA Responsibilities.

(a) GBRA shall be responsible for the operation and maintenance of the Treated Water Supply Project, as it may exist at any time, and for the design, permitting, financing, and construction of all expansions, extensions and other modifications to the Treated Water Supply Project. GBRA may assign or subcontract all or any part of such responsibilities.

(b) GBRA will select and retain all legal, financial, engineering and other consultants that GBRA determines are necessary or desirable for GBRA to satisfy its obligations under this Agreement.

Section 2.3 Ownership of the Treated Water Supply Project.

(a) Except as provided otherwise in subsection (b), below, or otherwise agreed to in writing by the Parties, GBRA shall own all facilities, lands and interests in land comprising the Treated Water Supply Project.

(b) GBRA may transfer title to any facilities, lands and interests in lands comprising a portion of the Treated Water Supply Project to any person; however, any such transfer shall be subject to the rights and obligations set forth in this Agreement.

Section 2.4 Extensions or Other Modifications of the Treated Water Supply Project.

GBRA may extend, expand, maintain, repair, improve, upgrade or otherwise modify the Treated Water Supply Project from time to time, as it determines to be necessary or desirable. GBRA is authorized to issue Bonds from time to time for any such expansion, maintenance, repair, improvements, upgrade or other modification of the Treated Water Supply Project. Such Bonds may be issued without approval from Owner.

Section 2.5 Financing of the Treated Water Supply Project.

(a) GBRA will define the terms and conditions (including maturity) of any Bonds issued by GBRA to finance the design, acquisition, construction and testing of any facilities, lands and interests in lands comprising the Treated Water Supply Project. GBRA will prepare such data, materials and documents as may be necessary to facilitate the sale and delivery of the Bonds, and Owner agrees to furnish GBRA with such data, projections and related

information as may reasonably be required by GBRA in the sale of the Bonds in compliance with all applicable laws, rules and regulations. In addition to the amounts paid under the construction contract or contracts, the proceeds of the Bonds will also be used to pay additional costs such as development costs (including without limitation, preliminary engineering costs, employee salaries, benefits and other expenses, legal and other advisory fees, charges by GBRA for administrative and general expenses, insurance premiums, if any, and any other costs incurred in developing and pursuing the Treated Water Supply Project), land acquisition costs, engineering, legal, financial and other advisory fees, charges by GBRA for administrative and general expenses, insurance premiums, if any, and any other costs incurred in the issuance of the Bonds and in the design, acquisition, construction and testing of the facilities, lands, and interests in lands comprising and directly related to the Treated Water Supply Project.

(b) GBRA shall be authorized from time to time to issue Bonds to refund outstanding Bonds or otherwise refinance costs of the Treated Water Supply Project. Such refunding Bonds may be issued without approval from the Owner.

Section 2.6 Additional Customers.

GBRA may enter into contracts with Other Customers to supply treated water from the Treated Water Supply Project, and may amend existing contracts with Other Customers to supply greater or lesser amounts of treated water from the Treated Water Supply Project, at any time and from time to time.

Section 2.7 Source of Water.

The raw water to be treated and supplied under this Agreement may be from any source or combination of sources that result in a firm supply during the worst drought of record and may be available to GBRA including, without limitation, water from Canyon Reservoir under GBRA's Certificate of Adjudication 18-2074, run-of-river flows of the Guadalupe River or its tributaries under existing, amended, or new water rights, and/or water obtained from sources other than surface waters of the Guadalupe River Basin.

ARTICLE III **CONNECTION BY GBRA TO THE TREATED WATER SUPPLY PROJECT** **AND SUPPLY OF TREATED WATER**

Section 3.1 Connection by GBRA.

(a) Connection to the Treated Water Supply Project at the Treated Water Point of Delivery shall be made by GBRA within 12 months after completion of construction by Owner of the Water Extension Facilities, extending to the Treated Water Point of Delivery. Connection shall be made in accordance with plans, specifications and requirements prepared or adopted by GBRA, and shall be accomplished by GBRA setting the meter and physically tying in to the Water Extension Facilities, at the Treated Water Point of Delivery.

(b) The Treated Water Point of Delivery for all treated water delivered by GBRA to the Service Area under this Agreement shall be as shown on Exhibit 2, or such other point as may be agreed to by GBRA and Owner.

(c) GBRA may design, acquire, install, construct, maintain and operate facilities intended to prevent backflow of water supplied by GBRA, or any flow of any other water or other substance, to the Treated Water Supply Project at the Treated Water Point of Delivery.

(d) Owner shall pay all costs associated with connecting to the Treated Water Supply Project at the Treated Water Point of Delivery including all reasonable costs of design, construction, installation, operation and maintenance of all connection facilities and equipment, including one or more meters, valves, backflow preventers, storage tank(s) to the extent required by Owner, and telemetry equipment.

(e) Owner agrees to provide GBRA with at least sixty (60) days written notice of the date when Owner desires GBRA to connect the Treated Water Supply Project at the Treated Water Point of Delivery. Upon receipt of such notice GBRA will review and determine the reasonableness of the proposed location of such connection regarding any impacts, if any to the operation of the Treated Water Supply Project. Additionally such notice is necessary to allow GBRA sufficient time to order the necessary equipment and to install such equipment per Owner's request.

Section 3.2 Delivery of the Treated Water to the Service Area.

(a) Upon connection to the Treated Water Supply Project at the Treated Water Point of Delivery, GBRA shall deliver treated water to the Treated Water Point of Delivery for use within the Service Area, subject to the limitations provided in this Agreement.

Section 3.3 Raw Water Reservation.

(a) The Raw Water Reservation is the amount of raw water that GBRA agrees to reserve under this Agreement for diversion, treatment, delivery and use within the Service Area in any calendar year for the purposes provided in this Agreement. Unless changed pursuant to subsection (b), below, the Raw Water Reservation shall be 322 acre-feet of raw water per year. The raw water may be from any source or combination of sources that result in a firm supply during the worst drought of record and that may be available to GBRA including, without limitation, water from Canyon Reservoir under GBRA's Certificate of Adjudication 18-2074, run-of-river flows of the Guadalupe River or its tributaries under existing, amended, or new water rights, and/or water obtained from sources other than surface waters of the Guadalupe River Basin.

(b) Notwithstanding anything in this Agreement to the contrary and regardless of the projected annual need for treated water by the anticipated number of Users within the Service Area that may be agreed upon by GBRA and Owner, GBRA shall be under no obligation at any time under this Agreement or otherwise to reserve for the Service Area any water in addition to the Owner's Raw Water Reservation in effect at that time, or to supply for use within the Service Area any water in addition to the Annual Commitment in effect at that time as defined in this Agreement.

Section 3.4 Annual Commitment and Supplement Supplies.

(a) GBRA shall not be required under any circumstances under this Agreement to supply an amount of treated water to the Treated Water Point of Delivery for use within the Service Area during any calendar year in excess of the annual commitment in effect for the Service Area during that year (the "*Annual Commitment*"). The Annual Commitment for treated water to be supplied for use within the Service Area shall be 322 acre-feet per year. The Annual Commitment may not be decreased without the written consent of GBRA.

(b) It is the intent of the Parties that GBRA be a non-exclusive supplier of water for use within the Service Area. In that regard, GBRA acknowledges and agrees that Owner has available to it other sources of water supply, and nothing in this Agreement shall prohibit Owner from continuing to use its existing sources of water, including groundwater, or from negotiating for, or entering into, any contract with any other supplier or source of water to provide for a supply of water for use within the Service Area.

Section 3.5 Maximum Delivery Rate.

(a) GBRA shall not be obligated to deliver an amount of treated water from the Treated Water Supply Project to the Treated Water Point of Delivery for use within the Service Area, expressed in gallons over any 24-hour period, in excess of the product of 1/365 times 325,851 times the Annual Commitment in effect at that time (the "*Daily Maximum*").

(b) GBRA shall not be obligated to deliver treated water from the Treated Water Supply Project to the Treated Water Point of Delivery for use within the Service Area at any time at an instantaneous rate, expressed in gallons per minute, in excess of the product of 1/1440 times the Daily Maximum in effect at that time.

Section 3.6 Purpose of Use.

All water delivered by GBRA to the Treated Water Point of Delivery for use within the Service Area under this Agreement shall be used for municipal use only, as such purpose of use is defined by the rules of the TCEQ. Water delivered under this Agreement for use within the Service Area may not be used for the irrigation of golf courses, parks, green belts or public right-of-way, however, this limitation shall not apply in the case where the water is first used and thereafter captured as reclaimed water from a wastewater treatment plant or wastewater collection system.

Section 3.7 Place of Use.

All water delivered by GBRA to the Treated Water Point of Delivery for use within the Service Area under this Agreement shall be used exclusively within the Service Area, and neither the Owner nor any User may use, or supply or resell for use, outside the Service Area any water delivered by GBRA to the Treated Water Point of Delivery for use within the Service Area.

Section 3.8 Allocation of Water During Drought.

During severe drought conditions as may be defined by GBRA, or in any other unforeseen condition beyond GBRA's control when water cannot be supplied to meet the demands of all customers, the water to be distributed shall be divided among all customers of stored water from Canyon Reservoir pro rata, according to the amount each may otherwise be entitled to under their respective contracts with GBRA, subject to reasonable conservation and drought management plans and requirements based on particular purposes of use of the water, so that preference is given to no one and everyone suffers alike.

Section 3.9 Water Quality.

(a) GBRA shall deliver to the Treated Water Point of Delivery for supply to Users within the Service Area water of quality that meets or exceeds the standards of the TCEQ or any other applicable regulatory agency for potable water.

(b) GBRA shall periodically collect samples of treated water delivered to the Treated Water Point of Delivery and Other Customers and cause the same to be analyzed consistent with guidelines established by the TCEQ using the then-current edition of Standard Methods for Examination of Water and Wastewater as published by the American Water Works Association and others.

Section 3.10 Measurement of Water.

(a) GBRA shall provide, operate, maintain, and read one or more meters, which shall record treated water delivered to the Treated Water Point of Delivery for supply to Users within the Service Area. GBRA shall also provide, operate, maintain, and read one or more meters, which shall record treated water taken by Other Customers receiving treated water from the Treated Water Supply Project at the points of delivery for them. GBRA shall also provide, operate, maintain, and read one or more meters which shall record the total amount of raw water diverted at Canyon Reservoir at the Point of Diversion and conveyed to the Water Plant, and the total amount of water, if any, supplied via the Treated Water Supply Project from other sources. All meters shall be conventional types of approved meter(s), which will be maintained to a measuring accuracy within five percent (5%).

(b) For all purposes under this Agreement, unless water from one or more sources other than Canyon Reservoir is supplied via the Treated Water Supply Project, the amount of raw water diverted from Canyon Reservoir by GBRA and conveyed to the Water Plant for treatment and delivery to the Treated Water Point of Delivery for supply to Users within the Service Area during any period of time shall be the greater of the following amounts:

- (1) the amount of treated water delivered to the Treated Water Point of Delivery for supply to Users within the Service Area during that period of time, as measured at the Treated Water Point of Delivery; or
- (2) the amount of water determined by allocating the total amount of raw water diverted during that period of time, as measured at the Point of Diversion, pro rata, based on the amounts of treated water delivered to

Owner at the Treated Water Point of Delivery and each Other Customer during that same period of time.

(c) GBRA shall keep accurate records of all measurements of water required under this Agreement, and the measuring device(s) and such records shall be open for inspection at all reasonable times. Measuring devices and recording equipment shall be accessible for adjusting and testing and the installation of check meter(s). If requested in writing, but not less than once in each calendar year, GBRA shall calibrate its water meter(s) that record raw water diverted from Canyon Reservoir at the Point of Diversion for delivery to the Water Plant and the treated water delivered for supply to Users within the Service Area at the Treated Water Point of Delivery. GBRA shall give Owner notice of the date(s) and time(s) when any such calibration is to be made and, if a representative of Owner is not present at the time set, calibration and adjustment may proceed in the absence of any representative of Owner.

