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Canyon Lake Water Service Company

Water Availability Report

For

Comal County Commissioners Court

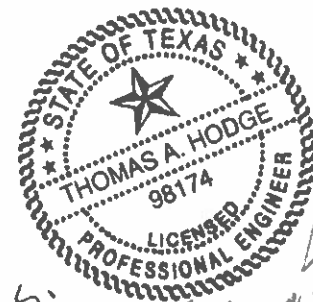
199 Main Plaza

New Braunfels, Texas 78130

January 2013

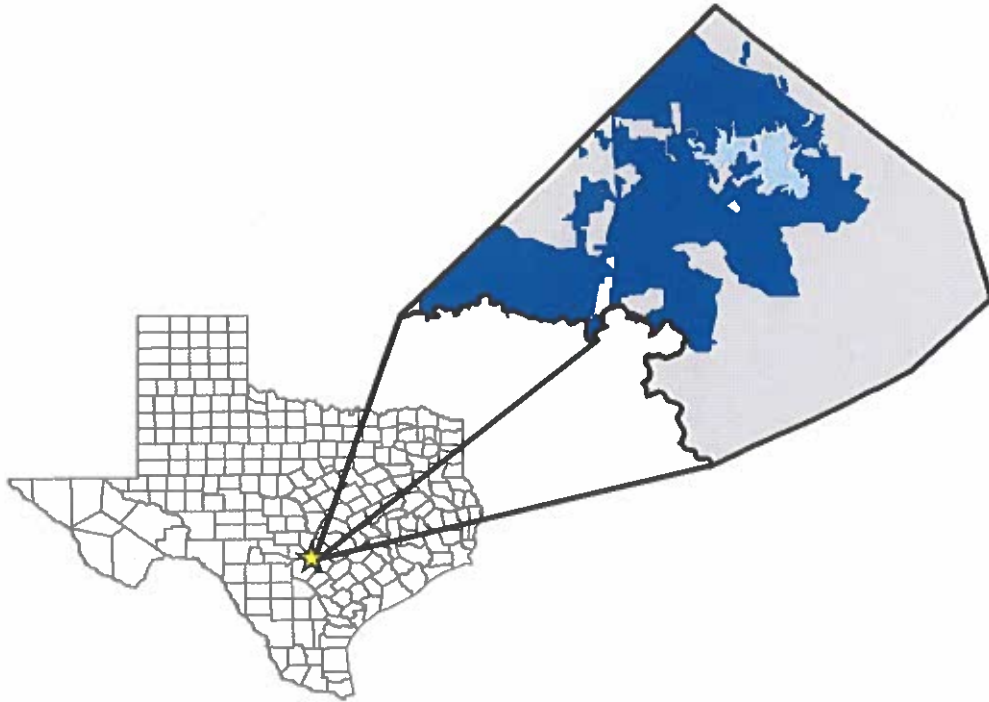
Revised April 2013

*We interpose no
objection to
approve plan
for next
3 years.*



*6373
5-7-2013*

**Canyon Lake Water Service Company
Water Availability Report
November 2012**



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REPORT OF FINDINGS

WRGS 12-009

**Canyon Lake Water Service Company
Water Availability Report**

for

Comal County Commissioners Court
199 Main Plaza
New Braunfels, TX 78130

Comal County, Texas
November 2012

Acknowledgement

This report was produced under the guidance of Mr. Thomas A. Hodge, P.E. by Wet Rock Groundwater Services, LLC.



Wet Rock Groundwater Services, LLC



Groundwater Specialists

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Section I: Introduction

Canyon Lake Water Service Company (CLWSC) is an investor owned water utility operating under the Texas Commission on Environmental Quality (TCEQ) Certificate of Convenience (CCN) #10692 located in South Central Texas (Figure 1). The water system provides high quality water and exceptional customer service to approximately 31,850 residents via 10,600 connections (approximate) in Comal County and southern Blanco County.

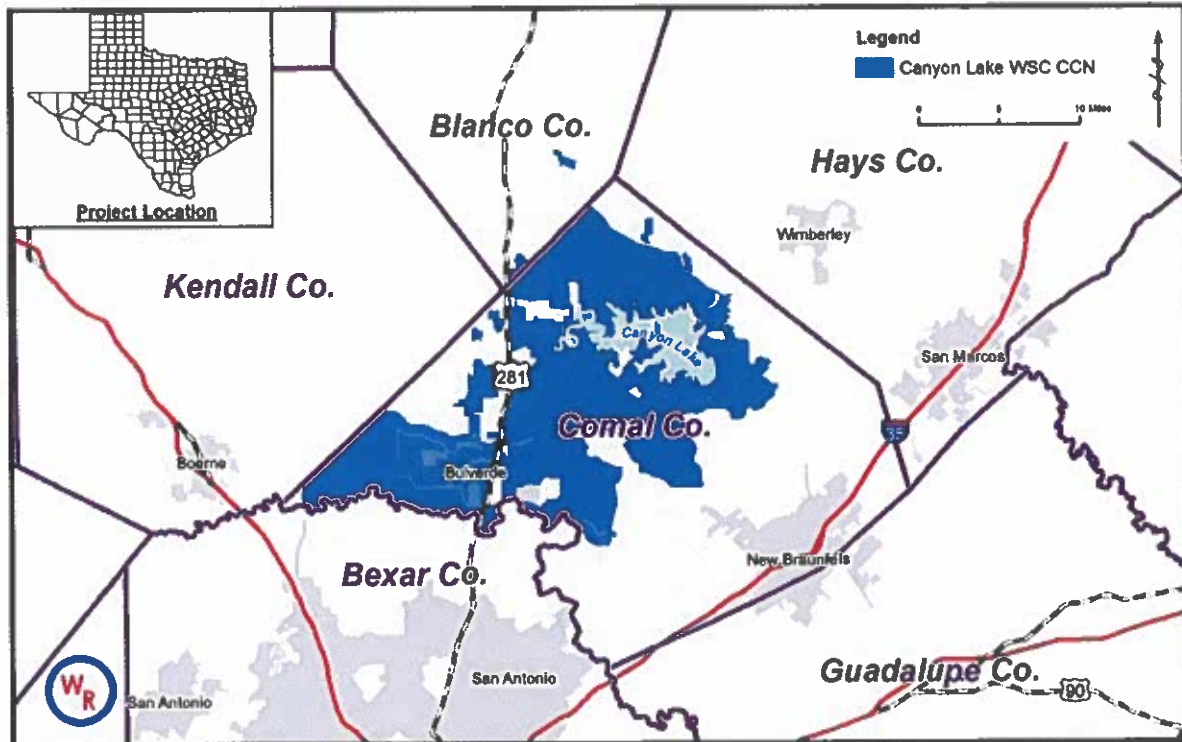


Figure 1: Location map

I.1. Purpose

With the goal of describing the relationship between existing and future water supplies, this update to the 2009 Water Availability Report presents CLWSC's strong ability to provide a diverse water supply to match 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 a 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 Service Company became an operating entity in 1994 as a member-owned non-profit water utility, consolidating 46 separate groundwater systems. In 2006, CLWSC was purchased by SJWTX Inc., a subsidiary of San Jose Water Corporation (SJWC).



SJWC is one of the largest privately owned water companies in the United States, providing service to nearly one million residents of Santa Clara and Santa Cruz Counties in Northern California since it was established in 1866.

According to the latest U.S. Census Bureau statistics, Comal County was the 47th fastest growing county in the United States between the years 2010 and 2011. 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.

In 2001, CLWSC's Water Availability Report was approved and accepted by the Comal County Commissioner's Court. CLWSC drafted an update in 2004, 2007, and 2009 which was subsequently approved by the Comal County Commissioner's Court. Since the 2009 report, CLWSC has acquired a number of water systems including the Comal County portions of the now dissolved Bexar Metropolitan Water District. This 2012 report updates the population and demand forecasts and describes how CLWSC will meet future water demands within their service area.

I.3. Climate

The Canyon Lake area experiences a humid climate with an average of approximately 32 inches of rain annually. Daily average temperatures between 1981 and 2010 ranged from the mid 60's to mid 90's (°F) in spring and summer and from the low 40's to low 60's (°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)	62.9	66.9	73.5	80.5	87	92.3	94.6	96	90.3	82.2	72.2	64
Avg. Min Temp (°F)	40.7	44.2	50.8	58.1	66.8	72.6	74.6	74.7	69.1	60.1	50.1	41.7
Avg. Precipitation (in)	1.76	1.79	2.31	2.10	4.01	4.14	2.74	2.09	3.03	4.11	2.28	1.91
Note: Data from the National Oceanic and Atmospheric Administration (NOAA) San Antonio International Airport station; Normals for the period of 1981-2010.												



Section II: Demand

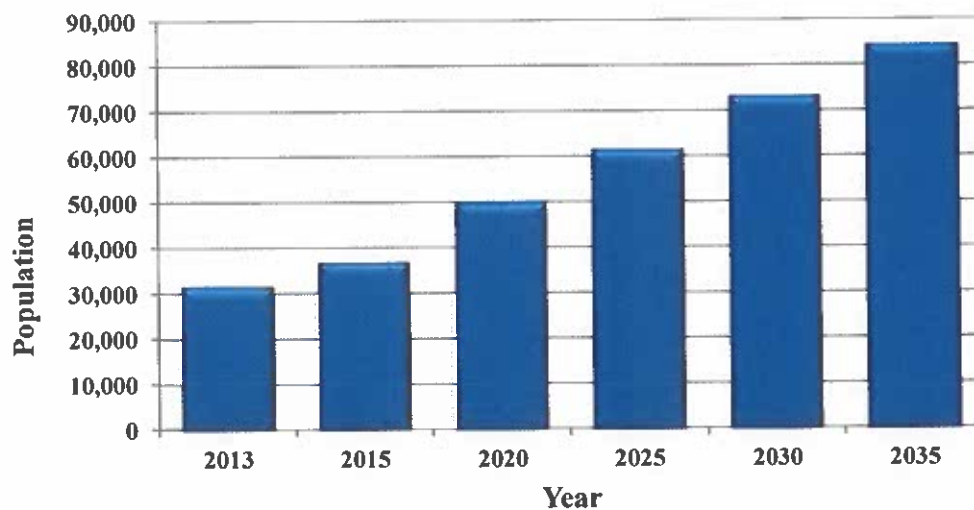
II.1. Service Area and Population

The CLWSC service area covers approximately 240 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 2013 to 2035. The initial population estimate for the year 2013 was based upon existing CLWSC records for number of meters in October 2012 assuming 3 persons per meter. Projections for the years 2015 through 2035 were based upon the 2011 Region L Regional Water Plan (Region L Plan) with the following assumptions:

- The Region L Plan provides population estimates for three areas which make up the CLWSC population projections; CLWSC, Bulverde Area - BexarMet Water District, and Bulverde Area - City of Bulverde;
- Population estimates in the Region L Plan are provided for the years 2010, 2020, 2030, 2040, 2050, and 2060. Estimates for the years 2015, 2025, and 2035 were interpolation based upon the 2020, 2030, and 2040 estimates provided in the Region L Plan; and
- Approximately 1,560 persons within the City of Bulverde area as defined in the Region L Plan are on private water wells (personal comm. Mr. John Hobson, City of Bulverde City Administrator). This number was subtracted from the Region L Plan population projections for the City of Bulverde for the years 2020 and 2030.

Table 2: CLWSC Population Projections (2013 - 2035)

Year	2013	2015	2020	2025	2030	2035
CLWSC Service Area Population Projection	31,851	37,070	50,116	61,759	73,401	84,802
Annual Growth Rate		8.2%	6.6%	4.4%	3.6%	3.0%



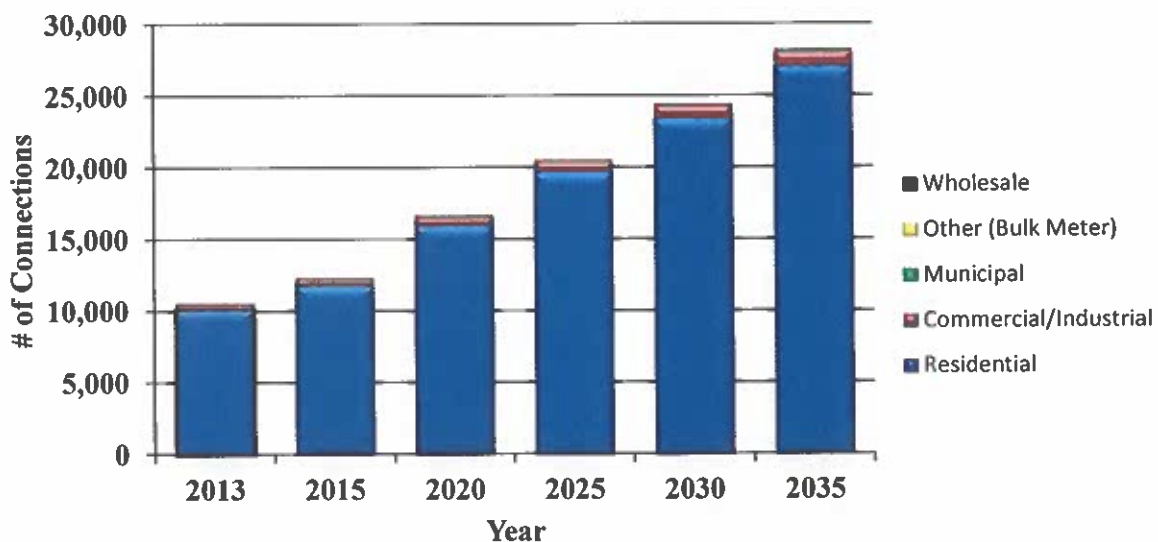
II.2. Current and Future Water Use

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 10,155 as of October 2012. 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 2013 - 2035.

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 and bulk meters will most likely not to increase. Projected number of connections for the CLWSC service area were estimated based upon the population projections listed in Table 2 which follow the Regional L Plan. This estimate was based upon the assumption that there are 3 persons per connection. By the year 2035 it is estimated that CLWSC will serve 28,267 connections.

Table 3: CLWSC Number and Type of Connections (2013 - 2035)

Year	2013	2015	2020	2025	2030	2035
Residential	10,155	11,827	15,993	19,711	23,431	27,071
Commercial/Industrial	398	457	618	762	905	1,046
Municipal	51	59	80	99	117	136
Wholesale	2	2	2	2	2	2
Other (Bulk Meter)	11	12	12	12	12	12
Total	10,617	12,357	16,705	20,586	24,467	28,267



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 the CLWSC for the years 2013-2035 in acre-feet. The projected demand was estimated based upon the information provided in Table 2 and Table 3 representing an average usage of 300 gallons per day (gpd) per connection. It is estimated that CLWSC's projected use will increase from an estimated 4,149 acre-feet per year in the year 2015 to 9,489 acre-feet per year in the year 2035. However, the majority of future connections will be generated from new residential building. Recent studies have shown that indoor water use in single family residences has been declining.

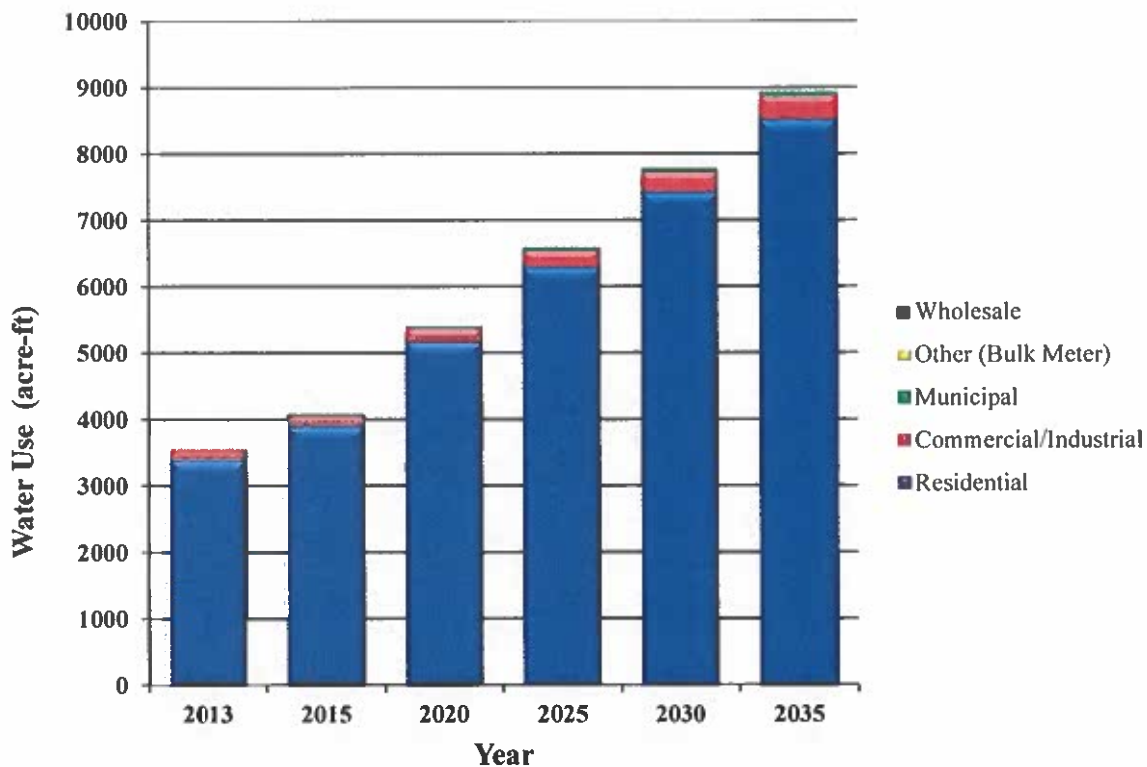
Water use in single-family residences has declined since 1995, and this trend is expected to continue as new technologies enter the market (DeOreo and Mayer, 2012). According to DeOreo and Mayer, the reduction in water use is mostly attributed to low flush toilets and more efficient clothes washers. The California Single-family Water Use Efficiency Study (CSFWUES) conducted by DeOreo in 2007 monitored 780 single family homes that were chosen at random from 10 water agencies throughout California. The CSFWUES study showed indoor water use for a family of three to be 162 gpd. The New Single Family Home Study (NSFHS) conducted by DeOreo monitored 240 homes that were built after January 1, 2001 that utilized more efficient fixtures and 36 high efficiency homes. The NSFHS showed indoor water use for a family of three to be 132 gpd. Based upon this research and assuming the majority of future growth in the CLWSC service area will be residential housing built using more efficient fixtures, CLWSC projects that future indoor water use for residential connections will be approximately 30 gpd less. This reduction in use will reduce the future demand by residential connections in the CLWSC service area. The adjusted residential use and total reduced future use is highlighted in Table 4.

Table 4: CLWSC Projected Water Use by Customer Type in Acre-Feet (2013 - 2035)

Year	2013	2015	2020	2025	2030	2035
Residential	3,413	3,974	5,374	6,624	7,874	9,097
Adjusted Residential*	-	3,918	5,178	6,303	7,428	8,529
Commercial/Industrial	134	154	208	256	304	351
Municipal	17	20	27	33	39	46
Wholesale	1	1	1	1	1	1
Other (Bulk Meter)	4	4	4	4	4	4
Total	3,569	4,153	5,614	6,918	8,222	9,499
Total Reduced Future Use*	-	4,097	5,418	6,597	7,776	8,931

* Assuming 270 gpd per new residential connection





CLWSC's projected total demand however, will be greater than the total water usage by metered customers as shown in Table 5. Table 5 provides the total water demand for the CLWSC for the years 2013 - 2035. Total water demand was estimated using the total water usage shown in Table 4 in addition to unaccounted for water. The estimate for unaccounted water for the year 2013 is based upon CLWSC records from 2012.

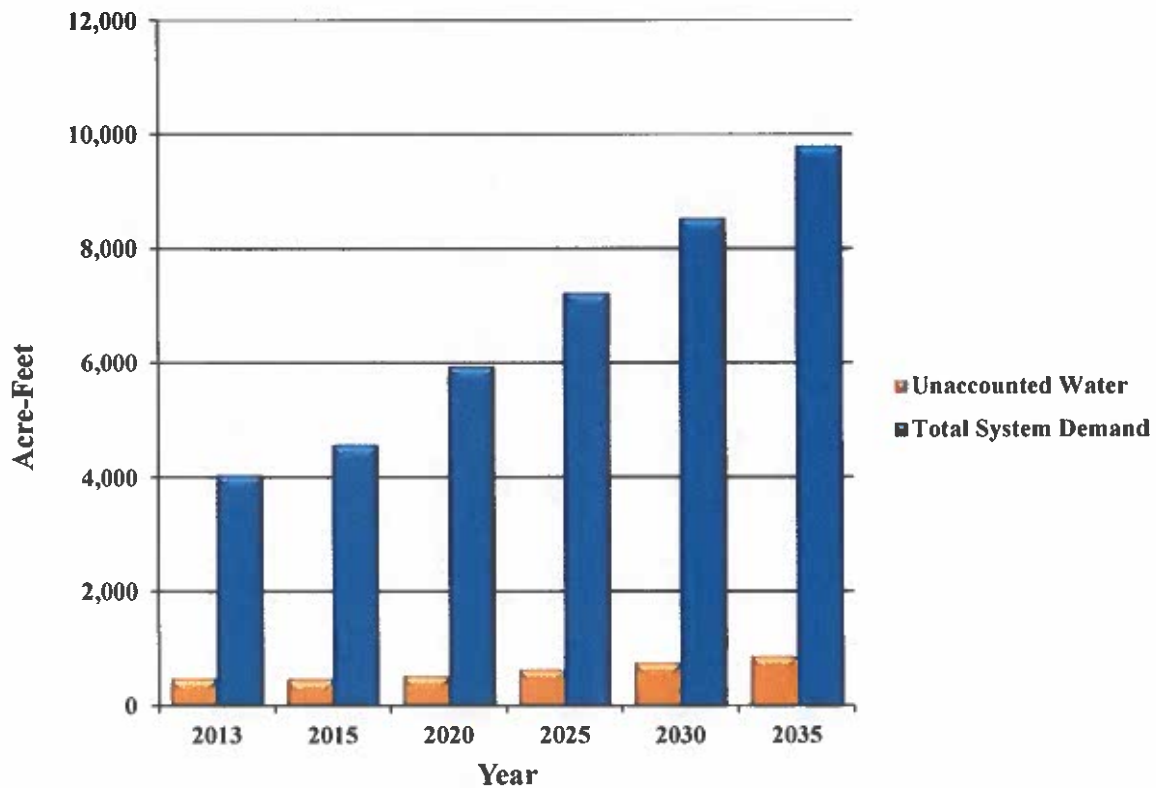
Water that is produced and cannot be accounted for is not billed and defined as unaccounted for water. This includes authorized unmetered uses for fire fighting, water main flushing, and public use. The remaining portion of unaccounted for water is then attributed to meter reading discrepancies, malfunctioning valves, leakage, and theft. CLWSC has gone to great lengths to reduce their unaccounted for water.

Water main flushing required by the Texas Commission on Environmental Quality (TCEQ) and leakage are the major sources of unaccounted for water. Many customer meters were old and not functioning properly leading to large amounts of water being unaccounted for; updating 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 rate of 14% (2012) as estimated by CLWSC staff. CLWSC will continue to replace old/damaged meters and water lines in an effort to achieve a 10% or less unaccounted for water in the future.



Table 5: CLWSC Projected Total Demand in Acre-Feet (2013 - 2035)

	2013	2015	2020	2025	2030	2035
Customer Metered Demand	3,568	4,096	5,418	6,596	7,775	8,930
Unaccounted Water	500	492	542	660	778	893
% Unaccounted Water	14%	12%	10%	10%	10%	10%
Total System Demand	4,068	4,588	5,960	7,256	8,553	9,823



Section III: Supply

III.1. Water Sources

CLWSC provides water to its customers via two sources of water: treated surface water via Canyon Lake and groundwater from the Trinity Aquifer. CLWSC has a total of 6,722 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 two surface water treatments plants (WTP): Triple Peak WTP on the south side of the lake and Canyon Lake Shores WTP on the north side of the lake (Figure 2). Triple Peak WTP and Canyon Lake Shores WTP have an estimated daily treatment capacity of 2.5 Million Gallons per Day (MGD) and 6.0 MGD respectively. The remaining 722 acre-feet/yr of surface water is sourced via the Western Canyon Project for use within the Bulverde Service Area.

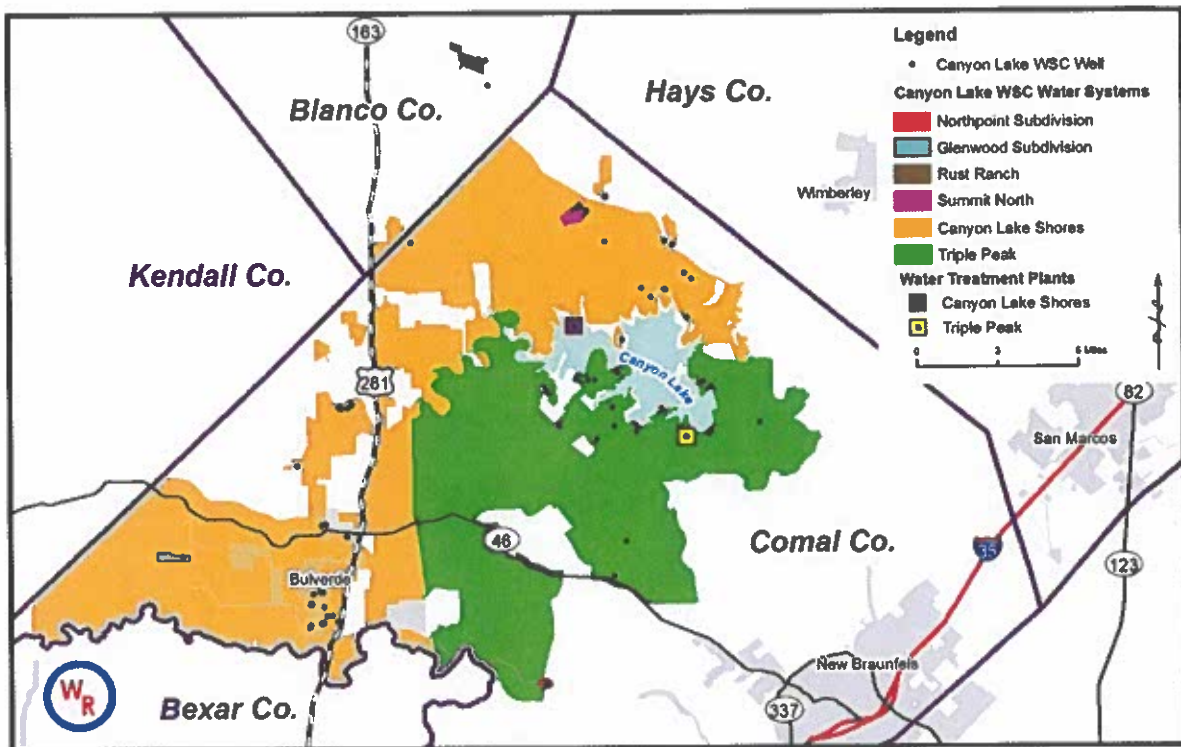


Figure 2: CLWSC water systems

Groundwater from the Trinity Aquifer is also provided via seventy-two (72) water wells (37 active, 31 standby, 2 monitoring, and 2 inactive wells) of which sixty-eight (68) are located within Comal County. As part of this report, a groundwater availability report has been completed and is provided in Appendix A. Appendix B provides a detailed system map showing the location of the water treatment plants, water wells, and distribution lines. The following conclusions were presented in the groundwater availability report:

- CLWSC provides water utility service to a large portion of Comal County via surface water (Canyon Lake) and groundwater (Trinity Aquifer). CLWSC has seventy-two existing 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 Wet Rock (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 twelve pumping tests performed between July 2008 and May 2009, CLWSC was able to prove up an additional 2,030 gpm of additional capacity or 2,183 acre-ft/yr of water. The results from three pump tests performed since June 2009 and the addition of new water systems has increased CLWSC's total well capacity to 8,294 gpm or 8,919 acre-ft/yr. CLWSC operates a total of seventy-two (72) wells with four (4) of the wells being located in Blanco County. The sixty-eight (68) wells within Comal County have a total capacity of 8,201 gpm or 8,891 acre-ft/yr;
- Transmissivities from the aquifer tests ranged from 32 ft²/day up to 125,000 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 15,223 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; and
- An Aquifer Storage and Recovery (ASR) project is in the development stages, and could provide additional capacity during high demand months.

III.2. Raw Surface Water Contracts

CLWSC has a total annual volume of 6,722 acre-feet of surface water contracts with GBRA. Appendix C provides a summary of the contracts. Of the total 6,722 acre-feet/yr of 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 and the Canyon Lake Shores WTP. The remaining 722 acre-feet/yr of surface water is under two contracts from the Western Canyon Project for use in the Bulverde Service Area (Figure 2).

III.3. Projected Supply

The groundwater availability report estimated that CLWSC has approximately 9,295 acre-feet/yr of available groundwater via seventy-two wells. This number was estimated based upon numerous aquifer tests completed throughout the CLWSC service area. The process of estimating the available groundwater supply is detailed in Appendix A. 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 2013 - 2035.

Table 6: CLWSC Projected Total Supply in Acre-Feet (2013 - 2035)

Year	2013	2015	2020	2025	2030	2035
Available Groundwater Supply	8,919	8,919	8,919	8,919	8,919	8,919
Available Surface Water Supply	6,722	6,722	6,722	6,722	6,722	6,722
Total Water Supply	15,641	15,641	15,641	15,641	15,641	15,641
Total System Demand	4,068	4,588	5,960	7,256	8,553	9,823
Excess Capacity	11,573	11,053	9,681	8,385	7,088	5,818

CLWSC is continually planning for future growth beyond the twenty year planning horizon set forth by Comal County. Since the 2009 update, a six well monitoring network has been implemented. A detailed description of the monitoring network is provided within Appendix A. During 2011, CLWSC began the process of researching and developing an ASR project. Recently, CLWSC received approval from the TCEQ Underground Injection Control (UIC) Program to proceed with phase 1 of the project which will be a testing phase to determine the feasibility of using the site as a long term ASR site. A proposed injection and pumping cycle is in the process of being developed and will be implemented for testing in the near future. The project will allow CLWSC to inject excess water during low use months and recover the water during high demand months. If the ASR project proves to be feasible in the Trinity Aquifer, additional sites will be considered to expand the program. 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:

- Carrizo Aquifer;
- Water Reuse; and
- An expanded ASR system

A Carrizo Aquifer project is being considered as an additional source for overall system redundancy, as well as to meet future demand based upon the possibility of annexing new service areas. Water reuse is being implemented at the Bulverde Waste Water Treatment Plant (Bulverde WWTP) for construction projects and irrigation at the River Crossing Golf Course.

III.4. Water Supply Vulnerability

Although groundwater by itself is shown to be sufficient to serve the CLWSC service area, diversity and redundancy in the water supply coupled with the ability to have emergency supply available is crucial to the ongoing stability of the system and sustainability of future growth, the environment and existing recreational areas. CLWSC has utilized Canyon Lake as an alternate water source for providing

a high quality, diverse and redundant source to its customers. In addition to excess supply, 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.

III.5. Consolidation of Public Water Systems

Canyon Lake Water Service Company (CLWSC) provides water service to over 10,000 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.

CLWSC currently operates six Public Water Systems, five of which are in Comal County. The largest of our water systems is the Triple Peak system with 6,042 active connections. The next in size are our Canyon Lake Shores system with 4,834 connections, Glenwood with 93 connections, Northpoint with 29 connections, and Summit North with 16 connections. Triple Peak and Canyon Lake Shores are both served by a combination of Trinity Aquifer groundwater and surface water from one of our two 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 well over 90% of all CLWSC customers. They each, individually, qualify 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 6,000 acre-fee/year of untreated water under contract that it can draw directly from Canyon Lake at either of its two major 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 FM 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, CLWSC's ability to acquire easements and the availability of funding. A reasonable estimate is that this should be completed between 2015 and 2020.

With a limited exception specific to the Glenwood system, discussed below, this Water Availability Report is intended to apply specifically to these two major CLWSC water systems. Unless specifically noted and special provision made via a supplemental addendum to this report approved by the county, all new land development or subdivisions receiving commitments of service from CLWSC will



be required to connect to one of these two major Public Water Systems.

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. CLWSC's only point of delivery for the Western Canyon Project water is into the Glenwood System.

The Glenwood Subdivision includes 93 current service connections, but a total of 120 buildable lots exist (27 vacant). CLWSC has also contracted with the owners of the proposed Park Village subdivision located in the general area of State Hwy 46 and Blanco Rd, to be initially served from the Glenwood system. The maximum service commitment made to Park Village is for 644 Living Unit Equivalents (LUE), which, combined with Glenwood adds up to 764 potential residential connections. The combined supply of 722 acre-ft/yr of GBRA surface water with the combined well capacity from the two Glenwood wells of 30 gpm equates to sufficient production capacity to serve 796 LUE while meeting the TCEQ requirement of 0.6 gpm/connection of production capacity, and more than sufficient capacity on an annual basis given CLWSC average customer consumption rate of less than 0.40 acre-ft/year/connection.

CLWSC's Bulverde Facility Master Plan calls for the eventual interconnection of the Glenwood water system with the Canyon Lake Shores PWS via pipelines along both Amman Road and FM 46. However, the timing of the construction of these pipelines will be driven by the need to serve future development in the intervening tracts of land, and is therefore uncertain. It is therefore CLWSC's intention to provide service to only the Glenwood and Park Village subdivisions from the Glenwood system until such time that construction of an interconnect with Canyon Lake Shores is feasible.

Northpoint and Summit North

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 one well in the Trinity Aquifer. CLWSC has contracted to construct a second well at Northpoint in 2013. CLWSC will provide additional or alternative sources of water as development occurs and funding permits.

The Summit North system is a groundwater only system located near FM 306 along Cranes Mill Rd. The water supply for Summit North is the Trinity Aquifer. There is one active well and two standby wells in the subdivision. Summit North is within a mile of Canyon Lake Shores PWS facilities in the Fischer area, but is not yet interconnected. As future development occurs CLWSC will determine the most economic and beneficial method of interconnecting the two systems to meet future water supply demands.

CLWSC does not consider the water supply currently available at Northpoint and Summit North sufficient to allow the creation of new subdivisions. The water supply is, or will soon be with planned improvements, 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 Summit North 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 them to be interconnected to one of the major PWSs within the 20 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 31,850 people within Comal and Blanco Counties. CLWSC provides exceptional water service to its customers and is in good standing with the TCEQ. Appendix D provides a copy of the latest TCEQ inspection report. All deficiencies have been remedied. In the Summary of Investigation Findings pages in the section identified as Resolution there is an explanation or a photo of CLWSC compliance. In the most recent investigation for SJWTX Summit North System (9-12-12) all items have been corrected. The CLWSC service area has experienced rapid growth over the past decade and State estimates project that this growth will continue into the future. Based upon the Region L Plan, the CLWSC's population is expected to increase to 84,802 people by the year 2035. Future growth in connections will be proportional to population increases with connection count growing from the current number of connections (10,600 connections) up to an estimated 28,267 connections in the year 2035. 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 4,068 acre-feet/yr in 2013 to 9,823 acre-feet/yr in 2035. The total demand includes projected water usage plus unaccounted for water. Currently, CLWSC has approximately 14% unaccounted for water. This percentage has been dramatically 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 6,722 acre-feet/yr of surface water rights and an estimated groundwater supply of 8,919 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, five of which are in Comal County. The largest is the Triple Peak system with 6,042 active connections. The next in size is the Canyon Lake Shores system with 4,834 connections, Glenwood with 93 connections, Northpoint with 29 connections, and Summit North with 16 connections. Triple Peak and Canyon Lake Shores are both served by a combination of Trinity Aquifer groundwater and surface water from one of our two surface water treatment plants located adjacent to Canyon Lake. The North Point and Summit North 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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Wet Rock Groundwater Services, LLC, 2008, An Evaluation of the Trinity Aquifer Within Kendall County and Analysis of the Trinity (Hill Country) GAM: 47p.

Wet Rock Groundwater Services, LLC, 2009, Report of Findings WRGS 09-005: Groundwater Availability Report: Canyon Lake Water Service Company: Appendix A





Appendix A

Groundwater Availability Report



REPORT OF FINDINGS

WRGS 12-007

Groundwater Availability Report

for

Canyon Lake Water Service Company
PO Box 1742
Canyon Lake, TX 78133

Comal County, Texas
October 2012

WRGS Project No. 042-003-12



Wet Rock Groundwater Services, L.L.C.

Groundwater Specialists

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Austin, Texas 78734

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TBPG Firm No: 50038

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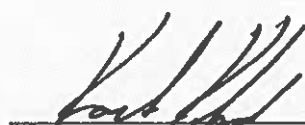


A handwritten signature in cursive script, appearing to read "Thomas A. Hodge", written over a horizontal line.

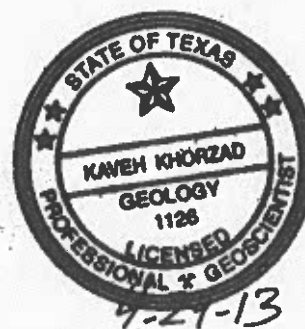
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SJWTX, Inc. dba. Canyon Lake Water Service Company

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Groundwater Specialists

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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 groundwater availability and their capacity to supply their groundwater needs for the next twenty years.

I.1. Service Area

Canyon Lake Water Service Company (CLWSC) is a state-regulated investor owned water utility providing service to approximately 31,851 people through 10,617 connections in the Canyon Lake region of Comal County and southern Blanco County (Figure 1). On May 31, 2006, the utility became part of the SJW Corp. / San Jose Water Company family via the purchase of Canyon Lake Water Supply Corporation by SJWTX, Inc., a subsidiary of SJW Corp.

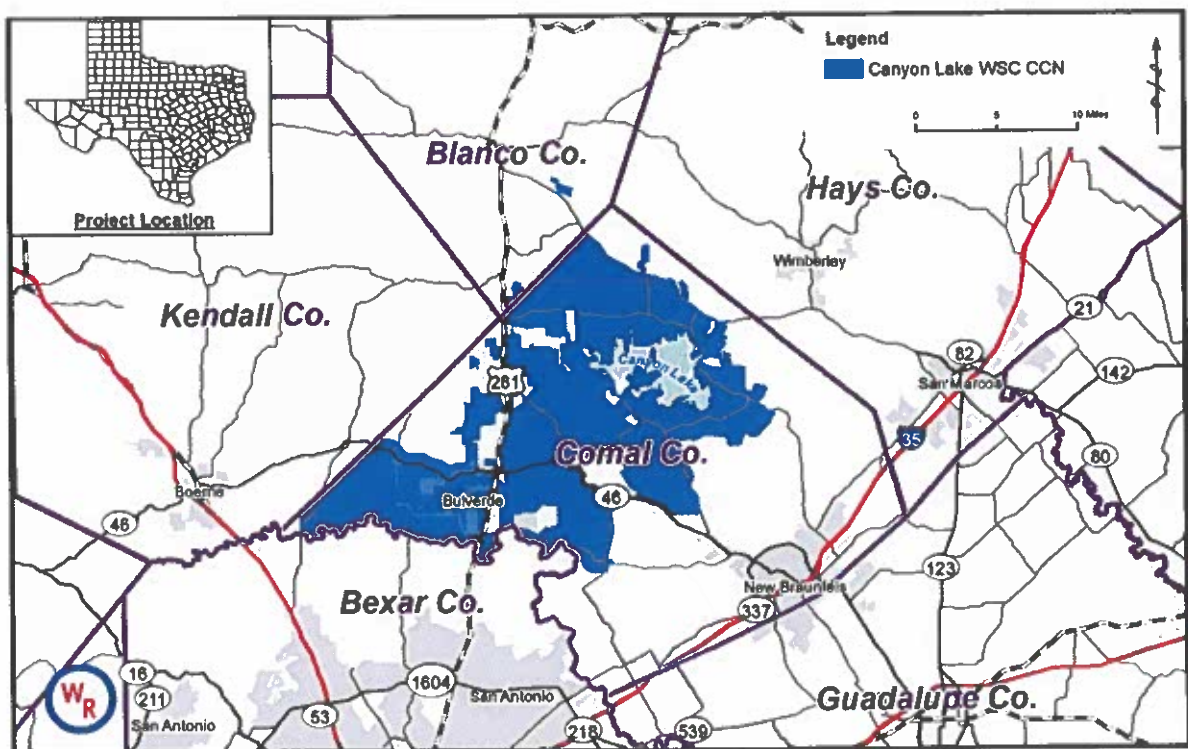


Figure 1: Location map

CLWSC surrounds Canyon Lake located on the Guadalupe River in the Texas Hill Country. Canyon Lake has a surface area of 8,230 acres and 80 miles of shoreline. The CLWSC service area includes approximately 240 square miles within Comal County and southern Blanco County. The county is ranked by the U.S. Census Bureau as the 47th fastest growing county in the United States for the period of 2010-2011. The Canyon Lake community continues to attract new commuter, retired, and weekend residents. The growth is responsible for new building of homes, schools, public parks, and a variety of businesses and services industries.



I.2. CLWSC - Groundwater Infrastructure

CLWSC provides water utility service from surface water (Canyon Lake) and groundwater (Trinity Aquifer) sources. Specifically, groundwater is provided from the Middle Trinity Aquifer via seventy-two (72) wells of which sixty-eight (68) wells are located throughout Comal and Blanco Counties (Figure 2). In the past two years, CLWSC has acquired six nearby public water systems (PWS) which added twenty-four (24) additional wells to the water system network.

Figure 2 provides a well location map and Appendix A provides a well detail summary of CLWSC's wells. Each well shown on the location map is labeled with a map identification number corresponding to the map id field in Appendix A. The majority of CLWSC's wells are completed within the Middle Trinity Aquifer producing largely from the Lower Glen Rose Formation and the Cow Creek Formation. A few of the wells are completed within both the Middle Trinity and the Lower Trinity Aquifers. The wells range in depth, diameter and capacity dependent upon where they are located and when they were completed.



