

Name of Project: Lake Dunlap and Wells Ranch Water Supply through Canyon Regional Water Authority

Duration of Project: Lake Dunlap 1998 - 2038 / Wells Ranch: 2007 - 2047

Amount of Water Available Annually: 6,800 acre-feet per year (AFY) up to 9,654 AFY in 2019 (6,800 AFY firm as of this benchmarking)

Cost per AF Annualized: \$1,041.00

Date Benchmarking Commenced: February 18, 2014

Date Benchmarking Completed: May 20, 2014

Managing Staff: Steven Siebert, Planner IV, Water Resources

SAWS Mission Statement: Sustainable Affordable Water Services

Executive Summary

Canyon Regional Water Authority (CRWA) provides wholesale water services to San Antonio Water System's Northeast service area. This service area, previously part of the former Bexar Metropolitan Water District (BexarMet), receives surface water from Lake Dunlap and groundwater from the Wells Ranch project through CRWA to either partially or fully meet annual demand in this service area.

SAWS has contracts for 4,000 AFY of Lake Dunlap surface water through 2028 with 500 AF leased to the City of Cibolo through 2018. There is a contract for 2,800 AFY of Carrizo Aquifer groundwater through 2047 from the Wells Ranch project. Of the 6,300 AF of water available to SAWS per year, SAWS requests 5,300 AF to meet customer demands in the Northeast service area.

Due to constraints posed by the current disinfection method (CRWA utilizes chloramines while SAWS is a free chlorine system) as well as infrastructure constraints within the SAWS distribution system, SAWS is currently unable to utilize the full contractual volume available. CRWA is currently conducting bench scale testing to evaluate effectiveness and costs to transition to a free chlorine system. SAWS currently is evaluating the costs to integrate the Northeast service area which would allow SAWS to supply larger volumes of water from CRWA into the overall distribution system further diversifying SAWS water resource portfolio.

The Citizens Advisory Panel (CAP) believes that SAWS' collaboration with CRWA offers an additional non-Edwards Aquifer water supply to its Northeast service area, and has the potential to bring additional water resources to SAWS in the future. The CAP notes that CRWA currently supplies surface water from the Guadalupe River through its Lake Dunlap Treatment Plant and

that additional Carrizo Aquifer groundwater is provided through its Wells Ranch project. These are independent sources that offer SAWS a level of certainty as to the availability of water, both in times of plenty and in times of drought.

The CAP recognizes that a change in CRWA's disinfection process from chloramines to free chlorine (the SAWS standard practice) will enable CRWA-supplied water to be integrated with SAWS water and be available over a wider geographic service area. This offers the potential for additional water supplies and for an assessment and potential reduction of pumping costs.

Finally, the CAP acknowledges that CRWA water costs more to acquire than other water sources currently in production. However, the CAP recognizes that the cost of any additional water resource will be noticeably higher than SAWS' traditional supply from the Edwards Aquifer. It's beneficial to SAWS customers and to SAWS water portfolio that CRWA has secured water rights, pumping permits, and has treatment and transmission facilities in place or planned.

The CAP views this supplier/customer partnership as compatible with the Water Management Plan (WMP) in that it diversifies resources and supports regional planning.

As with all other water resource issues, the CAP urges strong public education efforts to build widespread community understanding. These are complex issues requiring financial consideration and long-term planning to ensure sustainable, affordable water services for this area.

Project Overview

CRWA was established in 1989 through a legislative action on behalf of four water supply corporations in Bexar, Comal, Hays and Guadalupe Counties, some of which relied on Edwards Aquifer water as their sole supply. The former BexarMet Water District joined CRWA after its formation, recognizing that surface water resources available through CRWA diversified its supply. With the integration of BexarMet into the SAWS organization and service area, CRWA's water resources became available to SAWS, in particular to its Northeast service area. Water resources available to CRWA were not previously available to SAWS, but the integration of BexarMet has opened current and potentially future water resources to the SAWS portfolio.