(d) If upon any test of the water meter(s), the percentage of inaccuracy of such metering equipment is found to be in excess of five percent (5%), registration thereof shall be corrected for a period extending back to the time when such inaccuracy began, if such time is ascertainable. If such time is not ascertainable, then registration thereof shall be corrected for a period extending back one-half (1/2) of the time elapsed since the last date of calibration, but in no event further back than six (6) months. If any meter(s) that record treated water delivered to the Treated Water Point of Delivery for supply to Users within the Service Area are out of service or out of repair so that the amount of water delivered cannot be ascertained or computed from the reading thereof, the water delivered through the period such meters(s) are out of service or out of repair shall be estimated and agreed upon by GBRA and Owner upon the basis of the best data available, and, upon written request, GBRA shall install new meters or repair existing meters. If GBRA and Owner fail to agree on the amount of water delivered during such period, the amount of water delivered may be estimated by:

- (1) correcting the error if the percentage of the error is ascertainable by calibration tests or mathematical calculation; or
- (2) estimating the quantity of delivery by deliveries during the preceding periods under similar conditions when the meter or meters were registering accurately.

Section 3.11 Title to Water.

Title to and responsibility for all water supplied hereunder shall be in GBRA to Treated Water Point of Delivery, at which point title to and responsibility for such water shall pass to Owner.

Section 3.12 Conservation.

Owner agrees to provide to the maximum extent practicable for the conservation of water, and it agrees that it will operate and maintain its facilities in a manner that will prevent waste of water. Owner further agrees to assist GBRA in implementing water conservation and drought management plans applicable to the use of treated water by Users within the Service Area that, at a minimum, comply with all minimum standards that are required for retail public

utilities similar to Owner by the Texas Water Development Board (the "TWDB"), the TCEQ, GBRA, or Comal County. Such standards may include, but shall not be limited to, landscape requirements, landscape watering restrictions and curtailment programs, and conservation rates or surcharges for use of water in excess of amounts that are determined by the TWDB, the TCEQ, or GBRA to be adequate for essential indoor domestic uses. Notwithstanding the foregoing, nothing herein shall obligate Owner to impose obligations or requirements on Users in a manner which would: a) exceed Owner's legal authority to implement or enforce such obligations or requirements, or b) cause Owner to violate a law or regulation.

ARTICLE IV **PERMITTING AND OTHER REGULATORY REQUIREMENTS**

Section 4.1 Applicable Laws and Regulations.

This Agreement is subject to all applicable federal, state, and local laws and any applicable ordinances, rules, orders, and regulations of any local, state, or federal governmental authority having jurisdiction. This Agreement is specifically subject to all applicable sections of the Texas Water Code and the rules of the TCEQ, or any successor agency.

Section 4.2 Agreement Conditioned upon Permitting.

The Parties' obligations under this Agreement, other than Owner's obligations to make payments to GBRA as provided herein, are expressly conditioned upon GBRA and Owner obtaining the necessary permits, amendments to permits, licenses and other governmental authorizations to allow the construction, expansion, extension, modification, and operation of the Treated Water Supply Project, including the Water Extension Facilities, to supply treated water to Users within the Service Area as provided herein.

ARTICLE V **CHARGES**

Section 5.1 Owner's Required Monthly Water Purchase.

(a) Owner's Required Monthly Treated Water Purchase for each month during any calendar year shall be 1/365th of the Annual Commitment for that year multiplied by the number of days in that month. Owner agrees to pay GBRA each month for Owner's Required Monthly Treated Water Purchase, in accordance with paragraphs (1) and (3) of Section 5.2, below, whether or not such amount, or any of it, is taken by Owner.

(b) Owner's Required Monthly Raw Water Purchase for each month during any calendar year shall be 1/12th of the Raw Water Reservation in effect that year. Owner agrees to pay GBRA each month for Owner's Required Monthly Raw Water Purchase, in accordance with paragraph (4) of Section 5.2, below, whether or not such amount, or any of it, is taken by Owner.

Section 5.2 Monthly Charges to Owner.

The amount to be paid to GBRA by Owner each month under this Agreement will be the sum of the following four components:

- (1) Owner's Debt Service Component and Coverage;
- (2) Owner's Operation and Maintenance Component;
- (3) Owner's Miscellaneous Bond Requirements Component; and
- (4) Owner's Raw Water Component.

Section 5.3 Owner's Debt Service Component.

(a) Subject to the provisions of Subsections (b) and (c), below, Owner's Debt Service Component for any month shall equal $1/365$ th of the product of the Annual Debt Service Requirement applicable to the Treated Water Supply Project for that year multiplied by the number of days in that month and further multiplied by Owner's Debt Service Percentage for that month.

(b) If a debt service reserve fund is established by GBRA in the bond resolution to secure payment of debt service on the Bonds, the money on deposit in such debt service reserve fund will be used to pay the final debt service requirements on the Bonds when the remaining total outstanding debt service requirements on the Bonds equals the amount of money on deposit in such debt service reserve fund.

(c) All funds received by GBRA from Owner's Debt Service Component which constitute payment of the debt service coverage factor as a component of the Annual Debt Service Requirement shall be deposited by GBRA into a separate account, or shall be accounted for separately by GBRA, from all other funds received under this Agreement. Funds on deposit in such account may be used by GBRA in support of its "*Water Resource Division*" (of which the Treated Water Supply Project is or will be a part) for any of the following purposes: (1) paying the cost of improvements, enlargements, extensions, additions, replacements, or other capital expenditures related to the Water Resource Division, (2) paying the costs of unexpected or extraordinary repairs or replacements in connection with the Water Resource Division, (3) paying any bonds, loans or other obligations of the Water Resource Division, or (4) for any other lawful purpose related to the cost of operations of the Water Resource Division.

Section 5.4 Owner's Operation and Maintenance Component.

Owner's Operation and Maintenance Component for any month shall equal one-twelfth (1/12) of the product of the Annual Operation and Maintenance Requirement for that year multiplied by Owner's Operation and Maintenance Percentage for that month.

Section 5.5 Owner's Miscellaneous Bond Requirements Component.

Subject to the provisions of Section 5.3(c), above, Owner's Miscellaneous Bond Requirements Component for any month shall equal one-twelfth (1/12) of the product of the Annual Miscellaneous Bond Requirements applicable to the Treated Water Supply Project for that year multiplied by Owner's Debt Service Percentage for that month.

Section 5.6 Owner's Raw Water Component.

(a) Owner's Raw Water Component for each month beginning the Effective Date through the Termination Date shall equal the product of Owner's Required Monthly Raw Water Purchase for each month times the District-Wide Firm Water Rate in effect that month.

(b) The District-Wide Firm Water Rate may be changed by the GBRA Board of Directors at any time and from time to time, and any increase in such rate, and the resultant new rate, is a rate that is charged pursuant to a contract (this Agreement) for purposes of Sections 291.128-.138 of Title 30 of the Texas Administrative Code.

Section 5.7 Payments by Owner Unconditional.

GBRA and Owner recognize that the Bonds are and will be payable and secured by a pledge of the sums of money to be received by GBRA from Owner under this Agreement and from other customers under similar contracts. In order to make the Bonds marketable at the lowest available interest rate, it is to the mutual advantage of GBRA and Owner that Owner's obligation to make the payments required hereunder be, and the same is hereby, made unconditional. All sums payable hereunder to GBRA shall, so long as any part of the Bonds are outstanding and unpaid, be paid by Owner without set-off, counterclaim, abatement, suspension or diminution except as otherwise expressly provided herein; and so long as any part of the Bonds are outstanding and unpaid, Owner shall not have any right to terminate this Agreement nor shall Owner be entitled to the abatement of any payment or any reduction thereof nor shall the obligations of Owner be otherwise affected for any reason, it being the intention of the Parties that so long as any portion of the Bonds are outstanding and unpaid, all sums required to be paid by Owner to GBRA shall continue to be payable in all events and the obligations of Owner hereunder shall continue unaffected, unless the requirement to pay the same shall be reduced or terminated pursuant to an express provision of the Agreement.

Section 5.8 Source of Payments from Owner.

Notwithstanding anything herein to the contrary, all payments required to be made by Owner under this Agreement shall be payable from any and all sources available to Owner.

Section 5.9 Billing.

GBRA will render bills to Owner once each month for the payments required by this Article. GBRA shall, until further notice, render such bills on or before the 10th day of each month and such bills shall be due and payable at GBRA's office indicated below by the 20th day of each month or fifteen (15) days after such bill is deposited into the United States mail, properly stamped, addressed and postmarked to Owner, whichever is later. GBRA may,

however, by sixty (60) days written notice change the monthly date by which it shall render bills, and all bills shall thereafter be due and payable ten (10) days after such date or fifteen (15) days after such bill is deposited into the United States mail, properly stamped, addressed and postmarked to Owner, whichever is later. Owner shall make all payments in such coin or currency of the United States of America as at the time of payment shall be legal tender for the payment of public and private debts and shall make payment to GBRA at its office in the City of Seguin, Texas, or at such other place as GBRA may from time to time designate by sixty (60) days written notice.

Section 5.10 Delinquency in Payment.

(a) All amounts due and owing to GBRA by Owner shall, if not paid when due, bear interest at the maximum rate permitted by law, provided that such rate shall never be usurious. If any amount due and owing by Owner is placed with an attorney for collection by GBRA, Owner shall pay to GBRA, in addition to all other payments provided for by this Agreement, including interest, GBRA's collection expenses, including court costs and attorney's fees. Owner further agrees that GBRA may, at its option, terminate this Agreement, or it may discontinue delivering treated water until all amounts due and unpaid are paid in full with interest as herein specified.

(b) Notwithstanding any provision of this Agreement to the contrary, GBRA agrees that Owner may terminate this Agreement in the event that the developer of the Park Village subdivision has failed to pay Owner for the water supplied by Owner. Owner shall provide GBRA with thirty (30) days prior written notice of such a termination along with verification of the developer's failure to pay. Upon such termination, and after Owner has paid any outstanding invoices for water delivered prior to the termination, Owner shall have no further payment obligations under this Agreement. In the event of a conflict, this Section shall take precedence over Section 5.7.

**ARTICLE VI
PARTICIPATION CRITERIA**

Section 6.1 Participation Criteria.

Owner agrees to comply with the Participation Criteria for Treated Water Service from the Western Canyon Regional Treated Water Supply System (the "*Criteria*") initially approved by the GBRA Board of Directors on May 18, 2005, and amended on September 20, 2006. Owner further agrees that any amendments to this Agreement shall be subject to the Criteria in effect at that time.

**ARTICLE VII
TERM OF AGREEMENT; TERMINATION AND OTHER REMEDIES; AND RIGHTS
AFTER TERMINATION**

Section 7.1 Term.

(a) This Agreement shall be effective as of the date first written above and, unless it is terminated earlier pursuant to any provision of this Agreement, shall continue in effect until

December 31, 2040, or as it may be extended pursuant to subsection (d), below, on which date this Agreement shall terminate (the "*Termination Date*").

(b) From and after the Termination Date, Owner shall have no right to be supplied any raw or treated water and GBRA shall have no obligation to supply any raw water or retail water to Owner.

(c) If all of the Bonds (including principal and interest) will not be fully paid by the Termination date, then GBRA shall have the right, at any time before such date, to extend the Termination Date to December 31 of the year in which the Bonds are to be paid, but not later than December 31, 2050. Any extension by GBRA pursuant to this subsection shall be effective as of the date that GBRA gives Owner written notice of the extension.