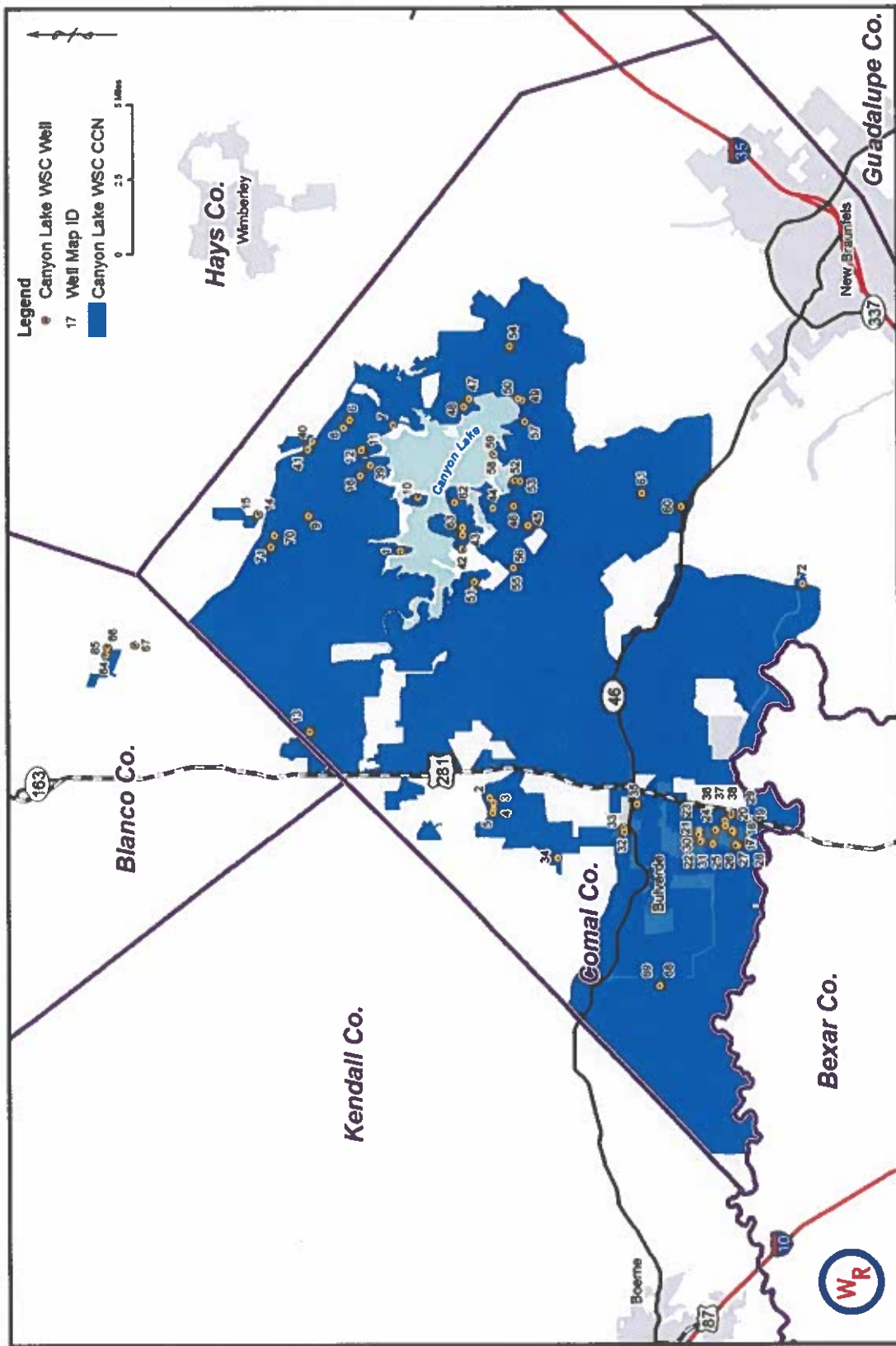


Figure 2: CLWSC well inventory

Figure 3 provides a map that shows the six separate water systems that make up CLWSC. The wells are divided into two main water systems that are not interconnected; 1) Canyon Lake Shores (shown in gold has 4,834 connections), located on the north side of Canyon Lake; and 2) Triple Peak (shown in green has 6,042 connections), located on the south side of the lake. These two water systems correspond to the two Water Treatment Plants (WTP) which provide surface water to these systems (Figure 3). Additional water systems served by wells which are not interconnected are the Rust Ranch Water System (85 connections), the Glenwood Subdivision (93 connections), Northpoint Subdivision (29 connections), and Summit North (16 connections).

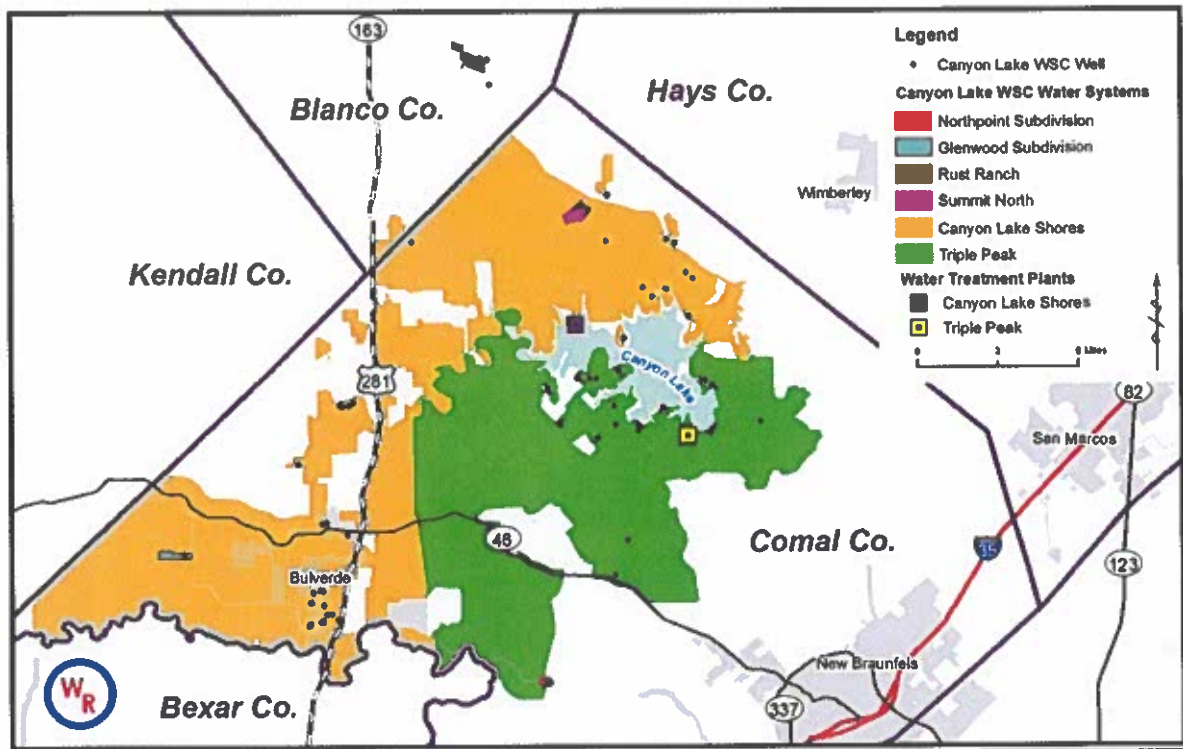


Figure 3: Canyon Lake WSC water systems

Section II: Hydrogeology

II.1. Geology of the CLWSC Area

Figure 4 provides a geologic map of the CLWSC area. Within the Hill Country region, there are three structural features that affect groundwater properties: the San Marcos Arch, the Llano Uplift and the Balcones Fault Zone. The San Marcos Arch is a broad fold in the rock layers that exists within Hays County near San Marcos. This fold, or anticline, is known to cause thinning formations and restriction in groundwater flow. The Llano Uplift is a large plutonic dome, composed of primarily granitic rock and different metamorphic rocks, which serve as the source comprising some of the sands of the Hosston and Hensell Members of the Travis Peak Formation (Ashworth, 1983). These sediments provide the source of elevated radionuclide concentrations found within some wells in Gillespie and Kerr Counties. While the San Marcos Arch and the Llano Uplift are major structures that affect the Trinity Aquifer, they are located a great distance from Comal County and play a smaller role in the hydrogeology of the area.

The Balcones Fault Zone is a series of normal en echelon faults that trend in a general northeast/southwest direction extending from Williamson County in the northeast to Kinney County in the west. Faulting associated with the Balcones Fault Zone has caused some rock formations to be upthrown against others causing both barriers to flow and conduits for water to pass through. The faulting in the area is the central controlling factor determining the amount and quality of the groundwater that a given well will produce.

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 4). Much of the area at the surface geologic contact of the Upper Glen Rose Formation and the Edwards Formation is marked by fracturing and faulting.



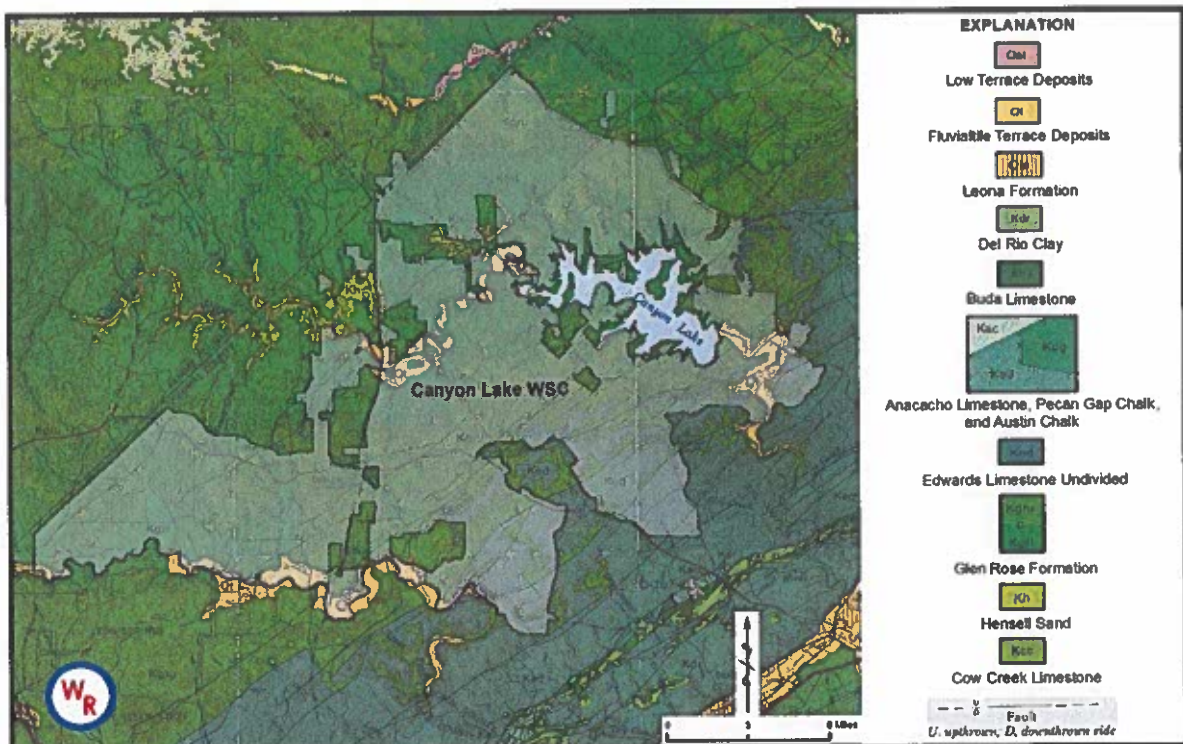


Figure 4: Geology map

II.2. Hydrogeology of the CLWSC Area

The two major aquifers located within Comal County are the Trinity and Edwards Aquifers (Figure 5). All of the geologic units associated with the Edwards and Trinity Aquifers were deposited during the Cretaceous period. The formations comprising the Trinity and Edwards Aquifers in the area dip or slant towards the southeast at approximately 100 ft per mile and also become thicker in that direction.

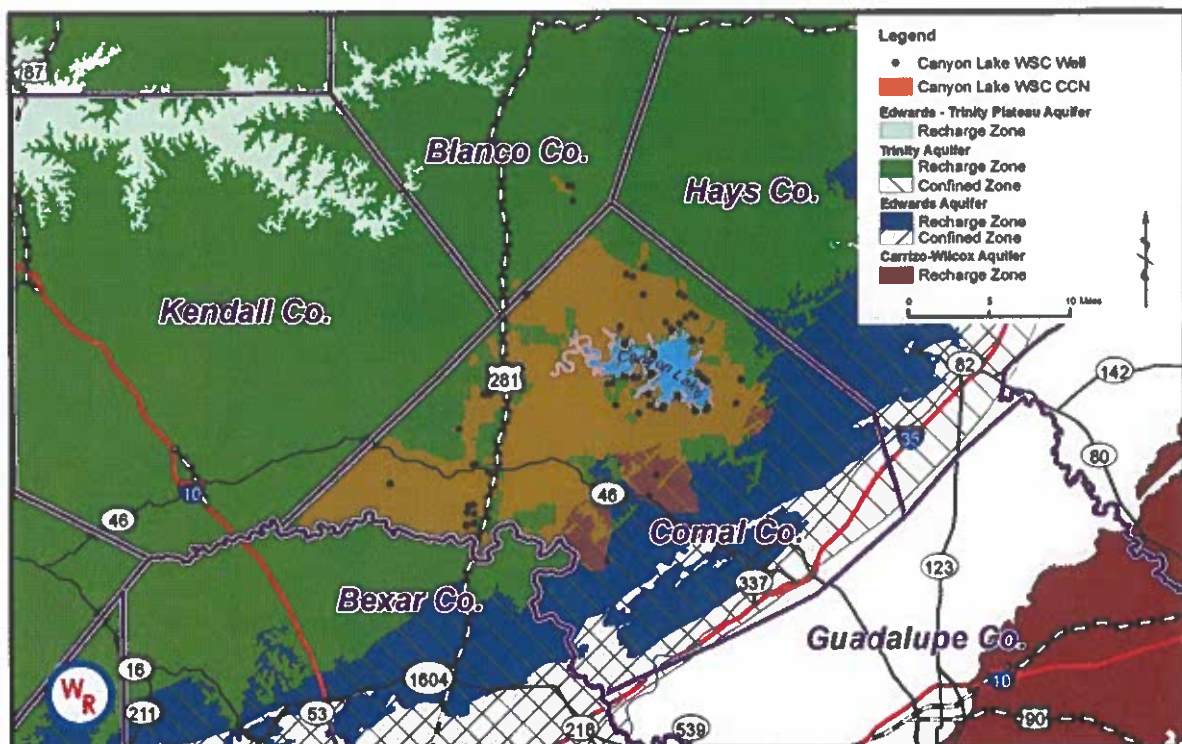


Figure 5: Aquifer map

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. Figure 5 shows the location of the Trinity Aquifer with respect to other major aquifers in the area including the Edwards Aquifer and the location of the CLWSC Trinity wells discussed in this report. The solid green portion reflects the recharge or unconfined zone of the Trinity Aquifer where water recharges the aquifer. The green diagonal hatched region reflects the artesian or confined zone of the aquifer where the formations that make up the Trinity Aquifer are located beneath the ground surface. Wells located within the confined portion of the aquifer generally have relatively more stable water levels and produce at higher rates.

Figure 6 provides a stratigraphic column detailing the geologic and hydrogeologic units within Comal County. The Trinity Aquifer is divided into three sections 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. Above the Lower Trinity Aquifer is a confining unit separating the Lower Trinity Aquifer from the Middle Trinity Aquifer called the Hammett Shale, also known as the Pine Island Shale. The Middle Trinity Aquifer is composed of from oldest to youngest, the Cow Creek Limestone, the Bexar Shale, and the Hensell Sand Members of the Travis Peak Formation and the Lower Glen Rose Formation. Above the Middle Trinity Aquifer is the Upper Trinity Aquifer composed of the Upper Glen Rose Formation. The Edwards Aquifer resides above the Upper Trinity Aquifer.

The Upper Trinity Aquifer sometimes produces poor quality water because of the presence of gypsum and anhydrite layers within the Upper Glen Rose Formation. Within Comal County, most of the Upper Trinity Aquifer is unsaturated and produces little water. The Middle Trinity Aquifer also contains

the Glen Rose Limestone and is separated from the Upper Trinity Aquifer and Upper Glen Rose Formation by the presence of a fossil marker bed called the Corbula Bed. The Corbula bed is a heavily fossiliferous layer that contains the small fossil clam called *Corbula martinae*. Typically, the highest yielding portion of the Trinity Aquifer is the Middle Trinity Aquifer and specifically, the Lower Glen Rose Formation and the Cow Creek Limestone Member of the Travis Peak Formation. High yield wells within the Middle Trinity Aquifer are associated with heavily fractured portions of the aquifer where conduits have formed to allow for increased water flow. In some areas, the Lower Glen Rose Formation contains the presence of a reef deposit which greatly increases the yield of a well due to its high permeability.

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, although regionally, the Middle Trinity Aquifer produces higher yielding wells with better quality water as compared to the lower Trinity Aquifer. The greater contact time of groundwater flowing within the Lower Trinity Aquifer results in typically poorer quality water.

Regionally, within the Middle Trinity Aquifer water flows from the recharge zone under gradient south and southeast towards the confined zone generally following the topography. The groundwater flows from areas of higher potential head to lower and can vary considerably on a localized scale dependent upon fracture orientation and connectivity.

The Middle Trinity Aquifer dips towards the southeast becoming thicker towards the confined zone of the aquifer where it is under pressure. Generally, the further downdip one travels, the larger the water column will be within the well and the more stable the water level. Water levels within the Middle Trinity Aquifer especially those of shallow wells within the recharge zone can vary seasonally up to tens of feet with a response to drought or a precipitation event.




Geologic Units					Hydrologic Units	Approximate Range in Thickness (feet)
ERA	System	Group	Formation	Member or Unit		
Cenozoic	Quaternary	Pleistocene to recent floodplain, terrace and fan alluvial deposits			Very Local Alluvial Aquifers	0-50
Mesozoic	Cretaceous	Fredricksburg	Edwards Formation	Segovia Member	Edwards Aquifer	170 - 380
				Comanche Peak Limestone		150 - 300
				Walnut Clay		
		Trinity Group	Glen Rose Formation	Upper Glen Rose Formation	Upper Trinity Aquifer	0 - 515
				Lower Glen Rose Formation	Middle Trinity Aquifer	0 - 400
			Travis Peak Formation	Hensell Sand Member		10 - 300
				Bexar Shale Member		
				Cow Creek Limestone Member		0 - 100
				Hammett Shale Member	0 - 60	
				Silgo Limestone Member	Lower Trinity Aquifer	0-120
		Hosston Sand Member	330-350			
Pre-Cretaceous Rocks						
Scale: none		GEOLOGIC AND HYDROGEOLOGIC UNITS OF COMAL COUNTY				
DRAWN BY: BB DATE: 9-12		CANYON LAKE WSC COMAL COUNTY, TEXAS			WET ROCK GROUNDWATER SERVICES, L.L.C. GROUNDWATER SPECIALISTS	
CHECKED BY: KK DATE: 9-12					311 RR 620 S., Suite 103 Austin, Texas 78734	
PROJECT NO: 042-003-12					PH: (512) 773-3226 www.wetrockgs.com	
Sources: TWDB Numbered Reports 60 (Reeves , 1967), 273 (Ashworth 1983) and 339 (Bluntzer, 1992)						

Figure 6: Geologic and hydrogeologic units of Comal County



II.3. Water Quality of the Trinity Aquifer

The water quality of a well completed within the Middle Trinity Aquifer depends upon several factors which include the degree of fracturing; the amount of time the groundwater is in contact with the rock it is flowing through and the minerals that compose the rock. For example, groundwater that flows through gypsum and anhydrite beds which are composed of calcium sulfate (CaSO_4) will typically contain elevated levels of sulfate. In addition, groundwater that has traveled a longer distance and at deeper depths will also likely contain a higher Total Dissolved Solids (TDS) content than groundwater that has been in contact with the same rock for a lesser amount of time. Wells that are producing from zones containing gypsum and anhydrite, or wells located far down dip in the aquifer are more likely to contain poor quality water.

Within the Trinity Aquifer the main constituent of concern is sulfate. Trinity groundwater that does not meet drinking water requirements does so typically because of elevated sulfate concentrations which causes elevated TDS. The sulfate in the groundwater is mainly sourced from the gypsum and anhydrite minerals found within parts of the formations that make up the Trinity Aquifer. 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 drinking water limit for sulfate and TDS is 300 mg/L and 1,000 mg/L respectively.

Iron is another constituent that can be present at elevated levels in the Middle Trinity Aquifer. Although, only a nuisance and not a health hazard, elevated iron concentrations can stain clothing and plumbing fixtures in addition to causing an unpleasant taste. Iron can be removed easily in some cases by sequestration or in higher concentrations by the use of sand filters.

Table 1 provides a water quality summary of CLWSC's active wells. The water quality of CLWSC's groundwater meets the Texas Commission on Environmental Quality's (TCEQ) drinking water standards.

All wells except the Triple Peak Well have TDS concentrations less than 1,000 mg/L. The Triple Peak Well also exceeded the TCEQ Secondary Maximum Contaminant Level (SMCL) for sulfate (300 mg/L). In addition, some wells also exceed the SMCL for fluoride. The Triple Peak well and additional wells exceeding the SMCL for fluoride are not included in Table 1 because these wells are not in use and have been taken offline.



Table 1: Water quality summary

Well Name	State Well No.	Water System	TWDB Aquifer	Depth (ft)	Date	Si	Ca	Mg	Na	CO ₃	HCO ₃	SO ₄	Cl	F	N	pH	TDS	Alk	Hardness	% Na	SAR
PCL ¹ , SCL ²																					
Canyon Lake Shores Well No. 1	6806911	Canyon Lake Shores	Trinity Group	396	4/19/1985		80	23	12	0	324.61	36	17	0.6	3.14	8	331	266	294	8	0.3
Cypress Springs Well No. 1	6813203	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995		61	50	231	0	341.7	190	268	2.4	0.04	7.8	970	280	357	58	5.31
Cypress Springs Well No. 2	6813204	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995		60	51	230	0	339.26	192	269	2.4	0.13	7.9	971	278	359	58	5.28
Cypress Springs Well No. 3	6813207	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995		69	52	203	0	322.17	213	247	2	0.04	7.7	944	264	385	53	4.49
Cypress Springs Well No. 4	6813205	Canyon Lake Shores	Hensell & Cow Creek	390	11/15/1995		68	55	216	0	338.04	206	263	2.2	0.04	7.7	976	277	395	54	4.72
Hillcrest Well	6807406	Canyon Lake Shores	L. Glen Rose	575	8/21/1995 10/24/2003	14.1	62	34	12	0	331.93	26	14	1.1	0.75	8	313	272	294	8	0.3
Hancock Well	6807404	Canyon Lake Shores	L. Glen Rose	250	1/1/1980		77	29	7	0	351.46	15	12	0.4	5.18	8.1	318	288	311	4	0.17
Tamarack Well	6807402	Canyon Lake Shores	L. Glen Rose	425	6/26/1979 6/30/1980 9/20/1976		65	31	15	0	329.49	25	14	0.6	0.04	7.9	312	270	289	10	0.38
FM 32	6807409	Canyon Lake Shores	L. Glen Rose	525	5/14/1997		54	34	24	0	324.61	44	28	1	0.4	7.6	345	266	274	15	0.63
Stallion Spring RD Woods at Spring Branch	6807408	Canyon Lake Shores	L. Glen Rose	485	8/21/1995		58	36	21	0	338.04	38	19	1.3	0.84	8	340	277	292	13	0.53
6813209		Canyon Lake Shores	Glen Rose	487	3/29/2012			0.023	N/A	N/A	N/A	114	116	2.31	<0.005	7.5	660	N/A	N/A		

¹ PCL = Primary Contaminant Level; ² SCL = Secondary Contaminant Level

Well Name	State Well No.	Water System	TWDB Aquifer	Depth (ft)	Date	Si	Ca	Mg	Na	CO3	HCO3	SO4	Cl	F	N	pH	TDS	Alk	Hardness	% Na	SAR
PCL 1, SCL 2																					
Astro Hills Well No. 1	6806907	Triple Peak	U. Glen Rose	380	6/28/1994	11	74	26	7.2	0	318.51	17	16	0.32	5.18	7.28	315	261	292	5	0.18
Canyon Lake Forest Well No. 1	6814306	Triple Peak	U. Glen Rose	476	4/2/1981		68	26	8	4.8	290.44	22	13	0.7	0.04	8.5	285	246	276	5	0.21
					7/12/1963		65	32	7	0	309.97	35	13	1	0.5	7.4	305	254	293	4	0.18
					7/31/1972		53	31	8	0	274.58	30	13	0.7	0.4	8.1	271	225	259	6	0.22
					10/15/1966		62	31	9	0	300.21	34	11	0.8	0.4	7.6	295	246	282	6	0.23
Canyon Lake Forest Well No. 2	6814311	Triple Peak	Glen Rose, Hensell & Cow Creek	520	10/24/2003	11.9	60.1	26.7	8.72	0	290.44	17.7	13.7	0.64	0.27	7.08	286	238	261	6	0.24
					8/21/1986		92	52	10	0	358.78	162	12	2	0.09	8.2	506	294	443	4	0.21
Village West Well No. 2	6815114	Triple Peak	L. Glen Rose	700	9/9/1980		105	9	12	0	317.29	25	25	0.2	8.15	8	340	260	299	8	0.3
Lakeview Park Well No. 1	6814206	Triple Peak	L. Glen Rose	340	2/10/1977		77	17	8	0	289.22	17	15	0.4	5.58	7.7	282	237	261	6	0.21
					4/1/1981		79	17	8	4.8	283.12	17	15	0.3	5.09	8.5	285	240	266	6	0.21
					4/11/1976		80	15	8	0	289.22	20	15	0.4	4.9	7.9	285	237	261	6	0.22
					4/18/1985		78	17	8	0	297.76	19	14	0.3	4.3	8.1	287	244	264	6	0.21
The Oaks Well No. 2	6815109	Triple Peak	U. Glen Rose	345	7/30/1974		78	17	8	0	283.12	19	18	0.4	5.5	8.3	285	232	264	6	0.21
					7/31/1972		86	12	8	0	288	19	15	0.4	5	8.3	287	236	264	6	0.21
					8/7/1965		61	43	6	0	340.48	44	12	0.7	3	7.9	337	279	329	3	0.14
Netherhill Well	6815207	Triple Peak	U. Glen Rose	430	6/27/1994	12	67	42	5.9	0	327.05	90	12	1.64	0.04	7.01	400	268	344	3	0.14
					2/10/1977		78	17	6	0	295.32	14	11	0.3	4.12	7.7	275	242	264	4	0.16
Rolling Hills Well No. 1	6814204	Triple Peak	L. Glen Rose	475	4/1/1981		85	14	6	7.2	281.9	13	13	0.3	4.29	8.5	281	243	269	4	0.16
					4/11/1978		82	15	6	0	301.43	16	12	0.4	4.2	7.9	283	247	266	4	0.16
Village West Well No. 1	6815113	Triple Peak	L. Glen Rose	180	7/30/1974		77	19	6	0	292.88	15	15	0.4	3.9		280	240	270	4	0.16
					1/15/1975		96	13	8	0	312.41	13	21	0.2	5.3	8.1	310	256	292	5	0.2
					4/25/1977		100	14	7	0	353.9	13	14	0.2	0.66	7.5	322	290	307	4	0.17
Village West Well No. 2	6815114	Triple Peak	L. Glen Rose	180	9/14/1976		105	11	11	0	335.6	18	21	0.2	5.3	7.5	336	275	307	7	0.27
					11/4/1998	12.72	109	14.5	22.9	0	351.46	21	38.5	0.12	9.12	6.79	402	288	331	13	0.55
					9/9/1980		105	9	12	0	317.29	25	25	0.2	8.15	8	340	260	299	8	0.3



II.4. 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 1998 and 2008, the Edwards BFZ Aquifer averaged a total pumpage of 13,007 acre-ft/yr while the Trinity Aquifer averaged 3,033 acre-ft/yr (Table 1). 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. Carrizo-Wilcox Aquifer water is transported into the county for municipal use by other water utility companies.

Table 2: Historical groundwater pumpage in Comal County

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1998	Trinity	3,305	0	0	11	0	227	3,543
1998	Edwards (BFZ)	4,871	6,031	0	14	2,224	1	13,141
1999	Trinity	3,940	0	0	9	0	246	4,195
1999	Edwards (BFZ)	5,806	7,467	0	13	7,911	1	21,198
2000	Trinity	2,951	0	0	13	0	237	3,201
2000	Edwards (BFZ)	4,348	5,942	0	17	2,224	1	12,532
2001	Trinity	2,630	0	0	14	0	237	2,881
2001	Edwards (BFZ)	4,066	1,753	0	18	2,224	1	8,062
2002	Trinity	2,575	0	0	21	0	225	2,821
2002	Edwards (BFZ)	4,881	1,940	0	25	2,224	1	9,071
2003	Trinity	2,337	0	0	45	0	82	2,464
2003	Edwards (BFZ)	4,087	1,779	0	56	2,224	0	8,146
2004	Trinity	2,170	24	0	61	0	87	2,342
2004	Edwards (BFZ)	4,304	1,468	0	92	6,609	66	12,539
2004	Carrizo-Wilcox*	3,182	0	0	0	0	0	3,182
2004	Trinity	5	0	0	0	0	0	5
2005	Trinity	2,134	23	0	204	0	42	2,403
2005	Edwards (BFZ)	5,980	478	0	306	6,609	32	13,405
2005	Carrizo-Wilcox*	3,005	0	0	0	0	0	3,005
2005	Other	6	0	0	0	0	0	6
2006	Trinity	2,330	0	0	294	0	39	2,663
2006	Edwards (BFZ)	6,499	537	0	441	6,609	30	14,116
2006	Carrizo-Wilcox*	4,223	0	0	0	0	0	4,223
2006	Other	7	0	0	0	0	0	7
2007	Trinity	2,477	0	0	101	0	47	2,625
2007	Edwards (BFZ)	9,910	2,181	0	151	6,609	36	18,887
2007	Carrizo-Wilcox*	3,617	0	0	0	0	0	3,617
2007	Other	6	0	0	0	0	0	6
2008	Trinity	4,175	0	0	0	0	46	4,221
2008	Edwards (BFZ)	4,445	1,620	0	0	5,879	34	11,978
2008	Other	7	0	0	0	0	0	7

Source: Texas Water Development Board - Historical Groundwater Pumpage Estimates

Units: Acre-Feet

* Carrizo-Wilcox groundwater is transported into the county by other water utility companies



II.5. Recharge

Recharge to the Trinity Aquifer is primarily through precipitation occurring on the aquifer where the rock units are located at the surface and through stream and lake losses. The karst nature of the rock units that compose the Trinity Aquifer allows for very rapid recharge to the aquifer. In this respect, the Trinity Aquifer is similar to the Edwards Aquifer in that recharge from large precipitation events can refill the aquifer very quickly. In Comal County, recharge to the Trinity Aquifer occurs in the northwestern half of the county where the Upper Glen Rose and Lower Glen Rose Formations are located at the surface (Figure 7).

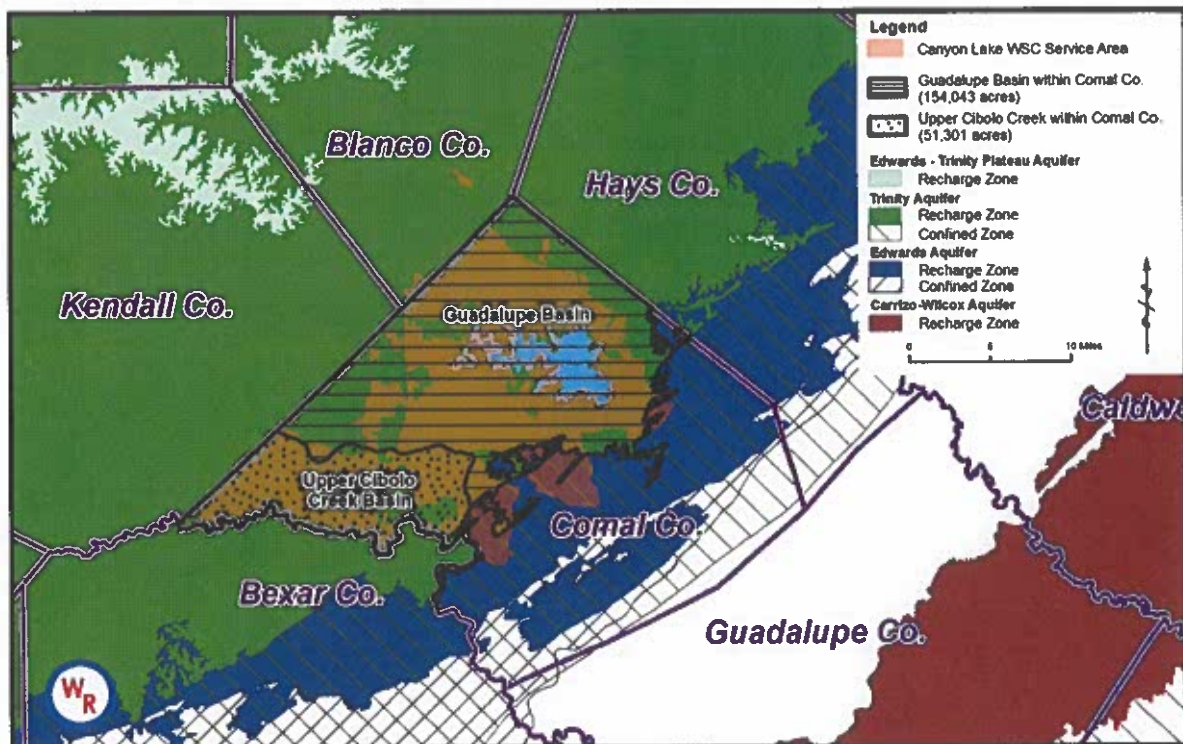


Figure 7: Trinity Aquifer Recharge - Comal County

Recharge is the most important factor involved in determining what the effects of pumpage will be on the aquifer and for determining a sustainable yield of production. Almost all of the estimates of recharge to the Trinity Aquifer have been based upon 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 all of the streams in the Texas Hill Country are gaining streams receiving flow from the aquifer. In areas of low pumpage (Steady State conditions), the amount of baseflow gained by the stream through discharge of the aquifer should therefore approximately equal the amount of recharge (Ashworth, 1973). Recharge estimates to the Trinity Aquifer by other studies 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 of the Guadalupe River between the Comfort gage and Spring Branch gage between the years 1940 and 1960. Mace and others (2000) used a similar approach to Ashworth's (1983). They employed an automated digital hydrograph-separation technique from Nathan and McMahon (1990) and Arnold and others (1995) to estimate a recharge rate of 6.6 percent of mean annual precipitation. They later reduced this recharge rate to 4 percent to be able to

calibrate the Trinity (Hill Country) GAM.

Most recently, Wet Rock Groundwater Services, LLC (WRGS, 2008) conducting a study for the Cow Creek Groundwater Conservation District (CCGCD) estimated average recharge to the Trinity Aquifer in the Guadalupe Basin at 9.45 percent of mean annual precipitation between the years 1940 to 2007. WRGS employed a hydrograph-separation technique to come up with their recharge estimates. Ockerman (USGS: Scientific Investigations Report 2007-5202, 2007) developed a watershed model to simulate streamflow and estimate recharge in the Upper Cibolo Creek Watershed between the years 1992 and 2004. Ockerman (2007) estimated that approximately 79,800 acre-ft/yr (~15% of mean annual precipitation) of recharge was attributed to the Upper Cibolo Creek Watershed. Of the 79,800 acre-ft/yr, approximately 61,500 acre-ft/yr (10.15% of mean annual precipitation) was recharge to the Trinity Aquifer. Figure 7 provides a map showing the Guadalupe Basin and the Upper Cibolo Creek Basin within Comal County.

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 3). 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 3).



Table 3: 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
<p>1 From USGS Scientific Investigations Report: 2007-5202</p> <p>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"</p> <p>3 From USGS Scientific Investigations Report: 2007-5202</p> <p>4 Basin Area within Trinity Aquifer Recharge Zone in Comal County = 154,043 acres</p> <p>5 Basin Area within Trinity Aquifer Recharge Zone in Comal County = 51,301 acres</p>						

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. For example, many small precipitation events in which the water evaporates or is transpired through plant life before reaching the aquifer will produce less recharge than moderate precipitation events even though both scenarios may still have the same total annual precipitation amount. In addition, a few very large precipitation events in which the water flows too fast within rivers and streams to recharge into the aquifer or overflows onto the land surface will also produce less recharge than moderate precipitation events. If precipitation occurs when the ground is over saturated or very dry, water will overflow or become easily evaporated causing less recharge.



Section III: CLWSC – Groundwater Overview

III.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 latitude and longitude of each well and acquiring available well construction information. After cataloging the wells, pumping tests were conducted to determine the maximum capacity of some wells in various locations throughout the water system. The results of twelve pump tests performed between July 2008 and May 2009 were provided in the previous groundwater availability report (WRGS 09-005, 2009). Three pump tests have been conducted between June 2009 and February 2012 on the Scenic Well, Hancock Well, and the Woods at Spring Branch Well. Figure 8 provides a location map and summary of the wells tested with their maximum capacity as determined by the TCEQ based upon existing use of the well and the maximum capacity determined by WRGS via the pumping tests. Appendix B provides the aquifer test analysis of each of the three wells that were tested since the last groundwater availability study was submitted in 2009. In many cases the maximum capacity of the wells determined after pumping tests were conducted was much higher, in large part because it was unknown what each of these wells was capable of producing. Most of CLWSC's wells were 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 making the well unable to produce at larger rates due to a limited pump size.

Based upon the twelve pumping tests performed between July 2008 and May 2009, CLWSC was able to prove up an additional 2,030 gpm of additional capacity or 2,183 acre-ft/yr of water. The results from three pump tests performed since June 2009 and the addition of new water systems has increased CLWSC's total well capacity to 8,294 gpm or 8,919 acre-ft/yr. CLWSC operates a total of seventy-two (72) wells with four (4) of the wells being located in Blanco County. The sixty-eight (68) wells within Comal County have a total capacity of 8,201 gpm or 8,891 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. Capacity ratings were not available for four wells which were not included in the calculations (Appendix A).

Transmissivities calculated from the aquifer tests ranged from 32 ft²/day up to 125,000 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 15,223 ft²/day (Appendix A). Based upon the well testing and analysis of CLWSC's wells, it is evident that most all of the wells in the CLWSC system produce substantial amounts of water on a consistent basis at sustainable rates.



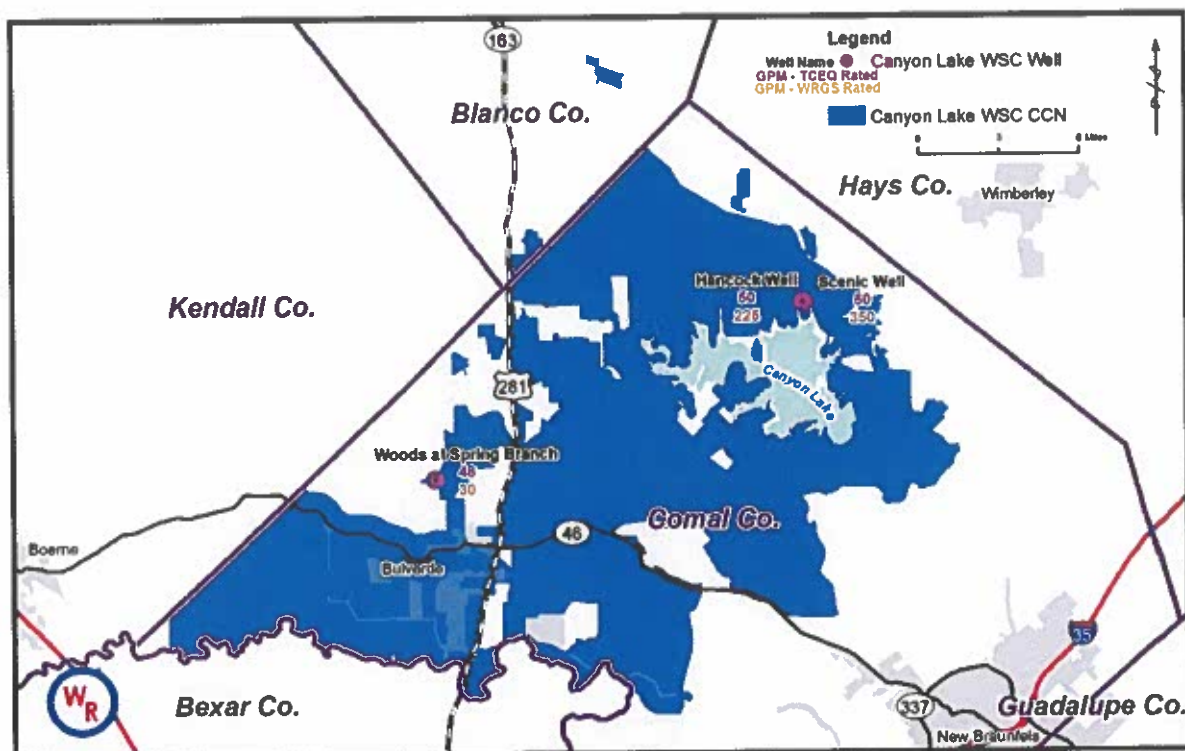


Figure 8: Recent aquifer tests

The pumping tests that were conducted 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. To meet the needs for the next twenty years, CLWSC will develop additional water via new wells completed within the Trinity Aquifer and replacement of existing wells. The proposed plan includes the drilling of one new well in the Northpoint Subdivision, upgrades to existing facilities, and testing the feasibility of an aquifer storage and recovery (ASR) well to ensure that the aquifer is being produced at sustainable rates and volumes.

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 2). 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).

III.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 six wells within the Trinity Aquifer. Figure 9 provides a map showing the monitoring network in relation to the Trinity and Edwards Aquifers. Five wells, Canyon Lake Shores No. 1, Glenwood No. 1, Vintage Oaks No. 2, State Well No. 6807407, and State Well No. 6815211 are wells that are owned by CLWSC. 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. Table 4 provides a summary of the well

completion information for the six wells, including a starting static water level and the most recent static water level for each well.