Benchmarking Document

1. How does this project reflect a cooperative relationship with neighboring communities?

CRWA is, in and of itself, a cooperative relationship of communities in the Greater San Antonio area and along the high growth I-35 corridor. SAWS recognizes that effective development and use of all available water resources is essential to cooperative economic growth in the region. SAWS direct involvement with CRWA strengthens its relationships with neighboring communities and the regional commitment to water resource development and utilization.

2. What are the water sources related to this project?

SAWS receives surface water from the CRWA surface treatment plant on the Guadalupe River at Lake Dunlap and groundwater from the Carrizo Aquifer/Wells Ranch project in Gonzales and Guadalupe counties.

3. What volume of water will be available during both average and drought of record conditions?

The volume of water is dependent upon contractual obligations, water disinfection method, and SAWS ability to integrate that water into its distribution system. As of this benchmarking, SAWS has access to the following volumes available if called upon by SAWS based on financial considerations and water supply needs of the System:

Year	Volume in acft/yr	Notes
2014	6,300	4,000 Dunlap+2,800 Wells Ranch-500 to Cibolo
2015	7,750	8,250 from all sources-500 to Cibolo
2016	7,750	8,250 from all sources-500 to Cibolo
2017	9,154.11	4,000 Dunlap + 5,654.11 Wells Ranch-500 to Cibolo
2018	9,154.11	4,000 Dunlap + 5,654.11 Wells Ranch-500 to Cibolo
2019	9,654.11	4,000 Dunlap + 5,654.11 Wells Ranch

The same volume of water will be available to SAWS ratepayers during average and drought of record years as CRWA delivers a firm water supply.

4. Is water available for the duration of this project in adequate quantity to justify the project?

SAWS has a 40-year contract (1998 - 2038) with CRWA for Lake Dunlap surface water provided by CRWA. This includes a \$24 per AF out-of-basin surcharge. However, Guadalupe-Blanco River Authority (GBRA) has the option to terminate the out-of-basin water as of January 1, 2024. If the contractual volume of Lake Dunlap water was removed, CRWA would replace the 4,000 AF via another CRWA water supply to make SAWS whole.

SAWS staff is exploring potential additional volumes of Wells Ranch groundwater that may be available to its ratepayers under several scenarios.

5. Is this project based on reliable scientific data?

Groundwater in this region is managed through the regional planning groups which establish Desired Future Conditions (DFC's) per Groundwater Management Area 13 (GMA 13). The current Modeled Available Groundwater (MAG) is based upon best available science. The DFC and MAG are reviewed at least every five years.

The Wells Ranch groundwater project is included within the current MAG which meets the DFC. CRWA has 7,400 AF of Carrizo Aquifer groundwater permitted from the Gonzales County Underground Water Conservation District (GCUWCD). The balance is permitted from the Guadalupe County Groundwater Conservation District (GCGCD).

The MAG in Gonzales County is 62,316 AF of Carrizo-Wilcox Aquifer production starting in the 2020 decade and fully includes the CRWA groundwater project. However, in the 2030 decade, permits currently exceed the MAG for planning purposes. The MAG increases thereafter to 75,970 AF through the 2070 decade of the current regional planning period and fully includes CRWA's Wells Ranch groundwater project (Appendix A).

6. Is there any adverse impact to groundwater? If so, what types of mitigation are possible and what will they cost?

The GCUWCD allows for a maximum pressure head reduction of 100 feet after 50 years (between 2002 - 2052). If the maximum pressure head reduction is reached, the GCUWCD has the ability to impose restrictions.

The GCUWCD in 2010 established a mitigation fund. The GCUWCD will administer the fund and provide mitigation support to local permitted or registered wells except municipal wells. All exporters who have permits for more than 3,000 AFY in western Gonzales County, Texas, are required to pay a surcharge per AF. CRWA, along with SAWS and other exporters of groundwater, has agreed to the district's mitigation plan to help address issues related to drawdown that may occur due to CRWA pumping.