(d) Owner may extend the Termination Date to December 31, 2050, by giving GBRA, after January 31, 2037 and by not later than June 30, 2037, written notice of such extension. If Owner gives GBRA timely written notice of extension, then the Termination Date shall be extended to December 31, 2050.

Section 7.2 Rights after Termination.

Except as specifically provided otherwise in this Agreement, all of the rights and obligations of the Parties under this Agreement shall terminate upon termination of this Agreement, except that such termination shall not affect any rights or liabilities accrued prior to such termination.

ARTICLE VIII OTHER PROVISIONS

Section 8.1 Authorship

This Agreement shall be construed without regard to any Party's authorship; and no presumption will apply in favor or against any Party in the interpretation of this Agreement based upon authorship.

Section 8.2 Waiver and Amendment.

Failure to enforce or the waiver of any provision of this Agreement or any breach or nonperformance by Owner or GBRA shall not be deemed a waiver by GBRA or Owner of the right in the future to demand strict compliance and performance of any provision of this Agreement. No officer or agent of GBRA is authorized to waive or modify any provision of this Agreement. No modifications of this Agreement may be made except by a written document signed by GBRA's and Owner's authorized representatives.

Section 8.3 Remedies.

It is not intended hereby to specify (and this Agreement shall not be considered as specifying) an exclusive remedy for any default by either Party, but all such other remedies existing at law or in equity shall be cumulative including, without limitation, specific

performance may be availed of by Owner, and specific performance, termination of this Agreement, or suspension of service may be availed of by GBRA. The prevailing Party shall be entitled to any reasonable attorney's fees, court costs or other expenses incurred in bringing or defending any suit alleging such default or claim.

Section 8.4 Force Majeure.

If for any reason of force majeure, either GBRA or Owner shall be rendered unable, wholly or in part, to carry out its obligations under this Agreement, other than the obligation of Owner to make the payments required under the terms of this Agreement, then if the Party shall give notice of the reasons in writing to the other Party within a reasonable time after the occurrence of the event, or cause relied on, the obligation of the Party giving the notice, so far as it is affected by the force majeure, shall be suspended during the continuance of the inability then claimed, but for no longer period. The term "force majeure" as used in this Agreement shall mean acts of God, strikes, lockouts, or other industrial disturbances, acts of public enemy, orders or actions of any kind of government of the United States or of the State of Texas, or any civil or military authority, insurrections, riots, epidemics, land slides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraints of government and people, civil disturbances, explosions, breakage or accident to dams, machinery, pipelines, canals, or other structures, partial or entire failure of water supply including pollution (accident or intentional), and any inability on the part of GBRA to deliver treated water on account of any other cause not reasonably within the control of GBRA.

Section 8.5 Non-Assignability.

A Party may not assign this Agreement to any person without first obtaining the written consent of the other Party, which consent shall not be unreasonably withheld or delayed.

Section 8.6 Entire Agreement.

This Agreement constitutes the entire agreement between GBRA and Owner and supersedes any prior understanding or oral or written agreements between GBRA and Owner respecting the subject matter of this Agreement.

Section 8.7 Severability.

The provisions of this Agreement are severable and if, for any reason, any one or more of the provisions contained in the Agreement shall be held to be invalid, illegal or unenforceable in any respect, the invalidity, illegality or unenforceability shall not affect any other provision of this Agreement and this Agreement shall remain in effect and be construed as if the invalid, illegal or unenforceable provision had never been contained in the Agreement.

Section 8.8 Captions.

The sections and captions contained herein are for convenience and reference only and are not intended to define, extend or limit any provision of this Agreement.

Section 8.9 No Third Party Beneficiaries.

This Agreement does not create any third party benefits to any person or entity other than the signatories hereto and their authorized successors in interest, and is solely for the consideration herein expressed.

Section 8.10 Due Authorization and Binding Obligation.

Each Party represents to the other that this Agreement has been duly authorized, executed and delivered by all necessary action of the Party, including approval of the Party's governing board, and is enforceable against the Party in accordance with its terms.

Section 8.11 Continuing Disclosure.

Pursuant to the Bond Resolution(s) adopted by GBRA which authorized the issuance of Bonds issued to finance the construction of the Treated Water Supply Project, in the event GBRA executes a water supply agreement with any public or private entity to the effect that such entity may purchase 10% or more of the treated water from the Treated Water Supply Project or otherwise becomes or may become obligated in the future to pay 10% or more of the Annual Debt Service Requirement, GBRA is required to enter into a Continuing Disclosure Agreement with such entity as a condition to executing or amending such water supply agreement. The Continuing Disclosure Agreement shall be in the form approved by GBRA's bond counsel in order to comply with the then-current requirement of Rule 15c2-12 promulgated by the Securities and Exchange Commission. At such time, whether now or in the future, that Owner is entitled to purchase 10% of the treated water from the Treated Water Supply Project, Owner agrees to promptly execute and return a Continuing Disclosure Agreement provided by GBRA to Owner.

Section 8.12 Notices.

All notices, payments and communications ("notices") required or allowed by this Agreement shall be in writing and be given by depositing the notice in the United States mail postpaid and registered or certified, with return receipt requested, and addressed to the Party to be notified. Notice deposited in the mail in the previously described manner shall be conclusively deemed to be effective from and after the expiration of three (3) days after the notice is deposited in the mail. For purposes of notice, the addresses of and the designated representative for receipt of notice for each of the Parties shall be as follows:

For GBRA:

Guadalupe-Blanco River Authority
Attention: General Manager
933 E. Court Street
Seguin, Texas 78155

And for Owner:

SJWTX, Inc dba Canyon Lake Water Service Company
Attention: Thomas Hodge, Vice President/General Manager
P.O. Box 1742
Canyon Lake, Texas 78133

Either Party may change the name and/or address of its designated representative for receipt of notice by giving written notice of the change to the other Party at least fourteen (14) days before the change becomes effective.

Section 8.13 Non-Waiver.


If either Party fails to insist on strict performance of any provision of this Agreement, such failure shall not be deemed a waiver by such Party of its right to insist on strict performance of such provision in the future or strict performance of any other provision of this Agreement.

In witness whereof, the Parties hereto, acting under the authority of the respective governing bodies, have caused this Agreement to be duly executed in multiple counterparts, each of which shall constitute an original.

GUADALUPE-BLANCO RIVER AUTHORITY

By: 
W.E. West, Jr., General Manager

**SJWTX, INC dba CANYON LAKE WATER
SERVICE COMPANY**

By:  24 Mar '09
Thomas Hodge, Vice President/General Manager

THE STATE OF TEXAS §

COUNTY OF GUADALUPE §

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared W.E. West, Jr., known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the GUADALUPE-BLANCO RIVER AUTHORITY, a conservation district and political subdivision, and that he executed the same as the act of such conservation district and political subdivision for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 27th day of March, 2009.



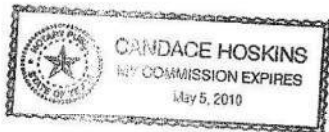
Christy S. Dietert
Notary Public
The State of Texas

THE STATE OF TEXAS §

COUNTY OF COMAL §

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared Thomas Hodge known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of SJWTX, INC dba CANYON LAKE WATER SERVICE COMPANY, and that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

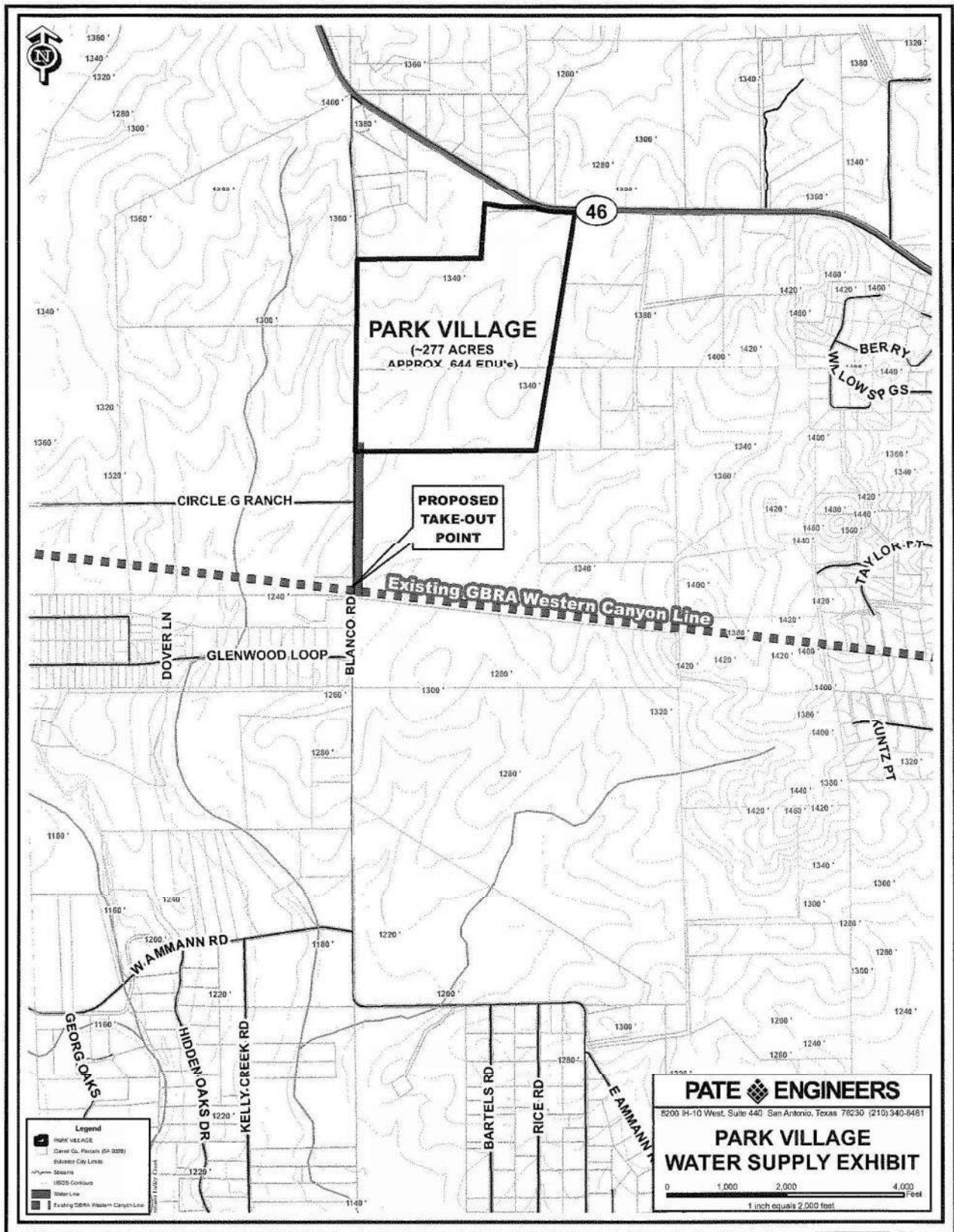
GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 24 day of MARCH, 2009.



Candace Hoskins
Notary Public
The State of Texas

INDEX OF EXHIBITS TO AGREEMENT

Exhibit 1 Map showing the Park Village Service Area located within the certificated service area of water CCN No. 12864 and showing the Treated Water Point of Delivery.