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 transducers were placed in the wells during October of 2011, however there was an equipment malfunction at the Vintage Oaks No. 2 well. Due to the malfunction in the Vintage Oaks No. 2 transducer, November 11, 2011 was selected as the monitoring network start date as it was the first day all of the transducers were properly recording water level data.

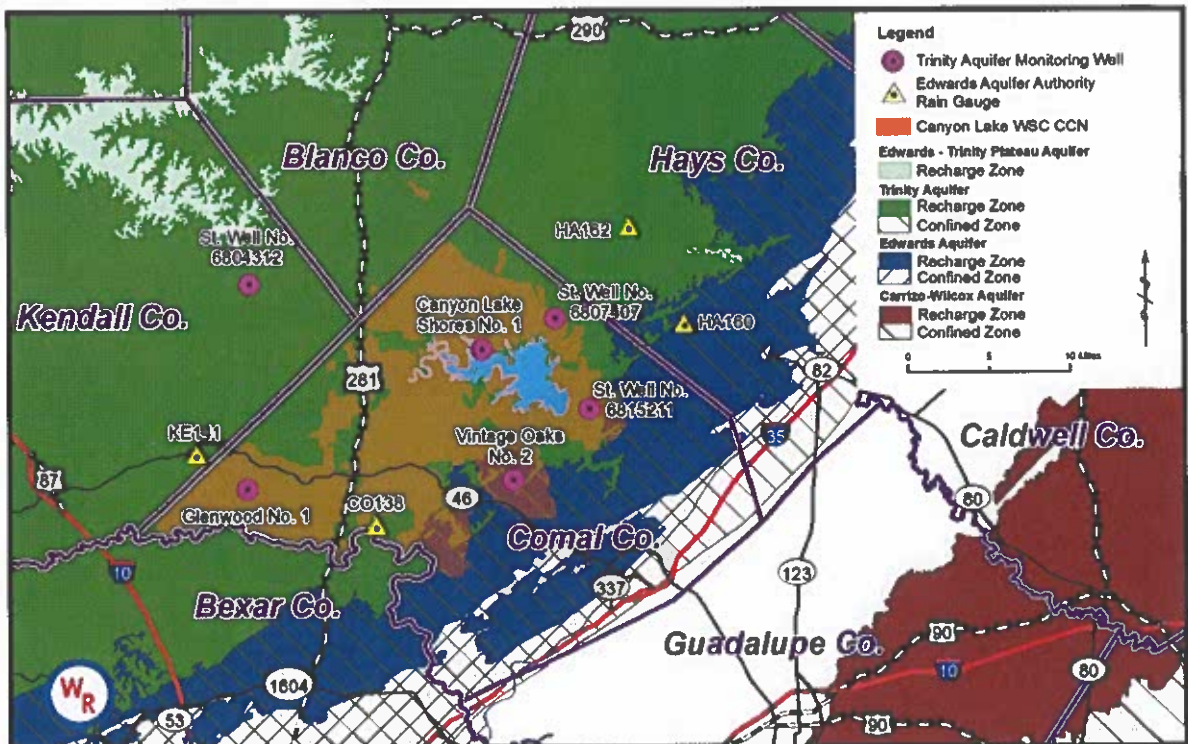


Figure 9: Trinity Aquifer monitoring network

The three wells that are part of a state wide TWDB Daily Water Level Network 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, 2012). The data from the wells are uploaded on a near real time basis and are available for download from the TWDB website.

Table 4: 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)	Ending Static Water Level - 2nd Qtr (ft MSL)	Ending Static Water Level - 3rd Qtr (ft MSL)
Canyon Lake Shores No. 1	n/a	n/a	n/a	Steel	6	n/a	n/a	904.01	907.8	906.29
	n/a	0	396	n/a	n/a	0	396	(11/11/2011)	(7/24/2012)	(9/21/2012)
Glenwood No. 1	7 7/8	0	30	Steel	6 5/8	0	30	1,056.62	1,057.04	1,054.72
	6	30	380	Open Hole	6	30	380	(11/11/2011)	(7/24/2012)	(9/21/2012)
Vintage Oaks No. 2	17 1/2	0	720	Steel	12 3/4	0	720	740.98	763.87	757.27
	11 1/2	720	1080	Open Hole	11 1/2	720	1080	(11/11/2011)	(7/24/2012)	(9/21/2012)
St. Well No. 6804312	8 1/2	0	310	PVC	5 1/2	0	246	1,238.06	1,243.42	1,241.28
	8 1/2	0	310	Open Hole	8 1/2	246	310	(11/11/2011)	(7/24/2012)	(9/21/2012)
St. Well No. 6807407	n/a	0	575	n/a	n/a	n/a	n/a	866.14	864.68	862.41
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(11/11/2011)	(7/24/2012)	(9/21/2012)
St. Well No. 6815211	n/a	0	249	n/a	n/a	n/a	n/a	738.92	747.33	745.44
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(11/11/2011)	(7/24/2012)	(9/21/2012)

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

Appendix C provides hydrographs of the six wells within the CLWSC monitoring network. Each hydrograph shows the water levels from the well accompanied by rain gauge data from nearby EAA rain gauges. The hydrograph map provided uses similar scales for easy comparison between locations and provides an overview of water levels in the Trinity Aquifer through the 3rd quarter 2012. The individual well hydrographs provide a more detailed look at water levels within each 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.

During 2011 Texas experienced lower than normal precipitation totals, which resulted in one of the worst single-year droughts in state history. Aquifers depend on precipitation to recharge their storage capacity and to maintain water levels. The lack of precipitation during 2011 impacted the Trinity Aquifer causing water levels to drop. During the end of 2011 and the 1st quarter of 2012 precipitation began to increase in and around the CLWSC service area, resulting in a recovery of water levels. This trend is noticeable in the Canyon Lake Shores No. 1 hydrograph, which shows a water level decline throughout 2011 with recovery beginning in the early part of 2012.

During the 3rd quarter of 2012, the area surrounding the monitoring network has experienced sporadic precipitation events resulting in relatively stable Trinity Aquifer water levels (Appendix C). The wells experienced a minor fall of water levels, with the water level in the Vintage Oaks Well dropping the most by 6.6 ft since the 2nd Quarter 2012 (Table 4). The hydrograph for Vintage Oaks Well No. 2 shows the water level gradually falling since a peak in June 2012, most likely due to the lack of significant rainfall events in the area.



III.3. Aquifer Storage and Recovery Project

During 2011, CLWSC began the process of researching and developing an ASR project. The Woods at Spring Branch Well was selected as the project site (Figure 8). In April of 2012, a pump test was conducted at the well to determine the capacity of the well (Appendix B). Recently, CLWSC received approval from the TCEQ Underground Injection Control (UIC) Program to proceed with phase 1 which will be a testing phase to determine the feasibility of using the site as a long term ASR well. A proposed injection and pumping cycle is in the process of being developed and will be implemented for testing in 2013. The project will allow CLWSC to inject excess water during low use months and recover the water during high demand months.

The ASR project will have numerous benefits. The seasonal storage will allow CLWSC to inject water during lower use months in the winter and recover that water during high use summer months. The ASR site was strategically located to allow for distribution to customers during high use months. This allows CLWSC to provide the water while reducing costs associated with building transmission pipeline networks. ASR projects also allow for storage of greater volumes at a much lower cost than other storage options such surface reservoirs or above ground storage. Loss of water due to evaporation is eliminated with ASR, and the stored water is less vulnerable to intentional and unintentional contamination.



Section IV: Conclusions

Based upon the information provided the following conclusions are presented:

- CLWSC provides water utility service to a large portion of Comal County via surface water (Canyon Lake) and groundwater (Trinity Aquifer). CLWSC has seventy-five existing 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 twelve pumping tests performed between July 2008 and May 2009, CLWSC was able to prove up an additional 2,030 gpm of additional capacity or 2,183 acre-ft/yr of water. The results from three pump tests performed since June 2009 and the addition of new water systems has increased CLWSC's total well capacity to 8,294 gpm or 8,919 acre-ft/yr. CLWSC operates a total of seventy-two (72) wells with four (4) of the wells being located in Blanco County. The sixty-eight (68) wells within Comal County have a total capacity of 8,201 gpm or 8,891 acre-ft/yr. The capacity calculations assumed each well pumping for 16 hours/day for 365 days.
- Transmissivities from the aquifer tests ranged from 32 ft²/day up to 125,000 ft²/day with an average transmissivity of the Middle Trinity Aquifer from these tests of 15,223 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; and
- An ASR project is in the development stages, and could provide additional capacity during high demand months.

Section V: References

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- Wet Rock Groundwater Services, LLC, 2009, Report of Findings WRGS 09-005: Groundwater Availability Report: Canyon Lake Water Service Company: Appendix A



Appendix i

Well Database



[illegible]

Canyon Lake Water Service Company - Well Details Summary

Well ID No.	Well Name	Well Number	Well Type	Well Status	Well Depth (ft)	Well Diameter (in)	Well Material	Well Construction	Well Completion	Well Production	Well Yield (gpm)	Well Capacity (gpm)	Well Notes
42	Arroyo Well No. 1	000001	Arroyo Well No. 1	Arroyo Well No. 1	100	10	Arroyo Well No. 1	Arroyo Well No. 1	Arroyo Well No. 1	Arroyo Well No. 1	100	100	Arroyo Well No. 1
43	Arroyo Well No. 2	000002	Arroyo Well No. 2	Arroyo Well No. 2	100	10	Arroyo Well No. 2	Arroyo Well No. 2	Arroyo Well No. 2	Arroyo Well No. 2	100	100	Arroyo Well No. 2
44	Arroyo Well No. 3	000003	Arroyo Well No. 3	Arroyo Well No. 3	100	10	Arroyo Well No. 3	Arroyo Well No. 3	Arroyo Well No. 3	Arroyo Well No. 3	100	100	Arroyo Well No. 3
45	Arroyo Well No. 4	000004	Arroyo Well No. 4	Arroyo Well No. 4	100	10	Arroyo Well No. 4	Arroyo Well No. 4	Arroyo Well No. 4	Arroyo Well No. 4	100	100	Arroyo Well No. 4
46	Arroyo Well No. 5	000005	Arroyo Well No. 5	Arroyo Well No. 5	100	10	Arroyo Well No. 5	Arroyo Well No. 5	Arroyo Well No. 5	Arroyo Well No. 5	100	100	Arroyo Well No. 5
47	Arroyo Well No. 6	000006	Arroyo Well No. 6	Arroyo Well No. 6	100	10	Arroyo Well No. 6	Arroyo Well No. 6	Arroyo Well No. 6	Arroyo Well No. 6	100	100	Arroyo Well No. 6
48	Arroyo Well No. 7	000007	Arroyo Well No. 7	Arroyo Well No. 7	100	10	Arroyo Well No. 7	Arroyo Well No. 7	Arroyo Well No. 7	Arroyo Well No. 7	100	100	Arroyo Well No. 7
49	Arroyo Well No. 8	000008	Arroyo Well No. 8	Arroyo Well No. 8	100	10	Arroyo Well No. 8	Arroyo Well No. 8	Arroyo Well No. 8	Arroyo Well No. 8	100	100	Arroyo Well No. 8
50	Arroyo Well No. 9	000009	Arroyo Well No. 9	Arroyo Well No. 9	100	10	Arroyo Well No. 9	Arroyo Well No. 9	Arroyo Well No. 9	Arroyo Well No. 9	100	100	Arroyo Well No. 9
51	Arroyo Well No. 10	000010	Arroyo Well No. 10	Arroyo Well No. 10	100	10	Arroyo Well No. 10	Arroyo Well No. 10	Arroyo Well No. 10	Arroyo Well No. 10	100	100	Arroyo Well No. 10
52	Arroyo Well No. 11	000011	Arroyo Well No. 11	Arroyo Well No. 11	100	10	Arroyo Well No. 11	Arroyo Well No. 11	Arroyo Well No. 11	Arroyo Well No. 11	100	100	Arroyo Well No. 11
53	Arroyo Well No. 12	000012	Arroyo Well No. 12	Arroyo Well No. 12	100	10	Arroyo Well No. 12	Arroyo Well No. 12	Arroyo Well No. 12	Arroyo Well No. 12	100	100	Arroyo Well No. 12
54	Arroyo Well No. 13	000013	Arroyo Well No. 13	Arroyo Well No. 13	100	10	Arroyo Well No. 13	Arroyo Well No. 13	Arroyo Well No. 13	Arroyo Well No. 13	100	100	Arroyo Well No. 13
55	Arroyo Well No. 14	000014	Arroyo Well No. 14	Arroyo Well No. 14	100	10	Arroyo Well No. 14	Arroyo Well No. 14	Arroyo Well No. 14	Arroyo Well No. 14	100	100	Arroyo Well No. 14
56	Arroyo Well No. 15	000015	Arroyo Well No. 15	Arroyo Well No. 15	100	10	Arroyo Well No. 15	Arroyo Well No. 15	Arroyo Well No. 15	Arroyo Well No. 15	100	100	Arroyo Well No. 15
57	Arroyo Well No. 16	000016	Arroyo Well No. 16	Arroyo Well No. 16	100	10	Arroyo Well No. 16	Arroyo Well No. 16	Arroyo Well No. 16	Arroyo Well No. 16	100	100	Arroyo Well No. 16
58	Arroyo Well No. 17	000017	Arroyo Well No. 17	Arroyo Well No. 17	100	10	Arroyo Well No. 17	Arroyo Well No. 17	Arroyo Well No. 17	Arroyo Well No. 17	100	100	Arroyo Well No. 17
59	Arroyo Well No. 18	000018	Arroyo Well No. 18	Arroyo Well No. 18	100	10	Arroyo Well No. 18	Arroyo Well No. 18	Arroyo Well No. 18	Arroyo Well No. 18	100	100	Arroyo Well No. 18
60	Arroyo Well No. 19	000019	Arroyo Well No. 19	Arroyo Well No. 19	100	10	Arroyo Well No. 19	Arroyo Well No. 19	Arroyo Well No. 19	Arroyo Well No. 19	100	100	Arroyo Well No. 19
61	Arroyo Well No. 20	000020	Arroyo Well No. 20	Arroyo Well No. 20	100	10	Arroyo Well No. 20	Arroyo Well No. 20	Arroyo Well No. 20	Arroyo Well No. 20	100	100	Arroyo Well No. 20
62	Arroyo Well No. 21	000021	Arroyo Well No. 21	Arroyo Well No. 21	100	10	Arroyo Well No. 21	Arroyo Well No. 21	Arroyo Well No. 21	Arroyo Well No. 21	100	100	Arroyo Well No. 21
63	Arroyo Well No. 22	000022	Arroyo Well No. 22	Arroyo Well No. 22	100	10	Arroyo Well No. 22	Arroyo Well No. 22	Arroyo Well No. 22	Arroyo Well No. 22	100	100	Arroyo Well No. 22
64	Arroyo Well No. 23	000023	Arroyo Well No. 23	Arroyo Well No. 23	100	10	Arroyo Well No. 23	Arroyo Well No. 23	Arroyo Well No. 23	Arroyo Well No. 23	100	100	Arroyo Well No. 23
65	Arroyo Well No. 24	000024	Arroyo Well No. 24	Arroyo Well No. 24	100	10	Arroyo Well No. 24	Arroyo Well No. 24	Arroyo Well No. 24	Arroyo Well No. 24	100	100	Arroyo Well No. 24
66	Arroyo Well No. 25	000025	Arroyo Well No. 25	Arroyo Well No. 25	100	10	Arroyo Well No. 25	Arroyo Well No. 25	Arroyo Well No. 25	Arroyo Well No. 25	100	100	Arroyo Well No. 25
67	Arroyo Well No. 26	000026	Arroyo Well No. 26	Arroyo Well No. 26	100	10	Arroyo Well No. 26	Arroyo Well No. 26	Arroyo Well No. 26	Arroyo Well No. 26	100	100	Arroyo Well No. 26
68	Arroyo Well No. 27	000027	Arroyo Well No. 27	Arroyo Well No. 27	100	10	Arroyo Well No. 27	Arroyo Well No. 27	Arroyo Well No. 27	Arroyo Well No. 27	100	100	Arroyo Well No. 27
69	Arroyo Well No. 28	000028	Arroyo Well No. 28	Arroyo Well No. 28	100	10	Arroyo Well No. 28	Arroyo Well No. 28	Arroyo Well No. 28	Arroyo Well No. 28	100	100	Arroyo Well No. 28
70	Arroyo Well No. 29	000029	Arroyo Well No. 29	Arroyo Well No. 29	100	10	Arroyo Well No. 29	Arroyo Well No. 29	Arroyo Well No. 29	Arroyo Well No. 29	100	100	Arroyo Well No. 29
71	Arroyo Well No. 30	000030	Arroyo Well No. 30	Arroyo Well No. 30	100	10	Arroyo Well No. 30	Arroyo Well No. 30	Arroyo Well No. 30	Arroyo Well No. 30	100	100	Arroyo Well No. 30
72	Arroyo Well No. 31	000031	Arroyo Well No. 31	Arroyo Well No. 31	100	10	Arroyo Well No. 31	Arroyo Well No. 31	Arroyo Well No. 31	Arroyo Well No. 31	100	100	Arroyo Well No. 31

Appendix ii

Pump Tests

(Note: DVDs are not included)



Results of Aquifer Test Analysis

for the

Scenic Well

for

Canyon Lake Water Service Company

P.O. Box 1742

Canyon Lake, TX 78133

WRGS Project No. 042-003-11

July 2011



Wet Rock Groundwater Services, LLC

Groundwater Specialists

TBPG Firm No: 50038

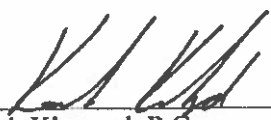
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The seal appearing on this document was authorized on July 8, 2011 by:


Kaveh Khorzad, P.G.
License No. 1126



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



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Groundwater Specialists

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Canyon Lake Water Service Company

Scenic Well

Middle Trinity Aquifer

Contents

Attachment 1:	Well Location Map
Attachment 2:	U.S. Geological Survey Topographic Map
Attachment 3:	Well Profile: Scenic Well
Attachment 4:	Table 1 - Well Construction Summary Table 2 - Aquifer Testing Summary Table 3 - Summary of Aquifer Testing Analysis
Attachment 5:	Aquifer Test Drawdown and Temperature Curves
Attachment 6:	Aquifer Test Analyses
Attachment 7:	Aquifer Test Data
Attachment 8:	Pump Specifications
Attachment 9:	Downhole Video Survey DVD



Introduction

The Scenic Well is located within the Canyon Lake Water Service Company (CLWSC) service area in northern Comal County near the intersection of FM 306 and FM 3424 (See Attachment 1). According to CLWSC staff, the production from the Scenic Well began to diminish approximately two years ago, it was taken out of service, and the pump was removed from the well. Before the drop in production, the Scenic Well was a standby well within a network of wells that supplied water for the CLWSC service area north of Canyon Lake (Attachment 2). Due to water demands in the area, additional supply from the Scenic Well is being evaluated as a possible source.

The objectives of this study are to:

1. Conduct a downhole video survey to determine the condition of the well casing and the production zone;
2. Conduct an aquifer test to determine the transmissivity and well capacity of the Scenic Well; and
3. Determine the proper pump size and future sustainable water supply capabilities of the Scenic Well.

Well Construction and Downhole Video Survey

Attachment 3 and Attachment 4 provide a well profile summary and the well construction summary of the Scenic Well. The well profile was created from information obtained from the downhole video survey as the well report on file with Texas Water Development Board is incomplete. Attachment 9 provides a copy of the downhole video survey conducted on the well June 28, 2011. The well is completed with 6-inch steel casing set to 147 ft below ground and an open hole completion that is approximately 6-inch in diameter from 147 ft to 349 ft. The well is believed to have been completed in the Lower Glen Rose of the Middle Trinity Aquifer during the year of 1970.

During the video survey, the steel casing was observed to be in good condition with some mineral deposits. At 126.4 ft a small deposit and stained casing was noted as a possible hole. It appeared that water may have seeped through the casing causing the deposit and staining below the deposit. On the day of the survey, the static water level was 130.7 ft below ground surface (bgs). In general, the open hole section contained massive limestone with vuggy sections and a few small fractures. A substantial cavern was noted at 326 ft bgs and continued until 330 ft bgs. Fill was encountered at 349 ft bgs with the total depth of the well unknown.



Aquifer Testing

A 5 horsepower (HP) submersible pump was set with 315 ft of 2-inch steel column pipe, and a pressure transducer capable of measuring the water level and temperature at one minute intervals was set within the Scenic Well. On June 30, 2011 a static water level was measured at 131.08 ft bgs. The pump was turned on and ran for thirty hours at a rate of 40 gpm. Attachment 4 summarizes the aquifer testing, Attachment 5 provides the graph of the aquifer test data, Attachment 6 provides the aquifer test analysis, and Attachment 7 provides the raw water level and temperature data.

The well maintained a constant rate of production at 40 gpm with 7.3 ft of drawdown (pumping level = 138 ft bgs) for a specific capacity of 5.47 gpm/ft. The pumping level and temperature were relatively stable throughout the test. The pumping level reached steady state approximately 8 hours into the test, with a slight drop in pumping level at approximately 23 hours into the test. The well recovered quickly reaching 90% recovery approximately 3 hours after the pump was shut off. The water level recovered to approximately 2 ft above the measured static water level likely due to precipitation in the area. The slight drop in pumping level at 23 hours into the test and the fluctuations during the end of monitoring are likely a result of influence from the pumping of a nearby well (Attachment 5). The influence from the pumping was minimal with an approximate 1 ft change in water level.

Based upon the analyses of the aquifer test, the capacity of a well completed at this location in the aquifer is approximately 300 - 350 gpm. However, the 6-inch well casing limits the size of pump and column pipe that can be used in the well. Based upon the data collected during the aquifer test and considering the size of the well, the maximum yield of the Scenic Well is approximately 80 - 90 gpm. Attachment 8 provides detailed pump specifications for the Scenic Well.

The aquifer test data was analyzed using the Theis and the Theis Recovery methods (Attachment 6). The Theis analysis and the Theis Recovery analysis results were similar with a transmissivity of 1,260 ft²/day and 1,040 ft²/day respectively.



Conclusions

The Scenic Well is located north of Canyon Lake and was historically used by CLWSC as a standby well for the nearby service area. It was removed from service approximately two years ago because of a drop in production. Due to recent water demands in the area additional water supply is desired from the Scenic Well. An analysis of the Scenic Well was conducted by Wet Rock Groundwater Services, LLC which included:

- Downhole Video Survey;
- Aquifer Testing; and
- Aquifer Test analysis

Based upon the analysis we provide the following conclusions:

1. The Scenic well is completed within the Middle Trinity Aquifer;
2. During the video survey the steel casing was observed to be in good condition with some mineral deposits. In the open hole section of the well, several small fractures and a small cavern were observed;
3. A thirty hour aquifer test was conducted on the Scenic Well at a rate of 40 gpm with the well reaching steady state after approximately 8 hours. Maximum drawdown was 7.3 ft with a pumping level of 138 ft bgs; and
4. Utilizing the Theis Recovery analysis, the specific capacity, transmissivity and hydraulic conductivity was calculated to be 5.47 gpm/ft, 1,040 ft²/day and 4.77 ft/day respectively. The maximum capacity of the well with a larger pump set at 315 ft bgs is estimated to be 80 - 90 gpm.





Attachment 1

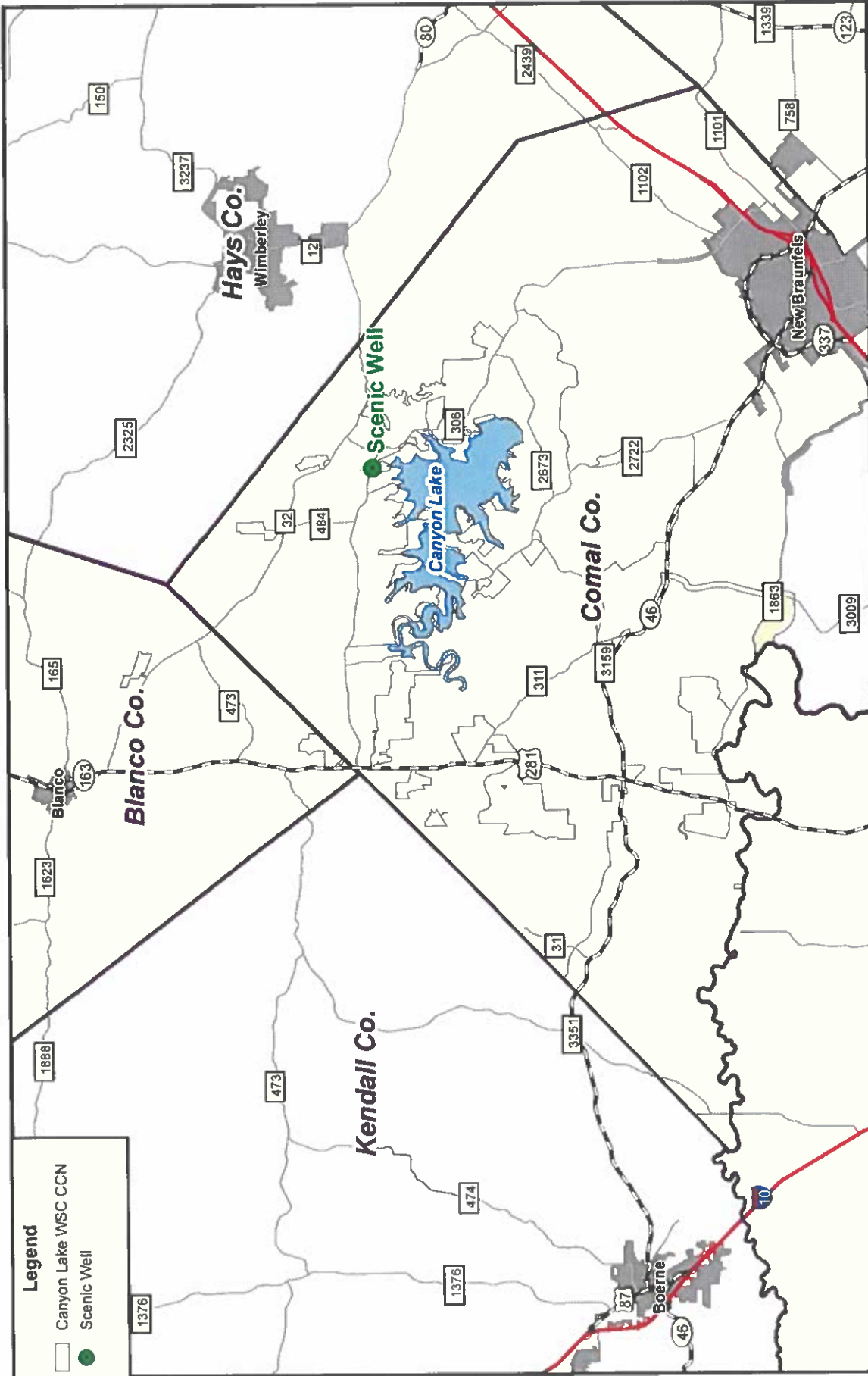
Scenic Well Location Map



Wet Rock Groundwater Services, LLC



Groundwater Specialists



Canyon Lake WSC - Scenic Well Location Map	
Legend Canyon Lake WSC CCN Scenic Well	SCALE: 1 in = 5 miles DRAWN BY: BWB DATE: 7/11 REVISED BY: DATE: PROJECTION: UTM NAD 83 Zone 14
Canyon Lake Water Service Company Comal County, Texas	
Wet Rock Groundwater Services, L.L.C. Groundwater Specialists TBPG Firm No: 50038 311 Ranch Road 620 South, Suite 103 Austin, Texas 78734 PH: 512-773-3226 FAX: 512-879-6809 www.wetrockgs.com	

Attachment 2

USGS Topographic Map



Wet Rock Groundwater Services, LLC



Groundwater Specialists

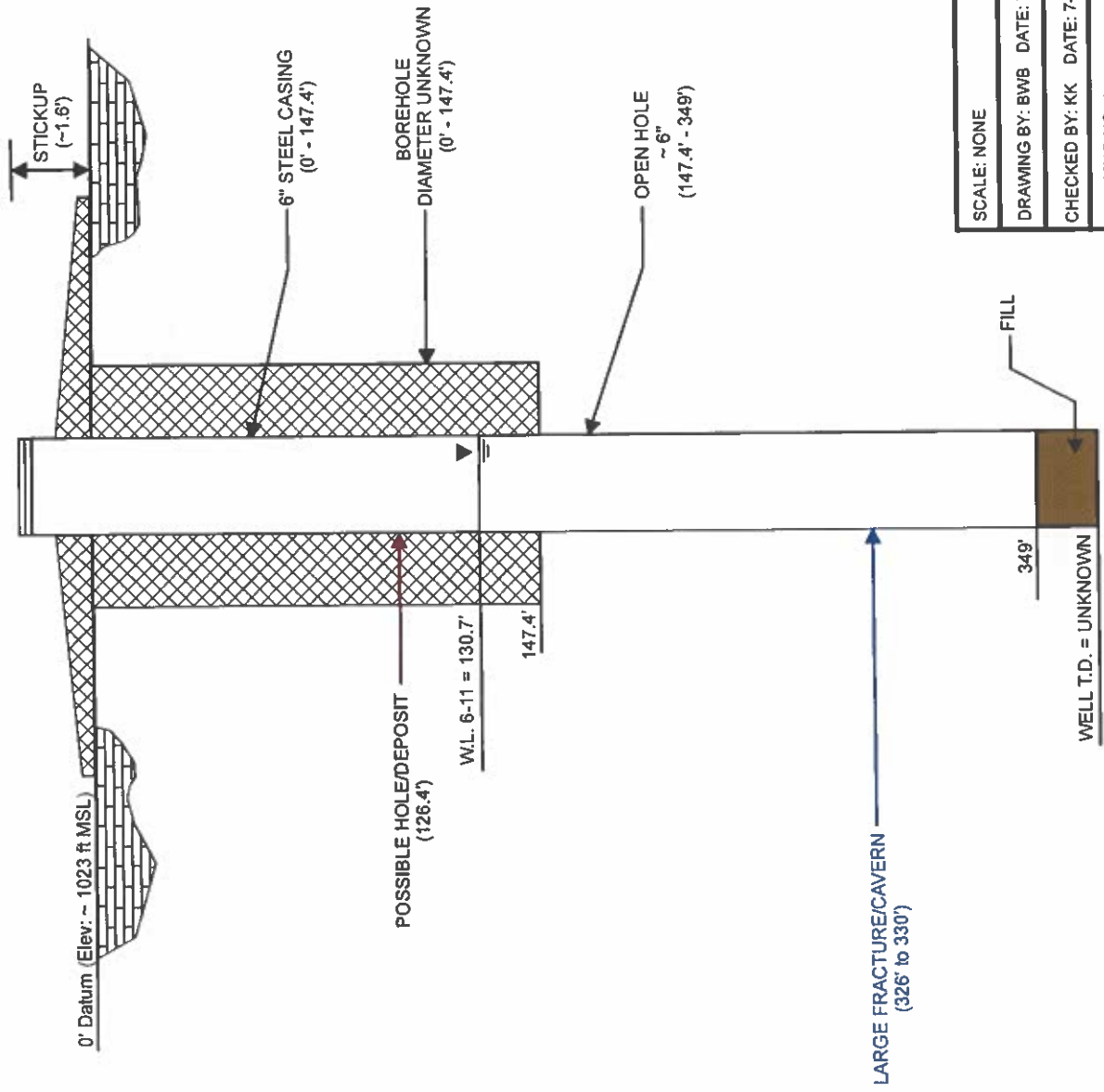


Attachment 3

Well Profile



NOTE: Construction details from down hole video survey taken June 28, 2011, no well report available.



Well Profile: CLWSC - Scenic Well

Canyon Lake WSC
Comal County, Texas

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SCALE: NONE
DRAWING BY: BWB DATE: 7-11
CHECKED BY: KK DATE: 7-11
DRAWING NO: 1
SHEET: 1 OF 1



Attachment 4

Table 1: Well Construction Summary

Table 2: Aquifer Testing Summary

Table 3: Summary of Aquifer Testing Analysis



Table 1 - Well Construction Summary

<u>Well</u>	<u>Hole Diameter (inches)</u>	<u>From (ft)</u>	<u>To (ft)</u>	<u>Casing Type</u>	<u>Casing Diameter (inches)</u>	<u>From (ft)</u>	<u>To (ft)</u>
Scenic Well	n/a	0	147	Steel	6	0	147
	6	147	349	Open Hole	6	147	349

Table 2 - Aquifer Testing Summary

<u>Well</u>	<u>Static Water Level (ft bgs)</u>	<u>Static Water Level (ft MSL)</u>	<u>Q (gpm)</u>	<u>Drawdown (ft)</u>	<u>SC (gpm/ft)</u>	<u>Pumping Duration (hours)</u>
Scenic Well	131.08	891.9	40	7.3	5.47	30

Notes: Q = discharge; SC = specific capacity; bgs = below ground surface; MSL = Mean Sea Level; gpm = gallons per minute; ft = feet

Table 3 - Summary of Aquifer Testing Analyses

<u>Well</u>	<u>Analysis</u>	<u>b (ft)</u>	<u>T (ft²/day)</u>	<u>K (ft/day)</u>
Scenic Well	Theis	219	1,260	5.74
Scenic Well	Theis Recovery	219	1,040	4.77

Notes: b = aquifer thickness; r = distance from pumping well; T = transmissivity; S = storativity; K = hydraulic conductivity



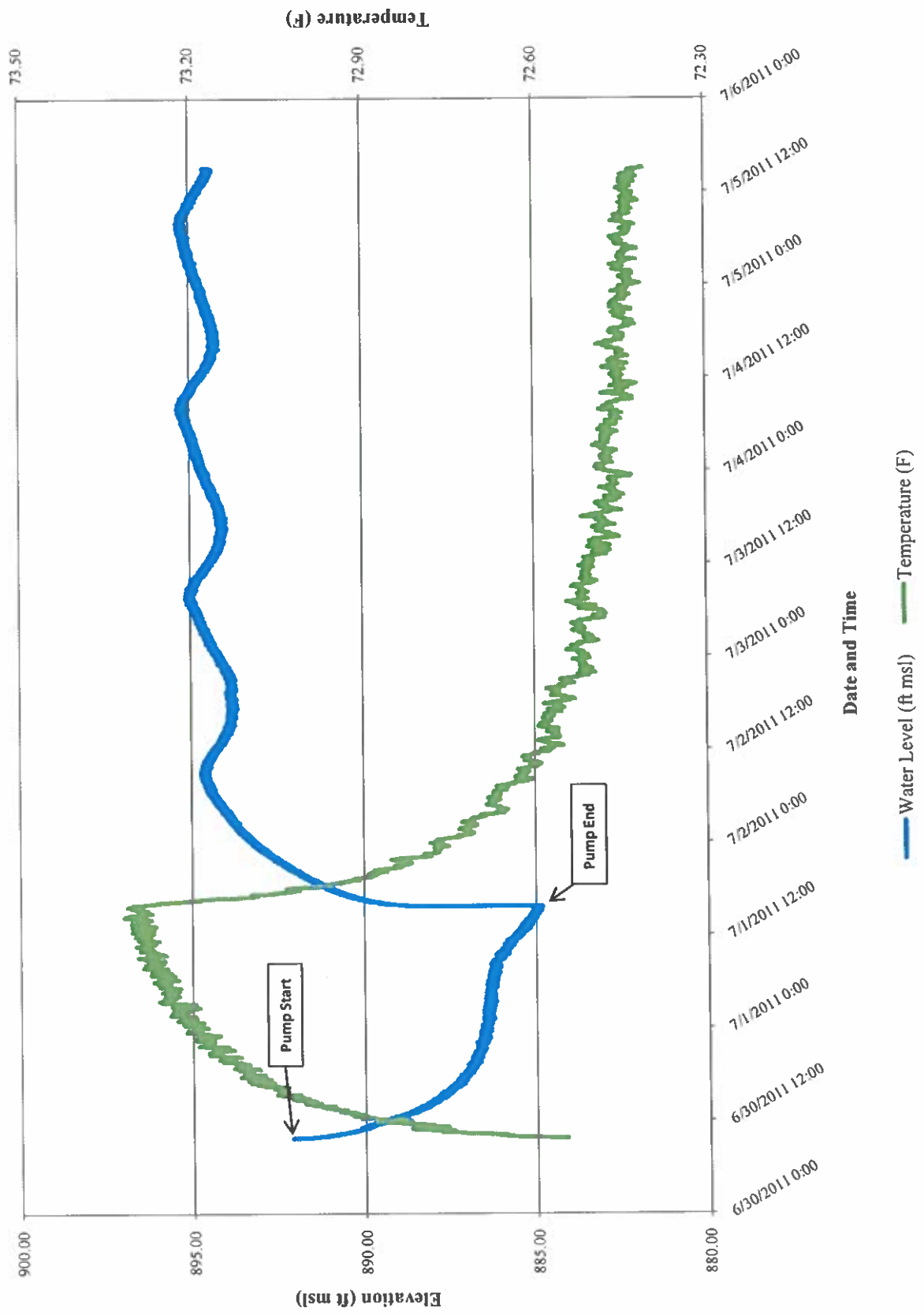


Attachment 5

Aquifer Test Drawdown and Temperature Curves



Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)





Attachment 6

Aquifer Test Analyses



Wet Rock Groundwater Services, LLC



Groundwater Specialists



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Pumping Test Analysis Report

Project: Scenic Well

Number: 042-003-11

Client: Canyon Lake WSC

Location: Comal County

Pumping Test: Scenic Well Pump Test

Pumping Well: Scenic Well

Test Conducted by: BWB

Test Date: 6/30/2011

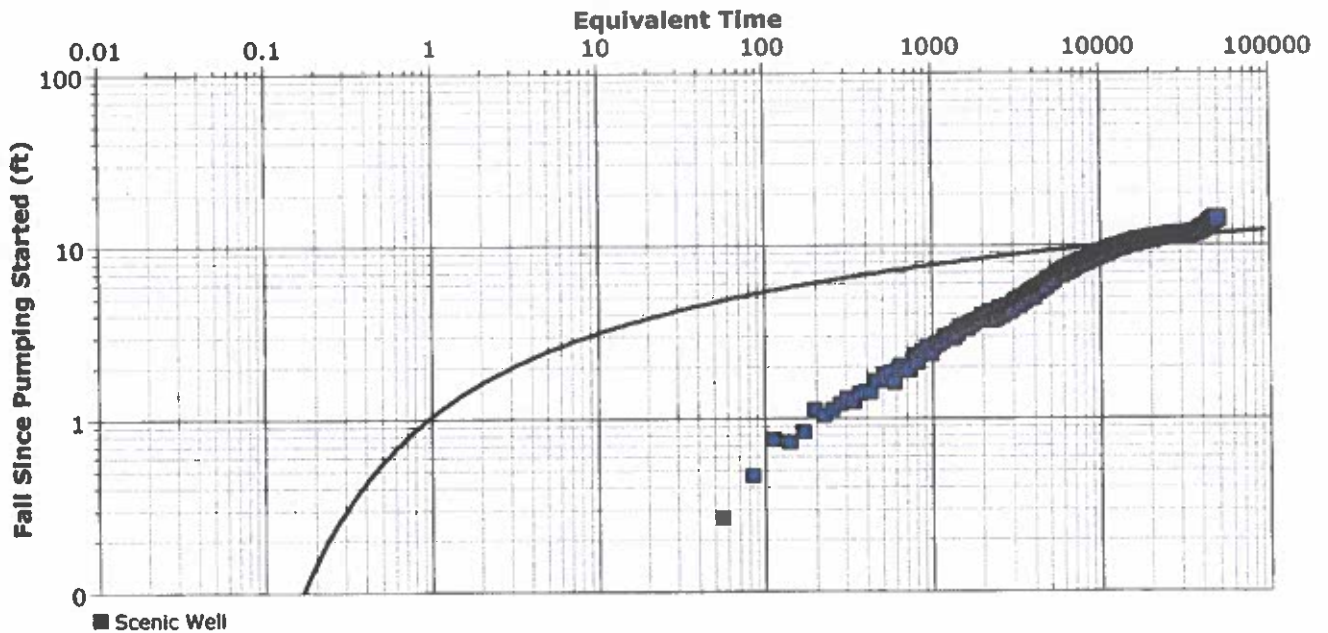
Analysis Performed by: BWB

Theis Analysis

Analysis Date: 7/6/2011

Aquifer Thickness: 219.00 ft

Discharge: variable, average rate 40 [U.S. gal/min]



Calculation after Theis

Observation Well	Transmissivity [ft ² /d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
Scenic Well	1.26×10^3	5.74×10^0			



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Pumping Test Analysis Report