7. Is there any adverse impact to surface water? If so, what types of mitigation are possible and what will they cost?

A specific surface water and environmental impact analysis by a third party has not been done. Water production from groundwater sources, however, is not anticipated to affect existing surface water sources. Regulation of surface water by the State of Texas takes into account impact on instream flows.

8. What are environmental impacts of this project other than those related to groundwater and surface water?

The 2011 Region L Plan identified the following environmental factors regarding the Wells Ranch Project and other groundwater projects within the area: "Within the well field areas, several species listed as threatened by the state may possibly have habitat which could be affected by the project. These include the Cagle's Map Turtle, Texas horned lizard, Texas tortoise, and timber/canebrake rattlesnake."

Infrastructure for the project is in place, so future impacts potentially would be small.

9. How does this project ensure quality of the delivered water supply?

Treatment for elevated levels of iron and manganese for the Wells Ranch groundwater will be performed at the Wells Ranch Treatment Plant. The treatment of surface water for organics is performed at the Lake Dunlap Treatment Plant. The present use of chloramines as a disinfectant limits the distribution to the SAWS District Special Project (DSP) Northeast service area (Appendix B). It is very likely that CRWA will transition water treatment from chloramines to chlorine. When this is completed, SAWS could elect to add additional infrastructure to integrate the CRWA water more fully into the SAWS distribution system.

10. Does this project document a long-term hydrologic balance between recharge and discharge of any aquifers involved?

Neither recharge nor discharge have been measured in the Carrizo Aquifer so the impact of the project on the long-term hydrologic balance is not well known. The Carrizo Aquifer is estimated to contain over 80 million AF of water in storage within the confines of Gonzales County, Texas. Recharge occurs over a large area and, unlike recharge to the Edwards Aquifer, the movement of water into the aquifer is very slow. The aquifer responds slowly to drought conditions and is, therefore, relatively drought resistant. The amount of water to be withdrawn will adhere to the GCUWCD's rules. The water volume is defined as available, regardless of the natural hydrologic balance, because the CRWA groundwater project is fully included within the Gonzales County MAG (Appendix A).

11. Is this project in accord with the SAWS WMP?

The SAWS' 2012 WMP was developed as SAWS was assuming responsibility for the former BexarMet water supplies. The WMP accounts for a firm supply of 6,300 AFY of groundwater from 2012 through 2018 from Lake Dunlap and the Wells Ranch project. This volume represents the current contractual volume available to SAWS minus the 500 AF leased to the City of Cibolo.

12. Is this project in accord with the Region L Plan?

Yes, both parts of the project are identified in the 2011 Region L Plan. The 2011 Region L Water Plan was submitted to the Texas Water Development Board (TWDB) September 1, 2010, to be included in the *2012 State Water Plan* adopted by TWDB December 15, 2011, and subsequently sent to the Governor January 5, 2012.

The surface water project is known as the Lake Dunlap Treatment Plant. Section 1.6.1 describes the project: "CRWA owns and operates treatment plants at Lake Dunlap on the Guadalupe River and in far western Caldwell County near the San Marcos River for surface water purchased from GBRA or leased from other water rights owners." CRWA receives slightly over 10,000 AFY from GBRA.

Section 4C.32.2.4 describes that CRWA “has acquired or leased several surface water rights including Certificate of Adjudication No. (CA#) 18-3834 for diversion of 90 AFY (18.52 AFY for municipal use and 71.48 AFY for irrigation use) from the Guadalupe River at Lake Dunlap.”

Section 3.2.3.1 Hydrologic Assumptions and Operational Procedures of Surface Water Supply: “delivery of GBRA’s present contractual obligations from Canyon reservoir (about 86,000 AFY) to points of diversion. Uncommitted yield assumed to be diverted at Lake Dunlap.”