Appendix E

TCEQ Public Water System Inspection Reports



Canyon Lake Shores

PWS 0460019

November 6, 2018

TCEQ EXIT INTERVIEW FORM: Potential Violations and/or Records Request

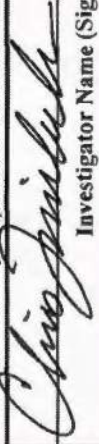

Regulated Entity/Site Name		CLWSC Canyon Lake Shores		TCEQ Add. ID No. RN No (optional)		0460019 RN101226678	
Investigation Type	CCI	Contact Made In-House (Y/N)	Y	Purpose of Investigation	Routine		
Regulated Entity Contact	Chelsca Hawkins			Telephone No.	830-312-4552		
Title	Water Quality Specialist			FAX #/Email address	Date Contacted	09/20/2018	
					FAX/Email date	11/15/2018	

NOTICE: The information provided in this form is intended to provide clarity to issues that have arisen during the investigation process between the TCEQ and the regulated entity named above and does not represent final TCEQ findings related to violations. Any potential or alleged violations discovered after the date on this form will be communicated to the regulated entity representative prior to the issuance of a notice of violation or enforcement. Conclusions drawn from this investigation, including additional violations or potential violations discovered (if any) during the course of this investigation, will be documented in a final investigation report.

Issue			For Records Request, identify the necessary records, the company contact and date due to the agency. For Alleged and Potential Violation issues, include the rule in question with the clearly described potential problem. Other type of issues: fully describe.	
No.	Type ¹	Rule Citation (if known)	Description of Issue	
1	AV	30 TAC 290.46(m)	Failure to maintain fencing in an intruder resistant condition. The barbed wire at the Lantana Booster Station needed to be tightened or replaced.	
2	AV	30 TAC 290.46(m)(4)	Failure to maintain watertight conditions. Specifically, leaks were noted at the Canyon Lake Shores SWTP Clearwell, Mystic Shores #1 service pump #1, Mystic Shores #1 ground storage tank and Hwy 281 North ground storage tank.	
3	AV	30 TAC 290.45(b)(1)(d)(i); 290.45b)(2)(B)	Failure to provide adequate water production capacity. (added 11/29/2018)	

Note 1: Issue Type Can Be One or More of: AV (Alleged Violation), PV (Potential Violation), O (Other), or RR (Records Request)

Did the TCEQ document the regulated entity named above operating without proper authorization?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Did the investigator advise the regulated entity representative that continued operation is not authorized?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Document Acknowledgment. Signature on this document establishes only that the regulated entity (RE) representative received a copy of this document and associated continuation pages on the date noted. If contact was made by telephone, the document will be sent via FAX or Email to RE; therefore, the RE signature is not required.	
 Investigator Name (Signed & Printed)	Chris Friesenhahn Date 11/29/18
 Regulated Entity Representative Name (Signed & Printed)	Chelsea Hawkins Date 11/29/18

If you have questions about any information on this form, please contact your local TCEQ Regional Office.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, call 512/239-3282.

White Copy: Regulated Entity Representative
TCEQ 20085 (4/08)

Yellow Copy: TCEQ

(Note: use additional pages as necessary) Page ____ of ____

7016 2140 0000 6879 3587

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ATTN: Cari-Michel La Caille, TCEQ
Water Supply Division, MC-154
PO Box 13087
Austin, Texas 78711-3087
CLS Rating Increase - 2018

chusea



December 20, 2018

Cari-Michel La Caille, Director
Water Supply Division, MC-154
Texas Commission on Environmental Quality
PO Box 13087
Austin, Texas 78711-3087

**Subject: CLWSC Canyon Lake Shores – Public Water System ID No. 0460019
Notification of Completion and Revised Contact Time (CT) Study
Treatment Plant Capacity Modifications – Park Shores Treatment Plant
Plan Review Log No. P-11192015-098
Comal County, Texas**

CN602969396; RN101226678

Ms. La Caille:

On November 19, 2015 the Texas Commission on Environmental Quality (TCEQ) Plan Review Team received planning materials prepared by BTS of Texas LLC (BTS) related to the subject project. The planning materials submitted by BTS included reference to modifications which were already underway at the time those documents were under development as well as modifications to be completed upon approval of the project by TCEQ. On January 20, 2016 the Plan Review Team issued a letter approving the subject project for construction.

Completion of Plant Modifications

The proposed modifications for the Park Shores Treatment Plant included rehabilitation, repairs and filter media replacement along with equipment and operational modifications to increase the treatment capacity of the plant from 4.0 million gallons per day (MGD) to 6.0 MGD. These modifications were implemented as a series of individual capital improvement efforts between 2015 and 2018.

Let this letter serve as notification that as of January 29, 2018 the final modification proposed in the approved planning documents was completed. All modifications were completed in general conformance with submitted and approved planning documents, drawings and specifications, and include:

- Replacement of existing Raw Water Pump Nos. 1 and 2 with two 2,100 gallons per minute (gpm) each pumps at the Raw Water Pump Station;
- Replacement of an existing high service pump with a 1,400 gpm pump at the High Service Pump Station;
- Rehabilitation of existing Filter A including repair of a gap between the underdrain and sidewall, and replacement of gravel filter media support;
- Rehabilitation of existing Filters A, B and C including protective coating to the interior of all three filters, replace granular activated carbon media to a depth of 48 inches and disinfect all three filters;
- Modification of the existing chlorine feed system to increase the feed rate of chlorine feed to 200 pounds per day capacity (6 MGD flow at 4 mg/L Cl_2);
- Modification of flow control to the filters to increase the hydraulic loading on filters (not exceeding 5 gallons per square feet per minute); and
- Various valves, fittings and related appurtenances.

Revised CT Study

Upon completion of construction, Canyon Lake Water Service Company (CLWSC) directed BTS to prepare a revised Contact time (CT) Study base on the capacity modifications described above.

Attached to this letter for review by the Water Quality Team, please find a copy of the Revised CT Study letter report prepared by BTS and submitted to CLWSC, along with the supporting CT Study Template Worksheet. The Revised CT Study demonstrates the capability of the Park Shores Treatment Plant to meet Giardia and virus inactivation requirements at treatment capacities up to 4,200 gpm (6.0 MGD).

Please do not hesitate to contact me with any questions or if additional information is required:

BTS of Texas LLC
17890 Blanco Road, Suite 211
San Antonio, Texas 78232
(210) 560-3287 | rgboyd@btstexas.com

Sincerely,

BTS OF TEXAS LLC

By 

Robert G Boyd, PE
Owner



December 4, 2018

Larry Bittle
Director of Operations
Canyon Lake Water Service Company
PO Box 1742
Canyon Lake, Texas 78133

VIA EMAIL: Larry.Bittle@clwsc.com

**Subject: SJWTX, Inc. dba Canyon Lake Water Service Company
Canyon Lake Shores Water System (PWS No. 0460019)
Park Shores Water Treatment Plant
Revised CT Calculations**

Mr. Bittle:

Canyon Lake Water Service Company (CLWS) recently completed the last phase of Treatment Plant Capacity Modifications at the Park Shores Water Treatment Plant. Those modifications were approved for construction by Texas Commission on Environmental Quality (TCEQ) as evidenced by a letter dated January 20, 2016 (TCEQ Plan Review Log No. P-11192015-098).

The modifications are intended to increase plant capacity from 4.0 million gallons per day (MGD) to 6.0 MGD. As noted in the TCEQ letter of January 20, 2016, a revised contact time (CT) study is required to be submitted and approved by TCEQ prior to plant operations at rates above 4.0 MGD.

BTS of Texas LLC (BTS) has prepared, and submits herewith for your use, revised CT calculations for the Park Shores WTP. The revised disinfection strategy presented herein addresses treatment of product water at a rate up to 6.0 MGD (4,200 gallons per minute). The increased flow through the plant is accomplished with raw water and high service pump improvements to increase flow, along with increased hydraulic loading on filters and increased chlorine feed rates for disinfection. All other parameters utilized in the current CT study remain unchanged.

The Park Shores WTP has been operated to date under a disinfection protocol submitted by River City Engineering, Ltd., dated April 5, 2007, and approved as the current CT study by TCEQ on July 12, 2007.

As described in the attached CT Study Template Worksheets, CLWSC Park Shores WTP is a 6.0-MGD surface water plant which pumps raw water from Canyon Lake through a 4,200-gpm raw water intake pump station, then injects alum, polymer and chlorine dioxide into the raw water which flows into two Claricone clarifiers which provide settled water. The settled water flows through three granular activated carbon (GAC) filters, and then into a 0.35-MG clearwell. The clearwell provides storage for high service pumps which feed the distribution system.

The disinfection protocol consists of chlorine dioxide injection prior to the Claricones and prior to the clearwell. A chlorination point is also provided upstream of the GAC filters for emergency purposes. Therefore, the GAC filters are excluded from the T10 calculations. Chlorine residual is monitored at the Claricone effluent and at the high service pump discharge.

Two disinfection zones have been identified for the Park Shores WTP. The first disinfection zone (D1) includes the Claricone clarifiers, beginning at the disinfectant application point (A1) upstream of the Claricones, and ending at the disinfectant residual monitoring point (M1) located downstream of the Claricones and prior to the GAC filters. The second disinfection zone (D2) includes the clearwell, beginning at the disinfectant application point (A2) downstream of the GAC filters, and ending at the disinfectant monitoring point (M2) on the high service pump station discharge. A schematic of the Park Shores WTP is included in the attached Figure 1.

Table 1 summarizes the results of T10 calculations for defined treatment units in each disinfection zone, D1 and D2. This information is the same as the information included in the 2007 TCEQ CT Study, with the exception that sodium hydroxide is no longer dosed at application point A1 and the Flow Rates have been increased to reflect the proposed plant capacity increase.

Table 1: T₁₀ Table for CLWSC Park Shores Water Treatment Plant

Disinfection Zone	Treatment Unit	Volume, gal	Flow Rate, MGD	Baffling Factor	T ₁₀ , min
D1	Claricone Clarifier (2)	155,845 ⁽¹⁾	3.024 ⁽³⁾	0.42 ⁽⁵⁾	31.17
D2	Clearwell (1)	165,555 ⁽²⁾	6.048 ⁽⁴⁾	0.5 ⁽⁶⁾	19.71

Notes:

- (1) Based on 51.5-ft diameter Claricone clarifier with side water depth of 3 ft and center water depth of 24 ft.
- (2) Based on a "worst case" operating condition assuming a minimum operating level of 50% nominal capacity of a 70-ft diameter clearwell with a side water depth of 11.5 ft.
- (3) Based on the even distribution of flow over two clarifiers.
- (4) Plant treatment capacity.
- (5) Based on assumption of Claricone clarifier manufacturer baffling characteristics.
- (6) Based on the assumption of "average" baffling characteristics for a baffled clearwell.

Table 2 summarizes the disinfection process parameters for the Park Shores WTP. The available T_{10} for each disinfection zone is provided based on the flow rate through each unit.

Table 2: Disinfection Process Parameters for CLWS Park Shores WTP

CT Study Parameters						Performance Standards: Log Inactivations	
Parameters	Disinfection Zones					Giardia	Viruses
	D1	D2	D3	D4	D5		
Flow Rate, MGD	3.024	6.048	na	na	na	0.5	2.0
T_{10} , min	31.2	19.7	na	na	na		

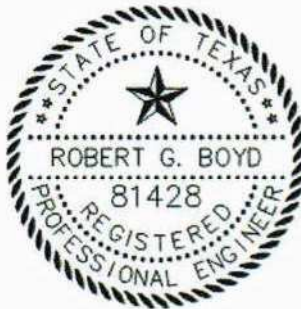
The Park Shores WTP disinfection strategy includes chlorine dioxide dosing of 0.8 mg/L for disinfection zone D1, and free chlorine dosing of 4.0 mg/L for disinfection zone D2. The calculated inactivation of Giardia and viruses found in the attached CT Study Template Worksheets indicate that the proposed disinfection strategy will meet required inactivation of Giardia and viruses. Additional detailed information regarding plant treatment units and calculations is included in the attached CT Study Template Worksheets.

Please do not hesitate to contact me if you have any questions regarding this matter. I can be reached at rgboyd@btstexas.com or by phone at (210) 872-5346.