Project: Scenic Well

Number: 042-003-11

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Location: Comal County

Pumping Test: Scenic Well Pump Test

Pumping Well: Scenic Well

Test Conducted by: BWB

Test Date: 6/30/2011

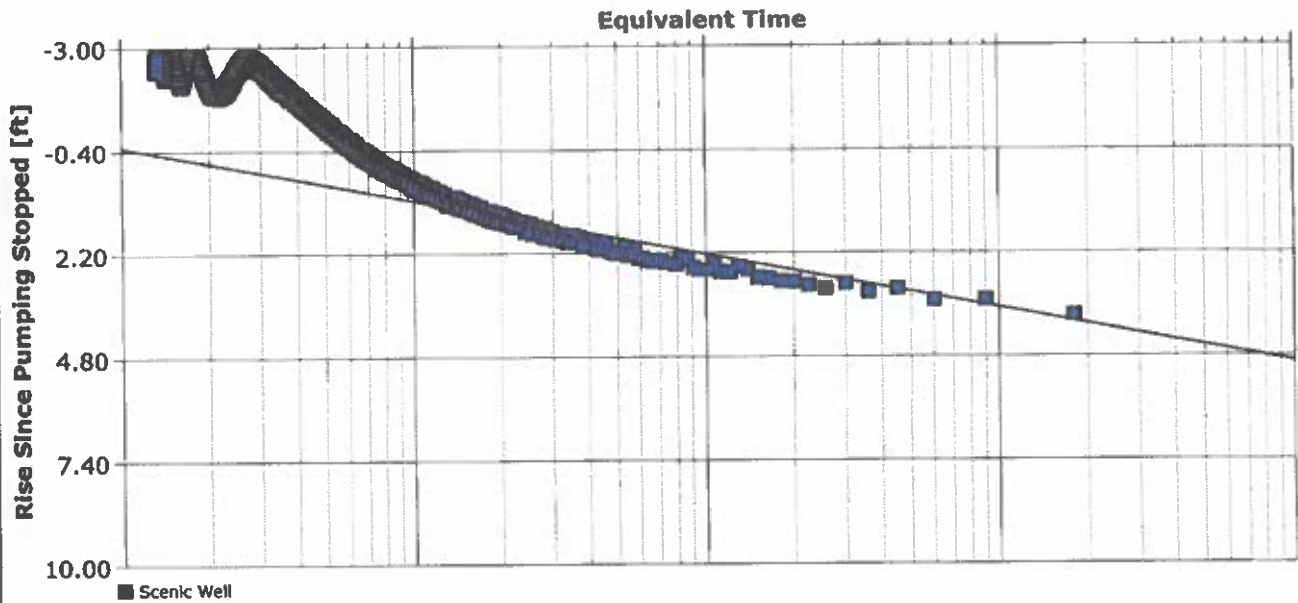
Analysis Performed by: BWB

Theis Recovery Analysis

Analysis Date: 7/6/2011

Aquifer Thickness: 219.00 ft

Discharge: variable, average rate 40 [U.S. gal/min]



Calculation after Theis & Jacob

Observation Well	Transmissivity [ft ² /d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
Scenic Well	1.04×10^3	4.75×10^0		



Attachment 7

Aquifer Test Data



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)

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)	Comments
6/30/2011 9:45	0		72.56	130.88	892.12	0.00			Start Pump
6/30/2011 9:46	1		72.55	131.12	891.88	0.24	40	164.98	Meter = 31,772 200 gallons
6/30/2011 9:47	2		72.55	131.21	891.79	0.33	40	121.48	
6/30/2011 9:48	3		72.55	131.31	891.69	0.43	40	92.61	
6/30/2011 9:49	4		72.56	131.45	891.55	0.57	39	68.82	
6/30/2011 9:50	5		72.58	131.44	891.56	0.56	40	71.93	
6/30/2011 9:51	6		72.59	131.49	891.51	0.60			
6/30/2011 9:52	7		72.62	131.63	891.37	0.75			
6/30/2011 9:53	8		72.63	131.59	891.41	0.71			
6/30/2011 9:54	9		72.60	131.63	891.37	0.75			
6/30/2011 9:55	10		72.62	131.67	891.33	0.79	39	49.50	
6/30/2011 9:56	11		72.63	131.72	891.28	0.84			
6/30/2011 9:57	12		72.63	131.69	891.31	0.81			
6/30/2011 9:58	13		72.64	131.76	891.24	0.88			
6/30/2011 9:59	14		72.65	131.78	891.22	0.90			
6/30/2011 10:00	15		72.65	131.77	891.23	0.89	39	43.82	
6/30/2011 10:15	30		72.67	132.22	890.78	1.34	40	29.96	
6/30/2011 10:30	45		72.74	132.49	890.51	1.61	40	24.80	
6/30/2011 10:45	60		72.74	132.82	890.18	1.94	40	20.60	
6/30/2011 11:00	75		72.81	132.97	890.03	2.09	40	19.11	
6/30/2011 11:15	90		72.76	133.17	889.83	2.29	40	17.49	
6/30/2011 11:30	105		72.81	133.15	889.85	2.27	40	17.64	
6/30/2011 11:45	120		72.82	133.32	889.68	2.44	40	16.38	
6/30/2011 12:45	180		72.90	134.02	888.98	3.14			
6/30/2011 13:45	240		72.97	134.58	888.42	3.69			
6/30/2011 14:45	300		73.02	134.95	888.05	4.07			
6/30/2011 15:45	360		73.05	135.49	887.51	4.61			
6/30/2011 16:45	420		73.08	135.62	887.38	4.74			
6/30/2011 17:45	480		73.10	135.96	887.04	5.07			
6/30/2011 18:45	540		73.12	136.15	886.85	5.27			
6/30/2011 19:45	600		73.14	136.13	886.87	5.25			
6/30/2011 20:45	660		73.17	136.41	886.59	5.53			
6/30/2011 21:45	720		73.17	136.31	886.69	5.43			
6/30/2011 22:45	780		73.18	136.64	886.36	5.76			
6/30/2011 23:45	840		73.19	136.46	886.54	5.58			
7/1/2011 0:45	900		73.18	136.68	886.32	5.79			
7/1/2011 1:45	960		73.23	136.65	886.35	5.77			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP

MSL = Mean Sea Level Pump Setting = 315 feet bgs

Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)

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)	Comments
7/1/2011 2:45	1020		73.21	136.68	886.32	5.80			
7/1/2011 3:45	1080		73.24	136.79	886.21	5.91			
7/1/2011 4:45	1140		73.24	136.58	886.42	5.70			
7/1/2011 5:45	1200		73.25	136.59	886.41	5.71			
7/1/2011 6:45	1260		73.24	136.67	886.33	5.79			
7/1/2011 7:45	1320		73.27	136.75	886.25	5.87			
7/1/2011 8:45	1380		73.25	136.83	886.17	5.95			
7/1/2011 9:45	1440		73.26	136.91	886.09	6.03			
7/1/2011 10:45	1500		73.29	137.11	885.89	6.23			
7/1/2011 11:45	1560		73.29	137.50	885.50	6.62			
7/1/2011 12:45	1620		73.30	137.67	885.33	6.79			
7/1/2011 13:45	1680		73.29	137.72	885.28	6.84			
7/1/2011 14:45	1740		73.29	138.05	884.95	7.17			
7/1/2011 15:44	1799	0	73.30	138.19	884.81	7.31			
7/1/2011 15:45	1800	1	73.30	134.85	888.15	3.97	40	5.47	Stop pumping Meter = 31,844,500 gallons
7/1/2011 15:46	1801	2	73.29	134.47	888.53	3.59			
7/1/2011 15:47	1802	3	73.30	134.48	888.52	3.60			
7/1/2011 15:48	1803	4	73.29	134.19	888.81	3.31			
7/1/2011 15:49	1804	5	73.29	134.27	888.73	3.39			
7/1/2011 15:50	1805	6	73.30	134.04	888.96	3.16			
7/1/2011 15:51	1806	7	73.30	134.17	888.83	3.29			
7/1/2011 15:52	1807	8	73.30	134.09	888.91	3.21			
7/1/2011 15:53	1808	9	73.30	134.01	888.99	3.12			
7/1/2011 15:54	1809	10	73.29	133.99	889.01	3.11			
7/1/2011 15:55	1810	11	73.29	133.92	889.08	3.04			
7/1/2011 15:56	1811	12	73.29	133.90	889.10	3.02			
7/1/2011 15:57	1812	13	73.28	133.69	889.31	2.81			
7/1/2011 15:58	1813	14	73.28	133.63	889.37	2.75			
7/1/2011 15:59	1814	15	73.28	133.77	889.23	2.88			
7/1/2011 16:14	1829	30	73.26	133.41	889.59	2.53			
7/1/2011 16:29	1844	45	73.20	132.98	890.02	2.10			
7/1/2011 16:44	1859	60	73.14	132.93	890.07	2.05			
7/1/2011 16:59	1874	75	73.10	132.52	890.48	1.64			
7/1/2011 17:14	1889	90	73.09	132.54	890.46	1.66			
7/1/2011 17:29	1904	105	73.05	132.22	890.78	1.34			
7/1/2011 17:44	1919	120	73.02	132.08	890.92	1.20			
7/1/2011 18:44	1979	180	72.95	131.57	891.43	0.69			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP

MSL = Mean Sea Level Pump Setting = 315 feet bgs

Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)

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)	Comments
7/1/2011 19:44	2039	240	72.88	131.31	891.69	0.43			
7/1/2011 20:44	2099	300	72.84	130.78	892.22	-0.10			
7/1/2011 21:44	2159	360	72.85	130.41	892.59	-0.47			
7/1/2011 22:44	2219	420	72.77	130.27	892.73	-0.61			
7/1/2011 23:44	2279	480	72.77	129.77	893.23	-1.11			
7/2/2011 0:44	2339	540	72.73	129.50	893.50	-1.38			
7/2/2011 1:44	2399	600	72.73	129.35	893.65	-1.53			
7/2/2011 2:44	2459	660	72.71	129.32	893.68	-1.56			
7/2/2011 3:44	2519	720	72.67	129.15	893.85	-1.73			
7/2/2011 4:44	2579	780	72.68	128.94	894.06	-1.94			
7/2/2011 5:44	2639	840	72.68	128.59	894.41	-2.29			
7/2/2011 6:44	2699	900	72.65	128.45	894.55	-2.43			
7/2/2011 7:44	2759	960	72.63	128.55	894.45	-2.33			
7/2/2011 8:44	2819	1020	72.62	128.48	894.52	-2.40			
7/2/2011 9:44	2879	1080	72.60	128.54	894.46	-2.34			
7/2/2011 10:44	2939	1140	72.61	128.61	894.39	-2.27			
7/2/2011 11:44	2999	1200	72.57	128.59	894.41	-2.29			
7/2/2011 12:44	3059	1260	72.57	128.94	894.06	-1.94			
7/2/2011 13:44	3119	1320	72.56	129.04	893.96	-1.84			
7/2/2011 14:44	3179	1380	72.57	129.19	893.81	-1.69			
7/2/2011 15:44	3239	1440	72.57	129.25	893.75	-1.63			
7/2/2011 16:44	3299	1500	72.57	129.07	893.93	-1.81			
7/2/2011 17:44	3359	1560	72.56	129.30	893.70	-1.58			
7/2/2011 18:44	3419	1620	72.55	129.13	893.87	-1.75			
7/2/2011 19:44	3479	1680	72.57	129.10	893.90	-1.78			
7/2/2011 20:44	3539	1740	72.54	129.10	893.90	-1.78			
7/2/2011 21:44	3599	1800	72.52	129.18	893.82	-1.70			
7/2/2011 22:44	3659	1860	72.52	129.06	893.94	-1.82			
7/2/2011 23:44	3719	1920	72.51	128.96	894.04	-1.93			
7/3/2011 0:44	3779	1980	72.53	128.80	894.20	-2.08			
7/3/2011 1:44	3839	2040	72.52	128.70	894.30	-2.18			
7/3/2011 2:44	3899	2100	72.50	128.38	894.62	-2.50			
7/3/2011 3:44	3959	2160	72.52	128.28	894.72	-2.60			
7/3/2011 4:44	4019	2220	72.50	128.19	894.81	-2.69			
7/3/2011 5:44	4079	2280	72.48	128.05	894.95	-2.83			
7/3/2011 6:44	4139	2340	72.53	127.99	895.01	-2.89			
7/3/2011 7:44	4199	2400	72.51	128.06	894.94	-2.82			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP

MSL = Mean Sea Level Pump Setting = 315 feet bgs

Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)

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)	Comments
7/3/2011 8:44	4259	2460	72.52	128.09	894.91	-2.79			
7/3/2011 9:44	4319	2520	72.49	128.22	894.78	-2.66			
7/3/2011 10:44	4379	2580	72.51	128.41	894.59	-2.47			
7/3/2011 11:44	4439	2640	72.52	128.56	894.44	-2.32			
7/3/2011 12:44	4499	2700	72.51	128.70	894.30	-2.18			
7/3/2011 13:44	4559	2760	72.47	128.87	894.13	-2.01			
7/3/2011 14:44	4619	2820	72.50	128.92	894.08	-1.96			
7/3/2011 15:44	4679	2880	72.47	128.81	894.19	-2.07			
7/3/2011 16:44	4739	2940	72.49	129.03	893.97	-1.85			
7/3/2011 17:44	4799	3000	72.48	129.01	893.99	-1.87			
7/3/2011 18:44	4859	3060	72.47	128.94	894.06	-1.94			
7/3/2011 19:44	4919	3120	72.49	128.69	894.31	-2.19			
7/3/2011 20:44	4979	3180	72.46	128.59	894.41	-2.29			
7/3/2011 21:44	5039	3240	72.48	128.69	894.31	-2.19			
7/3/2011 22:44	5099	3300	72.46	128.39	894.61	-2.49			
7/3/2011 23:44	5159	3360	72.46	128.33	894.67	-2.55			
7/4/2011 0:44	5219	3420	72.48	128.41	894.59	-2.48			
7/4/2011 1:44	5279	3480	72.47	128.12	894.88	-2.76			
7/4/2011 2:44	5339	3540	72.48	128.05	894.95	-2.83			
7/4/2011 3:44	5399	3600	72.48	128.17	894.83	-2.71			
7/4/2011 4:44	5459	3660	72.47	128.14	894.86	-2.74			
7/4/2011 5:44	5519	3720	72.47	127.85	895.15	-3.03			
7/4/2011 6:44	5579	3780	72.46	127.93	895.07	-2.95			
7/4/2011 7:44	5639	3840	72.46	127.84	895.16	-3.04			
7/4/2011 8:44	5699	3900	72.47	127.72	895.28	-3.16			
7/4/2011 9:44	5759	3960	72.45	127.83	895.17	-3.05			
7/4/2011 10:44	5819	4020	72.45	128.14	894.86	-2.74			
7/4/2011 11:44	5879	4080	72.45	128.15	894.85	-2.73			
7/4/2011 12:44	5939	4140	72.46	128.31	894.69	-2.57			
7/4/2011 13:44	5999	4200	72.44	128.42	894.58	-2.46			
7/4/2011 14:44	6059	4260	72.44	128.68	894.32	-2.20			
7/4/2011 15:44	6119	4320	72.47	128.81	894.19	-2.07			
7/4/2011 16:44	6179	4380	72.46	128.80	894.20	-2.08			
7/4/2011 17:44	6239	4440	72.46	128.83	894.17	-2.05			
7/4/2011 18:44	6299	4500	72.43	128.55	894.45	-2.33			
7/4/2011 19:44	6359	4560	72.45	128.52	894.48	-2.36			
7/4/2011 20:44	6419	4620	72.43	128.38	894.62	-2.50			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP

MSL = Mean Sea Level Pump Setting = 315 feet bgs

Canyon Lake WSC Scenic Well - Aquifer Test (June 30, 2011)

[illegible]

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP

Column Pipe Diameter = 2-inch

MSL = Mean Sea Level
Pump Setting = 315 feet bgs

Attachment 8

Pump Specifications



Wet Rock Groundwater Services, LLC



Groundwater Specialists



Wet Rock Groundwater Services, L.L.C.

Groundwater Specialists

TBPG Firm No: 50038

311 Ranch Road 620S, Ste. 103

Austin, Texas 78734

Ph: 512-773-3226 Fax: 512-879-6809

www.wetrockgs.com

Scenic Well Pump Specifications

TDH

Static W.L. (June 30, 2011)	131.08 ft
Pumping W.L. @ 85 GPM (estimated)	176.00 ft
Elevation	23 ft
<u>Frictional Loss in Column (3")</u>	<u>5.0 ft</u>
TDH	204 ft

Pump	Grundfos 75S50-8 63 GPM @ 204 Ft TDH
Motor	Franklin 4-inch Submersible motor 3,450 RPM, 5 H.P., 460v, 60 hz, Three-Phase
Electrical	Franklin Submonitor, NEMA Size 0 Starter, and No. 14 Power Cable
Discharge Column	315 ft. of 3.5-inch X 0.216-inch (3-inch nominal) threaded and coupled galvanized steel column, check valve at 252 ft. below ground, flanged discharge elbow
E-line Assembly	The well shall also be equipped with a 1-inch PVC pipe for checking water levels. The PVC pipe shall include a water-tight cover that can be readily opened and closed. The PVC line shall be 1-inch PVC extending down to the pump and strapped to the column pipe.

PERFORMANCE CURVES

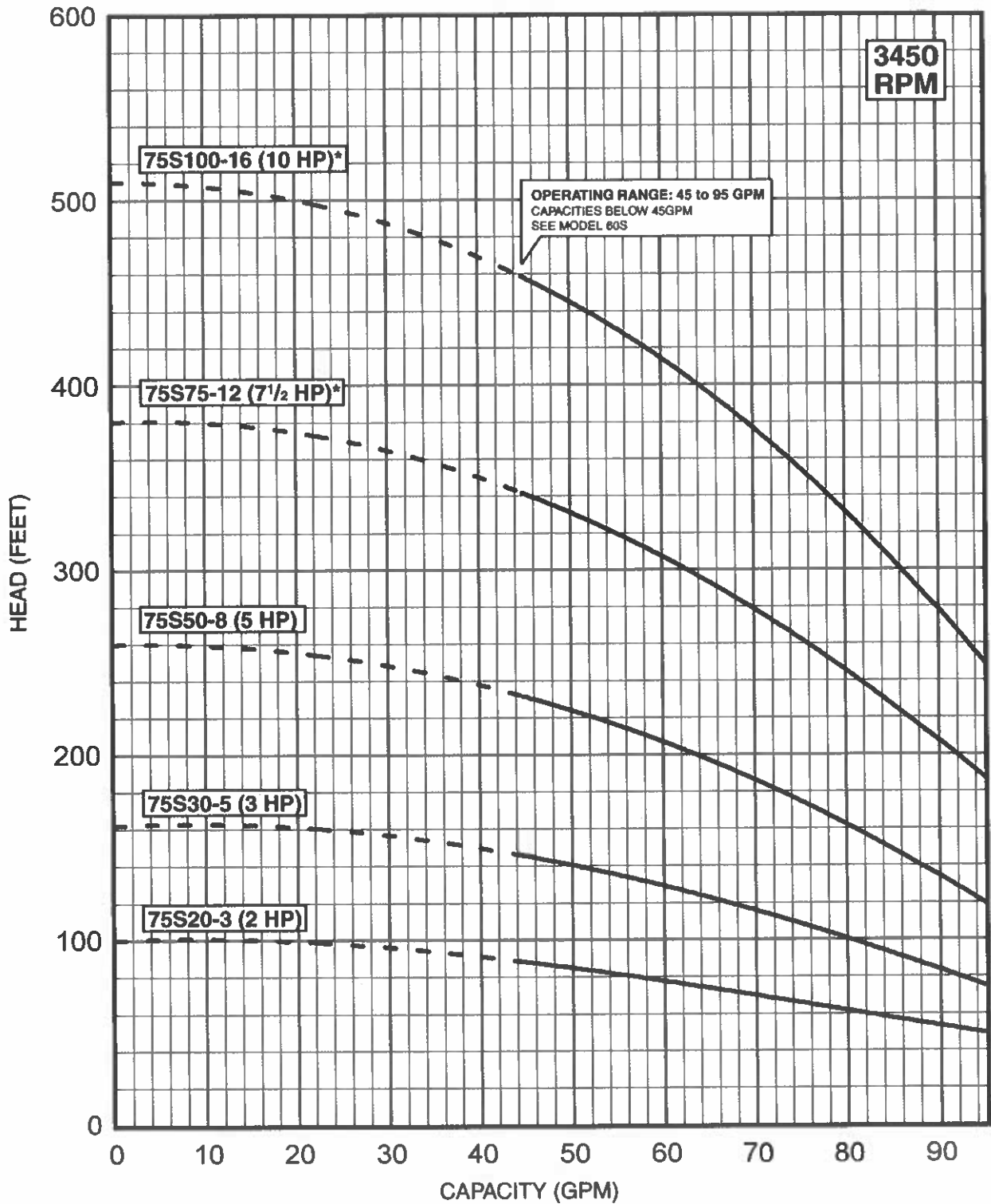
75 GPM

MODEL 75S

FLOW RANGE: 45 - 95 GPM

OUTLET SIZE: 2" NPT

NOMINAL DIA.: 4"



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

4" MOTOR STANDARD, 2-10 Hp 3450 RPM.

* Also available with 6" motor, performance is the same only at Best Efficiency point.
Consult factory for actual performance.

Performance conforms to ISO 9906: 1999 (E) Annex A
Minimum submergence is 5 feet.

DIMENSIONS AND WEIGHTS

MODEL NO.	FIG.	HP	MOTOR SIZE	DISCH. SIZE	DIMENSIONS IN INCHES					APPROX. SHIP WT.
					A	B	C	D	E	
75S20-3	A	2	4"	2" NPT	30.0	15.1	14.9	3.8	3.9	38
75S30-5	A	3	4"	2" NPT	40.7	20.6	20.1	3.8	3.9	64
75S50-8	A	5	4"	2" NPT	51.4	23.6	27.8	3.8	3.9	78
75S75-12*	A	7 1/2	4"	2" NPT	67.5	29.6	37.9	3.8	3.9	100
75S100-16*	A	10	4"	2" NPT	92.1	43.9	48.2	3.8	3.9	155

NOTES: All models suitable for use in 4" wells, unless otherwise noted.

Weights include pump end with motor in lbs.

* Also available with 6" motor, performance is the same only at Best Efficiency point. Consult factory for actual performance.

MATERIALS OF CONSTRUCTION

COMPONENT	CYLINDRICAL SHAFT (3-16 Stgs.)
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Diffuser Chamber	304 Stainless Steel
Impeller	304 Stainless Steel
Suction Interconnector	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	431 Stainless Steel
Straps	304 Stainless Steel
Cable Guard	304 Stainless Steel
Priming Inducer	304 Stainless Steel
Coupling	316/431 Stainless Steel**
Check Valve Seat	NBR/316 Stainless Steel
Top Bearing	NBR/316 Stainless Steel
Impeller Seal Ring	NBR/316 Stainless Steel
Intermediate Bearings	NBR/316 Stainless Steel
Shaft Washer	LCP (Vectra®)
Split Cone	304 Stainless Steel
Split Cone Nut	304 Stainless Steel

NOTES: Specifications are subject to change without notice.

Vectra® is a registered trademark of Hoechst Calanese Corporation.

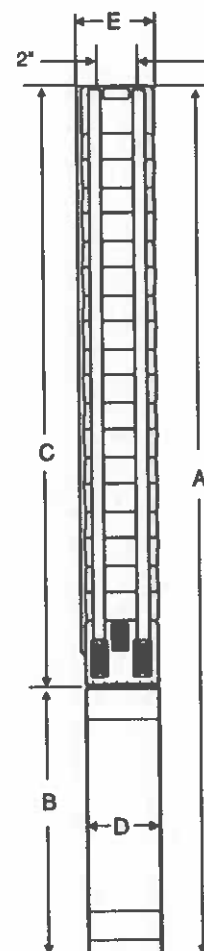


Fig. A



Attachment 9

Downhole Video Survey DVD



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Results of Aquifer Test Analysis

for the

Hancock Well

for

Canyon Lake Water Service Company

P.O. Box 1742

Canyon Lake, TX 78133

WRGS Project No. 042-002-12

February 2012



Wet Rock Groundwater Services, LLC

Groundwater Specialists


TBPG Firm No: 50038

311 Ranch Road 620 South, Suite 103

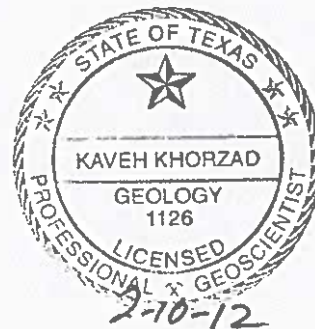
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Ph: 512-773-3226 www.wetrockgs.com

The seal appearing on this document was authorized on February 10, 2012 by:


Kaveh Khorzad, P.G.
License No. 1126

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



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Groundwater Specialists

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Austin, TX 78734

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Canyon Lake Water Service Company

Hancock Well

Middle Trinity Aquifer

Contents

Attachment 1:	Hancock Well Location Map
Attachment 2:	U.S. Geological Survey Topographic Map
Attachment 3:	Well Profile
Attachment 4:	Table 1 - Well Construction Summary Table 2 - Aquifer Testing Summary Table 3 - Summary of Aquifer Testing Analysis
Attachment 5:	Aquifer Test Drawdown and Temperature Curves
Attachment 6:	Aquifer Test Analyses
Attachment 7:	Aquifer Test Data
Attachment 8:	Pump Specifications
Attachment 9:	Downhole Video Survey DVD



Introduction

The Hancock Well is located within the Canyon Lake Water Service Company (CLWSC) service area in northern Comal County near the intersection of FM 306 and FM 3424 (See Attachment 1 & Attachment 2). The Hancock Well is approximately 275 feet from the Scenic Well which was put back into service during 2011. Based upon the successful production at the Scenic Well, CLWSC staff expressed interest in determining the condition and production capabilities of the Hancock Well.

The objectives of this study are to:

1. Conduct a downhole video survey to determine the condition of the well casing and the production zone;
2. Conduct an aquifer test to determine the transmissivity and well capacity of the Hancock Well; and
3. Determine the proper pump size and future sustainable water supply capabilities of the Hancock Well.

Well Construction and Downhole Video Survey

Attachment 3 and Attachment 4 provide a well profile summary and the well construction summary of the Hancock Well. The well profile was created from information obtained from the downhole video survey as the well report on file with Texas Water Development Board is incomplete. Attachment 9 provides a copy of the downhole video survey conducted on the well January 24, 2012. The well is completed with 6-inch PVC casing set to 19.8 ft below ground and an open hole completion that is approximately 6-inch in diameter from 19.8 ft to 334.5 ft. The well is believed to be completed in the Lower Glen Rose Formation of the Middle Trinity Aquifer.

During the video survey, the PVC casing was observed to be in good condition. On the day of the survey, the Scenic Well was pumping and the water level in the Hancock Well was 146.4 ft below ground surface (bgs). In general, the open hole section contained massive limestone with vuggy sections and numerous small fractures. Fill was encountered at 334.5 ft bgs with the total depth of the well unknown.

Aquifer Testing

A 5 horsepower (HP) submersible pump was set with 260 ft of 2-inch column pipe, and a pressure transducer capable of measuring the water level and temperature at one minute intervals



was set within the Hancock Well. On February 2, 2012 the initial water level was measured at 146.2 ft bgs. According to CLWSC staff, the Scenic Well had been pumping for approximately two hours when the water level was measured. The pump was turned on and ran for 24.5 hours at a rate of 40 gallons per minute (gpm). Attachment 4 summarizes the aquifer testing, Attachment 5 provides a water level and temperature graph of the aquifer test data, Attachment 6 provides the aquifer test analysis, and Attachment 7 provides the raw water level and temperature data.

The well maintained a constant rate of production at 40 gpm with a maximum drawdown of 36.8 ft. The maximum drawdown occurred approximately 30 minutes after the test was started while the Scenic Well was pumping. The Scenic Well turned off approximately 32 minutes into the test, which resulted in a continuous rise in water level until approximately 15 hours into the test. The pumping level in the Hancock Well stabilized resulting in approximately 22.8 ft of drawdown for a specific capacity of 1.75 gpm/ft (Attachment 4). The water level recovered quickly when the pump was shut off, and continued to rise above the initial measured water level of 146.2 ft bgs reaching a high point of 130.5 ft bgs. This is likely due to the influence of the pumping at the Scenic Well when the initial water level was measured. The water level remained relatively stable until the final two hours of the test when the water level began to drop, most likely due to pumping of the Scenic Well (Attachment 5). Due to the influence of the Scenic Well at the beginning of the test, it was determined that the static water level of the Hancock Well is approximately 130.5 ft bgs.

Based upon the analyses of the aquifer test, the capacity of a well completed at this location in the aquifer is approximately 200 - 225 gpm. However, the 6-inch well casing limits the size of pump and column pipe that can be used in the well. Also, the results of the aquifer test show a connection to the Scenic Well and pumping at a high rate would most likely influence production at both wells. Considering the proximity and connection to the Scenic Well, an appropriate pump rate for the Hancock Well is approximately 80 - 90 gpm. Attachment 8 provides detailed pump specifications for the Hancock Well.

The aquifer test data was analyzed using the Theis Recovery methods (Attachment 6). The Theis Recovery analysis results were a transmissivity of 342 ft²/day and a hydraulic conductivity of 1.68 ft/day.



Conclusions

The Hancock Well is located north of Canyon Lake and is approximately 275 feet from the Scenic Well which was put back into service during 2011. Based upon the successful production at the Scenic Well, CLWSC staff expressed interest in determining the condition and production capabilities of the Hancock Well. An analysis of the Hancock Well was conducted by Wet Rock Groundwater Services, LLC which included:

- Downhole Video Survey;
- Aquifer Testing; and
- Aquifer Test analysis

Based upon the analysis we provide the following conclusions:

1. The Scenic well is completed within the Middle Trinity Aquifer;
2. During the video survey the PVC casing was observed to be in good condition, however the casing is set to 19.8 ft bgs. The well would need to be reworked with casing pressure cemented in place to the static water level to meet the Texas Commission on Environmental Quality (TCEQ) public supply well standards. In the open hole section of the well, numerous fractures and vuggy sections were observed;
3. A 24.5 hour aquifer test was conducted on the Hancock Well at a rate of 40 gpm with the well reaching steady state after approximately 15 hours. Maximum drawdown was 36.8 ft with a pumping level of 167 ft bgs while the Scenic Well was pumping and 22.8 ft with a pumping level of 153 ft bgs when the Scenic Well was shut off ; and
4. Utilizing the Theis Recovery analysis, the specific capacity, transmissivity and hydraulic conductivity was calculated to be 1.75 gpm/ft, 342 ft²/day and 1.68 ft/day respectively. The maximum capacity of the well with a pump set at 315 ft bgs is estimated to be 80 - 90 gpm.





Attachment 1

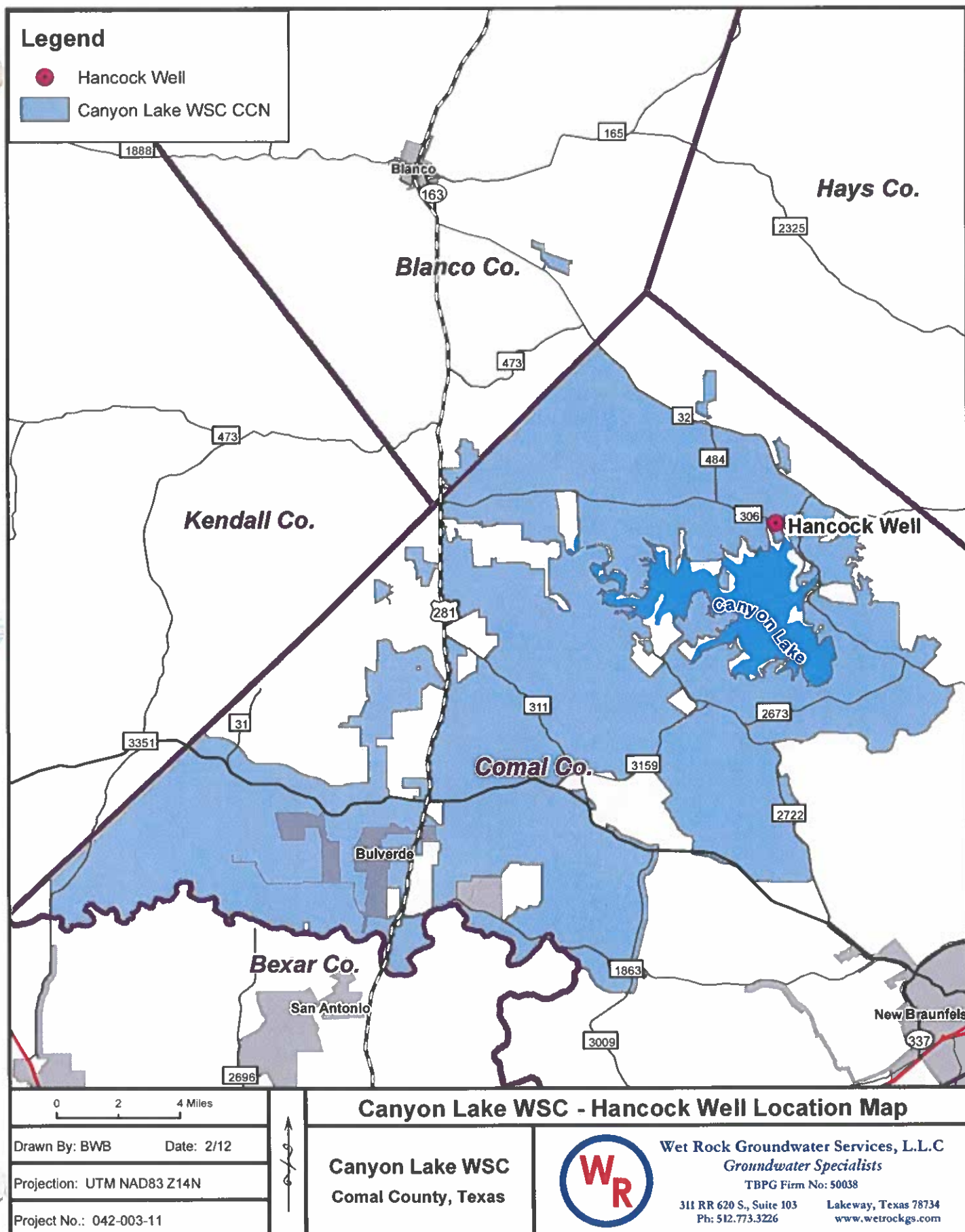
Hancock Well Location Map



Wet Rock Groundwater Services, LLC



Groundwater Specialists





Attachment 2

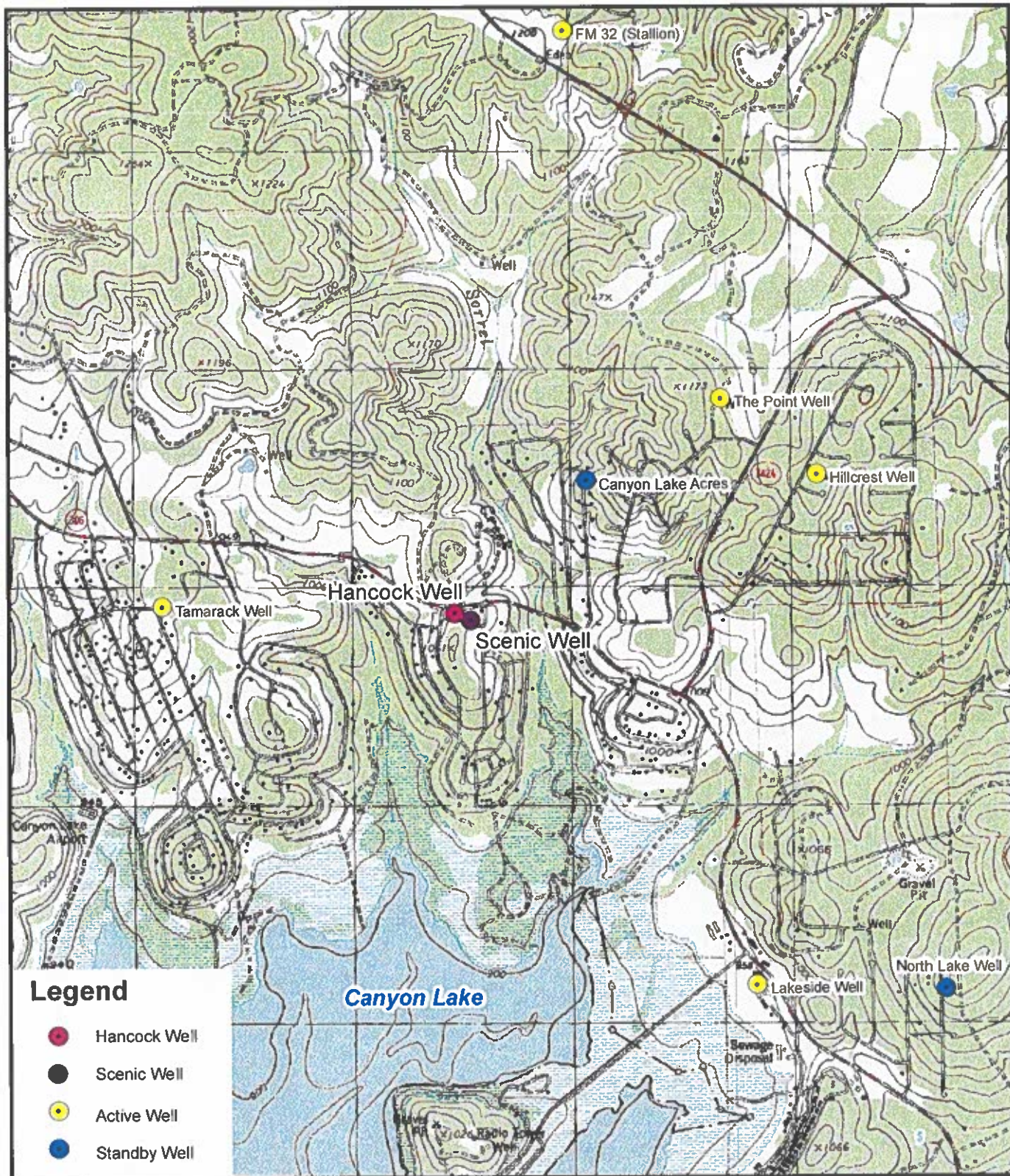
USGS Topographic Map



Wet Rock Groundwater Services, LLC



Groundwater Specialists



Legend

- Hancock Well
- Scenic Well
- Active Well
- Standby Well

SCALE: 1 Inch = 2,000 feet

DRAWN BY: BWB DATE: 2/12

REVISED BY: DATE:

PROJECTION: UTM NAD 83 Zone 14



**Canyon Lake
WSC**

Comal County, Texas

Hancock Well Topographic Map



Wet Rock Groundwater Services, L.L.C.
Groundwater Specialists

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Attachment 3

Well Profile

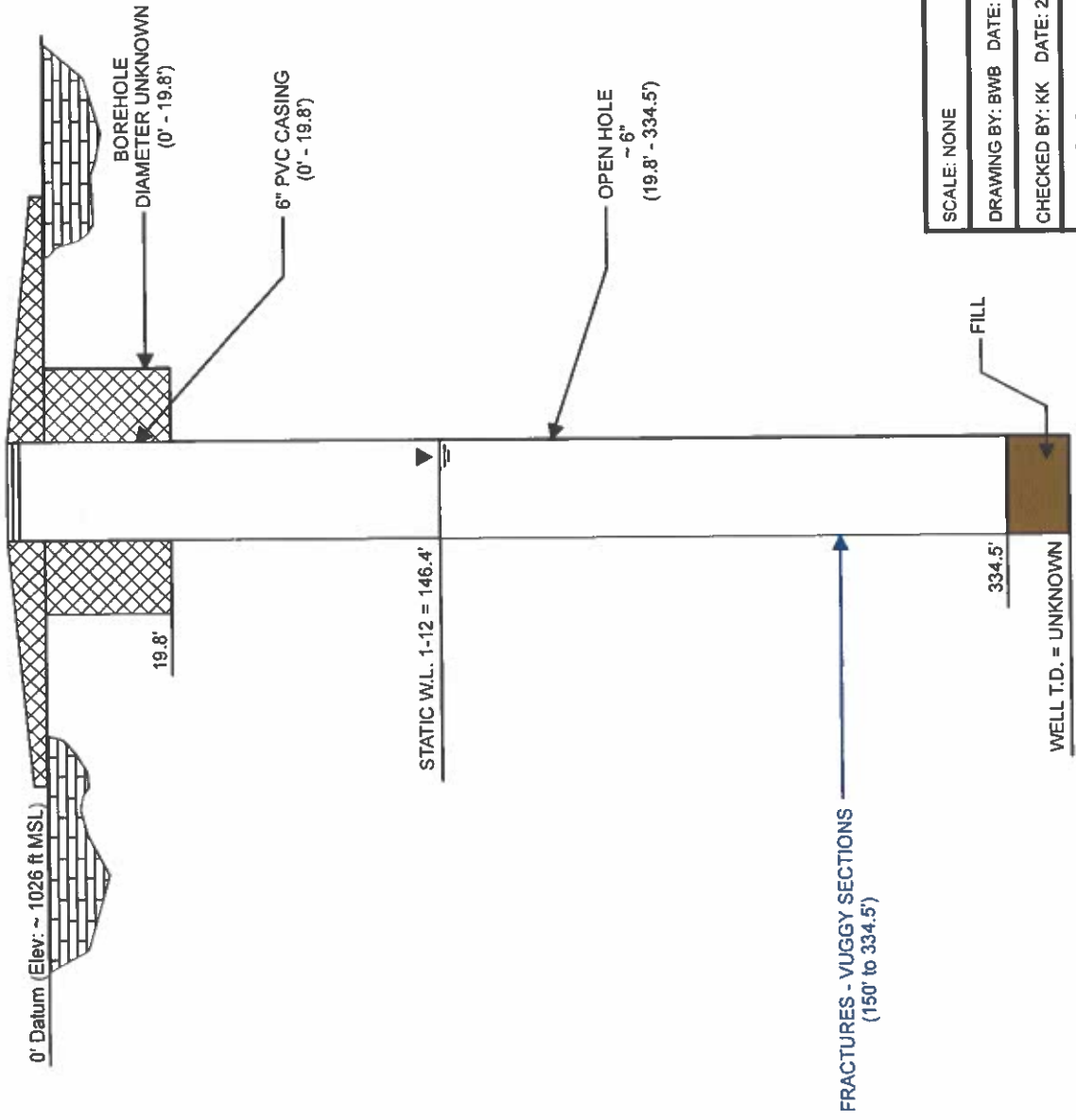


Wet Rock Groundwater Services, LLC



Groundwater Specialists

NOTE: Construction details from down hole video survey conducted on January 24, 2012, no well report available.