Section 4B.1.2.32 described the CRWA Wells Ranch Project: “Canyon Regional Water Authority (CRWA) is in the planning, permitting, and construction stages of a Carrizo Aquifer well field at Wells Ranch, straddling the border of Guadalupe and Gonzales Counties. The project has two phases. Phase I, which is nearly complete, will supply 5,200 AFY of water to CRWA customers and Phase II is envisioned to supply an additional 5,800 AFY in the future. To date, CRWA has: (1) conducted test drilling and well performance testing, (2) obtained drilling and production permits for wells from the GCUWCD and GCGCD, and (3) built conveyance infrastructure suitable for transmitting the full 11,000 AFY of supply to their distribution system. Volume II, Section 4C.27 includes a detailed discussion of this management strategy.” (Appendix C)

13. Will this project support economic growth in the SAWS service area?

Diverse and stable water resources are essential for supporting economic growth in the SAWS service area. This project, which provides diversification from the Edwards Aquifer, along with a firm yield during drought, will become an important part of any future WMP, which benefits the entire region.

14. Is this project in accord with Texas water law? Are there any unusual risks of litigation?

Yes, this project is in accord with Texas Water Law. The *Aransas Project v Shaw* lawsuit provides an unusual risk of litigation, as the case has the potential to require an increase of instream flows. This might impact GBRA surface water availability to CRWA if GBRA is required to increase instream flows downstream in the Guadalupe and San Antonio Rivers.

15. Is this project suitable for all of the geographic areas served by SAWS?

No. Treated Lake Dunlap water from the Guadalupe River and groundwater produced from the Wells Ranch Project at present are suitable only for distribution in the DSP Northeast service area due to the use by CRWA of chloramines as a disinfection method.

SAWS operates a free chlorine system. CRWA is currently conducting bench scale testing to evaluate treatment options to convert to free chlorine. Treatment type along with capital and O&M costs have not been determined to date. If CRWA converts to a free chlorine

system, and if SAWS were to integrate the Northeast service area, this would allow CRWA water to be distributed into the SAWS distribution system to meet customer demand and ensure a reliable supply of water. Additionally, the conversion to free chlorine would create the opportunity for SAWS and CRWA to explore the potential to receive additional volumes of water over time.

16. Has a benefit-cost analysis been done in connection with this project?

No. SAWS reviews the economics of all water projects on an annual basis. Staff determined that for this project a full benefit-cost analysis would not be more useful than the ongoing economic analysis.

17. Has a social and economic impact analysis been done in connection with this project?

No. A specific social and economic impact analysis by a third party has not been done.

18. What is the cost per AF of water for this project?

The cost per AF has varied for the initial two years SAWS has received water from CRWA. The cost per AF is expected to decrease over time as SAWS' received water volume increases to 5,300 AF. The cost per AF is also expected to decrease if larger volumes are received and supplied into the SAWS distribution system rather than solely to the DSP Northeast service area. While the SAWS 2012 WMP identifies the cost per AF at \$1,041 based upon SAWS full contractual volume of 6,300 AF, the cost has been updated to \$1,456/AF based upon SAWS take of 5,300 AF in 2013. These cost changes reflect information acquired through SAWS operational experience of the Project since early 2012.

Year	Volume (AF)	Cost per AF
2013	4,946.44	\$1,456
2012	2,897.66	\$2,012

(Previous years invoiced volumes)

19. What is the effect on the ratepayer?

All of SAWS water diversification strategies have an effect on the ratepayer. Although CRWA water is delivered only to SAWS' DSP Northeast service area, it has an impact on all SAWS customers. The CRWA water decreases use in the Northeast service area on local Edwards Aquifer wells, which is especially important during drought.

In the future, if CRWA switches disinfection methods and if SAWS integrates the Northeast service area, then additional volumes of CRWA water supply may be purchased, increasing SAWS diversification from the Edwards Aquifer.

20. How does this project rank compared to other SAWS projects?

Lake Dunlap surface water and Wells Ranch groundwater from CRWA supply have an annual cost per AF of \$1,456 as identified in question 18 as calculated with current costs and usage (Appendix D, CRWA cost per AF were calculated based on 6,300 AFY). While the current costs of this water is identified as higher than other projects by comparison, the CAP stresses that this supply is firm during times of drought. Any additional future volume added to this supply may reduce the overall project costs.

21. Are there any other issues that need to be addressed?

No other issues have been identified.