Sincerely,

BTS OF TEXAS LLC

By 
Robert G Boyd, PE



Attachment:
CT Study Template Worksheet

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)

Description Worksheet

PUBLIC WATER
SYSTEM NAME: CLWSC Canyon Lake Shores PWS ID No.: 460019

PLANT NAME Park Shores WTP Month: December
OR NUMBER: Park Shores WTP Day: 5
Year: 2018

Enter a detailed narrative description of the plant treatment processes and disinfection protocol.

CLWSC Park Shores WTP is a 6.0-MGD surface water plant which pumps raw water from Canyon Lake through a 4,200-gpm raw water intake pump station, then injects alum, polymer and chlorine dioxide into the raw water which flows into two Claricone clarifiers which provide settled water. The settled water flows through three granular activated carbon (GAC) filters, and then into a 0.35-MG clearwell. The clearwell provides storage for high service pumps which feed the distribution system.

The disinfection protocol consists of chlorine dioxide injection prior to the Claricones and prior to the clearwell. A chlorination point is also provided upstream of the GAC filters for emergency purposes. Therefore, the GAC filters are excluded from the T10 calculations. Chlorine residual is monitored at the Claricone effluent and at the high service pump discharge.

A disinfection zone is a segment of the treatment process which begins at a disinfectant application point, and ends at the subsequent disinfectant application point, or disinfectant residual monitoring point. Each disinfectant application point represents the beginning of a separate disinfection zone regardless of the frequency of use. However, a plant may have only one disinfectant point and choose to monitor at more than one point, creating multiple disinfection zones.

Two disinfection zones have been identified for the Park Shores WTP. The first disinfection zone (D1) includes the Claricone clarifiers, beginning at the disinfectant application point (A1) upstream of the Claricones, and ending at the disinfectant residual monitoring point (M1) located downstream of the Claricones and prior to the GAC filters. The second disinfection zone (D2) includes the clearwell, beginning at the disinfectant application point (A2) downstream of the GAC filters, and ending at the disinfectant monitoring point (M2) on the high service pump station discharge.

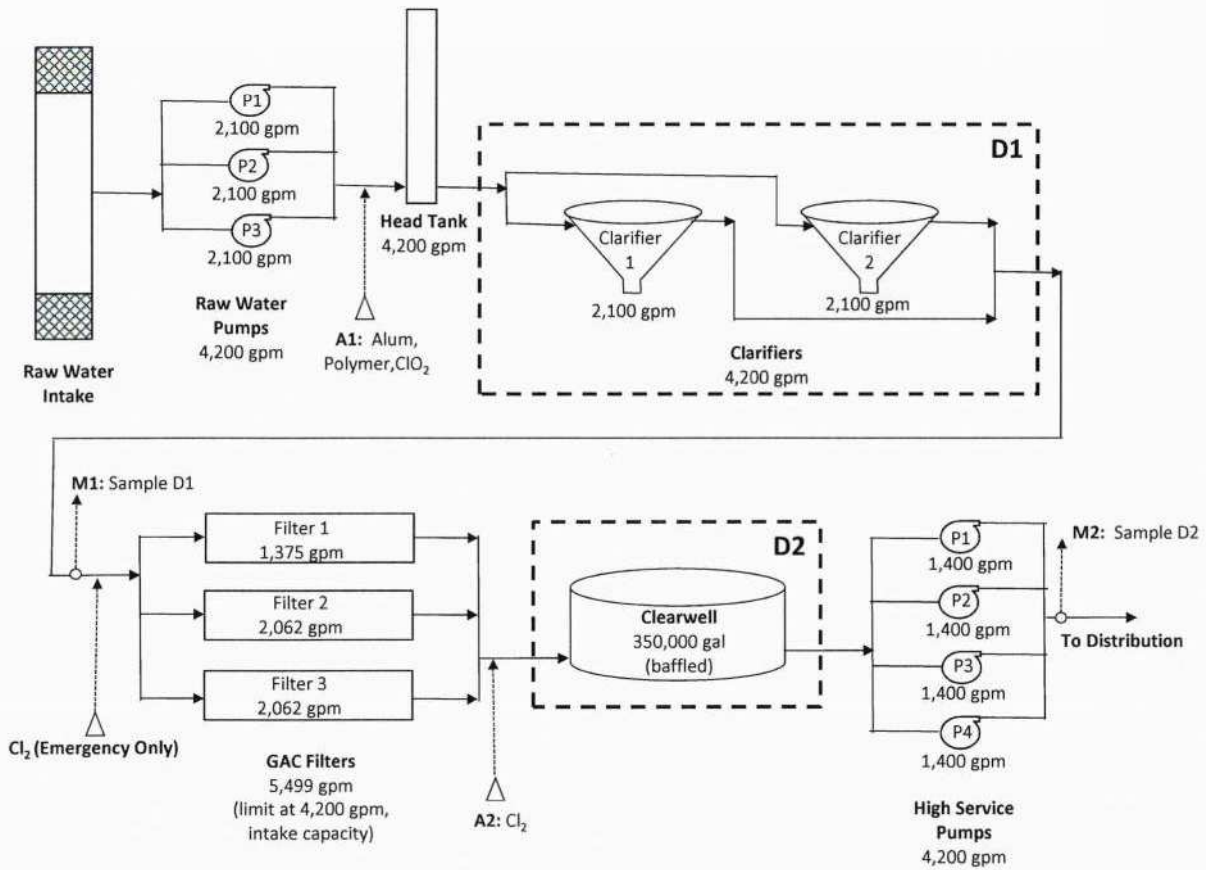
Submitted by: BTS of Texas LLC - Robert G Boyd PE
Contact
Information: rgboyd@bttexas.com | (210) 560-3287

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
Schematic Worksheet

PUBLIC WATER SYSTEM NAME:	CLWSC Canyon Lake Shores	PLANT NAME OR NUMBER:	Park Shores WTP
PWS ID No.:	460019	Date:	December 5, 2018

Use this worksheet to create your plant schematic with the Microsoft Drawing Tools.
If you are not familiar with the drawing tools, you may create your schematic using any other suitable medium.
Please refer to Section 3.3 of the Guidance Manual for instructions and guidance.



CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)

T10 Details Worksheet

PUBLIC WATER

SYSTEM NAME: CLWSC Canyon Lake Shores

PWS ID No.: 460019

PLANT NAME

OR NUMBER: Park Shores WTP

Date: December 5, 2018

Treatment Plant Capacity 6.048 mgd
4,200 gpm

--

Disinfection Zone:

D1

Disinfectant:

Chlorine Dioxide

Unit - 1

Type: Clarifier

Shape: Circular

Further Description: Claricone Clarifier

Characteristic

Number of Units

2

Diameter

51.5 ft

Side Water Depth

3 ft

Center Water Depth

24 ft

Comments

Volume (each)

155,845 gal

Flow Rate (each)

2,100 gpm

Detention Time

74.2 min

Split flow, 50% each unit

Baffling Factor

0.4

Baffling Characteristics: Manufacturer Approved
Approved Baffling Factor: 0.42

T₁₀

31.2 min

D1 FLOW RATE

3.024 mgd

T10 SUM FOR D1

31.2 min

Disinfection Zone:

D2

Disinfectant:

Free Chlorine

Unit - 1

Type: Clearwell

Shape: Circular

Further Description: Clearwell

Characteristic

Number of Units

1

Diameter

70 ft

Side Water Depth

11.5 ft

Center Water Depth

11.5 ft

Comments

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)

T10 Details Worksheet

Maximum Volume (each)	331,110	gal	_____
Minimum Operating Level	5.75	ft	_____
Worst Case Volume (each)	165,555	gal	_____
Percent of Maximum Volume	50	%	_____

Worst Case Volume (each)	165,555	gal	_____
Flow Rate (each)	4,200	gpm	_____
Detention Time	39.4	min	_____

Baffling Factor	0.5	_____
	Baffling Characteristics:	Average
	Approved Baffling Factor:	_____

T₁₀ 19.7 min

D2 FLOW RATE	6.048	mgd
--------------	-------	-----

T10 SUM FOR D2	19.7	min
----------------	------	-----

Disinfection Zone:	D3	Disinfectant:	_____
Disinfection Zone:	D4	Disinfectant:	_____
Disinfection Zone:	D5	Disinfectant:	_____
Disinfection Zone:	D6	Disinfectant:	_____
Disinfection Zone:	D7	Disinfectant:	_____
Disinfection Zone:	D8	Disinfectant:	_____
Disinfection Zone:	D9	Disinfectant:	_____
Disinfection Zone:	D10	Disinfectant:	_____

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)

Summary Worksheet

PUBLIC WATER

SYSTEM NAME: CLWSC Canyon Lake Shores PWS ID No.: 460019

PLANT NAME

OR NUMBER: Park Shores WTP Date: December 5, 2018

Disinfection Zone	Treatment Unit	Volume* (each) (gal)	Flow Rate* (each) (MGD)	Baffling Factor*	T ₁₀ * (min)	
					Unit	Zone
D1	Claricone Clarifier (2)	155,845	3.024	0.42	31.169	31.17
D2	Clearwell (1)	165,555	6.048	0.5	19.709	19.71

* These values are calculated on the T10 Details Sheet

TCEQ - (05-01-13)

CT STUDY

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
CT Calculator Worksheet

PUBLIC WATER SYSTEM NAME: CLWSC Canyon Lake Shores PLANT NAME OR NUMBER: Park Shores WTP
PWS ID No.: 460019 Date: December 5, 2018

DISINFECTION PROCESS PARAMETERS							
APPROVED CT STUDY PARAMETERS					PERFORMANCE STANDARDS		
Parameters	Disinfection Zones					Log Inactivations	
	D1	D2	D3	D4	D5	Giardia lamblia Cysts	Viruses
Flow Rate (MGD)	3.024	6.048				0.5	2.0
T ₁₀ (minutes)	31.2	19.7					

DISINFECTION PROCESS DATA												
INDIVIDUAL DISINFECTION ZONES										PLANT TOTAL		
Disinfectant	C (mg/L)	Flow (MGD)	Temp (°C)	pH	CT _{CALC}	Giardia CT _{REQD}	Virus CT _{REQD}	Giardia Log	Virus Log	Giardia Log	Virus Log	Inact. Ratio
CLO2 D1	0.8	3.024	10.0	8.5	24.9	3.8	4.0	3.29	12.33			
FCL D2	4.0	6.048	10.0	8.5	78.8	41.0	2.7	0.96	58.30			
D3										4.25	70.63	8.50
D4												(G)
D5												

SUBMITTED BY: _____ Certificate No. and Grade: _____ Date: _____

TCEQ - (05-01-13)

CT STUDY

CT STUDY

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
CT Calculator Worksheet

PUBLIC WATER SYSTEM NAME: CLWSC Canyon Lake Shores PLANT NAME OR NUMBER: Park Shores WTP

PWS ID No.: 460019 Date: December 5, 2018

DISINFECTION PROCESS PARAMETERS									
APPROVED CT STUDY PARAMETERS						PERFORMANCE STANDARDS			
Parameters	Disinfection Zones					Log Inactivations			
	D6	D7	D8	D9	D10	Giardia lamblia Cysts		Viruses	
Flow Rate (MGD)						0.5		2.0	
T ₁₀ (minutes)									

DISINFECTION PROCESS DATA												
INDIVIDUAL DISINFECTION ZONES										PLANT TOTAL		
Disinfectant	C (mg/L)	Flow (MGD)	Temp (°C)	pH	CT _{CALC}	Giardia CT _{REQD}	Virus CT _{REQD}	Giardia Log	Virus Log	Giardia Log	Virus Log	Inact. Ratio
D6												
D7												
D8												
D9												
D10												

SUBMITTED BY: _____ Certificate No. and Grade: _____ Date: _____

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 8, 2019

CERTIFIED MAIL NO.: 91 7199 9991 7039 2282 2124
RETURN RECEIPT REQUESTED

Mr. Thomas Hodge
President
SJWTX, Inc.
P.O. Box 1742
Canyon Lake, Texas 78133

Re: Notice of Violation for the Comprehensive Compliance Investigation at:
CLWSC Canyon Lake Shores, 798 Lakeshore Dr. and area around Canyon Lake, Comal
County, Texas
Regulated Entity No.: RN101226678, TCEQ ID No.: 0460019, Investigation No.: 1525948

Dear Mr. Hodge:

On November 6, 7 and 8, 2018, Mr. Chris Friesenhahn of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced regulated entity to evaluate compliance with applicable requirements for a public water supply. Enclosed is a summary which lists the investigation findings. During the investigation, some concerns were noted which were alleged noncompliances that have been resolved as an Area of Concern and Noted and Resolved based on subsequent corrective action. In addition, a certain outstanding alleged violation was identified for which compliance documentation is required. Please submit to this office by April 20, 2019 a written description of corrective action taken and the required documentation demonstrating that compliance has been achieved for the outstanding alleged violations.