Well Profile: CLWSC - Hancock Well

Canyon Lake WSC
Comal County, Texas

Wet Rock Groundwater Services, LLC
Groundwater Specialists
TBPC Firm No: 90038
311 Ranch Road 620 South, Ste. 103
Austin, Texas 78734
Ph: 512.773.3226 www.wetrockga.com



SCALE: NONE
DRAWING BY: BWB DATE: 2-12
CHECKED BY: KK DATE: 2-12
DRAWING NO: 1
SHEET: 1 OF 1

Attachment 4

Table 1: Well Construction Summary

Table 2: Aquifer Testing Summary

Table 3: Summary of Aquifer Testing Analysis



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Table 1 - Well Construction Summary

<u>Well</u>	<u>Hole Diameter (inches)</u>	<u>From (ft)</u>	<u>To (ft)</u>	<u>Casing Type</u>	<u>Casing Diameter (inches)</u>	<u>From (ft)</u>	<u>To (ft)</u>
Hancock Well	n/a	0	19.8	PVC	6	0	19.8
	6	19.8	334.5	Open Hole	6	19.8	334.5

Table 2 - Aquifer Testing Summary

<u>Well</u>	<u>Static Water Level (ft bgs)</u>	<u>Static Water Level (ft MSL)</u>	<u>Q (gpm)</u>	<u>Drawdown (ft)</u>	<u>SC (gpm/ft)</u>	<u>Pumping Duration (hours)</u>
Hancock Well	130.5	895.5	40	22.8	1.75	24.5

Notes: Q = discharge; SC = specific capacity; bgs = below ground surface; MSL = Mean Sea Level; gpm = gallons per minute; ft = feet

Table 3 - Summary of Aquifer Testing Analyses

<u>Well</u>	<u>Analysis</u>	<u>b (ft)</u>	<u>T (ft²/day)</u>	<u>K (ft/day)</u>
Hancock Well	Theis Recovery	204	342	1.68

Notes: b = aquifer thickness; r = distance from pumping well; T = transmissivity; K = hydraulic conductivity



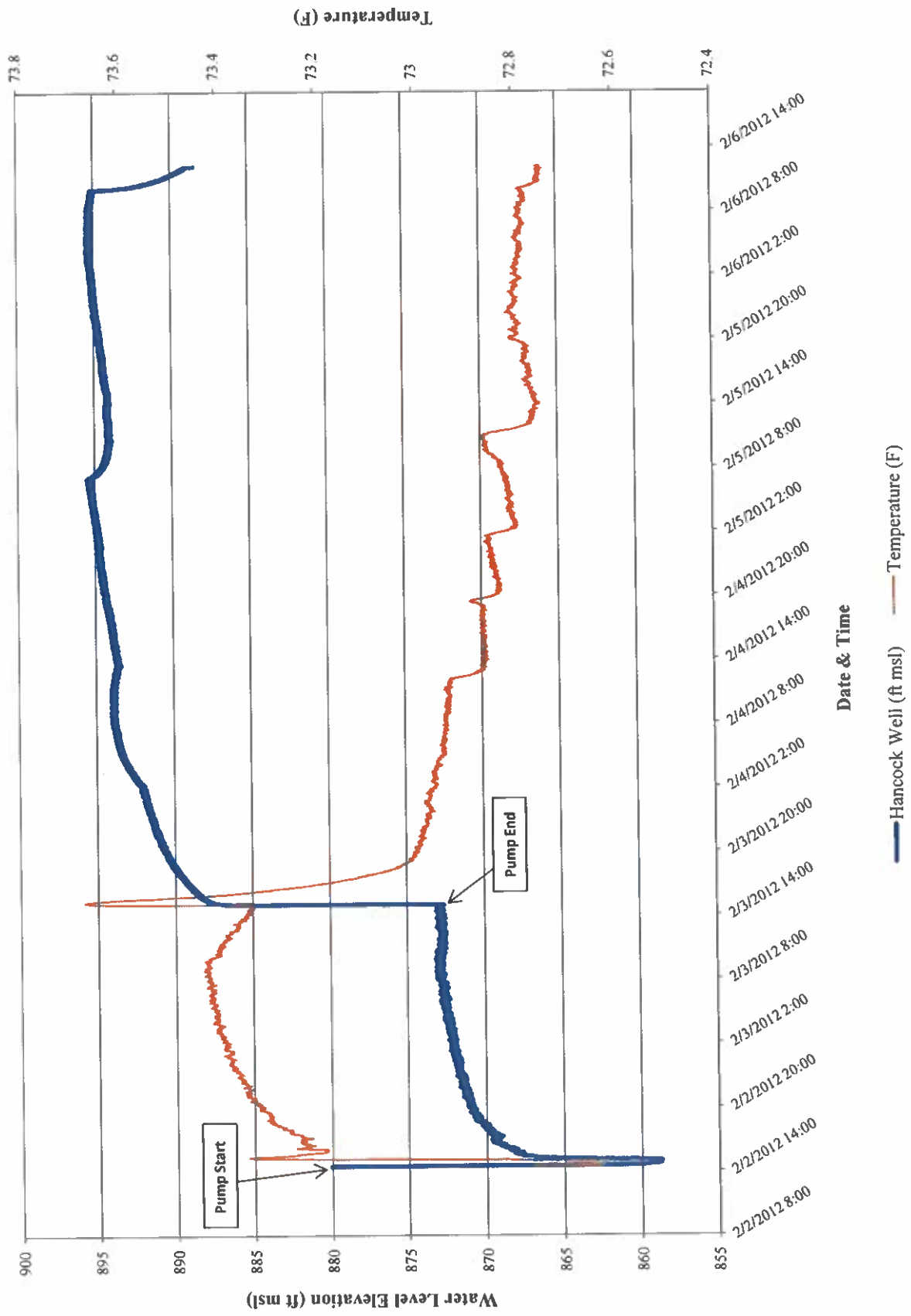


Attachment 5

Aquifer Test Drawdown and Temperature Curves



Canyon Lake WSC Hancock Well - Aquifer Test (February 2, 2012)





Attachment 6

Aquifer Test Analyses



Wet Rock Groundwater Services, LLC



Groundwater Specialists



Wet Rock Groundwater Services, LLC
Groundwater Specialists
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Austin, Texas 78734
Ph: 512.773.3226
www.wetrockgs.com

Pumping Test Analysis Report

Project: Hancock Well - Aquifer Test

Number: 042-002-12

Client: Canyon Lake WSC

Location: Comal County, TX

Pumping Test: Hancock Well

Pumping Well: Hancock Well

Test Conducted by: BWB

Test Date: 2/2/2012

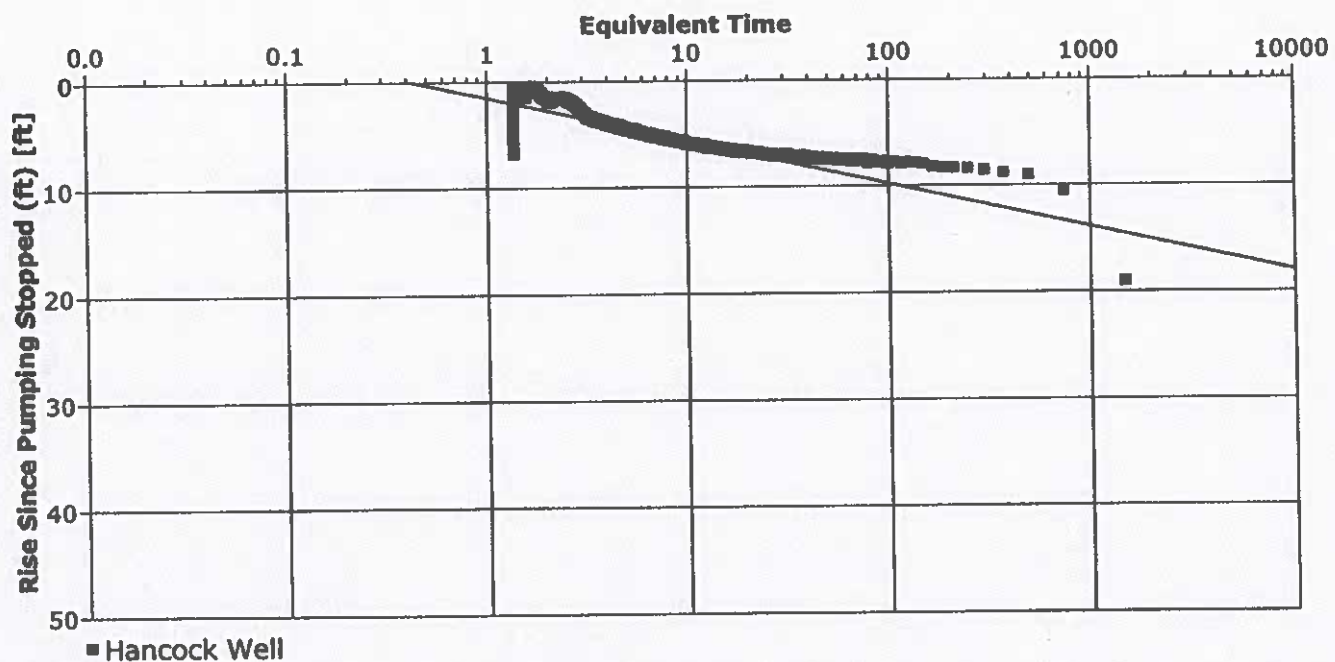
Analysis Performed by: BWB

Theis Recovery

Analysis Date: 2/6/2012

Aquifer Thickness: 204.00 ft

Discharge: variable, average rate 39.98 [U.S. gal/min]



Calculation after Theis & Jacob

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]
Hancock Well	3.42×10^2	1.68×10^0	



Attachment 7

Aquifer Test Data



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Canyon Lake WSC Hancock Well - Aquifer Test (February 2, 2012)

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)	Comments
2/2/2012 14:29	0		72.6	145.9	880.1	0.0			Scenic Well pumping when test started
2/2/2012 14:30	0		72.7	146.0	880.0	0.0			Meter = 735.141 Gallons
2/2/2012 14:31	1		72.8	152.2	873.8	6.2	40	6.42	Pumping Start
2/2/2012 14:32	2		72.7	150.0	866.0	14.1			
2/2/2012 14:33	3		72.7	153.2	862.8	17.3	39	2.26	Red water
2/2/2012 14:34	4		72.7	155.1	860.9	19.2			
2/2/2012 14:35	5		72.7	155.7	860.3	19.8	39	1.97	
2/2/2012 14:36	6		72.6	156.2	859.8	20.2			
2/2/2012 14:37	7		72.6	156.2	859.8	20.3			
2/2/2012 14:38	8		72.6	156.4	859.6	20.4			
2/2/2012 14:39	9		72.6	156.4	859.6	20.5			
2/2/2012 14:40	10		72.6	156.6	859.4	20.6	39	1.89	Clearing
2/2/2012 14:41	11		72.6	156.6	859.4	20.7			
2/2/2012 14:42	12		72.6	156.7	859.3	20.8			
2/2/2012 14:43	13		72.6	156.9	859.1	21.0			
2/2/2012 14:44	14		72.6	157.1	858.9	21.1			
2/2/2012 14:45	15		72.6	157.0	859.0	21.1	39	1.85	
2/2/2012 14:50	20		72.7	157.2	858.8	21.3	39	1.83	
2/2/2012 14:55	25		72.7	157.2	858.8	21.2	39	1.84	
2/2/2012 15:00	30		72.8	157.3	858.7	21.3	39	1.83	Milky grey
2/2/2012 15:15	45		73.3	159.5	866.5	13.6	40	2.94	
2/2/2012 15:30	60		73.3	158.3	867.7	12.4	40	3.23	
2/2/2012 15:45	75		73.2	158.0	868.0	12.1	40	3.32	Clearing
2/2/2012 16:00	90		73.2	157.5	868.5	11.6	40	3.45	
2/2/2012 16:15	105		73.2	157.2	868.8	11.2	40	3.56	
2/2/2012 16:30	120		73.2	157.1	868.9	11.1			
2/2/2012 17:30	180		73.2	156.8	869.2	10.9			
2/2/2012 18:30	240		73.3	155.8	870.2	9.9			
2/2/2012 19:30	300		73.3	155.1	870.9	9.1			
2/2/2012 20:30	360		73.3	155.0	871.0	9.0			
2/2/2012 21:30	420		73.3	154.8	871.2	8.9			
2/2/2012 22:30	480		73.4	154.6	871.4	8.7			
2/2/2012 23:30	540		73.4	154.2	871.8	8.3			
2/3/2012 0:30	600		73.4	154.3	871.7	8.4			
2/3/2012 1:30	660		73.4	154.1	871.9	8.1			
2/3/2012 2:30	720		73.4	154.0	872.0	8.1			
2/3/2012 3:30	780		73.4	153.6	872.4	7.6			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 260 feet bgs

Canyon Lake WSC Hancock Well - Aquifer Test (February 2, 2012)

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)	Comments
2/3/2012 4:30	840		73.4	153.6	872.4	7.6			
2/3/2012 5:30	900		73.4	153.7	872.3	7.7			
2/3/2012 6:30	960		73.4	153.4	872.6	7.5			
2/3/2012 7:30	1020		73.4	153.1	872.9	7.2			
2/3/2012 8:30	1080		73.4	152.9	873.1	7.0			
2/3/2012 9:30	1140		73.4	153.0	873.0	7.0			
2/3/2012 10:30	1200		73.4	153.4	872.6	7.4			
2/3/2012 11:30	1260		73.4	153.1	872.9	7.1			
2/3/2012 12:30	1320		73.4	153.1	872.9	7.2			
2/3/2012 13:30	1380		73.4	153.0	873.0	7.1			
2/3/2012 14:30	1440		73.3	153.0	873.0	7.0			
2/3/2012 15:02	1472	0	73.3	153.3	872.7	7.4	40	5.42	Pumping Stopped Meter = 793.727 Gallons
2/3/2012 15:03	1473	1	73.3	149.6	876.4	3.6			
2/3/2012 15:04	1474	2	73.4	141.1	884.9	-4.8			
2/3/2012 15:05	1475	3	73.5	139.6	886.4	-6.3			
2/3/2012 15:06	1476	4	73.5	139.4	886.6	-6.6			
2/3/2012 15:07	1477	5	73.6	139.1	886.9	-6.8			
2/3/2012 15:08	1478	6	73.6	139.0	887.0	-6.9			
2/3/2012 15:09	1479	7	73.6	138.9	887.1	-7.1			
2/3/2012 15:10	1480	8	73.6	138.8	887.2	-7.1			
2/3/2012 15:11	1481	9	73.7	138.8	887.2	-7.2			
2/3/2012 15:12	1482	10	73.7	138.5	887.5	-7.4			
2/3/2012 15:13	1483	11	73.7	138.5	887.5	-7.5			
2/3/2012 15:14	1484	12	73.7	138.4	887.6	-7.6			
2/3/2012 15:15	1485	13	73.7	138.5	887.5	-7.4			
2/3/2012 15:16	1486	14	73.7	138.3	887.7	-7.6			
2/3/2012 15:17	1487	15	73.7	138.5	887.5	-7.4			
2/3/2012 15:22	1492	20	73.7	138.1	887.9	-7.9			
2/3/2012 15:27	1497	25	73.6	138.2	887.8	-7.7			
2/3/2012 15:32	1502	30	73.6	138.1	887.9	-7.9			
2/3/2012 15:47	1517	45	73.5	137.8	888.2	-8.1			
2/3/2012 16:02	1532	60	73.4	137.4	888.6	-8.5			
2/3/2012 16:17	1547	75	73.3	137.4	888.6	-8.5			
2/3/2012 16:32	1562	90	73.3	137.3	888.7	-8.6			
2/3/2012 16:47	1577	105	73.2	136.9	889.1	-9.0			
2/3/2012 17:02	1592	120	73.2	136.7	889.3	-9.2			
2/3/2012 18:02	1652	180	73.1	136.1	889.9	-9.8			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 260 feet bgs

Canyon Lake WSC Hancock Well - Aquifer Test (February 2, 2012)

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)	Comments
2/3/2012 19:02	1712	240	73.0	135.9	890.1	-10.0			
2/3/2012 20:02	1772	300	73.0	135.3	890.7	-10.6			
2/3/2012 21:02	1832	360	73.0	135.2	890.8	-10.7			
2/3/2012 22:02	1892	420	73.0	135.0	891.0	-11.0			
2/3/2012 23:02	1952	480	73.0	134.7	891.3	-11.2			
2/4/2012 0:02	2012	540	73.0	134.3	891.7	-11.7			
2/4/2012 1:02	2072	600	73.0	134.3	891.7	-11.6			
2/4/2012 2:02	2132	660	73.0	134.1	891.9	-11.8			
2/4/2012 3:02	2192	720	73.0	133.4	892.6	-12.6			
2/4/2012 4:02	2252	780	73.0	132.9	893.1	-13.0			
2/4/2012 5:02	2312	840	72.9	132.6	893.4	-13.3			
2/4/2012 6:02	2372	900	72.9	132.6	893.4	-13.3			
2/4/2012 7:02	2432	960	72.9	132.2	893.8	-13.7			
2/4/2012 8:02	2492	1020	72.9	132.3	893.7	-13.6			
2/4/2012 9:02	2552	1080	72.9	132.2	893.8	-13.7			
2/4/2012 10:02	2612	1140	72.9	132.0	894.0	-13.9			
2/4/2012 11:02	2672	1200	72.9	132.0	894.0	-13.9			
2/4/2012 12:02	2732	1260	72.9	132.4	893.6	-13.6			
2/4/2012 13:02	2792	1320	72.9	132.5	893.5	-13.5			
2/4/2012 14:02	2852	1380	72.9	132.3	893.7	-13.7			
2/4/2012 15:02	2912	1440	72.9	132.1	893.9	-13.8			
2/4/2012 16:02	2972	1500	72.9	132.3	893.7	-13.7			
2/4/2012 17:02	3032	1560	72.9	132.2	893.8	-13.7			
2/4/2012 18:02	3092	1620	72.9	131.8	894.2	-14.1			
2/4/2012 19:02	3152	1680	72.9	131.7	894.3	-14.2			
2/4/2012 20:02	3212	1740	72.8	131.8	894.2	-14.2			
2/4/2012 21:02	3272	1800	72.8	131.5	894.5	-14.5			
2/4/2012 22:02	3332	1860	72.8	131.6	894.4	-14.4			
2/4/2012 23:02	3392	1920	72.8	131.3	894.7	-14.7			
2/5/2012 0:02	3452	1980	72.8	131.2	894.8	-14.7			
2/5/2012 1:02	3512	2040	72.9	131.1	894.9	-14.8			
2/5/2012 2:02	3572	2100	72.8	131.3	894.7	-14.7			
2/5/2012 3:02	3632	2160	72.8	131.0	895.0	-15.0			
2/5/2012 4:02	3692	2220	72.8	131.0	895.0	-14.9			
2/5/2012 5:02	3752	2280	72.8	131.0	895.0	-15.0			
2/5/2012 6:02	3812	2340	72.8	130.9	895.1	-15.1			
2/5/2012 7:02	3872	2400	72.8	130.8	895.2	-15.2			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 260 feet bgs

Canyon Lake WSC Hancock Well - Aquifer Test (February 2, 2012)

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)	Comments
2/5/2012 8:02	3932	2460	72.8	131.3	894.7	-14.6			
2/5/2012 9:02	3992	2520	72.8	131.9	894.1	-14.1			
2/5/2012 10:02	4052	2580	72.9	132.0	894.0	-13.9			
2/5/2012 11:02	4112	2640	72.9	131.9	894.1	-14.1			
2/5/2012 12:02	4172	2700	72.8	132.0	894.0	-13.9			
2/5/2012 13:02	4232	2760	72.8	131.8	894.2	-14.2			
2/5/2012 14:02	4292	2820	72.7	131.8	894.2	-14.2			
2/5/2012 15:02	4352	2880	72.8	132.0	894.0	-14.0			
2/5/2012 16:02	4412	2940	72.8	131.8	894.2	-14.1			
2/5/2012 17:02	4472	3000	72.8	131.5	894.5	-14.5			
2/5/2012 18:02	4532	3060	72.8	131.5	894.5	-14.5			
2/5/2012 19:02	4592	3120	72.8	131.3	894.7	-14.6			
2/5/2012 20:02	4652	3180	72.8	131.2	894.8	-14.7			
2/5/2012 21:02	4712	3240	72.8	131.4	894.6	-14.6			
2/5/2012 22:02	4772	3300	72.8	131.2	894.8	-14.7			
2/5/2012 23:02	4832	3360	72.8	130.9	895.1	-15.0			
2/6/2012 0:02	4892	3420	72.8	131.1	894.9	-14.8			
2/6/2012 1:02	4952	3480	72.8	130.8	895.2	-15.1			
2/6/2012 2:02	5012	3540	72.8	131.0	895.0	-15.0			
2/6/2012 3:02	5072	3600	72.8	130.7	895.3	-15.3			
2/6/2012 4:02	5132	3660	72.8	130.8	895.2	-15.1			
2/6/2012 5:02	5192	3720	72.8	130.8	895.2	-15.1			
2/6/2012 6:02	5252	3780	72.8	130.8	895.2	-15.1			
2/6/2012 7:02	5312	3840	72.8	130.6	895.4	-15.3			
2/6/2012 8:02	5372	3900	72.8	130.6	895.4	-15.3			
2/6/2012 9:02	5432	3960	72.8	130.7	895.3	-15.2			
2/6/2012 10:02	5492	4020	72.8	131.1	894.9	-14.8			
2/6/2012 11:02	5552	4080	72.8	135.1	890.9	-10.9			
2/6/2012 12:02	5612	4140	72.7	136.9	889.1	-9.1			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 260 feet bgs



Attachment 8

Pump Specifications





Wet Rock Groundwater Services, L.L.C.

Groundwater Specialists

TBPG Firm No: 50038

311 Ranch Road 620S, Ste. 103

Austin, Texas 78734

Ph: 512-773-3226 www.wetrockgs.com

Hancock Well Pump Specifications

TDH

Static W.L. (October 19, 2011)	130.5 ft
Pumping W.L. @ 85 GPM (estimated)	200.0 ft
Elevation (Standpipe)	15.0 ft
Frictional Loss in Column (3")	11.0 ft
<u>Frictional Loss in Line (3")</u>	<u>10.0 ft</u>
TDH	236.0 ft

Pump	Grundfos 85S75-6 88 GPM @ 230 Ft TDH
Motor	Franklin 4-inch Submersible motor 3,450 RPM, 7.5 H.P., 460v, 60 hz, Three-Phase
Electrical	Franklin Submonitor, NEMA Size 1 Starter, and No. 14 Power Cable
Discharge Column	315 ft. of 3.5-inch X 0.216-inch (3-inch nominal) threaded and coupled galvanized steel column, check valve at 252 ft. below ground, flanged discharge elbow
E-line Assembly	The well shall also be equipped with a 1-inch PVC pipe for checking water levels. The PVC pipe shall include a water-tight cover that can be readily opened and closed. The PVC line shall be 1-inch PVC extending down to the pump and strapped to the column pipe.

PERFORMANCE CURVES

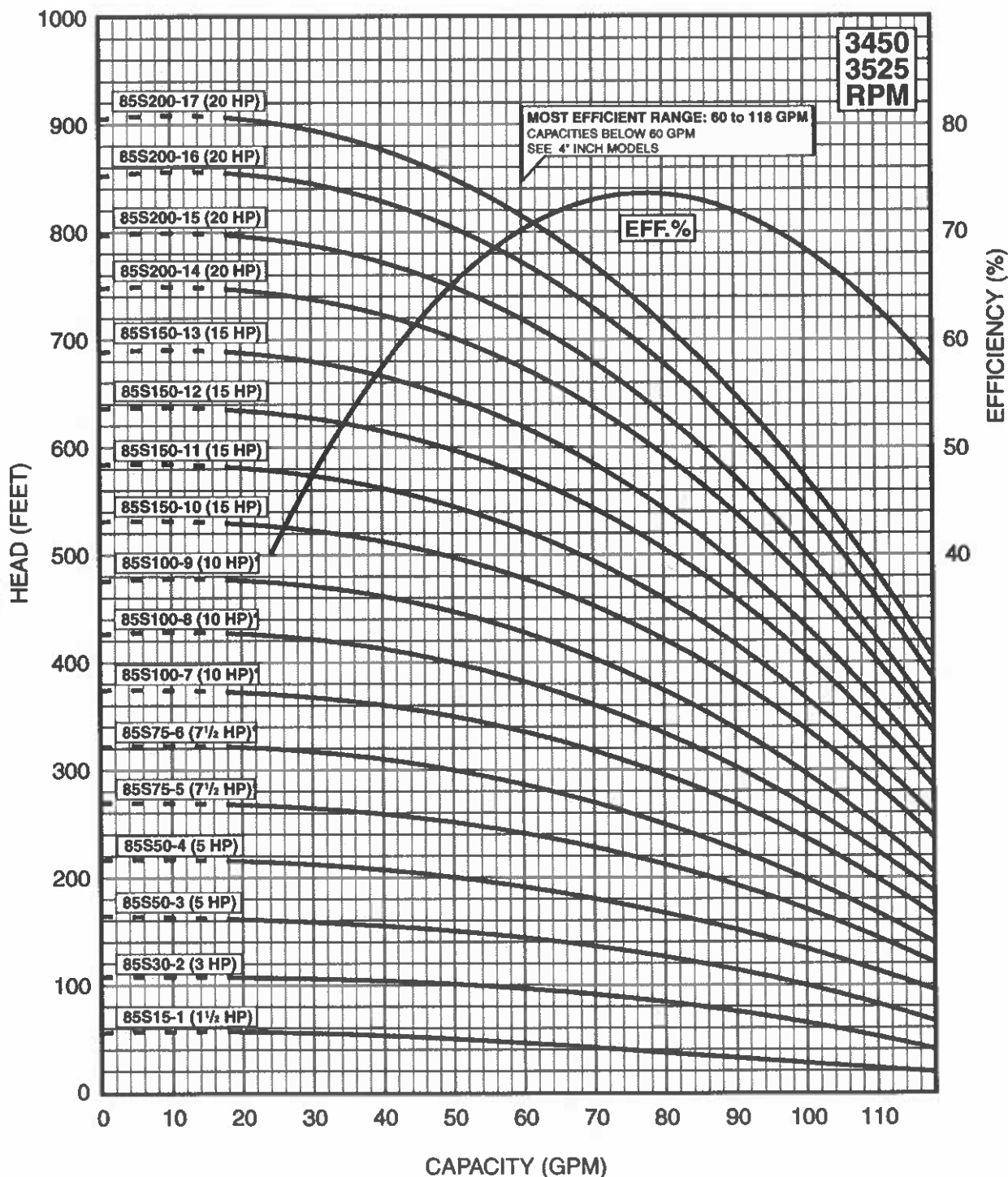
85 GPM

MODEL 85S

FLOW RANGE: 18 -118 GPM

OUTLET SIZE: 3" NPT

NOMINAL DIA. 6"



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

4" MOTOR STANDARD, 1.5-5 HP/3450 RPM

6" MOTOR STANDARD, 7.5-50 HP/3450 RPM.

* Alternate motor sizes available.

Performance conforms to ISO 9906 Annex A

@ 5 ft. min. submergence.

DIMENSIONS AND WEIGHTS

MODEL NO.	FIG.	HP	MOTOR SIZE	DISCH. SIZE	DIMENSIONS IN INCHES					APPROX. SHIP WT.
					A	B	C	D	E	
85S15-1	A	1 1/2	4"	3" NPT	25.9	13.6	12.3	3.75	5.2	37
85S30-2	A	3	4"	3" NPT	35.3	20.6	14.7	3.75	5.2	61
85S50-3	A	5	4"	3" NPT	40.7	23.6	17.1	3.75	5.2	75
85S50-4	A	5	4"	3" NPT	43.1	23.6	19.5	3.75	5.2	77
85S75-5	A	7 1/2	4"	3" NPT	51.5	29.6	21.9	3.75	5.2	95
85S75-6	A	7 1/2	4"	3" NPT	53.9	29.6	24.3	3.75	5.2	97
85S100-7	A	10	4"	3" NPT	70.5	43.9	26.6	3.75	5.2	151
85S100-8	A	10	4"	3" NPT	72.9	43.9	29.0	3.75	5.2	154
85S100-9	A	10	4"	3" NPT	75.3	43.9	31.4	3.75	5.2	156
85S75-5	A	7 1/2	6"	3" NPT	46.7	24.2	22.5	5.38	5.6	135
85S75-6	A	7 1/2	6"	3" NPT	49.1	24.2	24.9	5.38	5.6	137
85S100-7	A	10	6"	3" NPT	52.7	25.4	27.3	5.38	5.6	148
85S100-8	A	10	6"	3" NPT	55.0	25.4	29.6	5.38	5.6	151
85S100-9	A	10	6"	3" NPT	57.4	25.4	32.0	5.38	5.6	153
85S150-10	A	15	6"	3" NPT	62.4	28.0	34.4	5.38	5.6	170
85S150-11	A	15	6"	3" NPT	64.8	28.0	36.8	5.38	5.6	174
85S150-12	A	15	6"	3" NPT	67.2	28.0	39.2	5.38	5.6	176
85S150-13	A	15	6"	3" NPT	69.6	28.0	41.6	5.38	5.6	178
85S200-14	A	20	6"	3" NPT	74.5	30.6	43.9	5.38	5.6	193
85S200-15	A	20	6"	3" NPT	76.9	30.6	46.3	5.38	5.6	198
85S200-16	A	20	6"	3" NPT	79.3	30.6	48.7	5.38	5.6	200
85S200-17	A	20	6"	3" NPT	81.7	30.6	51.1	5.38	5.6	202
85S200-18	A	20	6"	3" NPT	84.1	30.6	53.5	5.38	5.6	204
85S250-19	A	25	6"	3" NPT	88.9	33.1	55.8	5.38	5.6	240
85S250-20	A	25	6"	3" NPT	91.9	33.1	58.8	5.38	5.6	244
85S250-21	A	25	6"	3" NPT	94.3	33.1	61.2	5.38	5.6	246
85S250-22	A	25	6"	3" NPT	96.7	33.1	63.6	5.38	5.6	249
85S300-23	A	30	6"	3" NPT	101.9	35.7	66.2	5.38	5.6	264
85S300-24	A	30	6"	3" NPT	104.1	35.7	68.4	5.38	5.6	266
85S300-25	A	30	6"	3" NPT	106.4	35.7	70.7	5.38	5.6	271
85S300-26	A	30	6"	3" NPT	108.8	35.7	73.1	5.38	5.6	273
85S300-27	A	30	6"	3" NPT	116.3	40.8	75.5	5.38	5.6	278
85S400-28	A	40	6"	3" NPT	118.7	40.8	77.9	5.38	5.6	281
85S400-29	A	40	6"	3" NPT	121.1	40.8	80.3	5.38	5.6	283
85S400-30	A	40	6"	3" NPT	123.4	40.8	82.6	5.38	5.6	287
85S400-33*	B	40	6"	3" NPT	139.7	40.8	98.9	5.38	6.9	343
85S400-36*	B	40	6"	3" NPT	146.9	40.8	106.1	5.38	6.9	354
85S500-39*	B	50	6"	3" NPT	171.0	57.8	113.2	5.38	6.9	448
85S400-33*	B	40	8"	3" NPT	134.7	35.8	98.9	7.5	6.9	377
85S400-36*	B	40	8"	3" NPT	141.9	35.8	106.1	7.5	6.9	390
85S500-39*	B	50	8"	3" NPT	152.0	38.8	113.2	7.5	6.9	498

NOTES: All models suitable for use in 6" wells, unless otherwise noted.

Weights include pump end with motor in lbs.

* Built into sleeve 3" NPT discharge, 8" min. well dia.

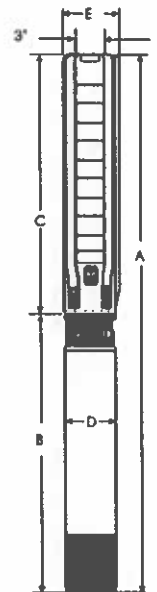


Fig. A

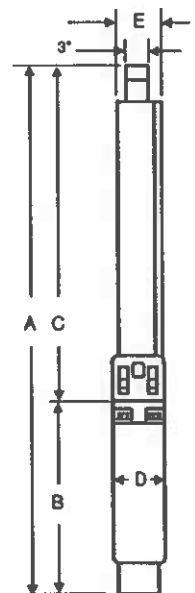


Fig. B



Attachment 9

Downhole Video Survey DVD



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Results of Aquifer Test Analysis

for the

Woods at Spring Branch Well

Canyon Lake Water Service Company
P.O. Box 1742
Canyon Lake, TX 78133

WRGS Project No. 042-003-11

April 2012



Wet Rock Groundwater Services, LLC

Groundwater Specialists


TBPG Firm No: 50038

311 Ranch Road 620 South, Suite 103

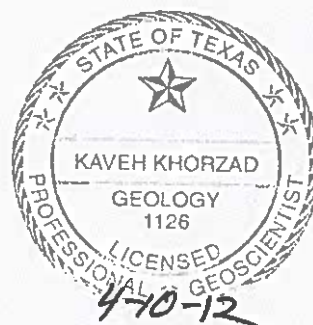
Austin, TX 78734

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The seal appearing on this document was authorized on April 10, 2012 by:


Kaveh Khorzad, P.G.
License No. 1126

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



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Wet Rock Groundwater Services, LLC

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Canyon Lake Water Service Company Woods at Spring Branch Well Middle Trinity Aquifer

Contents

Attachment 1:	Well Location Map
Attachment 2:	U.S. Geological Survey Topographic Map
Attachment 3:	Well Profile: Woods at Spring Branch Well
Attachment 4:	Table 1 - Well Construction Summary Table 2 - Aquifer Testing Summary Table 3 - Summary of Aquifer Testing Analysis
Attachment 5:	Aquifer Test Drawdown and Temperature Curves
Attachment 6:	Aquifer Test Analyses
Attachment 7:	Aquifer Test Data
Attachment 8:	Downhole Video Survey DVD



Introduction

The Woods at Spring Branch Well is located within the Canyon Lake Water Service Company (CLWSC) service area in western Comal County approximately two and half miles north of the intersection of State Highway 46 and Spring Branch Road (Attachment 1). The well was recently acquired from the former Bexar Metropolitan Water District in conjunction with other wells in the Spring Branch and Bulverde area. The CLWSC Cypress Springs wells are approximately 2.75 miles to the northeast and the Oakland Estates and Rancher's Circle wells are approximately 2.5 miles to the southeast (Attachment 2). The well is not currently in service, however it is being considered for use as an aquifer storage and recovery (ASR) well.

The objectives of this study are to:

1. Conduct a downhole video survey to determine the condition of the well casing and the production zone; and
2. Conduct an aquifer test to determine the transmissivity and well capacity of the Woods at Spring Branch Well.

Well Construction and Downhole Video Survey

Attachment 3 and Attachment 4 provide a well profile summary and the well construction summary of the Woods at Spring Branch Well. The well profile was created from information obtained from the downhole video survey as the well report on file with Texas Water Development Board is incomplete. Attachment 8 provides a copy of the downhole video survey conducted on the well February 27, 2012. The well is completed with 6-inch steel casing set to 318 ft below ground and an open hole completion that is approximately 6-inches in diameter from 318 ft to 487 ft. The well is completed in the Middle Trinity Aquifer, however the original total depth is unknown.

During the video survey, the steel casing was observed to be in good condition with some mineral deposits. On the day of the survey, the static water level was 223.9 ft below ground surface (bgs). In general, the open hole section contained massive limestone with vuggy sections and a few small fractures. Fill was encountered at 487 ft bgs with the total depth of the well being unknown. The existing column pipe in the well had a hole in one section which was preventing water from reaching the well head, and other sections were in poor condition. There was a noticeable biological material suspended in the water, in addition to black staining on the pump and column pipe.



Aquifer Testing

A 7.5 horsepower (HP) submersible pump was set with 445 ft of 2-inch steel and PVC column pipe, and a pressure transducer capable of measuring the water level and temperature at one minute intervals was set within the Woods at Spring Branch Well. On March 1, 2011 a static water level was measured at 223.9 ft bgs. The pump was turned on and ran for approximately forty-nine hours at an average rate of 21 gallons per minute (gpm). Attachment 4 summarizes the aquifer testing, Attachment 5 provides the graph of the aquifer test data, Attachment 6 provides the aquifer test analysis, and Attachment 7 provides the raw water level and temperature data.

The well averaged a production rate of 21 gpm with 167.2 ft of drawdown for a specific capacity of 0.13 gpm/ft. Initially, the well was pumped at a rate of 36 gpm and the water level quickly neared the top of the pump, at which time the pump was shut-off. A valve was put in place to restrict the flow, and the production rate was approximately 21 gpm for the remainder of the test. The pumping level continued to drop slightly throughout the test, however near the end of the pumping portion of the test, the water level appeared to stabilize. Before the pump was shut-off, the production rate was increased momentarily which caused a drop in the water level (Attachment 5). The water level recovered to approximately 17 ft below the measured static water level after forty-six hours of recovery.

The aquifer test data was analyzed using the Theis and the Theis Recovery methods (Attachment 6). The Theis analysis and the Theis Recovery analysis results were similar with a transmissivity of 32 ft²/day and 21 ft²/day respectively.

Based upon the analyses of the aquifer test, the production capacity of a well completed at this location in the aquifer is approximately 20 - 30 gpm. According to CLWSC staff, an existing pump owned by CLWSC will be used when the well is put into production.





Conclusions

The Woods at Spring Branch Well is located within the CLWSC service area in western Comal County. The well was recently acquired from the former Bexar Metropolitan Water District in conjunction with other wells in the Spring Branch and Bulverde area. The well is not currently in service, however it is being considered for use as an aquifer storage and recovery (ASR) well. An analysis of the Woods at Spring Branch Well was conducted by Wet Rock Groundwater Services, LLC which included:

- Downhole Video Survey;
- Aquifer Testing; and
- Aquifer Test analysis

Based upon the analysis we provide the following conclusions:

1. The Woods at Spring Branch Well is completed within the Middle Trinity Aquifer;
2. During the video survey, the steel casing was observed to be in good condition with some mineral deposits. In the open hole section of the well, several small fractures were observed;
3. A forty-nine hour aquifer test was conducted on the Woods at Spring Branch Well at a rate of 21 gpm with a maximum drawdown of 167.2 ft of drawdown for a specific capacity of 0.13 gpm/ft; and
4. Utilizing the Theis Recovery analysis, the transmissivity and hydraulic conductivity was calculated to be 32 ft²/day and 0.121 ft/day respectively. The production capacity of a well completed at this location in the aquifer is approximately 20 - 30 gpm.