Glossary

AF	Acre-Feet (volume) or Acre-Foot (cost)
CAP	Citizens Advisory Panel
CRWA	Canyon Regional Water Authority
DFC	Desired Future Condition
DSP	District Special Project
GBRA	Guadalupe-Blanco River Authority
GCGCD	Guadalupe County Groundwater Conservation District
GCUWCD	Gonzales County Underground Water Conservation District
GMA	Groundwater Management Area
MAG	Modeled Available Groundwater
TWDB	Texas Water Development Board
WMP	Water Management Plan

Definitions

Desired Future Condition (DFC) – Defined by Title 31, Part 10, §356.10 (6) of Texas Administrative Code as “the desired, quantified condition of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one time or more specified future times as defined by participating groundwater conservation districts within a groundwater management area as part of the joint planning process.”

Firm Yield – The volume of water which can be produced from a defined source during a repeat of the drought of record under existing regulatory, legal, contractual, hydrological or infrastructure constraints.

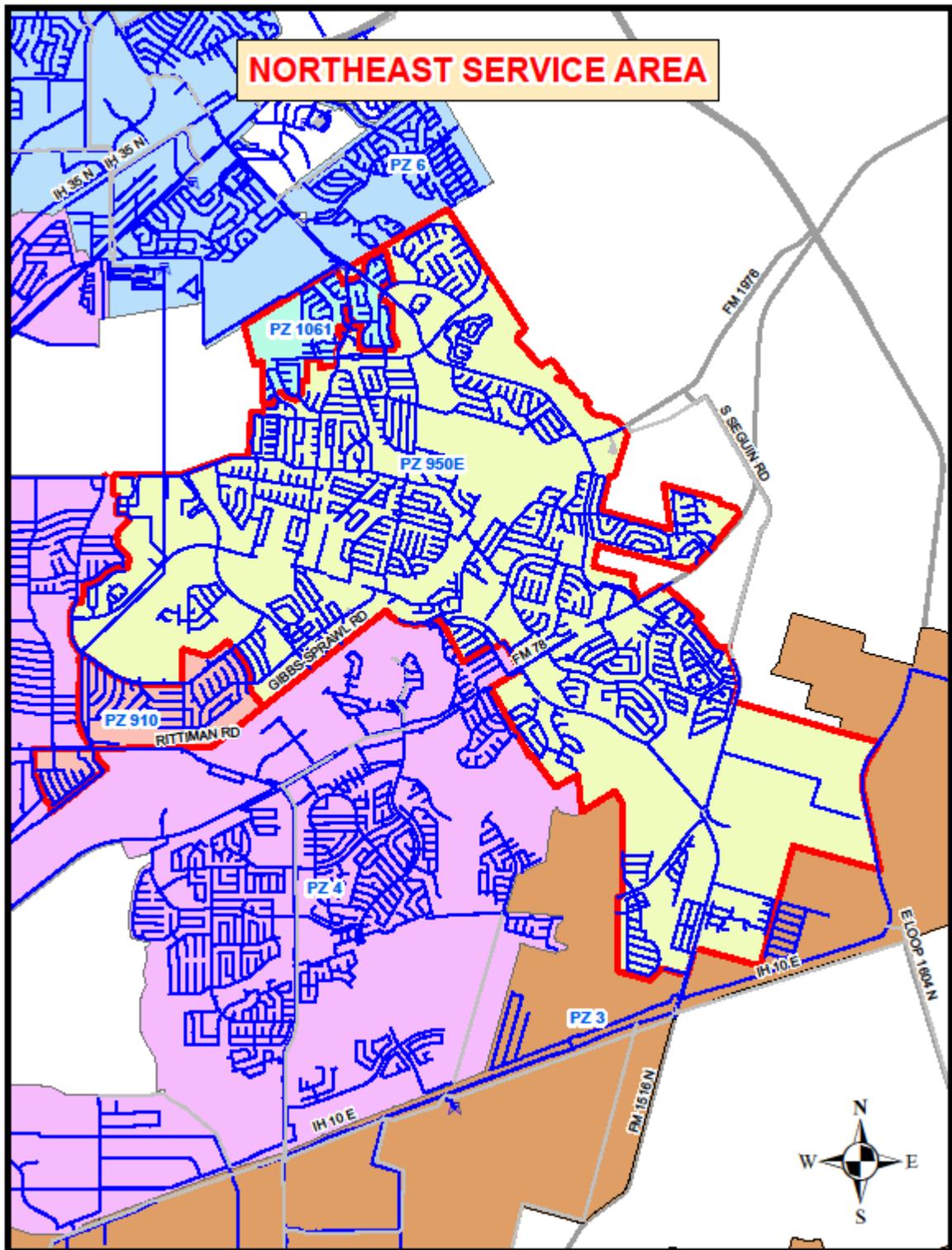
Modeled Available Groundwater (MAG) – Defined by TWDB as groundwater availability resulting from the addition of policy (desired future conditions) and science (model or other tool) to result in informed decision making.