In the listing of the alleged violations, we have cited applicable requirements, including TCEQ rules. Please note that both the rules themselves and the agency brochure entitled *Obtaining TCEQ Rules* (GI 032) are located on our agency website at <http://www.tceq.state.tx.us> for your reference. If you would like a hard copy of this brochure mailed to you, you may call and request one from either the San Antonio Region Office at (210) 490-3096 or the Central Office Publications Ordering Team at 512-239-0028.

The TCEQ appreciates your assistance in this matter. Please note that the Legislature has granted TCEQ enforcement powers which we may exercise to ensure compliance with environmental regulatory requirements. We anticipate that you will resolve the alleged violations as required in order to protect the State's environment. If you have additional information that we are unaware of, you have the opportunity to contest the violations documented in this notice. Should you choose to do so, you must notify the San Antonio Region Office within 10 days from the date of this letter. At that time, Mrs. Lynn Bumguardner, Water Section Manager will schedule a violation review meeting to be conducted within 21 days

Mr. Thomas Hodge, President
Page 2
January 8, 2019

from the date of this letter. However, please be advised that if you decide to participate in the violation review process, the TCEQ may still require you to adhere to the compliance schedule included in the enclosed Summary of Investigation Findings until an official decision is made regarding the status of any or all of the contested violations.

If you or members of your staff have any questions, please feel free to contact Mr. Friesenhahn in the San Antonio Region Office at (210)403-4055.

Sincerely,



Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office
Texas Commission on Environmental Quality

JTC/cmf/eg

Enclosure: Summary of Investigation Findings

Summary of Investigation Findings

CLWSC CANYON LAKE SHORES

798 PARK SHRS

CANYON LAKE, COMAL COUNTY, TX 78133

Investigation #

1525948

Investigation Date: 11/06/2018

Additional ID(s): 0460019

OUTSTANDING ALLEGED VIOLATION(S) ASSOCIATED TO A NOTICE OF VIOLATION

Track No: 699653

Compliance Due Date: 04/20/2019

30 TAC Chapter 290.45(b)(1)(D)(i)

30 TAC Chapter 290.45(b)(2)(A)

30 TAC Chapter 290.45(b)(2)(B)

Alleged Violation:

Investigation: 1525948

Comment Date: 12/19/2018

Failure to provide adequate water production capacity.

At the time of the investigation, it was determined that the combined water production from the wells and raw water pumps/treatment plant were not adequate to meet the 0.6 gallons per minute (gpm) per connection. With 8,783 connections, the water system is required to provide at least 5,269.8 gpm and it is only providing 4,283 gpm with the largest raw water pumps out of service at both surface water plants. The water system is currently 18.27% deficient for water production capacity.

30 TAC 290.45(b)(1)(D)(i) two or more wells having a total capacity of 0.6 gpm per connection. Where an interconnection is provided with another acceptable water system capable of supplying at least 0.35 gpm for each connection in the combined system under emergency conditions, an additional well will not be required as long as the 0.6 gpm per connection requirement is met for each system on an individual basis. Each water system must still meet the storage and pressure maintenance requirements on an individual basis unless the interconnection is permanently open. In this case, the systems' capacities will be rated as though a single system existed.

30 TAC 290.45(b)(2)(A) a raw water pump capacity of 0.6 gpm per connection with the largest pump out of service.

30 TAC 290.45(b)(2)(B) a treatment plant capacity of 0.6 gpm per connection under normal rated design flow.

Recommended Corrective Action: Increase the water system's water production capacity by increasing well production (additional well(s); larger production pump), increasing the raw water pump capacity (larger pumps; additional intake) and/or increase the treatment plant capacity.

Any significant change made to the water system must be approved by the TCEQ Plan Review Team. All plans need to be submitted to the following:

Plan Review Team, MC 159
Texas Commission on Environmental Quality
PO BOX 13087
Austin, Texas 78711 3087

To document compliance, submit documentation indicating that the water production capacity has been increased to the required amount to the this office by the compliance due date.

ALLEGED VIOLATION(S) NOTED AND RESOLVED ASSOCIATED TO A NOTICE OF VIOLATION

Track No: 699648

30 TAC Chapter 290.38(25)

30 TAC Chapter 290.46(m)

Alleged Violation:

Investigation: 1525948

Comment Date: 12/19/2018

Failure to maintain fencing in an intruder resistant condition.

At the time of the investigation, the barbed wire at the Lantana Booster Station needed to be tightened or replaced.

30 TAC 290.46(m)--Maintenance and housekeeping. The maintenance and housekeeping practices used by a public water system shall ensure the good working condition and general appearance of the system's facilities and equipment. The grounds and facilities shall be maintained in a manner so as to minimize the possibility of the harboring of rodents, insects, and other disease vectors, and in such a way as to prevent other conditions that might cause the contamination of the water.

30 TAC 290.38(41)--Intruder-resistant fence--A fence six feet or greater in height, constructed of wood, concrete, masonry, or metal with three strands of barbed wire extending outward from the top of the fence at a 45 degree angle with the smooth side of the fence on the outside wall. In lieu of the barbed wire, the fence must be eight feet in height. The fence must be in good repair and close enough to surface grade to prevent intruder passage.

Recommended Corrective Action: Repair the fencing so that it meets the definition of an intruder resistant fence (30 TAC 290.38(41)).

To document compliance, submit photographic documentation which indicates that the fence has been repaired and meets the definition of an intruder resistant fence to this office by the compliance due date.

Resolution: 11/15/2018--Compliance documentation was received indicating that the fencing had been repaired.

Track No: 699650

30 TAC Chapter 290.46(m)(4)

Alleged Violation:

Investigation: 1525948

Comment Date: 12/04/2018

Failure to maintain watertight conditions.

At the time of the investigation, leaks were noted at the Canyon Lake Shores SWTP Clearwell, Mystic Shores #1 service pump #1, Mystic Shores #1 ground storage tank and Hwy 281 North ground storage tank.

30 TAC 290.46(m)(4)--All water treatment units, storage and pressure maintenance facilities, distribution system lines, and related appurtenances shall be maintained in a watertight condition and be free of excessive solids.

Recommended Corrective Action: Using methods and materials which meet American Water Works Association (AWWA) standards, repair the leaks on the affected ground storage tanks to ensure that they are tight against leakage.

Resolution: 11/29/2018--Photographic documentation was received indicating that repairs had been made and water tight conditions are being maintained.

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 10, 2019

Mr. Thomas Hodge, President
SJWTX, Inc.
P.O. Box 1742
Canyon Lake, Texas 78133

Re: Notice of Compliance with Notice of Violation (NOV) dated January 8, 2109:
CLWSC Canyon Lake Shores, 798 Lakeshore Dr. and area around Canyon Lake, Comal
County, Texas
Regulated Entity No.: RN101226678, TCEQ ID No.: 0460019, Investigation No.: 1557496

Dear Mr. Hodge:

This letter is to inform you that the Texas Commission on Environmental Quality (TCEQ) San Antonio Regional Office has received adequate compliance documentation on April 15, 2019 to resolve the alleged violation documented during the investigation of the above-referenced regulated entity conducted from November 6, 7 and 8, 2018. Based on the information submitted, no further action is required concerning this investigation.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions, please feel free to contact Mr. Chris Friesenhahn at the San Antonio Regional Office at (210) 403-4055.

Sincerely,

A handwritten signature in black ink, appearing to read "Joy Thurston-Cook".

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office

JTC/CMF/sg

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



PWS_0460172_CO_20190501_CCR
RN101247039
CN602969396

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 1, 2019

PWS 0460172/CCR
SJWTX INC
THOMAS HODGE, PRESIDENT
PO BOX 1742
CANYON LAKE, TX 78133-0005

Subject: **2018 CONSUMER CONFIDENCE REPORT - REMINDER NOTICE**
SJWTX TRIPLE PEAK PLANT - PWS # 0460172
COMAL County, Texas

Attention Public Water System Owner / Manager / Operator:

Every community public water system (PWS) is required to deliver a 2018 Consumer Confidence Report (CCR) to their customers and to the Texas Commission on Environmental Quality (TCEQ) by July 1, 2019. This report contains drinking water data from the 2018 calendar year and informs customers about the quality of their drinking water.

To facilitate timely compliance, PWSs can generate a template CCR using the TCEQ CCR generator. The generator can be accessed through the "Generate CCR Report" button located on the left side of the home page of the Drinking Water Watch website at <https://www.tceq.texas.gov/goto/dww>. **Instructions to create the template CCR can be found on the TCEQ CCR web page at <http://www.tceq.texas.gov/drinkingwater/ccr>.**

Please be aware that the template generated is not the complete CCR. It is your responsibility to ensure that the CCR meets the requirements listed in 30 TAC 290

Subchapter H: Consumer Confidence Reports, located at

<http://www.tceq.texas.gov/publications/rg/rg-346.html>. All valid violations, including those which have been returned to compliance, must remain on the CCR. Please note that you must get confirmation from TCEQ that a violation has been rejected before you can remove the violation from your CCR.

The list below includes some commonly missed items. Please ensure you include these in your report:

- Water system's contact information,
- Disinfectant residual data,
- Data from any systems which provide water to your system (your provider is required to provide this information by April 1st each year),
- Required Spanish language statement,
- Required definitions, including level 1 and level 2 assessment definitions,
- Health language for any secondary Fluoride exceedances.

For your system to be properly credited for distributing the 2018 CCR, you must fill out the Consumer Confidence Report Certification of Delivery and **mail the complete 2018 CCR and the Certification of Delivery** to one of the addresses below by July 1, 2019. The CCR that you mail to TCEQ **must be a copy of what was provided to your customers**. Do not fax or email the CCR to the TCEQ.

THOMAS HODGE

Page 2

May 1, 2019

If submitting by certified mail:	If submitting by regular mail:
TCEQ PDW Section - MC 155, Attn CCR 12100 Park 35 Circle Austin, Texas 78753	TCEQ PDW Section - MC 155, Attn CCR PO BOX 13087 Austin, TX 78711-3087

The U.S. Environmental Protection Agency (EPA) published a memorandum on January 3, 2013 that found some forms of electronic delivery may qualify as CCR direct delivery. The EPA requirements for electronic direct delivery are as follows:

1. Electronic delivery must provide the CCR in a manner that is "direct." The EPA interprets this rule requirement to mean that PWSs can use separate mailings, such as utility bills with an Internet address link printed on it, to meet their CCR requirement if the Internet address provides a **direct** link to the CCR and if the communication prominently displays the Internet address and a notice explaining the nature of the link.
2. If a PWS is aware of a customer's inability to receive a CCR by the chosen electronic method, it must provide the CCR by an alternative method allowed by the rule.
3. A PWS must prominently display a message and the **direct** Internet address in all mail notifications of CCR availability.