Attachment 1

Woods at Spring Branch Well Location Map



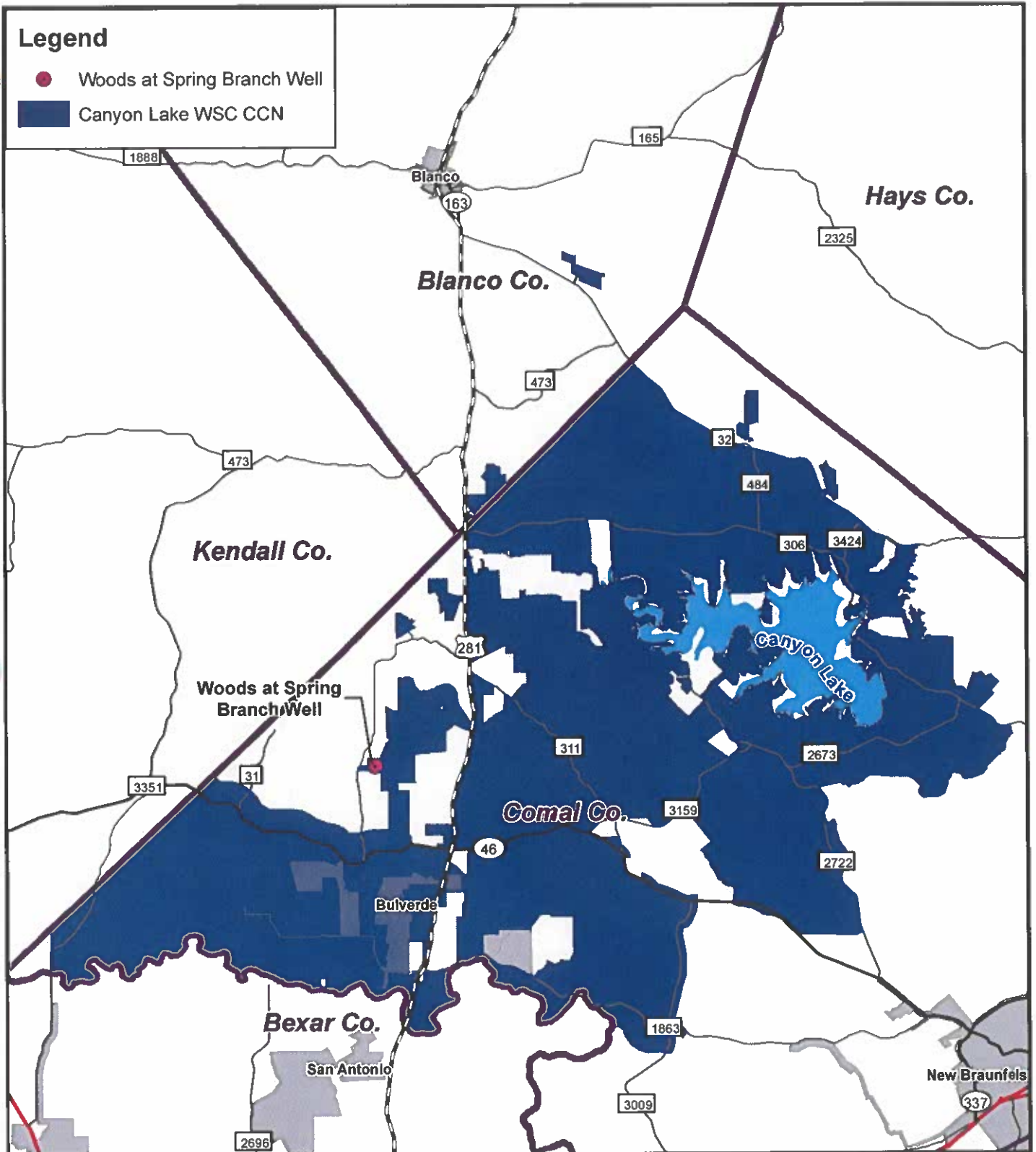
Wet Rock Groundwater Services, LLC



Groundwater Specialists

Legend

- Woods at Spring Branch Well
- Canyon Lake WSC CCN



0 2 4 Miles

Drawn By: BWB Date: 3/12

Projection: UTM NAD83 Z14N

Project No.: 042-003-11

Canyon Lake WSC - Woods at Spring Branch Well Location Map

Canyon Lake WSC
Comal County, Texas



Wet Rock Groundwater Services, L.L.C.
Groundwater Specialists

TBPG Firm No: 50038

311 RR 620 S., Suite 103
Ph: 512.773.3226

Lakeway, Texas 78734
www.wetrockgs.com



Attachment 2

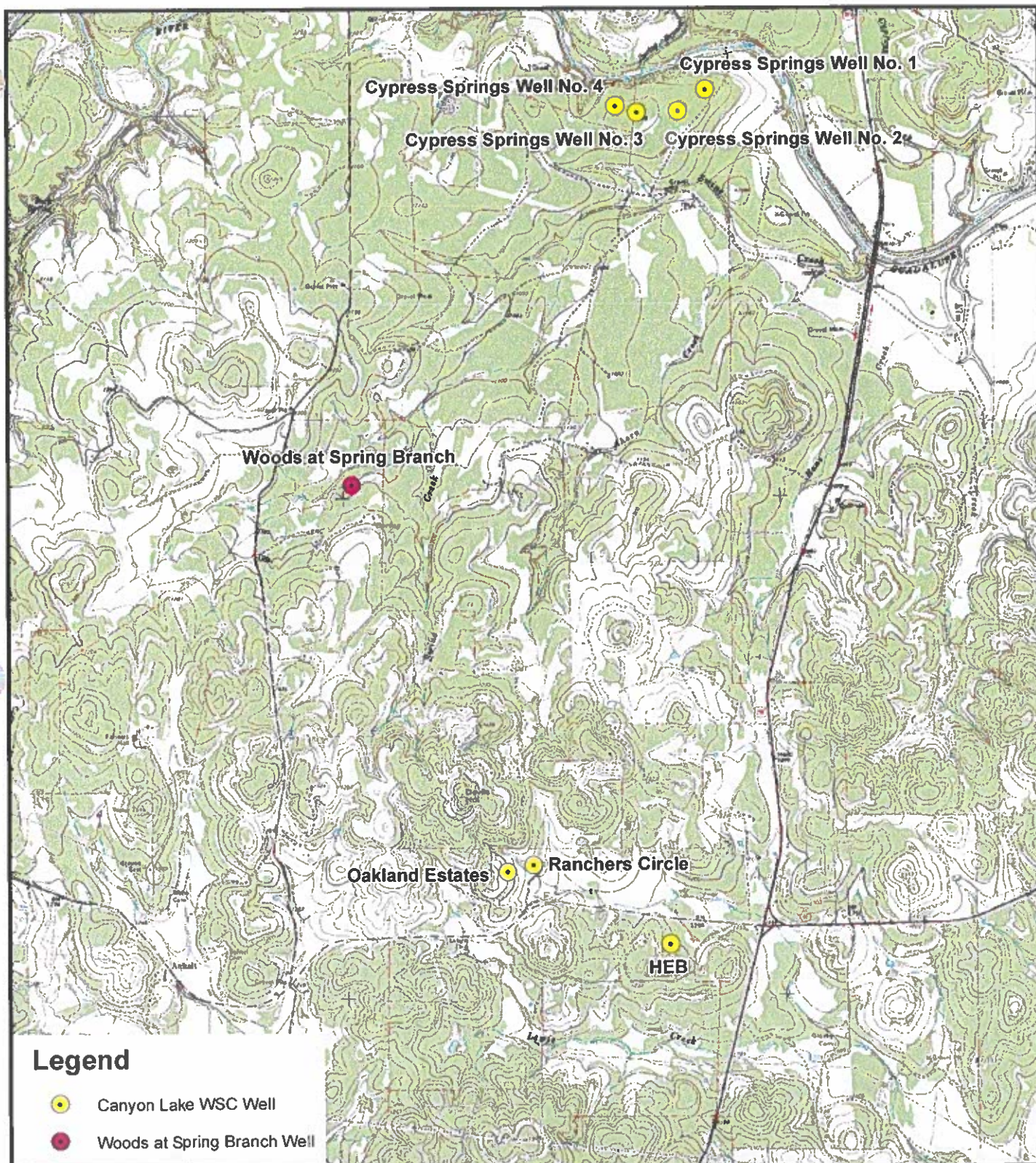
USGS Topographic Map



Wet Rock Groundwater Services, LLC



Groundwater Specialists



Legend

- Canyon Lake WSC Well
- Woods at Spring Branch Well

0 2,000 4,000 Feet

Drawn By: BWB Date: 3/12

Projection: UTM NAD83 Z14N

Project No.: 042-003-11

Canyon Lake WSC - Woods at Spring Branch Well Topographic Map

Canyon Lake WSC
Comal County, Texas



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Attachment 3

Well Profile

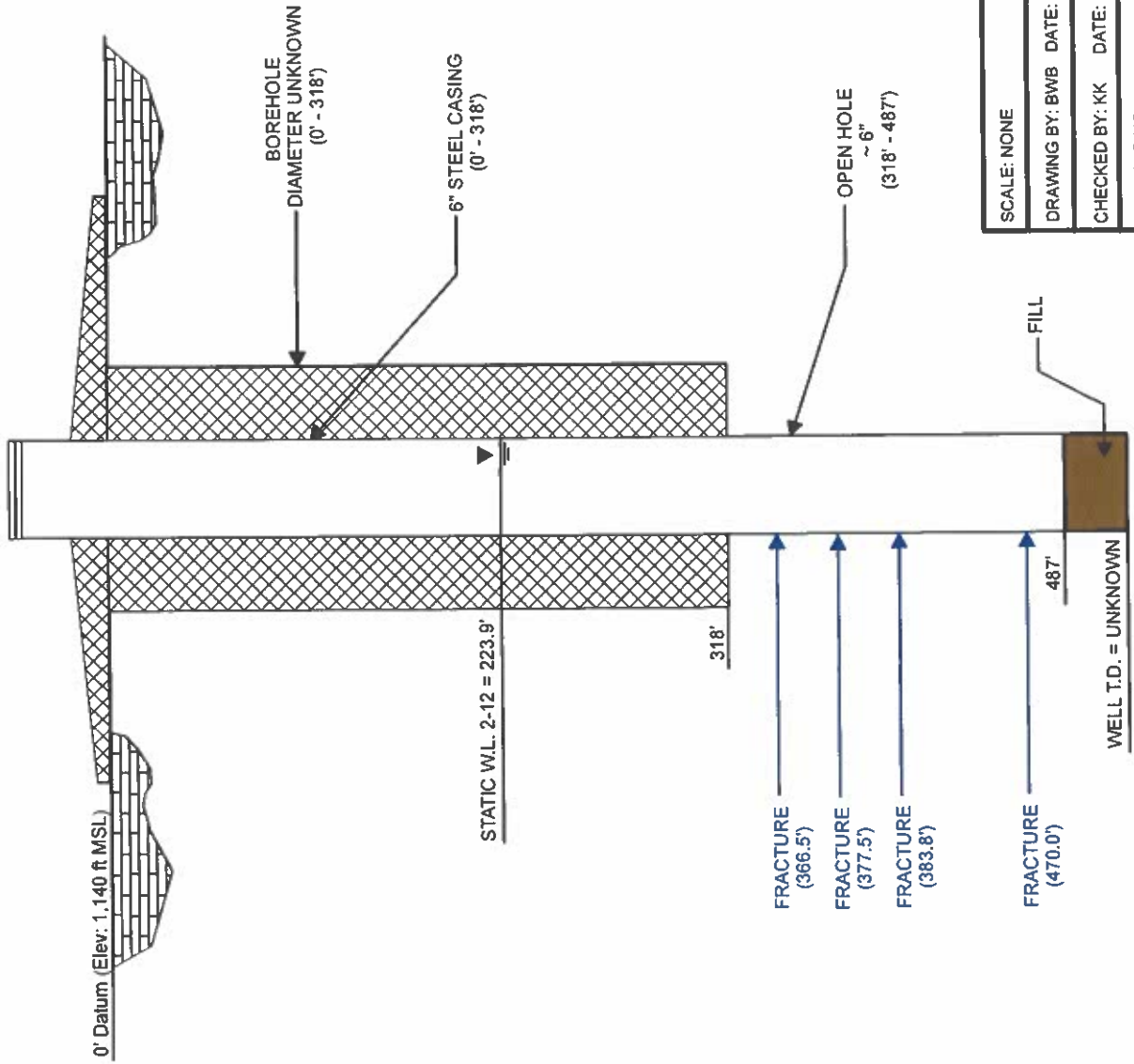


Wet Rock Groundwater Services, LLC



Groundwater Specialists

NOTE: Construction details from down hole video survey conducted on February 27, 2012, no well report available.



Well Profile: CLWSC - Woods at Spring Branch

Canyon Lake WSC
Comal County, Texas

Wet Rock Groundwater Services, LLC
Groundwater Specialists

TBPG Firm No: 90038
311 Ranch Road 620 South, Ste. 103
Lakeview, Texas 78734
Ph: 512.773.3226 www.wetrockga.com



SCALE: NONE

DRAWING BY: BWB DATE: 3-12

CHECKED BY: KK DATE: 3-12

DRAWING NO: 1

SHEET: 1 OF 1



Attachment 4

Table 1: Well Construction Summary

Table 2: Aquifer Testing Summary

Table 3: Summary of Aquifer Testing Analysis



Table 1 - Well Construction Summary

Well	Hole Diameter (inches)	From (ft)	To (ft)	Casing Type	Casing Diameter (inches)	From (ft)	To (ft)
Woods at Spring Branch Well	n/a	0	318	Steel	6	0	147
	6	318	487	Open Hole	6	318	487

Table 2 - Aquifer Testing Summary

Well	Static Water Level (inches)	Static Water Level (ft MSL)	Q (gpm)	Drawdown (ft)	SC (gpm/ft)	Pumping Duration (hours)
Woods at Spring Branch Well	223.9	916.1	21	167.2	0.13	49

Notes: Q = discharge; SC = specific capacity; MSL = Mean Sea Level; gpm = gallons per minute; ft = feet

Table 3 - Summary of Aquifer Testing Analyses

Well	Analysis	b (ft)	T (ft ² /day)	K (ft/day)
Woods at Spring Branch Well	Theis	263.6	32.00	0.12
Woods at Spring Branch Well	Theis Recovery	263.6	20.50	0.08

Notes: b = aquifer thickness; T = transmissivity; K = hydraulic conductivity



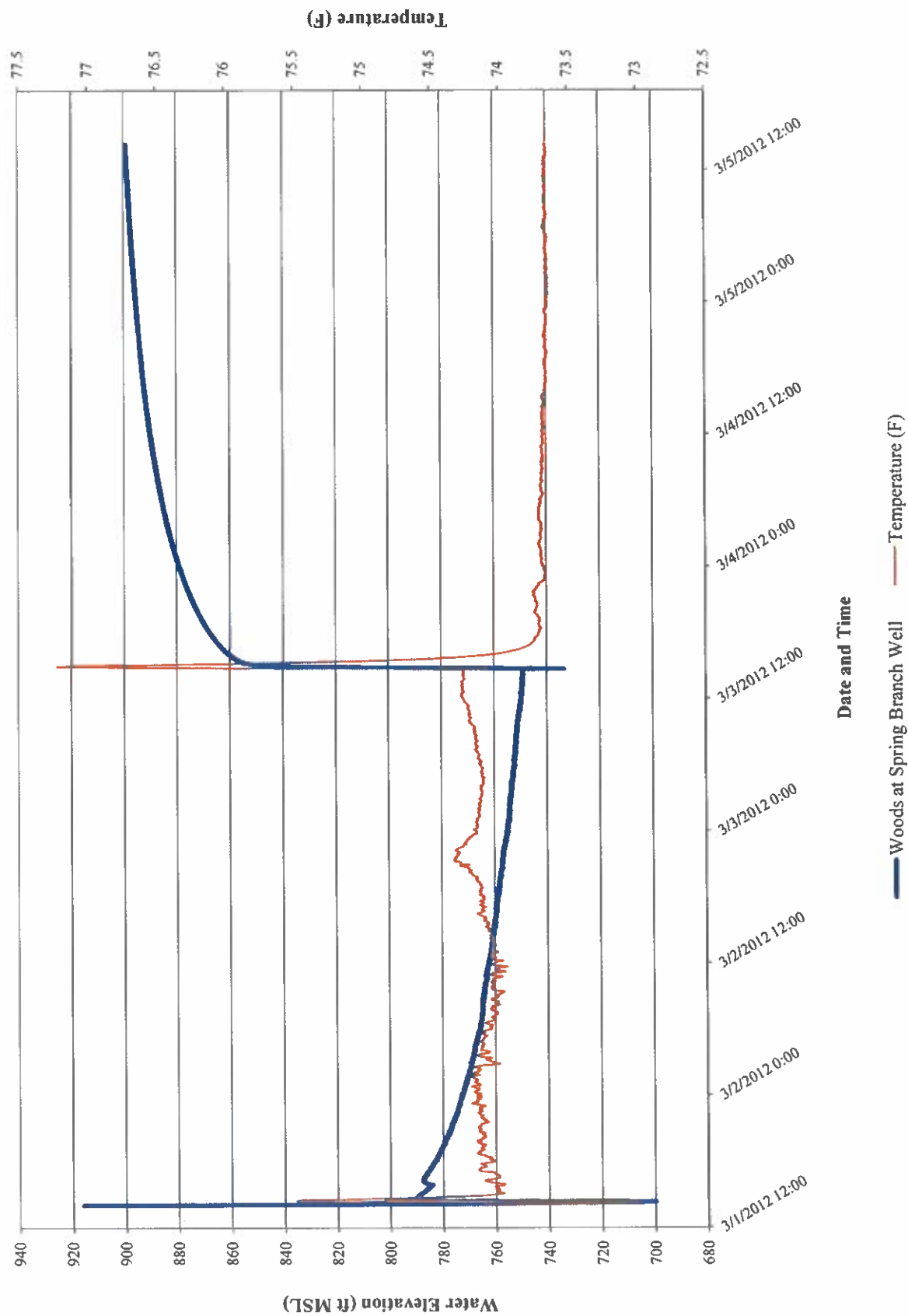


Attachment 5

Aquifer Test Drawdown and Temperature Curves



Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)





Attachment 6

Aquifer Test Analyses





Wet Rock Groundwater Services, LLC
Groundwater Specialists
311 Ranch Road 620 South, Suite 103
Austin, Texas 78734
Ph: 512.773.3226
www.wetrockgs.com

Pumping Test Analysis Report

Project: Woods at Spring Branch - Aquifer Test

Number: 042-003-12

Client: Canyon Lake WSC

Location: Comal County, TX

Pumping Test: Woods at Spring Branch Well

Pumping Well: Woods at Spring Branch

Test Conducted by: BWB

Test Date: 3/1/2012

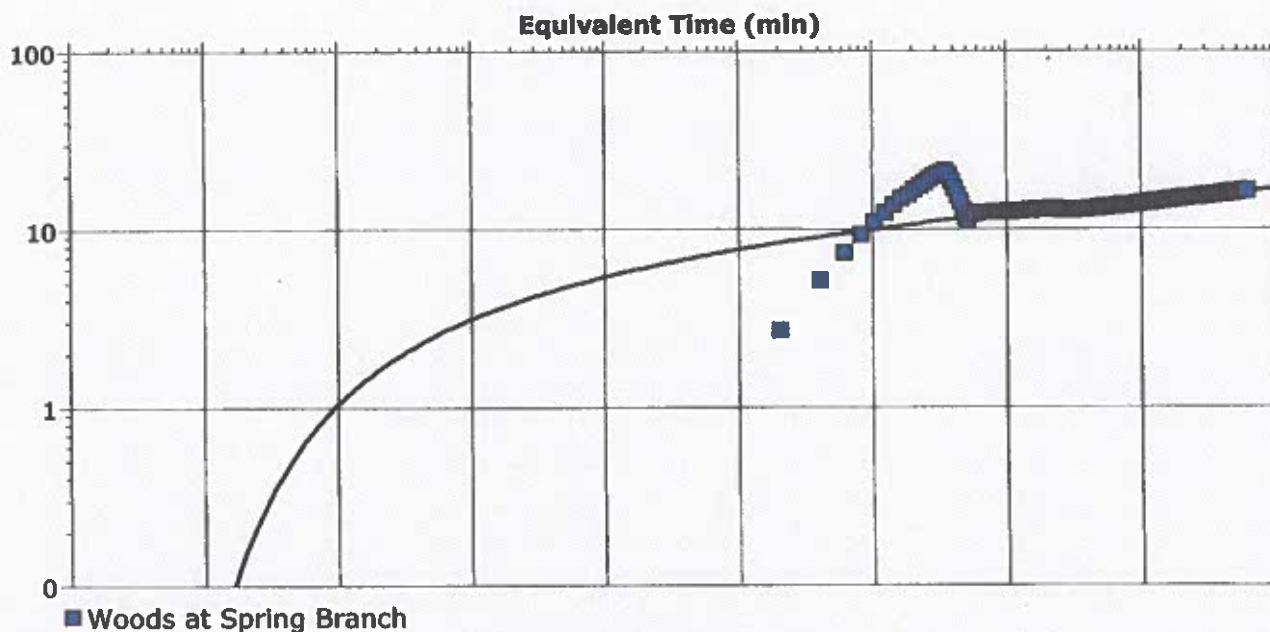
Analysis Performed by: BWB

Thels

Analysis Date: 3/28/2012

Aquifer Thickness: 263.60 ft

Discharge: variable, average rate 21.102 [U.S. gal/min]



Calculation after Thels

Observation Well	Transmissivity [ft ² /d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
Woods at Spring Branch	3.20×10^1	1.21×10^{-1}			



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Pumping Test Analysis Report

Project: Woods at Spring Branch - Aquifer Test

Number: 042-003-12

Client: Canyon Lake WSC

Location: Comal County, TX

Pumping Test: Woods at Spring Branch Well

Pumping Well: Woods at Spring Branch

Test Conducted by: BWB

Test Date: 3/1/2012

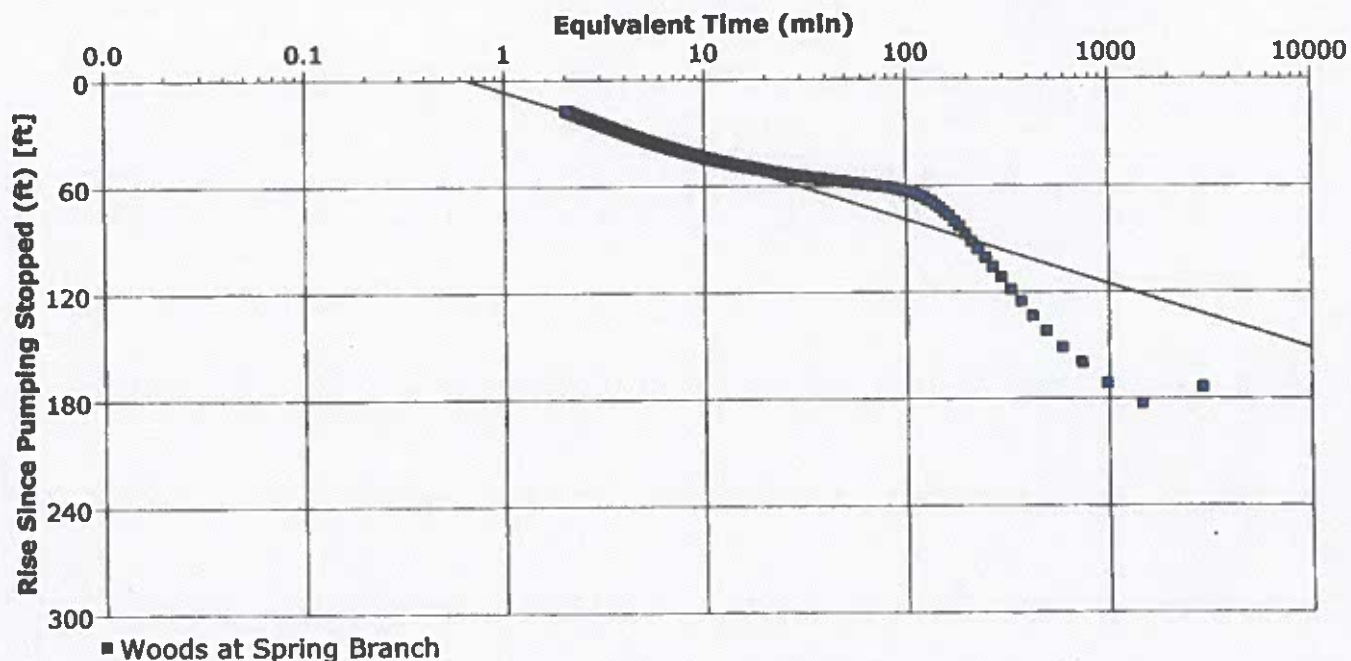
Analysis Performed by: BWB

Theis Recovery

Analysis Date: 3/26/2012

Aquifer Thickness: 263.60 ft

Discharge: variable, average rate 21.102 [U.S. gal/min]



Calculation after Theis & Jacob

Observation Well	Transmissivity [ft ² /d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
Woods at Spring Branch	2.05×10^1	7.79×10^2		



Attachment 7

Aquifer Test Data



Wet Rock Groundwater Services, LLC



Groundwater Specialists

Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)

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)	Comments
3/1/2012 14:05	0		74.14	223.92	916.08	0.00			
3/1/2012 14:06	1		74.04	251.64	888.36	27.72	36	1.30	
3/1/2012 14:07	2		73.90	276.88	863.12	52.95	36	0.68	
3/1/2012 14:08	3		73.76	299.36	840.64	75.43	36	0.48	
3/1/2012 14:09	4		73.65	319.00	821.00	95.08	36	0.38	
3/1/2012 14:10	5		73.55	335.48	804.52	111.56	36	0.32	
3/1/2012 14:11	6		73.46	350.01	789.99	126.09	36	0.29	
3/1/2012 14:12	7		73.39	363.33	776.67	139.41			
3/1/2012 14:13	8		73.37	374.90	765.10	150.98			
3/1/2012 14:14	9		73.28	383.01	756.99	159.09			
3/1/2012 14:15	10		73.27	393.45	746.55	169.53	36	0.21	
3/1/2012 14:16	11		73.21	401.65	738.35	177.72			
3/1/2012 14:17	12		73.14	410.20	729.80	186.28			
3/1/2012 14:18	13		73.09	418.22	721.78	194.30			
3/1/2012 14:19	14		72.99	424.93	715.07	201.01			
3/1/2012 14:20	15		72.98	430.94	709.06	207.01	36	0.17	
3/1/2012 14:21	16		73.00	435.88	704.12	211.96			Stopped Pump
3/1/2012 14:22	17		73.05	440.16	699.84	216.24			
3/1/2012 14:23	18		73.20	429.73	710.27	205.81			
3/1/2012 14:24	19		74.09	412.10	727.90	188.17			
3/1/2012 14:25	20		74.72	396.23	743.77	172.31			
3/1/2012 14:30	25		75.48	338.13	801.87	114.21	23	0.20	Restarted Pump - Choked Back
3/1/2012 14:35	30		75.32	349.38	790.62	125.45	22.5	0.18	
3/1/2012 14:50	45		74.40	350.31	789.69	126.39	22.5	0.18	
3/1/2012 15:05	60		74.01	351.44	788.56	127.52	22.5	0.18	
3/1/2012 15:20	75		74.02	352.83	787.17	128.91	22.5	0.17	
3/1/2012 15:35	90		74.04	354.55	785.45	130.63	22.5	0.17	
3/1/2012 15:50	105		73.99	355.63	784.37	131.71	21.5	0.16	
3/1/2012 16:05	120		74.03	353.28	786.72	129.36	21.5	0.17	
3/1/2012 17:05	180		74.07	353.90	786.10	129.98			
3/1/2012 18:05	240		74.05	356.66	783.34	132.74			
3/1/2012 19:05	300		74.14	359.24	780.76	135.32			
3/1/2012 20:05	360		74.14	361.03	778.97	137.11			
3/1/2012 21:05	420		74.16	363.20	776.80	139.28			
3/1/2012 22:05	480		74.15	364.43	775.57	140.51			
3/1/2012 23:05	540		74.12	365.87	774.13	141.95			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 7.5 HP
MSL = Mean Sea Level Pump Setting = 445 feet bgs

Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)

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)	Comments
3/2/2012 0:05	600		74.17	367.05	772.95	143.13			
3/2/2012 1:05	660		74.16	368.65	771.35	144.73			
3/2/2012 2:05	720		74.19	369.71	770.29	145.79			
3/2/2012 3:05	780		74.06	370.82	769.18	146.89			
3/2/2012 4:05	840		74.11	371.95	768.05	148.03			
3/2/2012 5:05	900		74.13	373.04	766.96	149.12			
3/2/2012 6:05	960		74.07	374.17	765.83	150.25			
3/2/2012 7:05	1020		74.05	374.87	765.13	150.94			
3/2/2012 8:05	1080		74.05	375.19	764.81	151.27			
3/2/2012 9:05	1140		74.03	375.44	764.56	151.52			
3/2/2012 10:05	1200		74.05	376.58	763.42	152.66			
3/2/2012 11:05	1260		74.06	376.78	763.22	152.85			
3/2/2012 12:05	1320		74.03	377.69	762.31	153.77			
3/2/2012 13:05	1380		74.03	378.56	761.44	154.64			
3/2/2012 14:05	1440		74.06	379.36	760.64	155.44			
3/2/2012 15:05	1500		74.07	379.90	760.10	155.98			
3/2/2012 16:05	1560		74.10	380.15	759.85	156.23			
3/2/2012 17:05	1620		74.11	380.86	759.14	156.94			
3/2/2012 18:05	1680		74.12	381.07	758.93	157.15			
3/2/2012 19:05	1740		74.13	381.73	758.27	157.81			
3/2/2012 20:05	1800		74.20	382.33	757.67	158.41			
3/2/2012 21:05	1860		74.29	383.00	757.00	159.08			
3/2/2012 22:05	1920		74.29	383.40	756.60	159.47			
3/2/2012 23:05	1980		74.24	384.01	755.99	160.09			
3/3/2012 0:05	2040		74.18	384.89	755.11	160.97			
3/3/2012 1:05	2100		74.16	385.45	754.55	161.53			
3/3/2012 2:05	2160		74.15	385.98	754.02	162.06			
3/3/2012 3:05	2220		74.14	385.94	754.06	162.02			
3/3/2012 4:05	2280		74.13	386.56	753.44	162.64			
3/3/2012 5:05	2340		74.13	387.04	752.96	163.11			
3/3/2012 6:05	2400		74.14	387.62	752.38	163.69			
3/3/2012 7:05	2460		74.16	388.32	751.68	164.40			
3/3/2012 8:05	2520		74.16	388.20	751.80	164.28			
3/3/2012 9:05	2580		74.18	388.63	751.37	164.71			
3/3/2012 10:05	2640		74.21	389.26	750.74	165.34			
3/3/2012 11:05	2700		74.23	389.78	750.22	165.86			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 7.5 HP
MSL = Mean Sea Level Pump Setting = 445 feet bgs

Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)

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)	Comments
3/3/2012 12:05	2760		74.27	390.40	749.60	166.47			
3/3/2012 13:05	2820		74.27	390.79	749.21	166.87			
3/3/2012 14:05	2880		74.26	391.07	748.93	167.15			
3/3/2012 14:44	2919	0	74.07	406.52	733.48	182.60	21	0.12	
3/3/2012 14:45	2920	1	74.24	394.95	745.05	171.03			
3/3/2012 14:46	2921	2	75.08	383.61	756.39	159.69			
3/3/2012 14:47	2922	3	75.64	375.04	764.96	151.12			
3/3/2012 14:48	2923	4	75.90	366.00	774.00	142.08			
3/3/2012 14:49	2924	5	76.00	357.50	782.50	133.57			
3/3/2012 14:50	2925	6	76.10	349.24	790.76	125.31			
3/3/2012 14:51	2926	7	76.25	342.22	797.78	118.30			
3/3/2012 14:52	2927	8	76.43	335.46	804.54	111.53			
3/3/2012 14:53	2928	9	76.64	329.75	810.25	105.83			
3/3/2012 14:54	2929	10	76.78	324.35	815.65	100.43			
3/3/2012 14:55	2930	11	76.85	319.42	820.58	95.50			
3/3/2012 14:56	2931	12	76.95	315.09	824.91	91.17			
3/3/2012 14:57	2932	13	77.13	310.64	829.36	86.72			
3/3/2012 14:58	2933	14	77.22	306.97	833.03	83.05			
3/3/2012 14:59	2934	15	77.16	303.97	836.03	80.05			
3/3/2012 15:04	2939	20	76.88	292.86	847.14	68.94			
3/3/2012 15:09	2944	25	76.34	288.09	851.91	64.17			
3/3/2012 15:14	2949	30	75.85	285.68	854.32	61.76			
3/3/2012 15:29	2964	45	74.90	283.19	856.81	59.27			
3/3/2012 15:44	2979	60	74.37	281.28	858.72	57.35			
3/3/2012 15:59	2994	75	74.10	280.19	859.81	56.27			
3/3/2012 16:14	3009	90	73.95	278.74	861.26	54.82			
3/3/2012 16:29	3024	105	73.86	277.95	862.05	54.03			
3/3/2012 16:44	3039	120	73.80	276.74	863.26	52.81			
3/3/2012 17:44	3099	180	73.72	273.37	866.63	49.44			
3/3/2012 18:44	3159	240	73.70	270.66	869.34	46.74			
3/3/2012 19:44	3219	300	73.73	268.59	871.41	44.66			
3/3/2012 20:44	3279	360	73.72	266.55	873.45	42.63			
3/3/2012 21:44	3339	420	73.75	264.72	875.28	40.80			
3/3/2012 22:44	3399	480	73.67	262.92	877.08	39.00			
3/3/2012 23:44	3459	540	73.67	261.70	878.30	37.78			
3/4/2012 0:44	3519	600	73.68	260.04	879.96	36.12			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 7.5 HP
MSL = Mean Sea Level Pump Setting = 445 feet bgs

Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)

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)	Comments
3/4/2012 1:44	3579	660	73.70	259.03	880.97	35.11			
3/4/2012 2:44	3639	720	73.69	257.59	882.41	33.67			
3/4/2012 3:44	3699	780	73.69	256.53	883.47	32.61			
3/4/2012 4:44	3759	840	73.70	255.90	884.10	31.98			
3/4/2012 5:44	3819	900	73.69	254.93	885.07	31.00			
3/4/2012 6:44	3879	960	73.68	254.11	885.89	30.19			
3/4/2012 7:44	3939	1020	73.68	253.05	886.95	29.13			
3/4/2012 8:44	3999	1080	73.67	252.29	887.71	28.37			
3/4/2012 9:44	4059	1140	73.68	251.57	888.43	27.65			
3/4/2012 10:44	4119	1200	73.69	250.90	889.10	26.98			
3/4/2012 11:44	4179	1260	73.68	250.59	889.41	26.66			
3/4/2012 12:44	4239	1320	73.67	249.98	890.02	26.05			
3/4/2012 13:44	4299	1380	73.68	249.13	890.87	25.21			
3/4/2012 14:44	4359	1440	73.67	248.55	891.45	24.63			
3/4/2012 15:44	4419	1500	73.66	248.35	891.65	24.43			
3/4/2012 16:44	4479	1560	73.65	247.81	892.19	23.89			
3/4/2012 17:44	4539	1620	73.65	247.08	892.92	23.16			
3/4/2012 18:44	4599	1680	73.66	246.95	893.05	23.03			
3/4/2012 19:44	4659	1740	73.65	246.52	893.48	22.60			
3/4/2012 20:44	4719	1800	73.66	245.84	894.16	21.92			
3/4/2012 21:44	4779	1860	73.65	245.48	894.52	21.56			
3/4/2012 22:44	4839	1920	73.65	245.14	894.86	21.22			
3/4/2012 23:44	4899	1980	73.64	245.05	894.95	21.13			
3/5/2012 0:44	4959	2040	73.64	244.41	895.59	20.49			
3/5/2012 1:44	5019	2100	73.64	244.07	895.93	20.15			
3/5/2012 2:44	5079	2160	73.65	243.77	896.23	19.84			
3/5/2012 3:44	5139	2220	73.64	243.45	896.55	19.52			
3/5/2012 4:44	5199	2280	73.66	243.42	896.58	19.50			
3/5/2012 5:44	5259	2340	73.64	243.14	896.86	19.22			
3/5/2012 6:44	5319	2400	73.67	242.59	897.41	18.67			
3/5/2012 7:44	5379	2460	73.65	242.33	897.67	18.41			
3/5/2012 8:44	5439	2520	73.65	242.04	897.96	18.12			
3/5/2012 9:44	5499	2580	73.66	242.13	897.87	18.21			
3/5/2012 10:44	5559	2640	73.66	241.88	898.12	17.96			
3/5/2012 11:44	5619	2700	73.66	241.69	898.31	17.76			
3/5/2012 12:44	5679	2760	73.66	241.09	898.91	17.16			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 7.5 HP
MSL = Mean Sea Level Pump Setting = 445 feet bgs

Canyon Lake WSC Woods at Spring Branch - Aquifer Test (March 1, 2012)

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)	Comments
3/5/2012 13:44	5739	2820	73.65	241.17	898.83	17.25			
3/5/2012 14:20	5775	2856	73.66	240.72	899.28	16.80			

Note: bgs = below ground surface Column Pipe Diameter = 2-inch Horsepower = 7.5 HP
 MSL = Mean Sea Level Pump Setting = 445 feet bgs



Attachment 8

Downhole Video Survey DVD

Available from CLWSC upon request



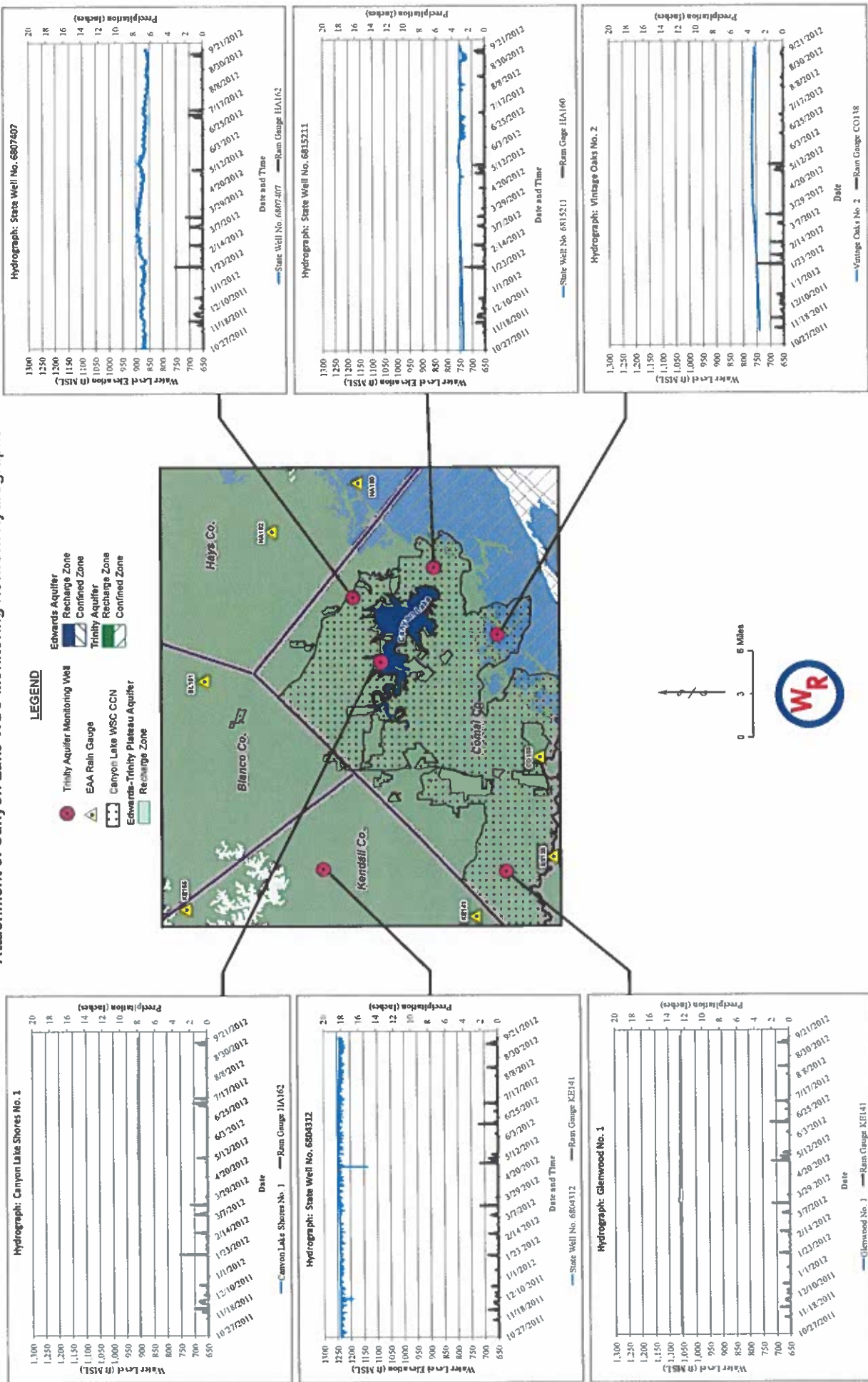


Appendix iii

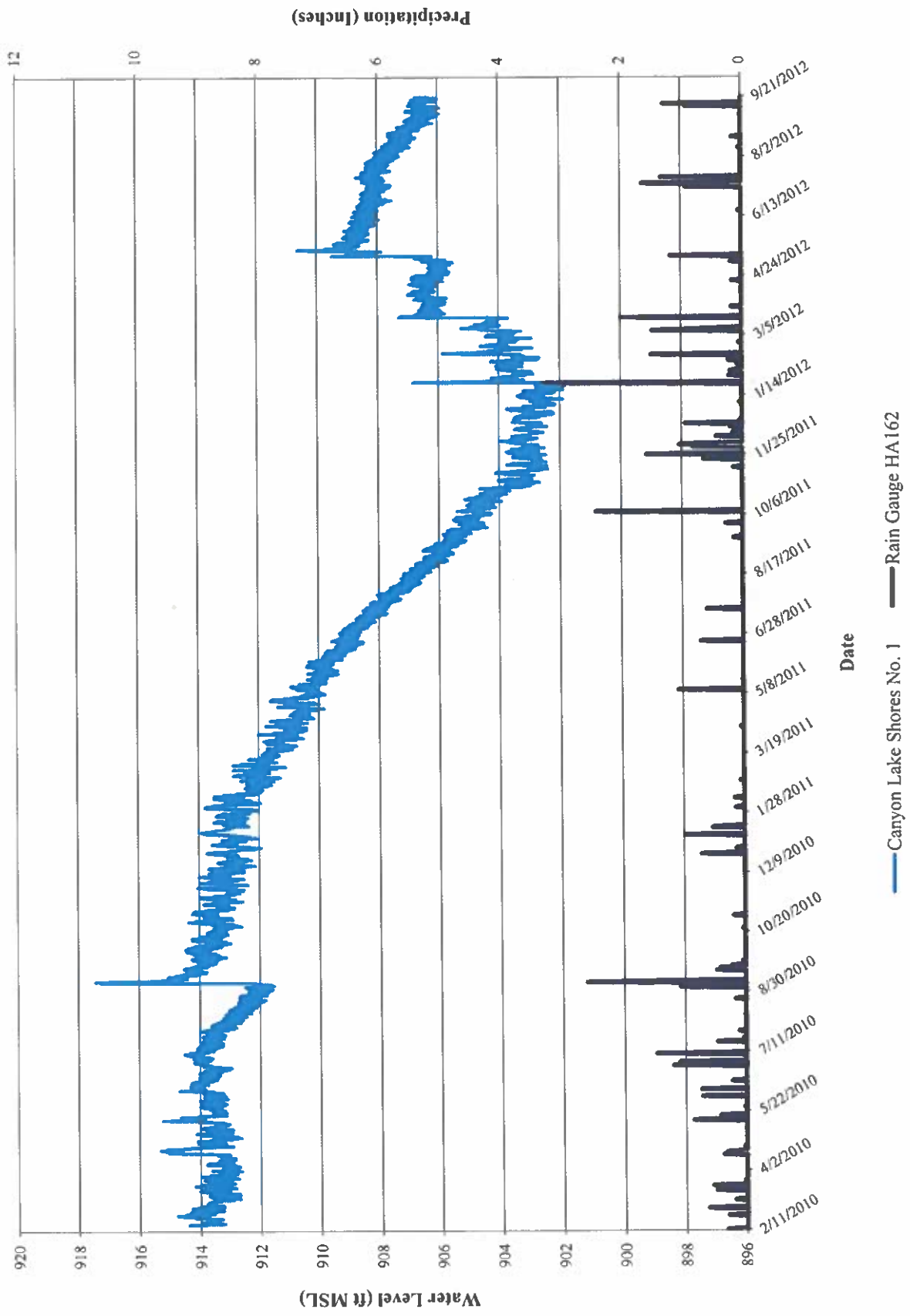
Monitoring Network Hydrographs



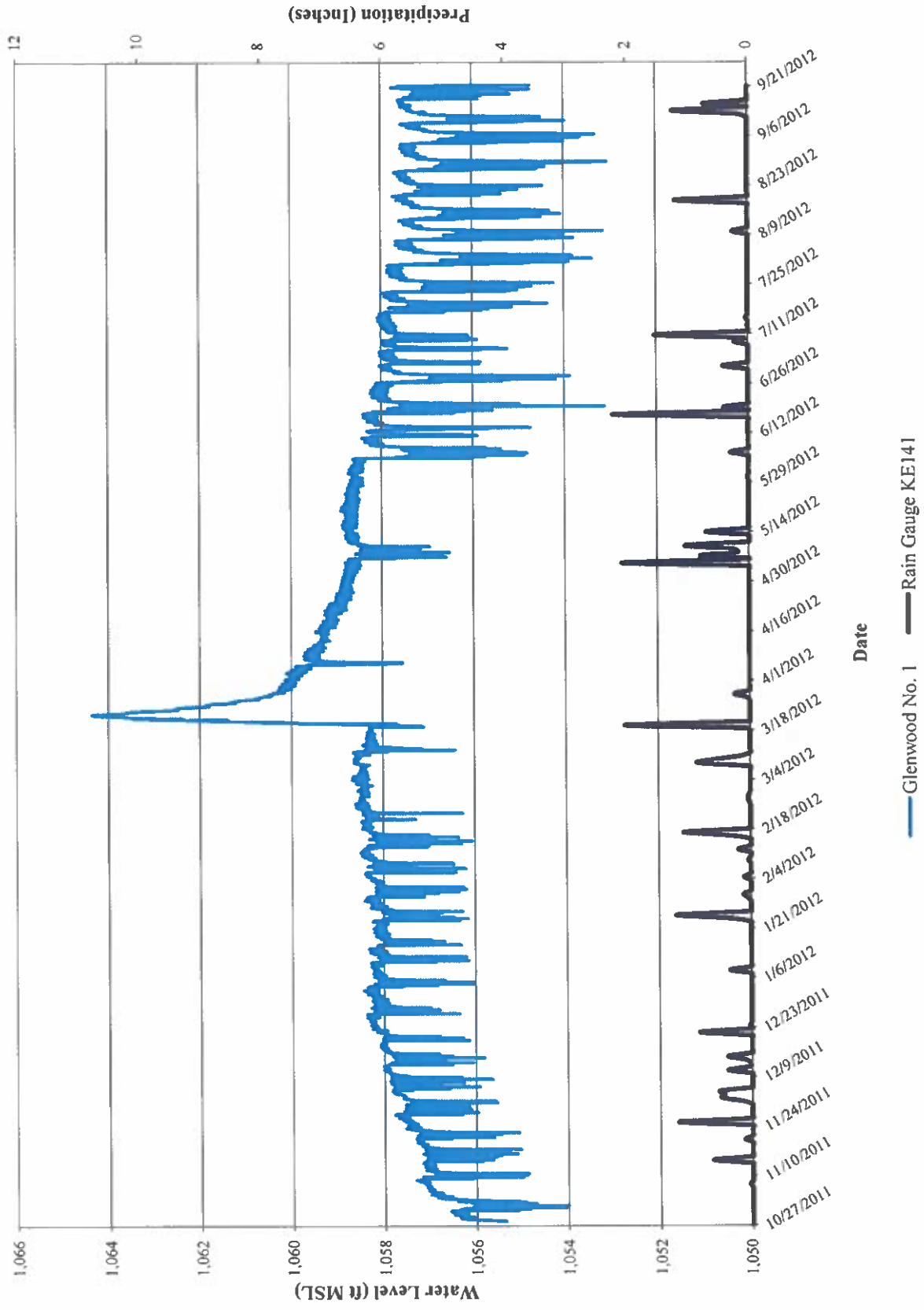
Attachment 3: Canyon Lake WSC Monitoring Network Hydrographs