Appendix A: Supply for Regional Water Planning (based on MAG proration)

Source: Region L: Carrizo Aquifer Workgroup Table 3

Gonzales County	YR 2020	YR 2030	YR 2040	YR 2050	YR 2060	YR 2070
MAG	62,316	70,317	75,791	75,970	75,970	75,970
Exempt	1215	1025	890	850	863	863
SSLGC	19,362	18,914	19,362	19,362	19,362	19,362
SAWS	11,688	11,418	11,688	11,688	11,688	11,688
CRWA	7,400	7,229	7,400	7,400	7,400	7,400
TWA	3,846	13,526	13,846	13,846	13,846	13,846
Gonzales Co WSC	712	696	712	712	712	712
Smiley	730	713	730	730	730	730
Nixon	3,629	3,545	3,629	3,629	3,629	3,629
Irrigation	4,242	4,144	4,242	4,242	4,242	4,242
Gonzales	5,805	5,671	5,805	5,805	5,805	5,805
Gonzales Co WSC	2,800	2,735	2,800	2,800	2,800	2,800
Smiley	242	236	242	242	242	242
Warm Springs	403	394	403	403	403	403
Irrigation	73	71	73	73	73	73
Totals	62,147	70,317	71,822	71,782	71,795	71,795
Remaining	169	0	3,969	4,188	4,175	4,175