If a system wishes to deliver the CCR electronically the system may provide the **direct** link to the report by the following methods:

- Mailing notification of online CCR availability;
- Emailing notification of online CCR availability;
- Emailing the CCR as an embedded image;
- Emailing the CCR as an attachment to an email.

For more information regarding recent updates to the CCR and to the EPA Memorandum please visit https://www.tceq.texas.gov/drinkingwater/ccr/ccr_customer_service.html.

If you need additional explanation of how to complete your 2018 CCR please contact:

CCR Compliance Coordinators

PWSCCR@tceq.texas.gov

512-239-4691

Sincerely,



Michele Risko, Section Manager
Drinking Water Special Functions Section
Water Supply Division
Texas Commission on Environmental Quality

MR/NJ/av

cc: TCEQ Region Attention Water Section Manager
LARRY L BITTLE, PO BOX 1742, CANYON LAKE TX 78133-0005

CONSUMER CONFIDENCE REPORT TCEQ CERTIFICATE of DELIVERY

For Calendar year 2018

Public Water System (PWS) Name: SJWTX TRIPLE PEAK PLANT

PWS ID Number: 0460172

I certify that the community water system named above has distributed the Consumer Confidence Report (CCR) for the calendar year of 2018 and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the TCEQ. Systems serving 100,000 or more people are required to post the CCR on a publicly available web site and provide the direct URL.

Date of Delivery: _____

Certified By: Name (print): _____
 Title: _____
 Phone Number: _____

Signature: _____ Date: _____

You must use at least one direct delivery and at least one good faith delivery method:
 (indicate "☒" all that apply):

Systems serving 100,000 or more people are required to post the CCR on a publicly available web site and provide the direct URL here: http:// _____

Direct Delivery Methods

- ☐ Mail a paper copy of the CCR
- ☐ Mail notification that CCR is available on-line at http:// _____
 *The Internet link (url) you insert above **must** take customers directly to the open CCR.
- ☐ Email direct web address of the CCR, available at http:// _____
- ☐ Email CCR as an attachment to or an embedded image in an email.
- ☐ Other direct delivery (for example, door hangers or additional electronic delivery method).
 Please specify: _____

Good faith delivery methods - to reach people who do not receive bills (check all that apply):

- ☐ Posting the CCR on the Internet at http:// _____
- ☐ Mailing the CCR to people who receive mail, but who do not receive bills.
- ☐ Advertising the availability of the CCR in news media.
- ☐ Posting the CCR in public places.
- ☐ Delivering multiple copies to single billing addresses serving multiple persons.
- ☐ Delivering multiple copies of the CCR to community organizations.

All systems are required to mail by July 1 the Certificate of Delivery and complete Consumer Confidence Report to:

Sending by certified mail:	Sending by regular mail:
TCEQ DWSF, MC-155, Attn: CCR, 12100 Park 35 Circle Austin, TX 78753	TCEQ DWSF, MC-155, Attn: CCR, PO Box 13087 Austin, TX 78711-3087

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



PWS_2270049_CO_20190501_CCR
RN100822527
CN602969396

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 1, 2019

PWS 2270049/CCR
SJWTX INC
THOMAS HODGE, PRESIDENT
PO BOX 1742
CANYON LAKE, TX 78133-0005

Subject: **2018 CONSUMER CONFIDENCE REPORT – REMINDER NOTICE**
DEER CREEK WATER - PWS # 2270049
TRAVIS County, Texas

Attention Public Water System Owner / Manager / Operator:

Every community public water system (PWS) is required to deliver a 2018 Consumer Confidence Report (CCR) to their customers and to the Texas Commission on Environmental Quality (TCEQ) by July 1, 2019. This report contains drinking water data from the 2018 calendar year and informs customers about the quality of their drinking water.

To facilitate timely compliance, PWSs can generate a template CCR using the TCEQ CCR generator. The generator can be accessed through the "Generate CCR Report" button located on the left side of the home page of the Drinking Water Watch website at <https://www.tceq.texas.gov/goto/dww>. **Instructions to create the template CCR can be found on the TCEQ CCR web page at <http://www.tceq.texas.gov/drinkingwater/ccr>.** Please be aware that the template generated is not the complete CCR. It is your responsibility to ensure that the CCR meets the requirements listed in 30 TAC 290 Subchapter H: Consumer Confidence Reports, located at <http://www.tceq.texas.gov/publications/rg/rg-346.html>. All valid violations, including those which have been returned to compliance, must remain on the CCR. Please note that you must get confirmation from TCEQ that a violation has been rejected before you can remove the violation from your CCR.

The list below includes some commonly missed items. Please ensure you include these in your report:

- Water system's contact information,
- Disinfectant residual data,
- Data from any systems which provide water to your system (your provider is required to provide this information by April 1st each year),
- Required Spanish language statement,
- Required definitions, including level 1 and level 2 assessment definitions,
- Health language for any secondary Fluoride exceedances.

For your system to be properly credited for distributing the 2018 CCR, you must fill out the Consumer Confidence Report Certification of Delivery and **mail the complete 2018 CCR and the Certification of Delivery** to one of the addresses below by July 1, 2019. The CCR that you mail to TCEQ **must be a copy of what was provided to your customers**. Do not fax or email the CCR to the TCEQ.

THOMAS HODGE
Page 2
May 1, 2019

If submitting by certified mail:	If submitting by regular mail:
TCEQ PDW Section - MC 155, Attn CCR 12100 Park 35 Circle Austin, Texas 78753	TCEQ PDW Section - MC 155, Attn CCR PO BOX 13087 Austin, TX 78711-3087

The U.S. Environmental Protection Agency (EPA) published a memorandum on January 3, 2013 that found some forms of electronic delivery may qualify as CCR direct delivery. The EPA requirements for electronic direct delivery are as follows:

1. Electronic delivery must provide the CCR in a manner that is "direct." The EPA interprets this rule requirement to mean that PWSs can use separate mailings, such as utility bills with an Internet address link printed on it, to meet their CCR requirement if the Internet address provides a **direct** link to the CCR and if the communication prominently displays the Internet address and a notice explaining the nature of the link.
2. If a PWS is aware of a customer's inability to receive a CCR by the chosen electronic method, it must provide the CCR by an alternative method allowed by the rule.
3. A PWS must prominently display a message and the **direct** Internet address in all mail notifications of CCR availability.

If a system wishes to deliver the CCR electronically the system may provide the **direct** link to the report by the following methods:

- Mailing notification of online CCR availability;
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For more information regarding recent updates to the CCR and to the EPA Memorandum please visit https://www.tceq.texas.gov/drinkingwater/ccr/ccr_customer_service.html.

If you need additional explanation of how to complete your 2018 CCR please contact:

CCR Compliance Coordinators
PWSCCR@tceq.texas.gov
512-239-4691

Sincerely,



Michele Risko, Section Manager
Drinking Water Special Functions Section
Water Supply Division
Texas Commission on Environmental Quality

MR/NJ/av

cc: TCEQ Region Attention Water Section Manager
LARRY L BITTLE, PO BOX 1742, CANYON LAKE TX 78133-0005

CONSUMER CONFIDENCE REPORT TCEQ CERTIFICATE of DELIVERY

For Calendar year 2018

Public Water System (PWS) Name: DEER CREEK WATER

PWS ID Number: 2270049

I certify that the community water system named above has distributed the Consumer Confidence Report (CCR) for the calendar year of 2018 and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the TCEQ. Systems serving 100,000 or more people are required to post the CCR on a publicly available web site and provide the direct URL.

Date of Delivery: _____

Certified By: Name (print): _____
 Title: _____
 Phone Number: _____

Signature: _____ Date: _____

You must use at least one direct delivery and at least one good faith delivery method:
 (indicate "☒" all that apply):

Systems serving 100,000 or more people are required to post the CCR on a publicly available web site and provide the direct URL here: http:// _____

Direct Delivery Methods

- ☐ Mail a paper copy of the CCR
- ☐ Mail notification that CCR is available on-line at http:// _____
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 Please specify: _____

Good faith delivery methods - to reach people who do not receive bills (check all that apply):

- ☐ Posting the CCR on the Internet at http:// _____
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Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



PWS_0460019_CO_20190501_CCR
RN101226678
CN602969396

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 1, 2019

PWS 0460019/CCR
SJWTX INC
THOMAS HODGE, PRESIDENT
PO BOX 1742
CANYON LAKE, TX 78133-0005

Subject: **2018 CONSUMER CONFIDENCE REPORT – REMINDER NOTICE**
CLWSC CANYON LAKE SHORES - PWS # 0460019
COMAL County, Texas

Attention Public Water System Owner / Manager / Operator:

Every community public water system (PWS) is required to deliver a 2018 Consumer Confidence Report (CCR) to their customers and to the Texas Commission on Environmental Quality (TCEQ) by July 1, 2019. This report contains drinking water data from the 2018 calendar year and informs customers about the quality of their drinking water.

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THOMAS HODGE

Page 2

May 1, 2019

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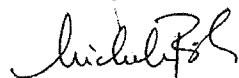
If you need additional explanation of how to complete your 2018 CCR please contact:

CCR Compliance Coordinators

PWSCCR@tceq.texas.gov

512-239-4691

Sincerely,



Michele Risko, Section Manager
Drinking Water Special Functions Section
Water Supply Division
Texas Commission on Environmental Quality

MR/NJ/av

cc: TCEQ Region Attention Water Section Manager
LARRY L BITTLE, PO BOX 1742, CANYON LAKE TX 78133-0005

CONSUMER CONFIDENCE REPORT TCEQ CERTIFICATE of DELIVERY

For Calendar year 2018

Public Water System (PWS) Name: CLWSC CANYON LAKE SHORES

PWS ID Number: 0460019

I certify that the community water system named above has distributed the Consumer Confidence Report (CCR) for the calendar year of 2018 and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the TCEQ. Systems serving 100,000 or more people are required to post the CCR on a publicly available web site and provide the direct URL.

Date of Delivery: _____

Certified By: Name (print): _____

Title: _____

Phone Number: _____

Signature: _____ Date: _____

You must use at least one direct delivery and at least one good faith delivery method:
(indicate "☒" all that apply):

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- ☐ Mail notification that CCR is available on-line at http://_____
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- ☐ Email direct web address of the CCR, available at http://_____
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Please specify: _____

Good faith delivery methods - to reach people who do not receive bills (check all that apply):

- ☐ Posting the CCR on the Internet at http://_____
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Sending by certified mail:	Sending by regular mail:
TCEQ DWSF, MC-155, Attn: CCR, 12100 Park 35 Circle Austin, TX 78753	TCEQ DWSF, MC-155, Attn: CCR, PO Box 13087 Austin, TX 78711-3087



Triple Peak

PWS 0460172

May 23, 2017

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 26, 2017

Mr. Thomas Hodge, Chief Operating Officer
SJWTX, Inc.
P. O. Box 1742
Canyon Lake, Texas 78133

Re: Compliance Evaluation Investigation at:
SJWTX Triple Peak Plant, Intersection of Meckel Rd and Triple Peak Rd., Comal County,
Texas
Regulated Entity No.: RN101247039, TCEQ ID No.: 0460172, Investigation No.: 1424213

Dear Mr. Hodge:

On May 23, 2017, Mrs. Stacy Anderson of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced facility to evaluate compliance with applicable requirements for public water supply. No violations are being alleged as a result of the investigation; however, please see the enclosed Additional Issue.

The TCEQ appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact Mrs. Anderson in the San Antonio Region Office at (210) 403-4078.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joy Thurston-Cook".