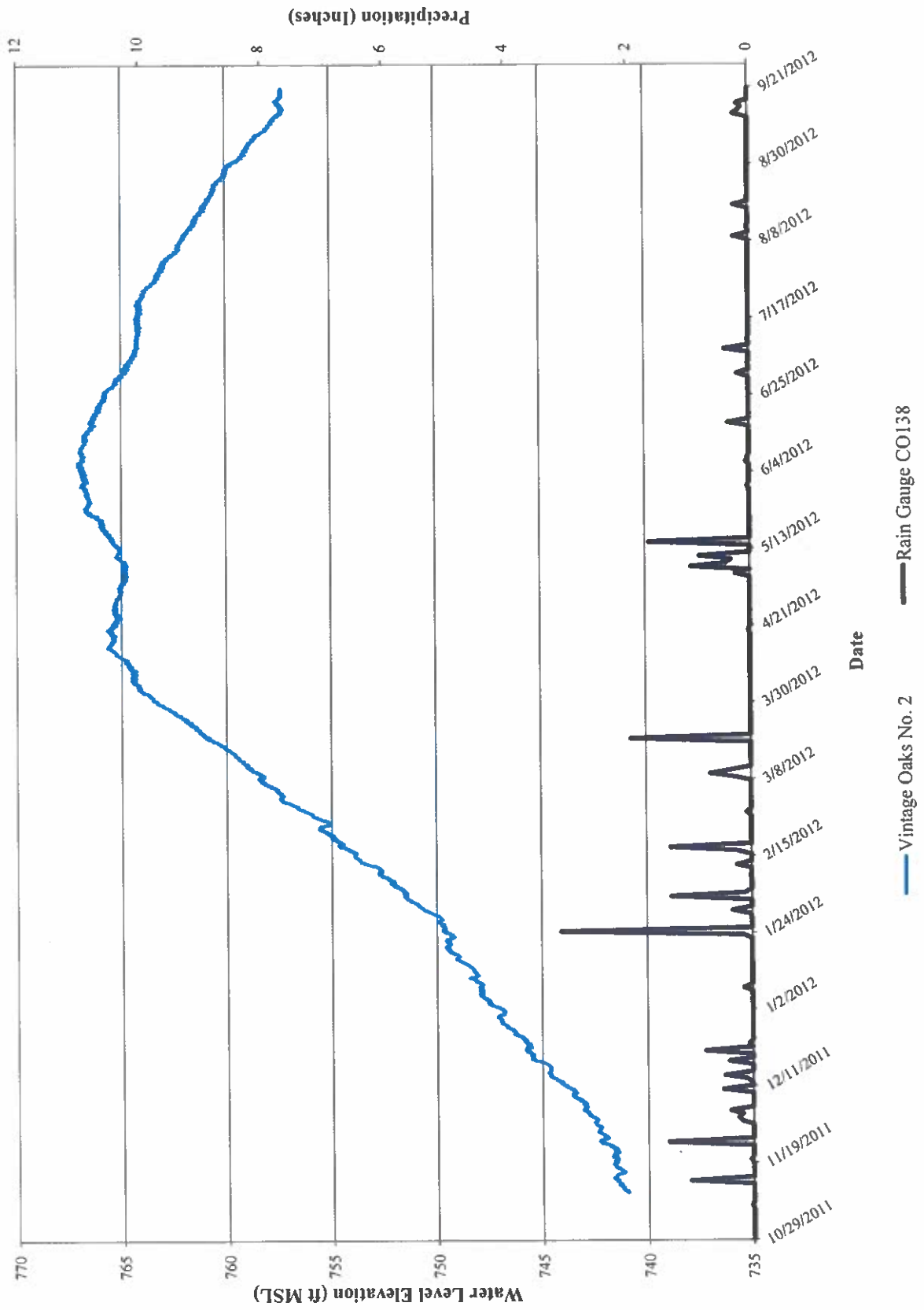
Hydrograph: Canyon Lake Shores No. 1



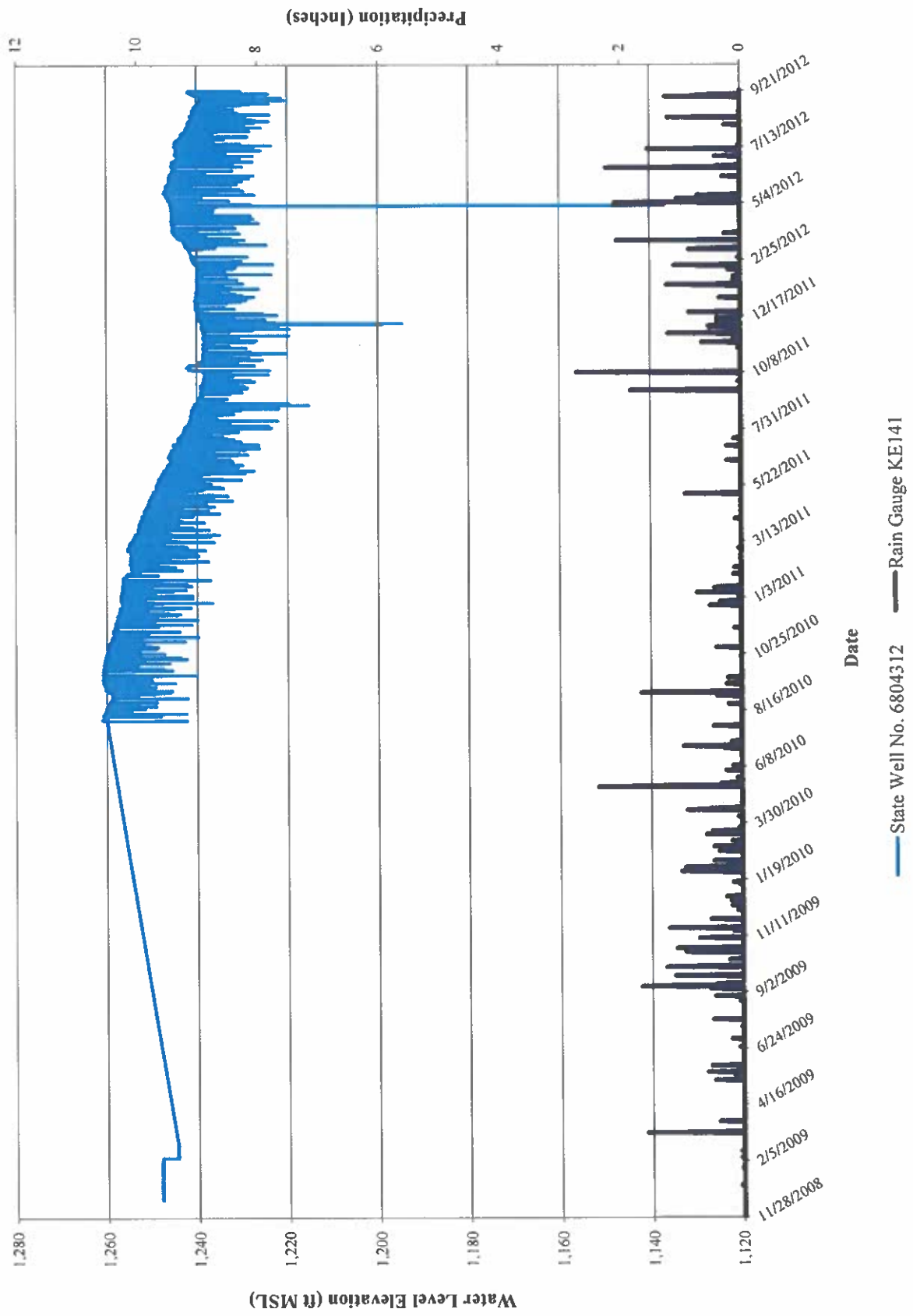
Hydrograph: Glenwood No. 1



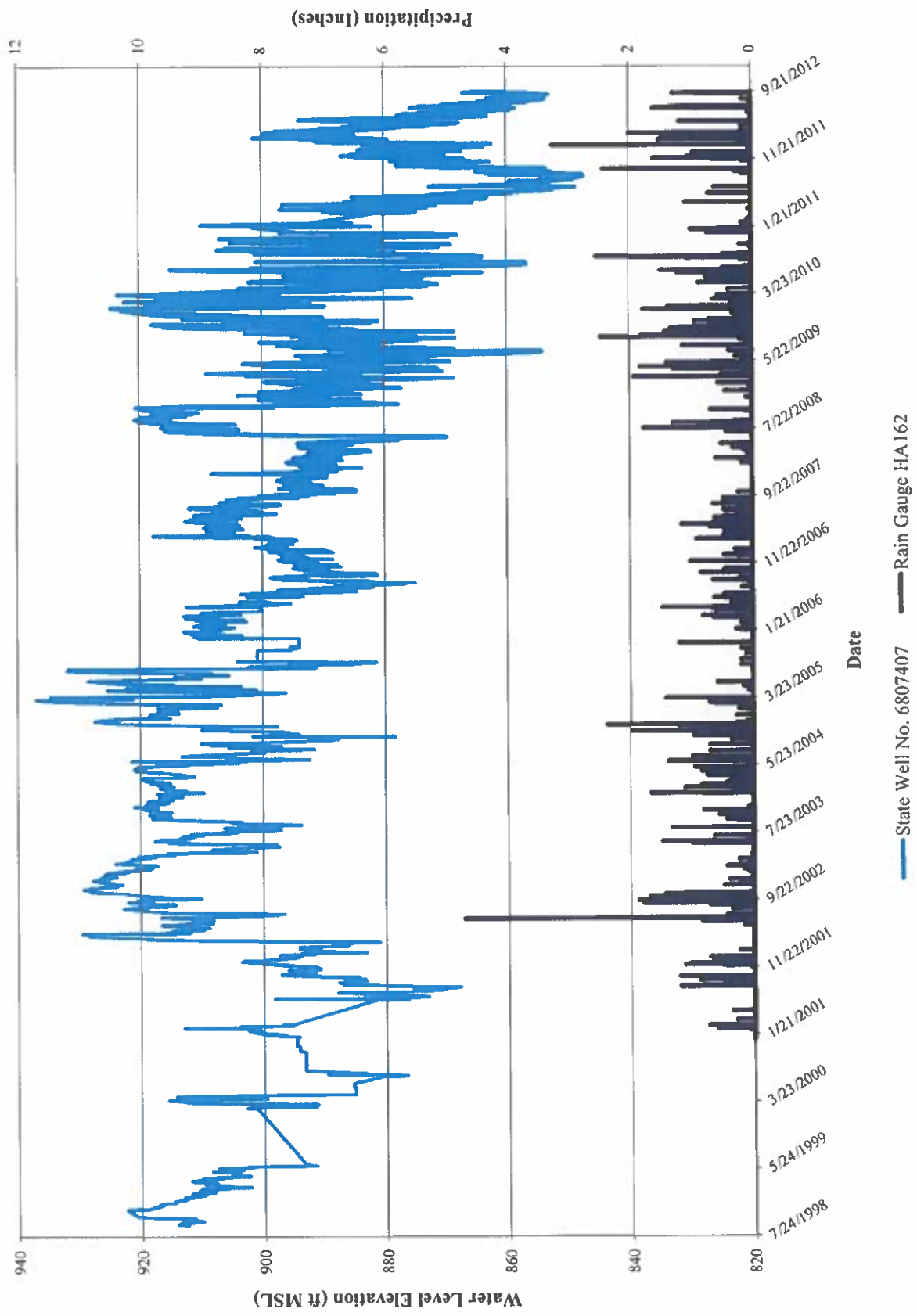
Hydrograph: Vintage Oaks No. 2



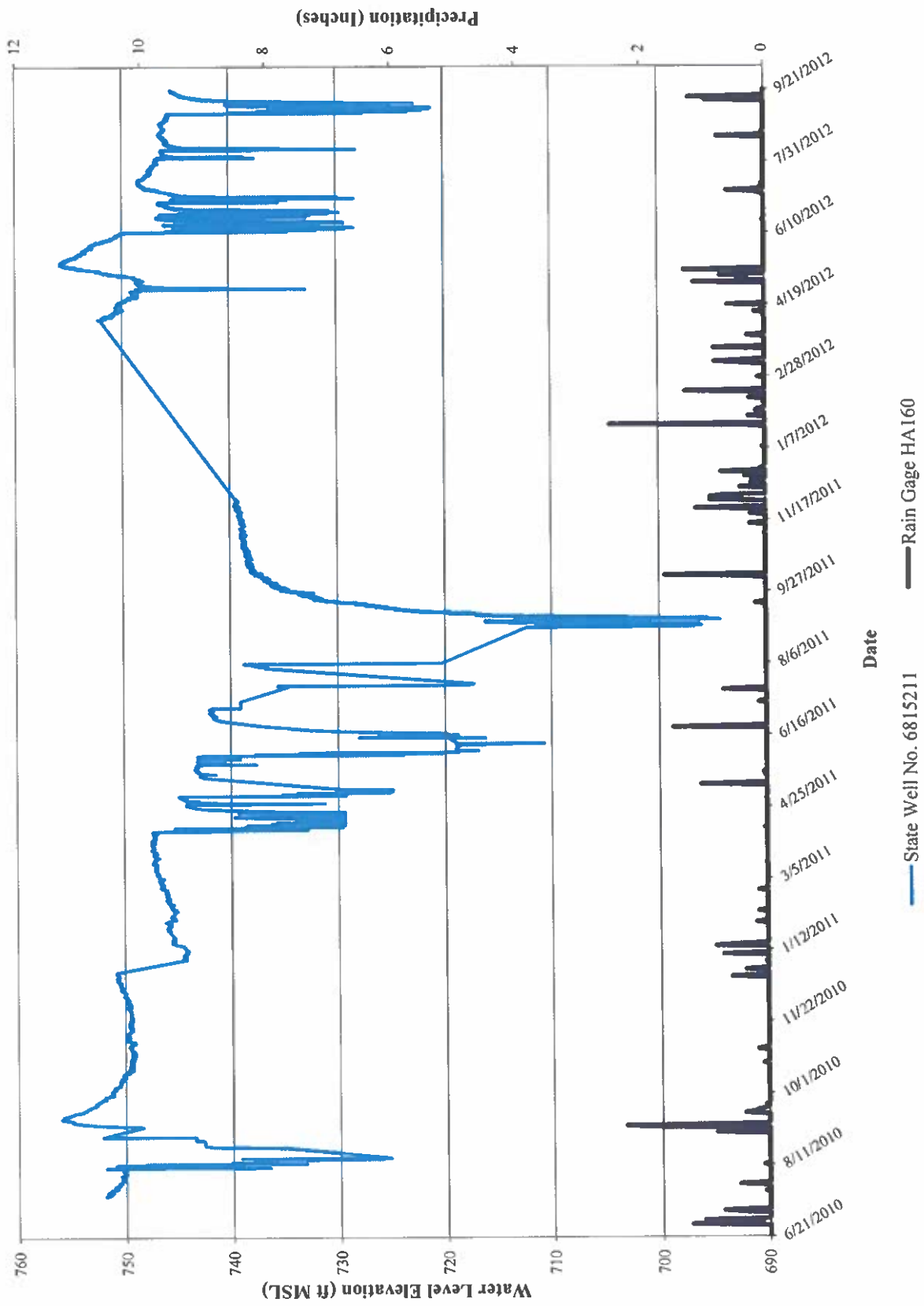
Hydrograph: State Well No. 6804312



Hydrograph: State Well No. 6807407



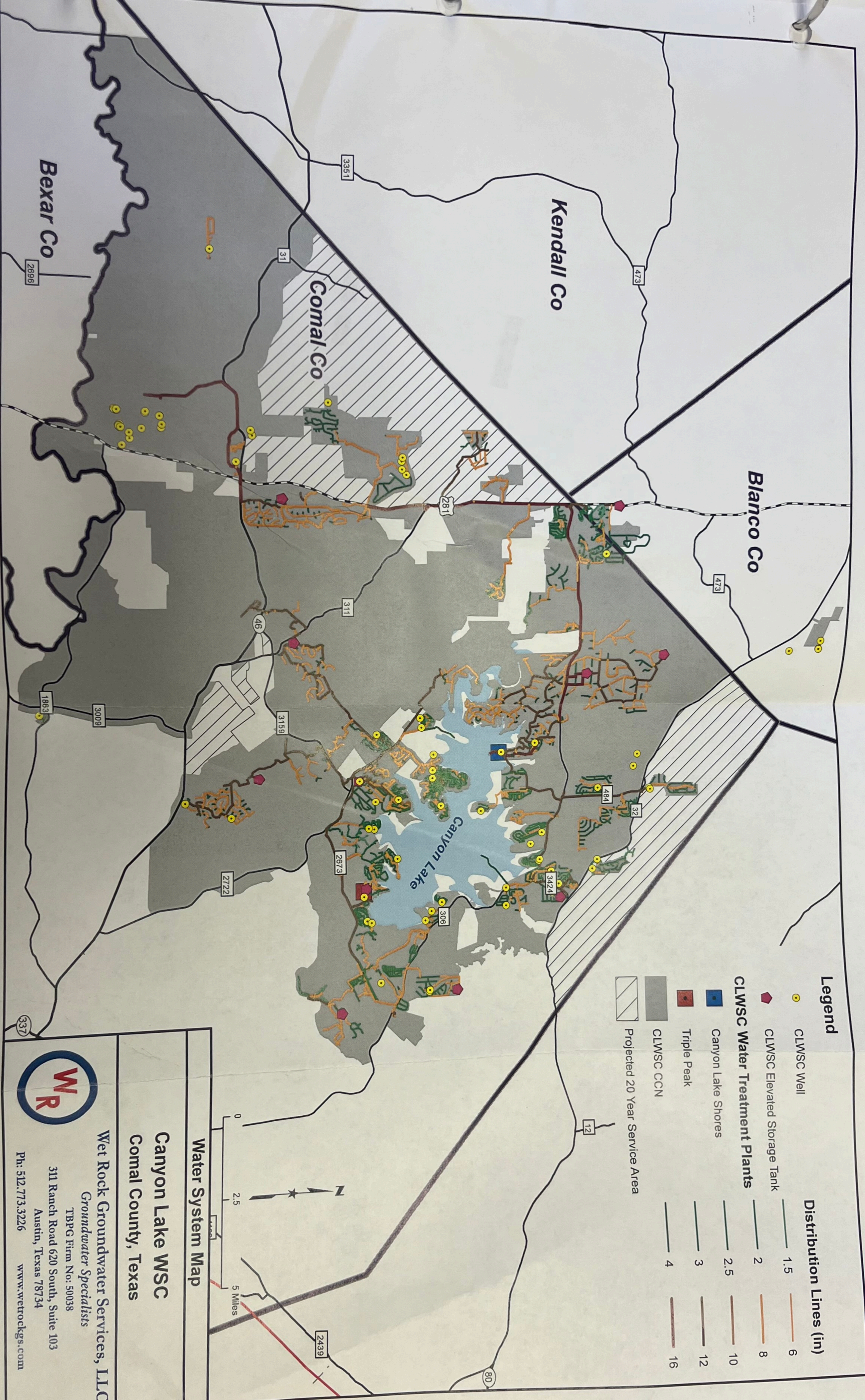
Hydrograph: State Well No. 6815211



Appendix B

Water System Map





Legend

- CLWSC Well
 - CLWSC Elevated Storage Tank
 - CLWSC Water Treatment Plants**
 - Canyon Lake Shores
 - Triple Peak
 - CLWSC CCN
 - Projected 20 Year Service Area
- Distribution Lines (in)**
- | | |
|-----|----|
| 1.5 | 6 |
| 2 | 8 |
| 2.5 | 10 |
| 3 | 12 |
| 4 | 16 |

Water System Map

Canyon Lake WSC
Comal County, Texas

Wet Rock Groundwater Services, LLC
Groundwater Specialists
TBPG Firm No: 50038
311 Ranch Road 620 South, Suite 103
Austin, Texas 78734
Ph: 512.773.3226
www.wetrockgs.com





Appendix C

Water Rights Contract Summary



GBRA Surface Water Contracts Summary

CONTRACT DATE	CONTRACT EXPIRES	CONTRACT NUMBER	TIME PERIOD REMAINING (In Years)	SOURCE	ALLOCATION (Acre-Feet)
10/1/1994	12/31/2044	1978	31	Canyon Lake Raw Water	560
4/30/1997	12/31/2044	1978 (Amended)	31	Canyon Lake Raw Water	440
11/3/1999	12/31/2044	1978 (Amended)	31	Canyon Lake Raw Water	1000
8/27/2001	12/31/2050	2343	37	Canyon Lake Raw Water	2000
9/29/2006	12/31/2050		37	Canyon Lake Raw Water	2000
2/6/2009	12/31/2040		27	Western Canyon Pipeline	400
3/24/2009	12/31/2040		27	Western Canyon Pipeline	322

TOTAL RAW/TREATED WATER UNDER CONTRACT WITH GBRA = 6,722 ACFT PER YEAR.

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 Corporation
P. O. Box 1742
Canyon Lake, Texas 78130

and

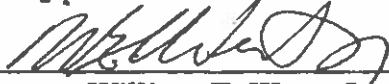
Todd Kern
National Bank for Cooperatives

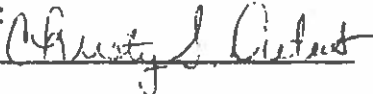
5500 South Quebec St
Englewood, Colorado, 8011

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: 

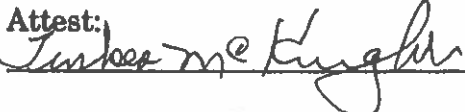
Canyon Lake Water Supply Corp.

By 
Dorene Rust, Vice-President

P.O. Box 1742
Address

Canyon Lake, Tx 78130
City, State, Zip

210-899-4603
Telephone No.

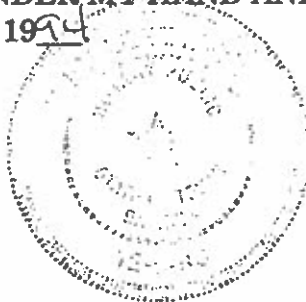
Attest: 

THE STATE OF TEXAS §

COUNTY OF GUADALUPE §

BEFORE ME, the undersigned, a Notary Public in and for said State, on this day personally appeared 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



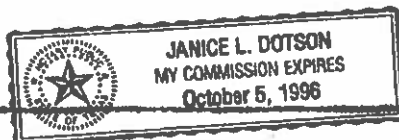
[Signature]
Notary Public
The State of Texas

THE STATE OF TEXAS §

COUNTY OF Cook §

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

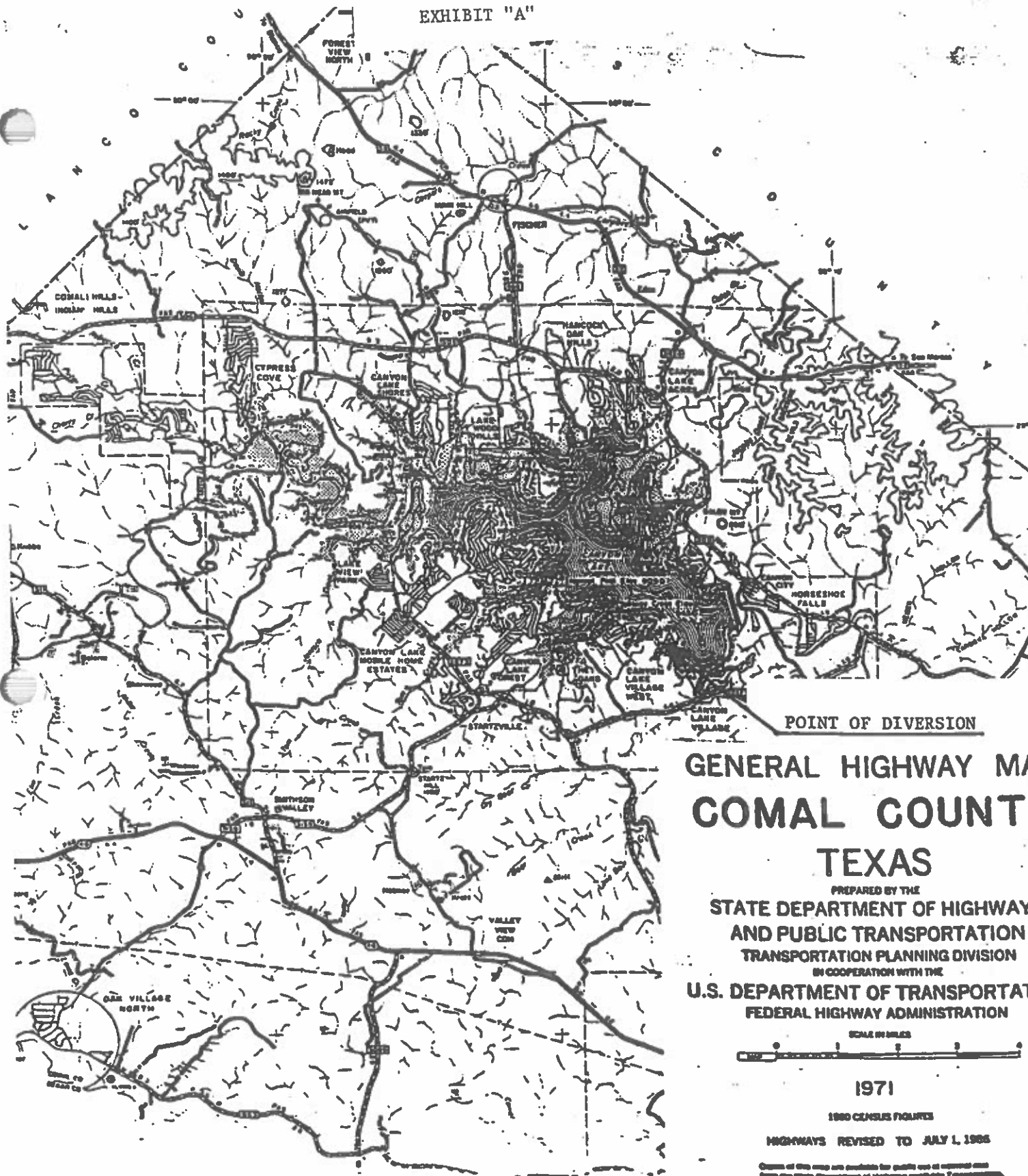
From the easternmost corner of the William G. Smith Survey, A-542, traveling north a distance of 58°, west 3,000 feet to the southernmost shore of Canyon Reservoir.

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.

↑
Phone place
540 RF

EXHIBIT "A"

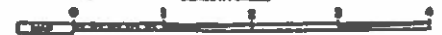


POINT OF DIVERSION

GENERAL HIGHWAY MAP COMAL COUNTY TEXAS

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

SCALE IN MILES



1971

1960 CENSUS FIGURES

HIGHWAYS REVISED TO JULY 1, 1965

Changes of this map are available for public use at nominal cost
from the State Department of Highway and Public Transportation,
P.O. Box 5051, Austin, Texas 78765

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

NOTICE

This map has been prepared for official department use and
has no official status. Accuracy is limited to quality of available
data used in the map's design.

Sheet 1 of 1 map sheet and 2 copies

COMAL COUNTY

**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

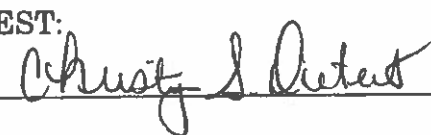
be duly executed in three (3) counterparts, each of which shall constitute an original.

GUADALUPE-BLANCO RIVER AUTHORITY

By

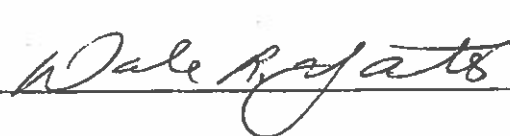

General Manager

ATTEST:

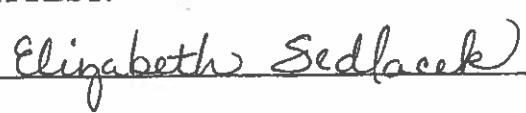


CANYON LAKE WATER SUPPLY CORPORATION

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 Breuch

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 Breuch

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. 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).

POINTS OF DIVERSIONS
COMAL COUNTY
TEXAS

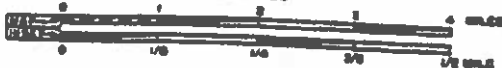
DIVERSION "B"

DIVERSION "A"

GENERAL HIGHWAY MAP
COMAL COUNTY
TEXAS

PREPARED BY THE
TEXAS STATE HIGHWAY DEPARTMENT
PLANNING SURVEY DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

SCALES



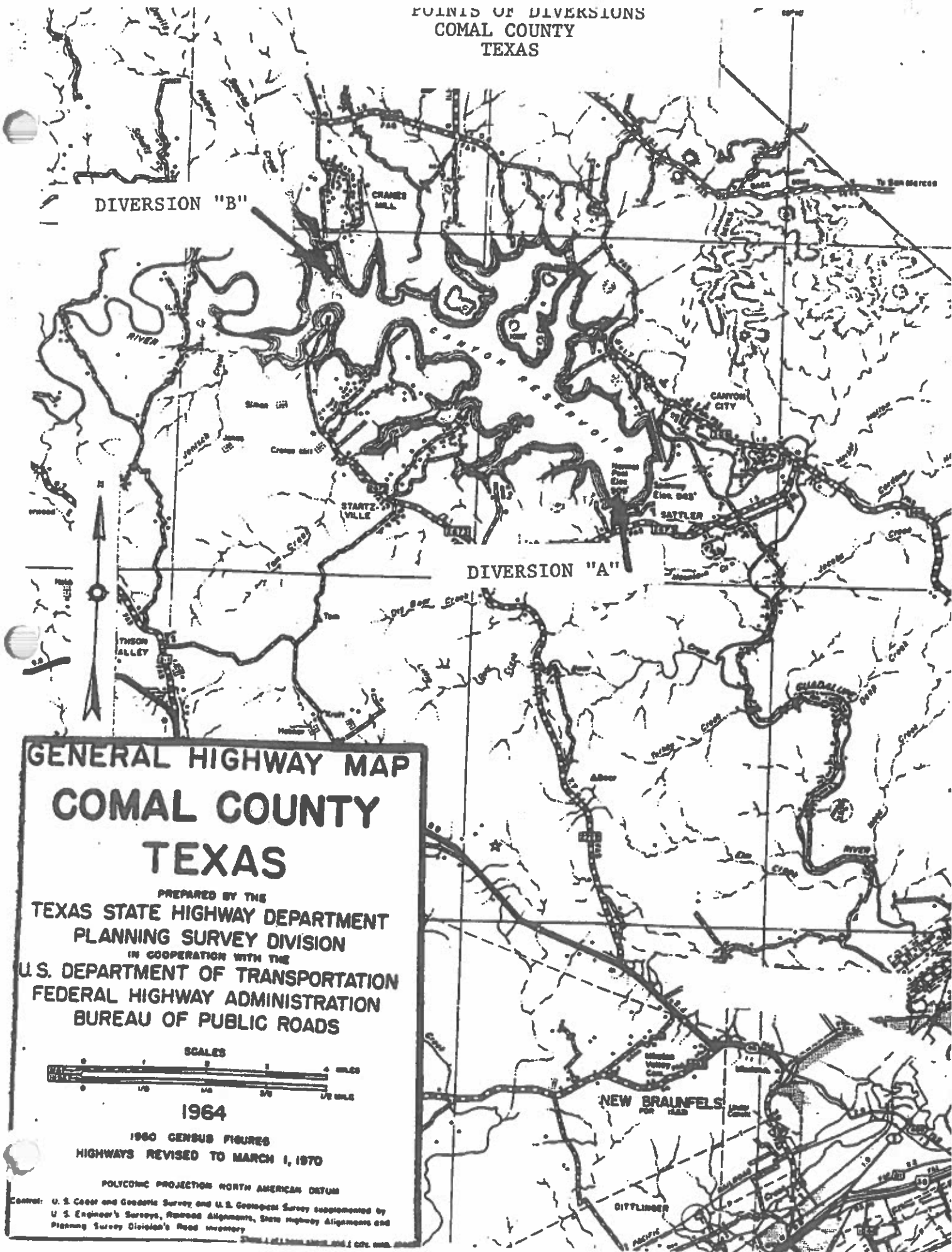
1964

1960 CENSUS FIGURES
HIGHWAYS REVISED TO MARCH 1, 1970

POLYCONIC PROJECTION NORTH AMERICAN DATUM

Control: U. S. Coast and Geodetic Survey and U. S. Geological Survey supplemented by
U. S. Engineer's Surveys, Railroad Alignments, State Highway Alignments and
Planning Survey Division's Road Inventory

STATE OF TEXAS, LAND AND WATER COMMISSION



**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 Gupfe

CANYON LAKE WATER SUPPLY

By Jeff Branecky
Jeff Branecky, President

ATTEST:

William K. Holmes
William K. Holmes, Secretary

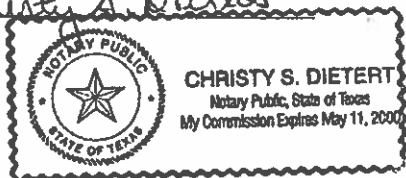
THE STATE OF TEXAS

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

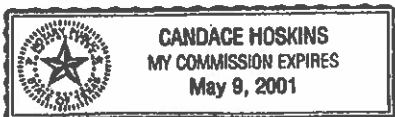
My Commission Expires: May 11, 2000

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).



GUADALUPE-BLANCO RIVER AUTHORITY

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

June 14, 2001

20-041-04-0108--041008

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

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

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

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

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

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.

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

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

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

Sincerely,

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

Fred M. Blumberg
Fred M. Blumberg
Deputy General Manager

FMB:sb

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

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

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

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 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.

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 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 the previous month. 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 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 Natural Resource Conservation Commission, or any successor agency.

9. 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.

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.

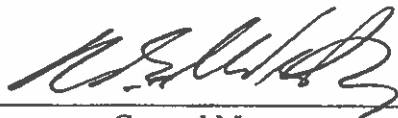
12. TERMINATION. Purchaser may terminate this contract at any time for any reason by giving GBRA written notice of termination thirty (30) days prior to the date of termination. If Purchaser fails to pay any amounts payable under this contract when due and payable, GBRA may give written notice of such 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.

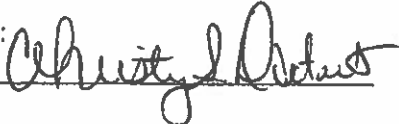
13. AMENDMENTS REQUIRED. Purchaser understands and acknowledges that GBRA's Application to Amend the Canyon Certificate may need to be approved by the TNRCC before GBRA will or may supply, and before Purchaser may divert and use, water pursuant to the terms of this Contract. GBRA's obligations under 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.

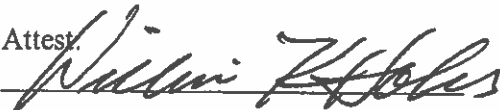
Guadalupe-Blanco River Authority

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.

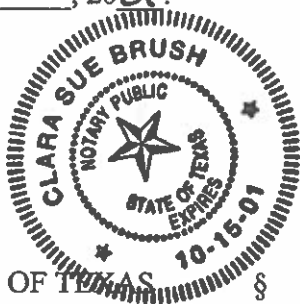
Attest: 

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.



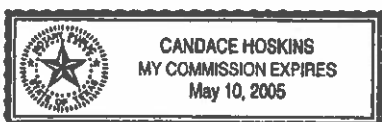
Clara Sue Brush
Notary Public
The State of Texas

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. RATLIFF 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 “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.

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 
William E. West, Jr., 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 29th day of September, 2006.



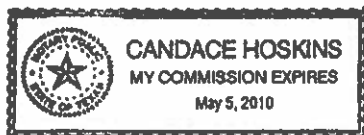
Susan K Cochran
Notary Public
The State of Texas

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

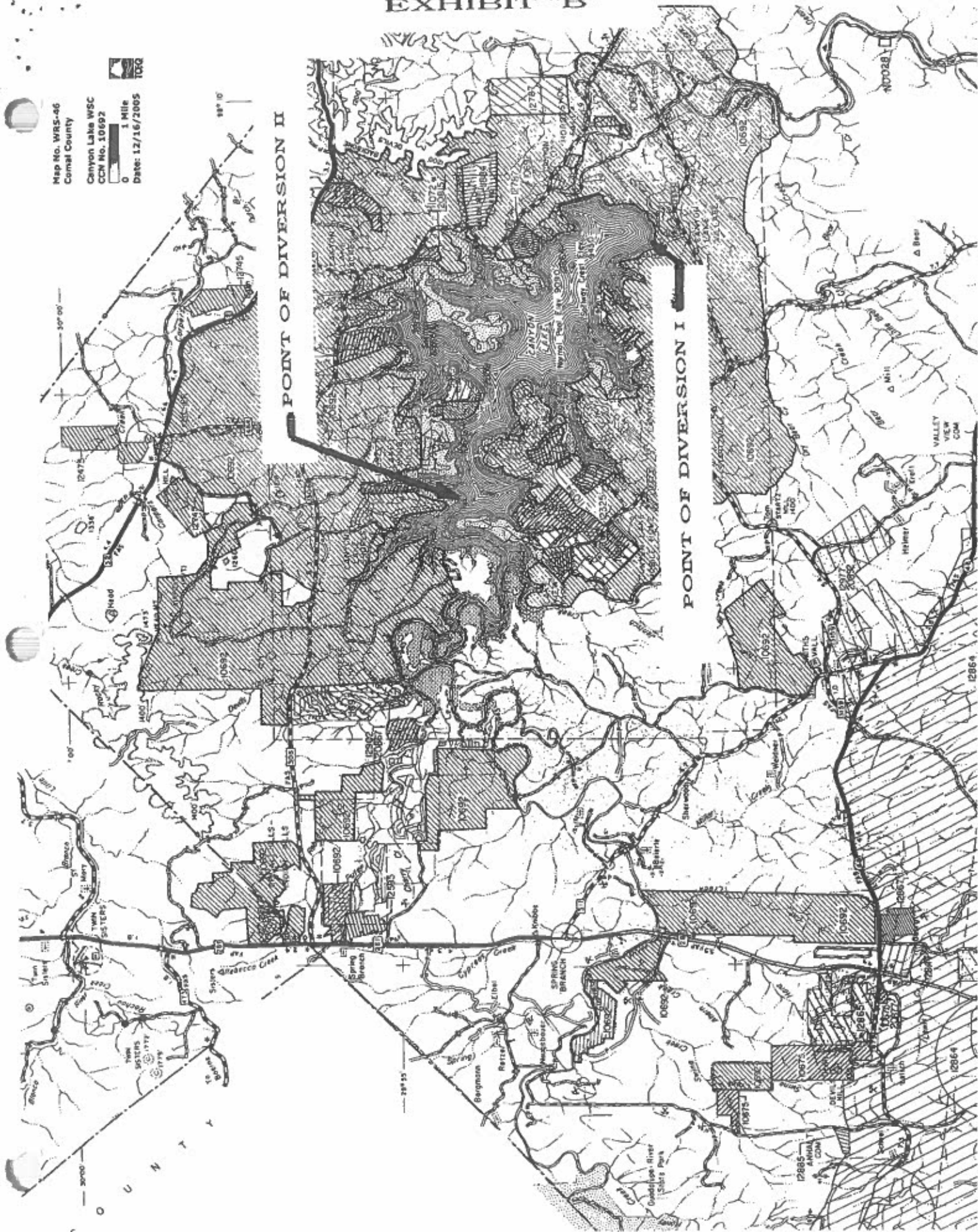
On the North bank of the Guadalupe River in the A.S. Cuning Survey No. 701, Abstract No. 102, Comal County, Texas, Southwest 62°. 50 feet from the South corner of Lot 77, Canyon Lake Shores Subdivision and is at North Latitude of 29° 17'09.6" (WSG 894).