Appendix B: DSP Northeast Service Area Location Map



Appendix C: CRWA Facilities Location Map

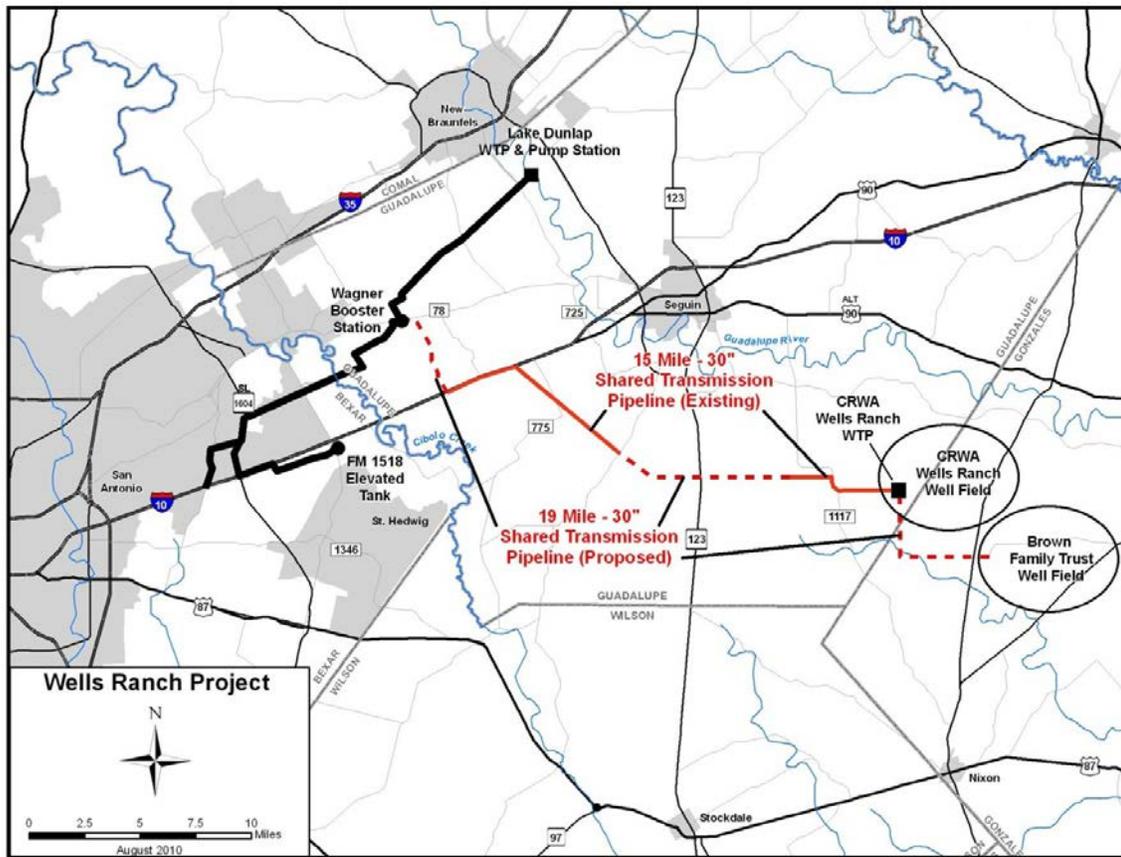
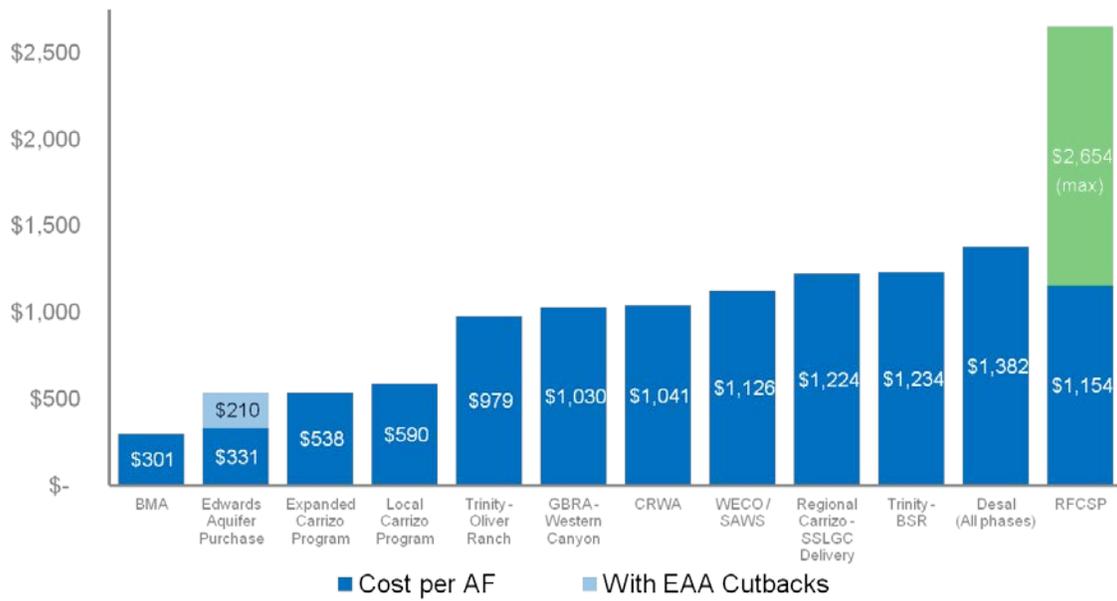


Figure 4C.27-2. Wells Ranch Project Location Map

Source: 2011 Region L Plan

Appendix D: Annual Cost per Acre-Foot by Project



Source: SAWS 2012 Water Management Plan