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office

JTC/sa/eg

Summary of Investigation Findings

SJWTX TRIPLE PEAK PLANT

Investigation #

1424213

Investigation Date: 05/23/2017

, COMAL COUNTY,

Additional ID(s): 0460172

No Violations Associated to this Investigation

ADDITIONAL ISSUES

Description

Item 1

Additional Comments

30 TEX. ADMIN. CODE 291.93(3)

At the time of the investigation, it was noted that the entity has reached 87.2 % of its production capacity. This was based upon 6,611 connections. The entity must submit to the Texas Commission on Environmental Quality (TCEQ) Technical Review Team, MC 159, PO Box 13087, Austin, TX 78711-3087; (512)239-4691 an 85% planning report that clearly explains how the retail public utility will provide the expected service demands to the remaining areas within the boundaries of its certificated area and submit to the TCEQ San Antonio Region Office documentation verifying submittal.



August 1, 2017

Texas Commission on Environmental Quality
Technical Review Team (MC 159)
P.O. Box 13087
Austin, TX 78711-3087

Certified Mail:
7016 2140 0000 6877 3756

**RE: Compliance Evaluation Investigation at SJWTX Triple Peak Plant, PWS ID: TX0460172
Regulated Entity No.: RN101247039, Investigation No.: 1424213**

To whom it may concern,

Enclosed please find the TCEQ approval for construction of the Dorothy Drive production facility in the SJWTX Triple Peak Plant system, dated November 22, 2016. The facility will consist of approximately 800 gpm of total well capacity, 1,000 gpm of total booster pump capacity, a 160,000 gallon ground storage tank, disinfection system, and related appurtenances.

The two source water wells for this facility (TCEQ Well ID Nos.: G0460172AK, G0460172AL) are complete, but will remain inactive until the facility has completed construction.

The contractor began mobilizing equipment on Friday, July 28, 2017, and the consulting engineer has estimated the project will take 260 days to complete. We will be sure to notify the TCEQ upon completion of this project.

Unless instructed otherwise, I believe the information provided in this letter should satisfy the requirements addressed in the "Additional Issues" section regarding production capacity on Investigation No. 1424213.

Should you require any additional documentation or have any questions regarding our response, please contact me at (830) 964-2166, or by e-mail to larry.bittle@clwsc.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "L. Bittle", is written over a horizontal line.

Larry Bittle
General Manager

Enclosure: TCEQ Approval for Construction of Dorothy Drive Plant dated November 22, 2016
CC: TCEQ Region 13, San Antonio Office

Canyon Lake Water Service Company
P.O. Box 1742 • Canyon Lake, Texas 78133
(830) 964-3854 / Fax (830) 964-2779
www.clwsc.com

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



PWS_0460172_CO_20161122_Plan Ltr

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 22, 2016

Mr. Richard C. Collins, P.E.
Southwest Engineers, Inc.
307 Saint Lawrence Street
Gonzales, Texas 78629



Re: SJWTX Triple Peak Plant - Public Water System ID No. 0460172
Proposed Ground Storage Tank and Pump Station - Dorothy Drive Plant
Engineer Contact Telephone: (830) 672-7546
Plan Review Log No. P-09232016-145
Comal County, Texas

CN602969396; RN101247039

Dear Mr. Collins:

On September 23, 2016, the Texas Commission on Environmental Quality (TCEQ) received planning material with your letter dated September 22, 2016, for the proposed ground storage tank and pump station at Dorothy Drive for the above referenced public water system. Based on our review of the information submitted, the project generally meets the minimum requirements of Title 30 Texas Administrative Code (TAC) Chapter 290 - Rules and Regulations for Public Water Systems and is **conditionally approved for construction** if the project plans and specifications meet the following requirements:

1. When chlorine gas is used, a full-face self-contained breathing apparatus or supplied air respirator that meets Occupational Safety and Health Administration (OSHA) standards for construction and operation, and a small bottle of fresh ammonia solution (or approved equal) for testing for chlorine leakage shall be readily accessible outside the chlorinator room and immediately available to the operator in the event of an emergency as required in 30 TAC Section 290.42(e)(4)(A).
2. Adequate ventilation, which includes both high level and floor level screened vents, shall be provided for all enclosures in which gas chlorine is being stored or fed. Enclosures containing more than one operating 150-pound cylinder of chlorine shall also provide forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the top vent and discharges to the outside atmosphere through the floor level vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current International Fire Code (IFC) as required in 30 TAC Section 290.42(e)(4)(C).

The submittal consisted of 10 sheets of engineering drawings and technical specifications. The approved project consists of:

November 22, 2016

- One 163,000 gallon American Water Works Association Standard D100 welded steel ground storage tank;
- Pump building to house one 400 gallon per minute (gpm) and one 600 gpm vertical turbine variable frequency drive water supply pumps with associated piping, valves and control;
- Chlorine shelter to house 100 pounds per day gas chlorination system with associated gas cylinder, feeder, scale, piping, valves and control; and
- Various valves, fittings and related appurtenances.

This approval is for the construction of the above listed items only.

This project enables the Triple Peak Plant water system to transfer water from the wells (Woodlands Well No. 1 and 2) located at Dorothy Drive to the 142,000 gallon tank located at the Valley View Plant. The pressure of the system will be maintained by the existing Startzville elevated storage tank.

The SJWTX Triple Peak Plant public water supply system provides water treatment.

The project is located approximately 940 feet east of the intersection of Dorothy Drive and Old Sattler Road in Comal County, Texas.

An appointed engineer must notify the TCEQ's Region 13 Office in San Antonio at (210) 490-3096 when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner will notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the completed work is substantially in accordance with the plans and change orders on file with the commission as required in 30 TAC Section 290.39(h)(3).

Please refer to the Plan Review Team's Log No. P-09232016-145 in all correspondence for this project.

Please Note: In order to determine if a new source of water or a new treatment process results in corrosive or aggressive finished water that may endanger human health, we are requesting additional sampling and analysis of lead, alkalinity (as calcium carbonate), calcium (as calcium carbonate) and sodium in addition to the required chemical test results for public water system new sources. We are requiring these additional sampling results as listed in our currently revised checklists (Public Well Completion Data Checklist for Interim Use - Step 2 and Membrane Use Checklist - Step 2) which can be found on TCEQ's website at the following address:

<https://www.tceq.texas.gov/drinkingwater/udpubs.html>

Please include these additional sampling results in well completion submittals, membrane use submittals, and other treatment process submittals.

New surface water sources will need to also include lead, total dissolved solids, pH, alkalinity (as calcium carbonate), chloride, sulfate, calcium (as calcium carbonate) and sodium with the analysis required in 30 TAC Section 290.41(e)(1)(F).

Mr. Richard C. Collins, P.E.

Page 3

November 22, 2016

Please complete a copy of the most current Public Water System Plan Review Submittal form for any future submittals to TCEQ. Every blank on the form must be completed to minimize any delays in the review of your project. The document is available on TCEQ's website at the address shown below. You can also download the most current plan submittal checklists and forms from the same address.

<https://www.tceq.texas.gov/drinkingwater/udpubs.html>

For future reference, you can review part of the Plan Review Team's database to see if we have received your project. This is available on TCEQ's website at the following address:

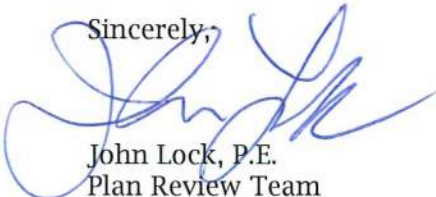
<https://www.tceq.texas.gov/drinkingwater/planrev.html/#status>

You can download the latest revision of 30 TAC Chapter 290 - Rules and Regulations for Public Water Systems from this site.

If you have any questions concerning this letter or need further assistance, please contact Kamal Adhikari at (512)239-0680 or by email at kamal.adhikari@tceq.texas.gov or by correspondence at the following address:

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Sincerely,



John Lock, P.E.
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality



Vera Poe, P.E., Team Leader
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

VP/JL/KA/av

cc: SJWTX Triple Peak Plant - Attn: Water Utilities Official, P.O. Box 1742, Canyon Lake, Texas 78133

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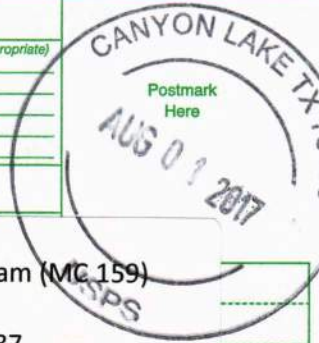
TCEQ

Technical Review Team (MC 159)

P.O. Box 13087

Austin, TX 78711-3087

2017 Triple Peak CCI Response



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Technical Review Team (MC 159)
P.O. Box 13087
Austin, TX 78711-3087



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Canyon Lake, TX 78133

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Joy Thurston-Cook
TCEQ Region 13
14520 Judson Road
San Antonio, TX 78233-4480

2017 Triple Peak CCI Response

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Joy Thurston-Cook
TCEQ Region 13
14520 Judson Road
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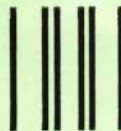
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Attn: Aubry Wolff

CANYON LAKE WATER SERVICE COMPANY

PO Box 1742

Canyon Lake, TX 78133

2017 Triple Peak CCI Response





Glenwood

PWS 0460246

January 10, 2018

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Stephanie Bergeron Perdue, *Interim Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 4, 2018

RECEIVED APR 10 2018 *AW*

Mr. Eric Thornburg
President
SJWTX Inc.
PO Box 1742
Canyon Lake, Texas 78133-0005

Re: Compliance Evaluation Investigation at:
SJWTX Glenwood Subdivision, located on Blanco Rd. 1.7 miles south of Hwy 46,
Bulverde, Bexar County, Texas
Regulated Entity No.: RN104710108, TCEQ Additional ID: 0460246, Investigation No.:
1464732

Dear Mr. Thornburg:

On January 10, 2018, Mrs. Agnieszka Hobson of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced facility to evaluate compliance with applicable requirements for public water supply. No violations are being alleged as a result of this investigation.

The TCEQ appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact Mrs. Hobson in the San Antonio Region Office at (210) 403-4075.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joy Thurston-Cook".

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office

JTC/AMH/eg



Summit North

PWS 0460220

December 6, 2018

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 8, 2019

Mr. Richard W. Roth
President
SJWTX, Inc.
P.O. Box 1742
Canyon Lake, Texas 78133-0005

Re: Compliance Evaluation Investigation at: SJWTX Summit North Subdivision, Located on
Crane Mill Road S of SH 32, Comal County, Texas
Regulated Entity No.: RN101206977, TCEQ ID No.: 0460220, Investigation No.: 1525625

Dear Mr. Roth,

On December 6, 2018, Mrs. Agnieszka Hobson of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced facility to evaluate compliance with applicable requirements for public water supply. No violations are being alleged as a result of the investigation.

The TCEQ appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact Mrs. Hobson in the San Antonio Region Office at (210) 403-4075.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joy Thurston-Cook".

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office

JTC/AMH/adj



North Point

PWS 0460235

December 6, 2017

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Stephanie Bergeron Perdue, *Interim Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 4, 2018

Mr. Eric Thornburg
President
SJWTX Inc.
PO Box 1742
Canyon Lake, Texas 78133-0005

RECEIVED APR 10 2018 *aw*

Re: Compliance Evaluation Investigation at:
SJWTX North Point Subdivision, 9114 Ozark Terrace, San Antonio, Bexar County, Texas
Regulated Entity No.: RN101215358, TCEQ Additional ID: 0460235, Investigation No.:
1455558

Dear Mr. Thornburg:

On December 6, 2017, Mrs. Agnieszka Hobson of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced facility to evaluate compliance with applicable requirements for public water supply. No violations are being alleged as a result of the investigation.

The TCEQ appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact Mrs. Hobson in the San Antonio Region Office at (210) 403-4075.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joy Thurston-Cook".

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office

JTC/AMH/eg