EXHIBIT "B"

Map No. WRS-46
Carmel County
Canyon Lake WSC
CCR No. 10692
0 1 Mile
Date: 12/16/2005
1060

POINT OF DIVERSION II

POINT OF DIVERSION I



Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
Martin A. Hubert, *Commissioner*
Glenn Shankle, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 24, 2007

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

Re: Filing of Water Supply Contract, TCEQ No. 12116
SJWTX Water, Inc., dba Canyon Lake Water Service Company

Dear Mr. Blumberg:

The Water Supply Contract between the Guadalupe-Blanco River Authority and SJWTX Water, Inc., dba Canyon Lake Water Service Company has been accepted for filing. The Agreement meets the filing requirements of 30 Texas Administrative Code §295.101 and §297 Sub-Chapter J.

Please note that for correspondence and reporting purposes this contract is being identified as Water Supply Contract TCEQ No. 12116.

Term: 44 years, beginning September 29, 2006 and ending December 31, 2050

Use: Municipal, 2000 acre-feet per year

Source: Canyon Reservoir

Supplier: Guadalupe-Blanco River Authority

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

If you have any questions concerning this matter please feel free to contact me at (512) 239-2270 or at talleman@tceq.state.tx.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Allemant".

Tom Allemant, MS - MC 160
Project Manager
Water Rights Permitting Team
Water Supply Division

cc: SJWTX Water, Inc., dba Canyon Lake water Service Company

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

This Agreement Regarding the Bulverde Service Area (this "*Agreement*") is made and entered into as of the 6th day of February, 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 certificated water service area is shown on the map attached as **Exhibit 1** ("*Bulverde 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;
- (b) 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.

“Bulverde 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 or points 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 and facility plan attached as Exhibit 2. 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 400 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 400 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 1/365th 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.

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.

**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.

[Remainder of Page Intentionally Left Blank]

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 **APPROVED**
LEGAL DW

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

By: 
Thomas Hodge, Vice President/General Manager

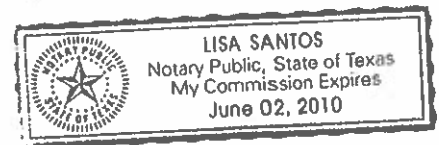
THE STATE OF TEXAS §

COUNTY OF Bexar §

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 6th day of February, 2009.

Lisa Santos
Notary Public
The State of Texas



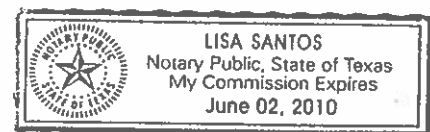
THE STATE OF TEXAS §

COUNTY OF Bexar §

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 16th day of February, 2009.

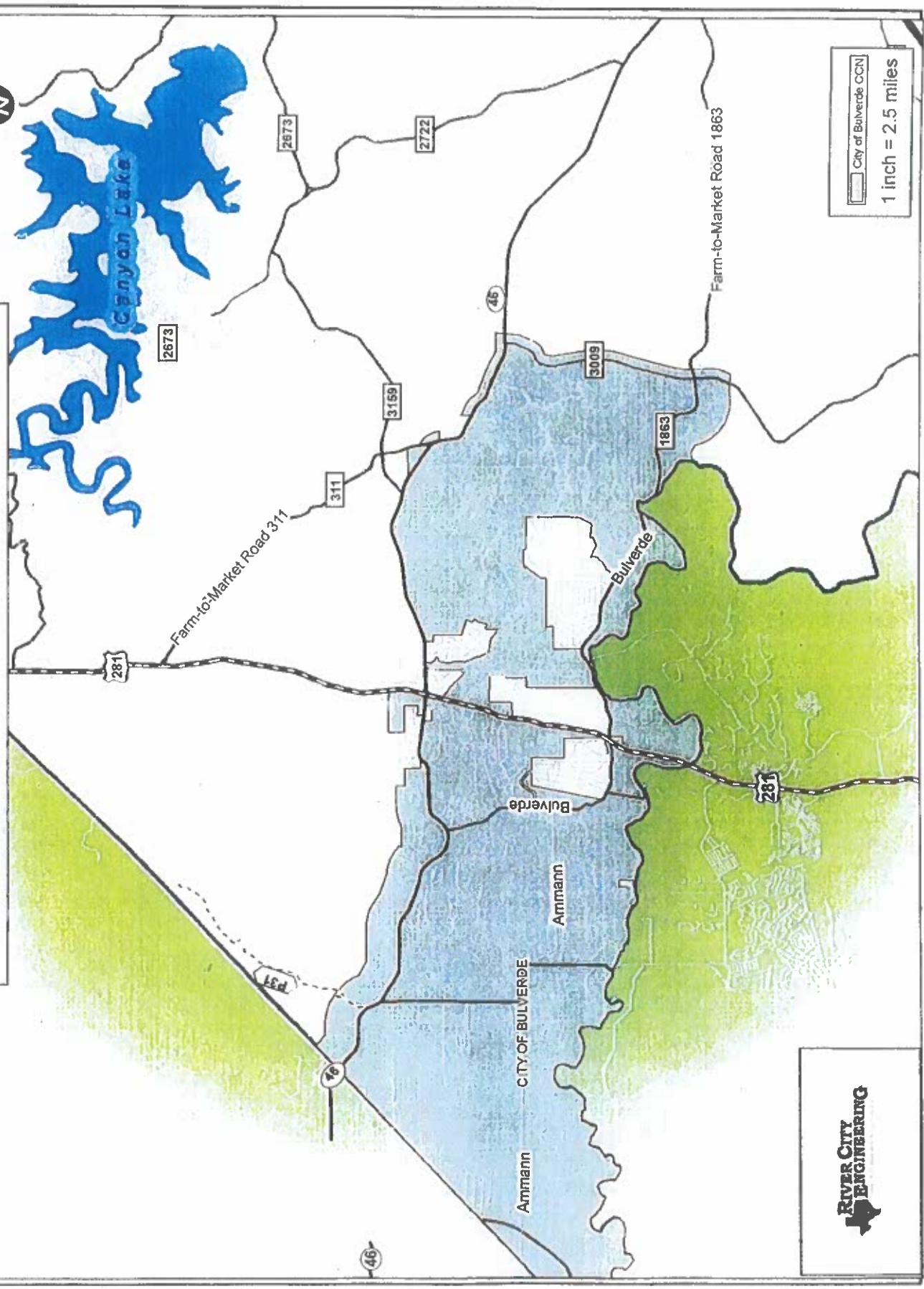
Lisa Santos
Notary Public
The State of Texas

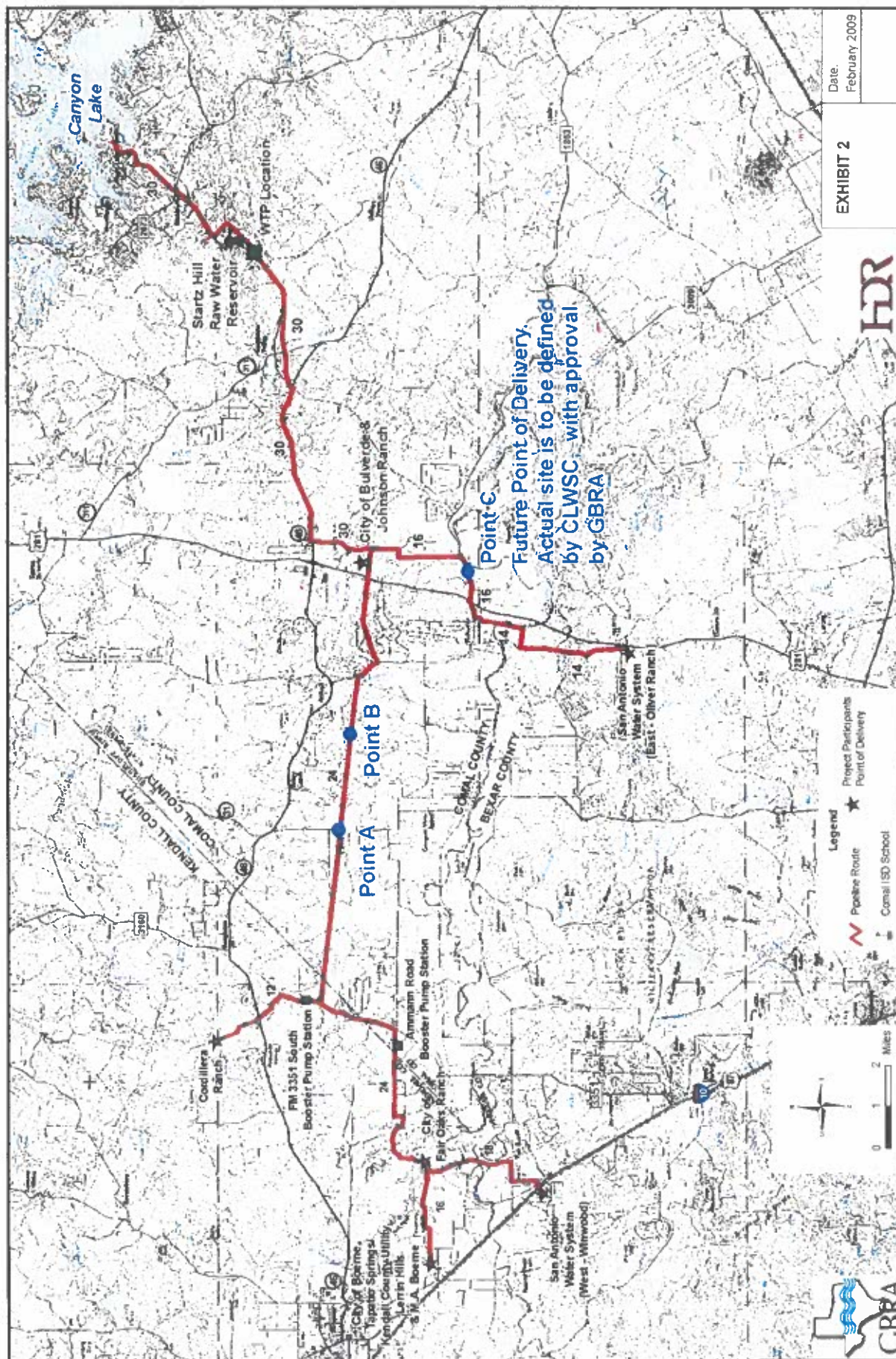


INDEX OF EXHIBITS TO AGREEMENT

- Exhibit 1** Map showing the certificated service area of water CCN No. 12864.
- Exhibit 2** Map and facility plan of the Treated Water Supply Project (the Western Canyon Project) showing the Treated Water Point(s) of Delivery.

EXHIBIT 1: BULVERDE SERVICE AREA





**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;
- (b) 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: [Signature]
W.E. West, Jr., General Manager

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

By: [Signature] 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.



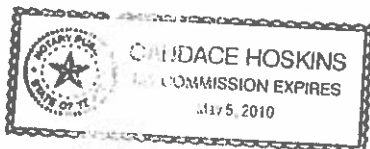
Christy S. Dietert
Notary Public
The State of Texas

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.

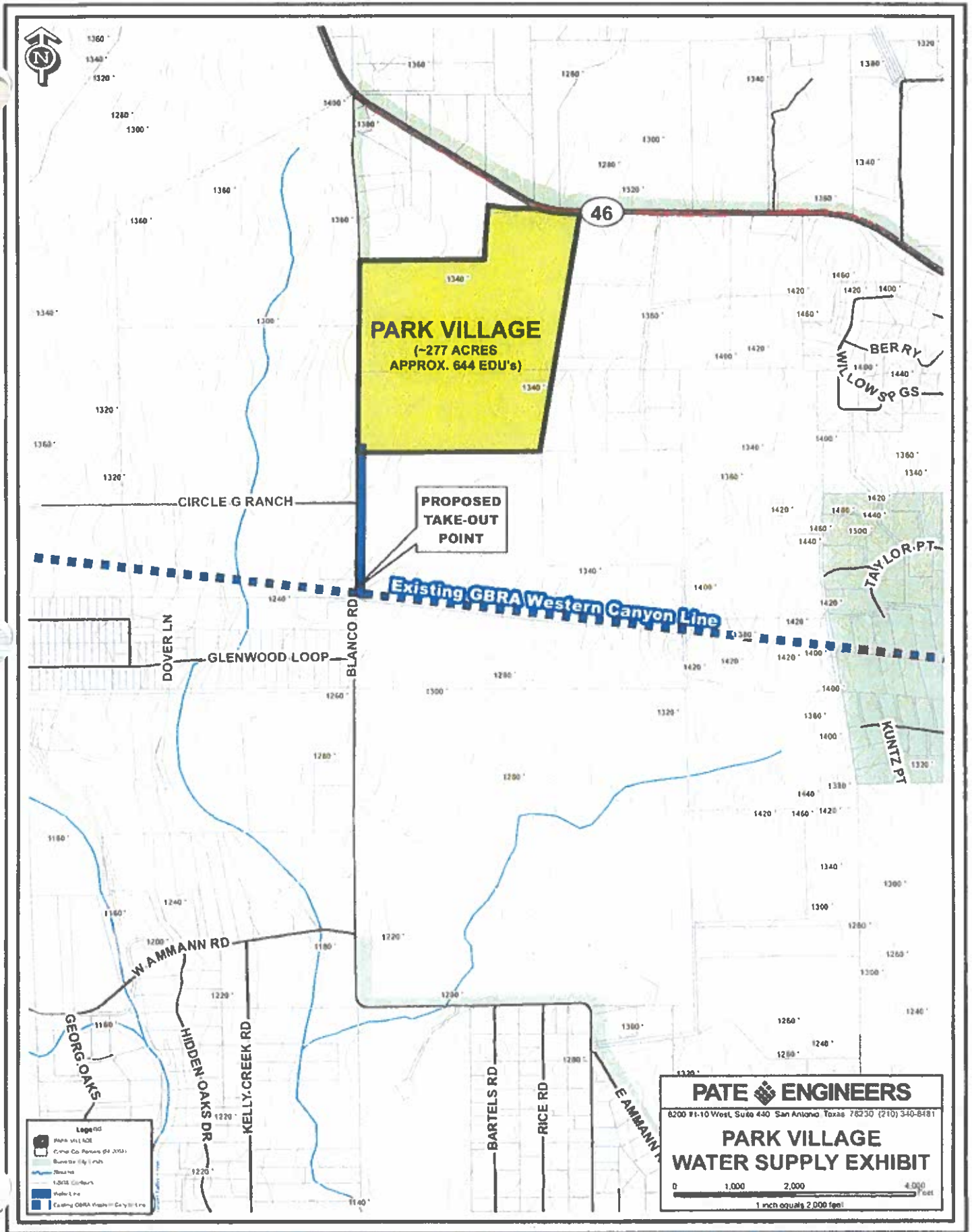
GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 24 day of MARCH, 2009.



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 D

TCEQ Inspection Report



Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 12, 2010

CERTIFIED MAIL NO: 91 7108 2133 3938 5437 6883
RETURN RECEIPT REQUESTED

Mr. W. Richard Roth, President
c/o Mr. Thomas Hodge, P.E., General Manager
SJWTX Inc
PO Box 1742
Canyon Lake, TX 78133-0005

Re: Notice of Violation for the Comprehensive Compliance Investigation at:
SJWTX Canyon Lake Shores, Comal County, Texas
RN101226678, TCEQ PWS ID 0460019, Investigation No. 860384

Dear Mr. Roth:

On September 16, and September 21, 2010, Jay Don Jobson 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 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 subsequent corrective action. Based on the information you have provided, the TCEQ has adequate documentation to resolve the alleged violation. Therefore, no further action is required. Also, please note two "Additional Issues" which will require your attention.

In the listing of alleged violations, we have cited applicable requirements, including TCEQ rules. If you would like to obtain a copy of the applicable TCEQ rules, you may contact any of the sources listed in the enclosed brochure entitled "Obtaining TCEQ Rules." Copies of applicable federal regulations may be obtained by calling Environmental Protection Agency's Publications at (800) 490-9198.

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 violation documented in this notice. Should you choose to do so, you must notify San Antonio Region Office within 10 days from the date of this letter. At that time, Ms. Lynn Bumguardner, Water Section Manager will schedule a violation review meeting to be conducted within 21 days from the date of this letter. However, please be advised that if you decide to participate in the

REPLY TO: REGION 13 • 14250 JUDSON RD. • SAN ANTONIO, TEXAS 78233-4480 • 210-490-3096 • FAX 210-545-4329

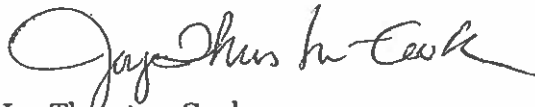
P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • Internet address: www.tceq.state.tx.us

Mr. W. Richard Roth
October 12, 2010
Page 2

violation review process, the TCEQ may still require you to adhere to the compliance schedule included in the attached 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. Jay Don Jobson in the San Antonio Region Office at (210) 403-4056.

Sincerely,



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

JTC/JDJ/eg

Enclosures: Summary of Investigation Findings
Obtaining TCEQ Rules

Summary of Investigation Findings

CANYON LAKE SHORES

Investigation # 860384

Investigation Date: 09/16/2010

, COMAL COUNTY,

Additional ID(s): 0460019

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

Track No: 331775

30 TAC Chapter 290.41(c)(3)(J)

Alleged Violation:

Investigation: 639030

Comment Date: 5/9/2008

Failure to provide the Tamarack Shores Well with a concrete sealing block extending at least 3 feet from the exterior well casing in all directions. The finished slab must have a minimum dimension of 6 feet plus the outside diameter of the well casing, a minimum thickness of 6 inches, and must be sloped to drain away from the well head at not less than 0.25 inches per foot.

Investigation: 701814

Comment Date: 9/11/2008

Compliance for this violation has not yet been resolved. Completion is expected in November of 2008.

Investigation: 860384

Comment Date: 9/30/2010

Compliance noted during investigation on 09/21/2010.

Recommended Corrective Action: Extend the sealing block at the Tamarack well. Compliance documentation: submit a photo of the extended sealing block.

Resolution: Compliance noted during investigation on 09/21/2010.

Track No: 413389

30 TAC Chapter 290.42(d)(13)

Alleged Violation:

Investigation: 860384

Comment Date: 9/30/2010

Failure to identify the influent, effluent, waste backwash, and chemical feed lines by the use of labels or various colors of paint. Where labels are used, they shall be placed along the pipe at no greater than five foot intervals. At the time of this investigation, the chemical feed lines were not labeled at the point of injection into the clarifiers.

Recommended Corrective Action: Label the chemical feed lines at the point of injection into the clarifiers. Compliance documentation: submit a photo of the labeled chemical feed lines.

Resolution: Compliance documentation received 09/29/2010.

ADDITIONAL ISSUES

Description

Additional Comments

CANYON LAKE SHORES**Investigation # 860384**

MINIMUM WATER SYSTEM CAPACITY REQUIREMENTS: Meets applicable 290.45 standards?	30 TEX. ADMIN. CODE , '291.93(3) A retail public utility that possesses a certificate of public convenience and necessity that has reached 85% of its capacity as compared to the most restrictive criteria of the commission's minimum capacity requirements in Chapter 290 T.A.C., must submit to the executive director a 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. At the time of this investigation, the system was at 96% of its production capacity.
MINIMUM ACCEPTABLE OPERATING PRACTICES FOR PWS: Meets applicable 290.46 standards?	30 TEX. ADMIN. CODE, '290.46(f)(3)(A) Monthly Reports of Water Works Operation must be compiled regularly each month and kept on file for commission review for at least 2 years. The reports must be completed in ink, typed, or computer-printed and must be signed by the certified operator. During this investigation it was noted that, while the Monthly Reports for the groundwater sources were being maintained, the amount of chemicals used and volume of water treated were not recorded on a daily basis. For systems which serve more than 250 connections, the reading must be taken daily.

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

Regulated Entity/Site Name	CLWSC - CANYON LAKE SHORES		TCEQ Add. ID No. RN No. (optional)	04600019
Investigation Type	CCI	Contact Made In-House (Y/N)	Purpose of Investigation	
Regulated Entity Contact	LARRY BITTLE		Telephone No.	Date Contacted
Title	PRODUCTION MANAGER		Fax No.	Date Faxed

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 by telephone 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	Description of Issue
1	AV	CHEMICAL FEED LINES AT POINT OF INFLECTION NEED TO BE LABELED

¹Issue 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 type="checkbox"/> No
Did the investigator advise the regulated entity representative that continued operation is not authorized?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Document Acknowledgment. Signature on this document establishes only that the regulated entity (company) representative received a copy of this document and associated continuation pages on the date noted. If contact was made by telephone, document will be faxed to regulated entity; therefore, signature not required.

	Jay Don Johnson	09/21/2010		9/21/10
Investigator Name (Signed & Printed)		Date	Regulated Entity Representative Name (Signed & Printed)	

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

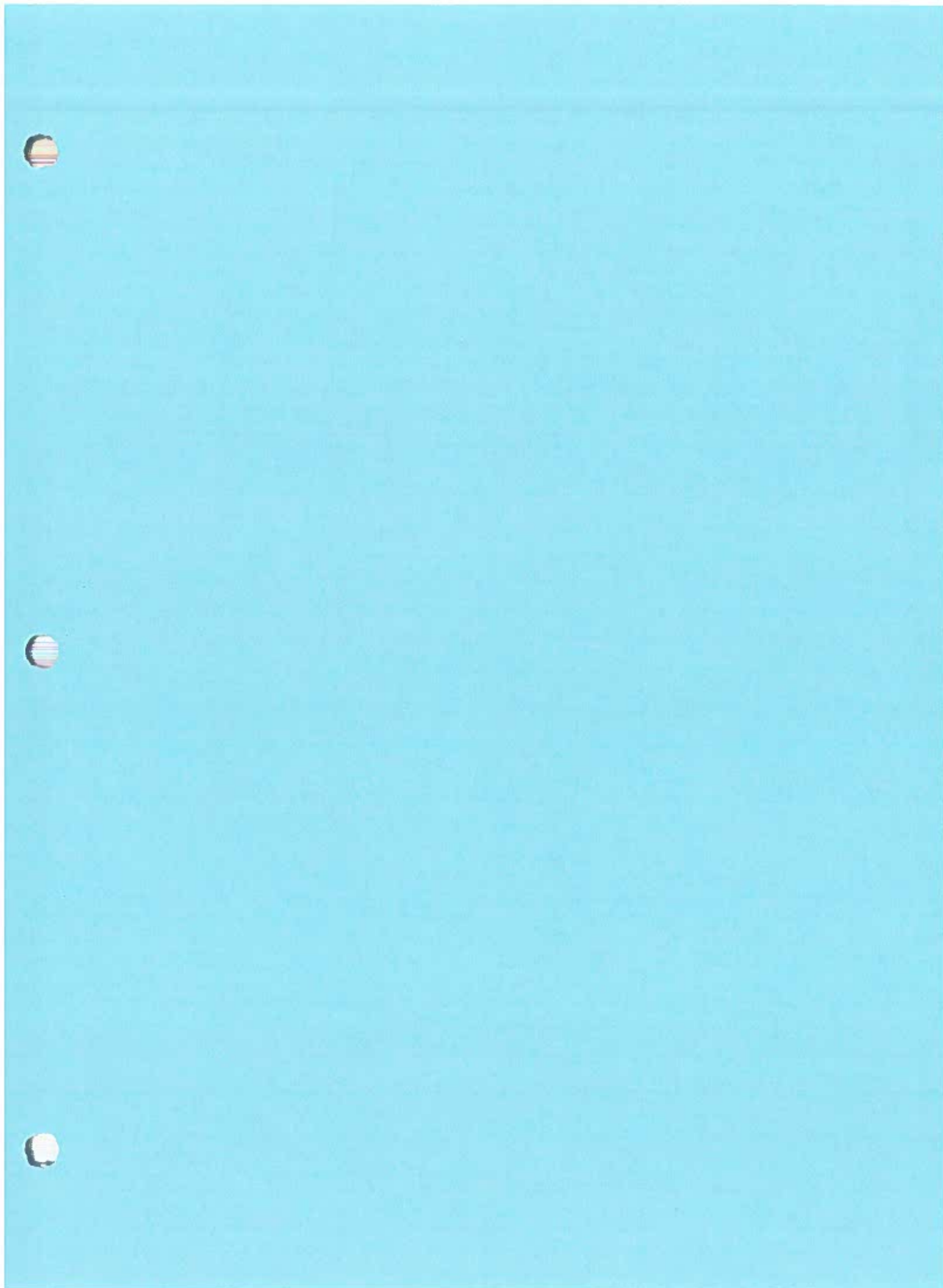
Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, call 512-239-3282.



LABELED Chemical Feed Lines



LABELED Chemical Feed Lines



Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 12, 2010

CERTIFIED MAIL NO: 91 7108 2133 3938 5437 6982
RETURN RECEIPT REQUESTED

Mr. Thomas Hodge, P.E., General Manager
SJWTX, Inc.
PO Box 1742
Canyon Lake, TX 78133-0005

Re: Notice of Violation for the Comprehensive Compliance Investigation at:
SJWTX Triple Peak Plant, FM 2673, Comal County, Texas
RN101247039, TCEQ PWS ID 0460172, Investigation No. 860323

Dear Mr. Hodge:

On September 8 and 16, 2010, Jay Don Jobson 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 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 subsequent corrective action. In addition, certain outstanding alleged violations were identified for which compliance documentation is required. Please submit to this office by December 30, 2010, a written description of corrective action taken and the required documentation demonstrating that compliance has been achieved for each of the outstanding alleged violations.

In the listing of alleged violations, we have cited applicable requirements, including TCEQ rules. If you would like to obtain a copy of the applicable TCEQ rules, you may contact any of the sources listed in the enclosed brochure entitled "Obtaining TCEQ Rules." Copies of applicable federal regulations may be obtained by calling Environmental Protection Agency's Publications at (800) 490-9198.

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 violation(s) documented in this notice. Should you choose to do so, you must notify San Antonio Region Office within 10 days from the date of this letter. At that time, Ms. Lynn Bumguardner, Water Section Manager will schedule a violation review meeting to be conducted within 21 days from the date of this letter. However, please be advised that if you decide to participate in the

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P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • Internet address: www.tceq.state.tx.us

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Mr. Thomas Hodge
November 12, 2010
Page 2

violation review process, the TCEQ may still require you to adhere to the compliance schedule included in the attached 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. Jay Don Jobson in the San Antonio Region Office at (210) 403-4056.

Sincerely,



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

JTC/JDJ/eg

Enclosures: Summary of Investigation Findings
Obtaining TCEQ Rules

Summary of Investigation Findings

SJWTX TRIPLE PEAK PLANT

Investigation # 860323

Investigation Date: 09/08/2010

, COMAL COUNTY,

Additional ID(s): 0460172

OUTSTANDING ALLEGED VIOLATION(S)

Track No: 414792 Compliance Due Date: 12/30/2010

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

Alleged Violation:

Investigation: 860323

Comment Date: 11/1/2010

Failure to provide adequate pressure maintenance facilities meeting the minimum requirements. The use of continuously operating booster pumps to maintain pressure in the distribution system is unacceptable due to the immediate loss of pressure in the event of a power failure. Pressure is maintained to one connection at the EVIAN I elevated ground storage tank by one service pump.

Recommended Corrective Action: Provide pressure maintenance facilities at this location. Compliance documentation: submit a photo of the installed pressure maintenance facilities.

Track No: 414794 Compliance Due Date: 12/30/2010

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

Alleged Violation:

Investigation: 860323

Comment Date: 10/20/2010

Failure to meet this Agency's "Minimum Water System Capacity Requirements." These requirements include: a raw water pump capacity of 0.6 gallons per minute per connection with the largest pump out of service.

Recommended Corrective Action: Your water system must be modified to meet this requirement to assure an adequate supply of water at all times.

Please be advised that public water systems shall notify the executive director prior to making any significant change or addition to the system's production, treatment, storage, or distribution facilities. Public water systems shall submit plans and specifications for the proposed changes upon request.

The water system may request an exception to these requirements by writing to TCEQ, Water Supply Division, Public Drinking Water Section, Surveillance and Technical Assistance, MC 155, P.O. Box 13087, Austin, TX 78711-3087; phone: (512) 239-6020.

Compliance Documentation: Submit a compliance plan, engineering report or certification OR a copy of a letter requesting an exception in addition to a compliance plan for final compliance, OR a copy of a letter granting an exception to verify compliance OR documentation demonstrating that the raw water pump capacity has been increased to meet requirements.

ALLEGED VIOLATION(S) NOTED AND RESOLVED

Track No: 331767

30 TAC Chapter 290.41(c)(3)(J)

Alleged Violation:

Investigation: 637774

Comment Date: 5/9/2008

Failure to provide the Netherhill Well with a concrete sealing block extending at least 3 feet from the exterior well casing in all directions. The finished slab must have a minimum dimension of 6 feet plus the outside diameter of the well casing, a minimum thickness of 6 inches, and must be sloped to drain away from the well head at not less than 0.25 inches per foot.

Investigation: 688981

Comment Date: 9/10/2008

Partial compliance documentation received 07/29/2008.

Investigation: 860323

Comment Date: 10/20/2010

Compliance noted during investigation on 09/08/2010.

Recommended Corrective Action: Extend the sealing block at the Netherhill well. Compliance documentation: submit a photo of the extended sealing block.

Resolution: Compliance noted during investigation on 09/08/2010.

Track No: 331770**30 TAC Chapter 290.46(m)(4)****Alleged Violation:**

Investigation: 637774

Comment Date: 5/9/2008

Failure to maintain all water storage facilities in a watertight condition. In this connection, the leaking ground storage tank located at Charter Oaks must be repaired or replaced as necessary.

Investigation: 688981

Comment Date: 9/10/2008

Partial compliance documentation received 07/29/2008.

Investigation: 860323

Comment Date: 10/20/2010

Compliance noted during investigation on 09/08/2010.

Recommended Corrective Action: Repair or replace the leaking ground storage tank. Compliance documentation: submit a photo of the repaired tank OR a schedule for replacement.

Resolution: Compliance noted during investigation on 09/08/2010.

Track No: 413662**30 TAC Chapter 290.43(c)(2)****Alleged Violation:**

Investigation: 860323

Comment Date: 10/5/2010

Failure to maintain the roof hatch on the ground storage tank locked at all times to prevent any contamination from entering the water supply from outside sources. During the investigation, it was noted that the hatch on the ground storage tank at the Canyon Lake Hills Plant was not locked.

Recommended Corrective Action: Provide a lock on the ground storage tank hatch. Compliance documentation: submit a photo of the locked hatch.

Resolution: Compliance documentation received 09/29/2010.

Track No: 413664

30 TAC Chapter 290.41(c)(3)(K)

Alleged Violation:

Investigation: 860323

Comment Date: 10/5/2010

Failure to seal each wellhead with the use of gaskets or a pliable crack resistant caulking compound. The Lakeview #2 well is in need of caulking.

Recommended Corrective Action: Caulk the Lakeview #2 wellhead. Compliance documentation: submit a photo of the caulked wellhead.

Resolution: Compliance documentation received 09/29/2010.

ADDITIONAL ISSUES

Description

MINIMUM ACCEPTABLE OPERATING PRACTICES FOR PWS: Meets applicable 290.46 standards?

Additional Comments

30 TEX. ADMIN. CODE, '290.46(f)(3)(A) Monthly Reports of Water Works Operation must be compiled regularly each month and kept on file for commission review for at least 2 years. The reports must be completed in ink, typed, or computer-printed and must be signed by the certified operator. During this investigation it was noted that, while the Monthly Reports for the groundwater sources were being maintained, the amount of chemicals used and volume of water treated were not recorded on a daily basis. For systems which serve more than 250 connections, the reading must be taken daily.

TCEQ EXIT INTERVIEW FORM: Potential Violations and/or Records Requested				
Regulated Entity/Site Name	CLWSC - TRIPLE PEAK		TCEQ Add. ID No. RN No. (optional)	0460172
Investigation Type	CCI	Contact Made In-House (Y/N)	Purpose of Investigation	
Regulated Entity Contact	LARRY BUTTE		Telephone No.	Date Contacted
Title	PRODUCTION MANAGER		Fax No.	Date Faxed

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 by telephone 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		WELL AT LAKEVIEW PARK NEEDS TO BE SEALED
2	AV		GROUND STORAGE AT CANYON LAKE HUES NEEDS TO BE LOCKED
3	AV		NEED A PRESSURE TANK AT EVIAN I

¹Issue 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 type="checkbox"/> No
Did the investigator advise the regulated entity representative that continued operation is not authorized?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Document Acknowledgment. Signature on this document establishes only that the regulated entity (company) representative received a copy of this document and associated continuation pages on the date noted. If contact was made by telephone, document will be faxed to regulated entity; therefore, signature not required.

Investigator Name (Signed & Printed)	Date	Regulated Entity Representative Name (Signed & Printed)	Date
Jay Don Johnson	09/21/2010		9/21/10

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.



SEAL-Lakeview
Park Well



GST LOCK-Canyon
Lake Hills

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 6, 2011

CERTIFIED MAIL NO: 91 7108 2133 3938 5437 1611
RETURN RECEIPT REQUESTED

Mr. Thomas Hodge, P.E., General Manager
SJWTX, Inc.
PO Box 1742
Canyon Lake, TX 78133-0005

Re: Failure to Submit Compliance Documentation for:
SJWTX Triple Peak Plant, FM 2673, Comal County, Texas
FN101247039, TCEQ PWS ID 0460172, Investigation No. 860323

Dear Mr. Hodge:

By letter dated November 12, 2010, the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office requested that you submit information to us by December 30, 2010 verifying that the outstanding alleged violations referenced in the letter have been corrected. The alleged violations were noted during the investigation of the above-referenced facility conducted on September 8 and 16, 2010. Enclosed for your information is a copy of the letter. As of this date, we have not received from you a written description of corrective action taken and the required compliance documentation for these alleged violations. Please submit this information to us by no later than July 29, 2011.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and looks forward to receiving your response. Please note that the Legislature has granted TCEQ enforcement powers which we may exercise to ensure compliance with environmental regulatory requirements.

If you or members of your staff have any questions, please feel free to contact Mr. Jay Don Jobson in the San Antonio Region Office at (210) 403-4056.

Sincerely,

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

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

JTC/CW/eg

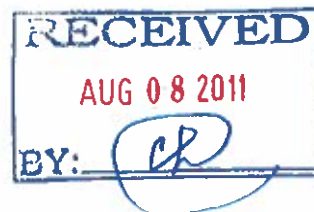
Enclosure: Copy of Previous Letter dated November 12, 2011

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 4, 2011

Mr. Thomas Hodge, P.E., General Manager
SJWTX, Inc.
PO Box 1742
Canyon Lake, TX 78133-0005

Re: Notice of Compliance with Notice of Violation (NOV) dated *November 12, 2010*:
SJWTX Triple Peak Plant, FM 2673, Comal County, Texas
RN101247039, TCEQ PWS ID: 0460172, Investigation No. 937558

Dear Mr. Hodge:

This letter is to inform you that Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office has received adequate compliance documentation on December 8, 2010 and June 21, 2011, to resolve the alleged violations documented during the investigation of the above-referenced regulated entity conducted on September 8 and 16, 2010. Based on the information submitted, no further action is required concerning 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, please feel free to contact Mr. Jay Don Jobson at the San Antonio Region Office at (210)403-4056.

Sincerely,

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

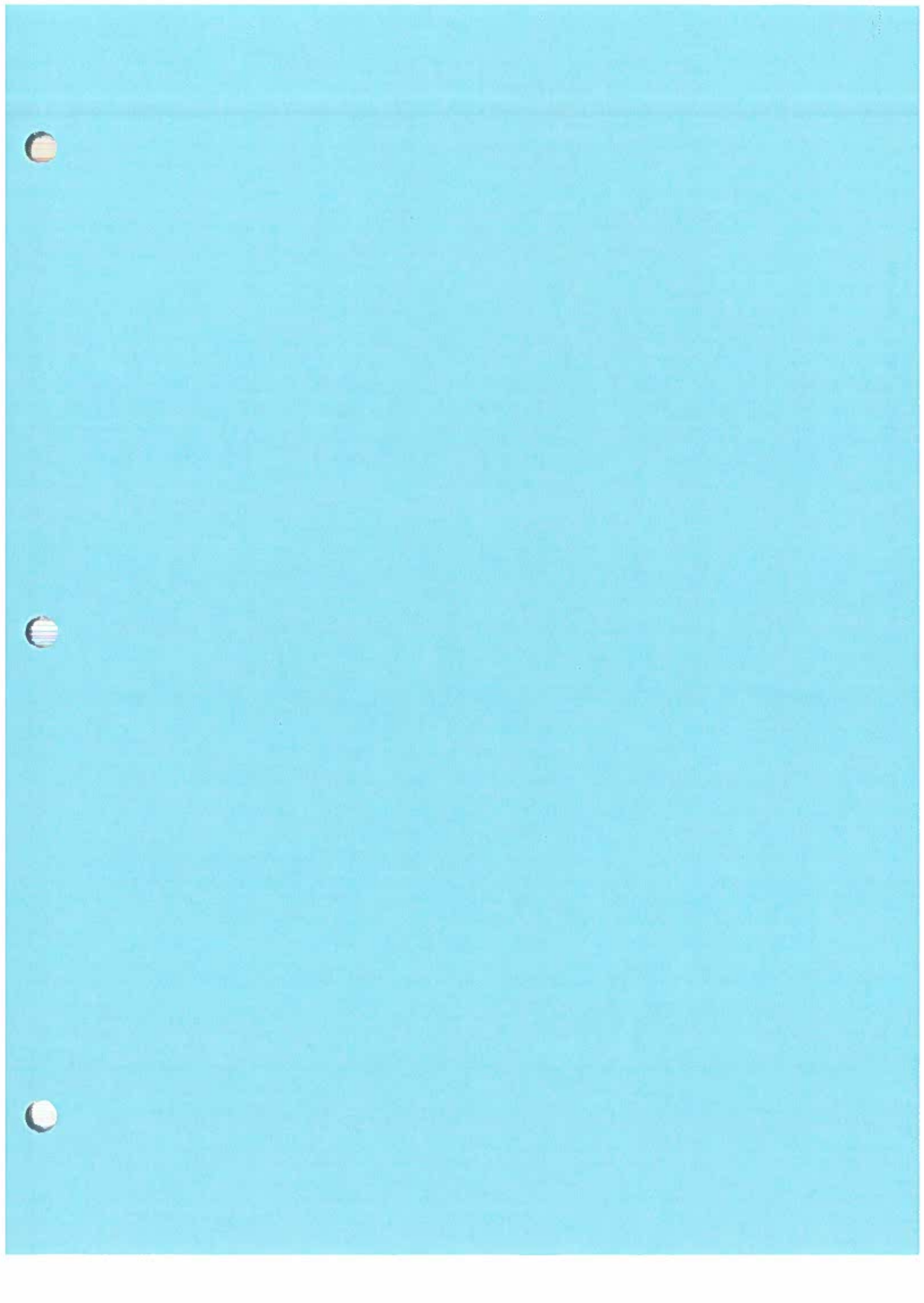
Joy Thurston-Cook
Water Section Work Leader
San Antonio Region Office

JMTC/JDJ/eg

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 30, 2011

Mr. Thomas Hodge, P.E., General Manager
San Jose Water of Texas
PO Box 1742
Canyon Lake, TX 78133-0005

Re: Compliance Evaluation Investigation at:
SJWTX Glenwood Subdivision, Blanco Rd, Comal County, Texas
RN#104710108, TCEQ PWS ID No.: 0460246, Investigation No.: 955625

Dear Mr. Hodge:

On September 14, 2011, Jay Don Jobson of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced operation to evaluate compliance with applicable requirements for public water supply systems. 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 Mr. Jay Don Jobson in the San Antonio Region Office at (210)403-4056.

Sincerely,

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

JTC/JDJ/eg

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

Regulated Entity/Site Name		SIVTX Summit North Subdivision		TCEQ Add. ID No.		0460220	
Investigation Type	CCI	Contact Made In-House (Y/N)	Y	Purpose of Investigation	Compliance		
Regulated Entity Contact	Thomas Hodge		Telephone No.	830-964-2166		Date Contacted	09/12/12
Title	General Manager		FAX #/Email address	larry.bittle@clwsc.com		FAX/Email date	10/18/2012

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.

No.	Type	Rule Citation (if known) Texas Administrative Code = TAC	Description of Issue- Notice of Violation
1	AV	30 TAC§290.41(c)(3)(K)	Failure to seal the wellhead with the use of gaskets or a pliable crack-resistant caulking compound.
2	AV	30 TAC§290.109(c)(1),(2)	Failure to submit at least one sample of water collected from different locations in the distribution system regularly each month to a TCEQ certified laboratory for bacteriological analysis as required by this agency's Drinking Water Standards. Sampling from the entry point is not part of the distribution. Sampling sites are not being rotated.
3	AV	30 TAC §290.110(c)(4)(A)	Failure to perform at least once every seven days, chlorine residual tests on water collected from various locations within the distribution system. (A record of these tests and the sample location should be kept in your files for a minimum of 3 years.) Samples sites are not being rotated.
4	AV	30 TAC§290.121	Failure by the regulated entity to develop and maintain an up to date system monitoring plan. The plan shall identify all bacteriological and chemical sampling locations, describe the sampling frequency, and specify the analytical procedures and laboratories to be used to comply with monitoring requirements. The completed plan must be retained at each water plant, and made available to agency personnel for review during succeeding sanitary surveys. No plant schematics were provided. The entry point sampling location should reflect sampling is collected from the ground storage tank spigot.
5	O		Photographs, work orders, invoices, receipts, and applicable records/documents along with written verification are considered acceptable compliance documentation. All compliance documentation must be submitted via fax; 210-545-4329 or regular mail; 14250 Judson Rd., San Antonio, TX 78233.

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	<input type="checkbox"/> N/A
Did the investigator advise the regulated entity representative that continued operation is not authorized?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
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)		Date		Regulated Entity Representative Name (Signed & Printed)
T. J. Hodge		10/18/12		