



Pflugerville Water Supply Alternatives Evaluation

Final Technical Memorandum



Prepared For:

City of Pflugerville

December 2020



Water Supply Alternatives Evaluation

Technical Memorandum

City of Pflugerville, Texas

Garver Project No. 19W07185



Prepared by:



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December 2020

Garver Project No.: 19W07185



Engineer's Certification

I hereby certify that this Water Supply Evaluation for the Pflugerville WTP Expansion Project was prepared by Garver under my direct supervision for the City of Pflugerville.

Digitally Signed 12/08/2020



Ian P. Toohey, PE
State of Texas PE License No. 116105



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1.0 Introduction

Garver was retained by the City of Pflugerville (the City) to complete an evaluation of water supply alternatives to keep pace with future demands. The City recently completed a Water Master Plan (WMP) which identifies capital improvements that would enable the City to provide a continuous treated water supply to its customer base through full buildout. Included in the WMP was a quantification of the water supply needed to meet projected demands at defined future intervals. The WMP concluded that by 2029 the City will be required to have additional water sources online in order to meet anticipated demands. This technical memorandum expands upon the water supply assessment outlined within the 2020 Water Master Plan and outlines conceptual water supply alternatives which will allow the City to proactively plan for the future and meet all anticipated water demands.

1.1 Background

The City of Pflugerville is in Travis County in Central Texas just northeast of the City of Austin. The 2020 WMP estimates that the City's 2019 water service population is 56,558 which equates to 19,108 water service area connections based upon an assumption of 2.96 people per connection. In 2019, the City had an average daily water demand of 7.7 MGD and a max day water demand of 19.1 MGD. The City is growing rapidly with an average growth rate of 5.6% per year from 2009-2017, and the service population is anticipated to nearly double to an average day demand of 16.3 MGD by 2029. The City has an existing Water Treatment Plant (WTP) with a rated capacity of 17.3 MGD and two active groundwater pumps with a combined supply of 6.2 MGD (variable).

1.2 Project Scope

The project scope consists of the development of a set of water supply alternatives to address the projected water supply gap for the City of Pflugerville. The general scope of work is summarized below:

- Water Rights Gap Analysis
 - Demand Forecast Review
 - Water Rights Confirmation
 - Water Supply Gap Confirmation
- Water Rights Availability Analysis
 - Available Raw Water Rights Evaluation
 - Wholesale Water Purchasing Alternatives Development
- Water Supply Alternatives Development
 - Conceptual Capital Improvements
 - Qualitative Comparative Analysis

The intent of this evaluation is primarily to research and summarize the options available to the City to acquire new sources of water, and to relay information gathered from multiple sources and stakeholders involved in local water rights management and governance.



2.0 Water Rights Gap Analysis

2.1 Water Demand Forecasts

Two separate entities have recently developed population and water demand projections for the City of Pflugerville: the City of Pflugerville through its 2020 Water Master Plan Update, and the Texas Water Development Board (TWDB) through the development of 2021 Regional Water Plan Updates. The results of the water demand analyses from both sources are outlined in the sections below.

2.1.1 2020 Water Master Plan

The City of Pflugerville's 2020 Water Master Plan contains a detailed analysis of historical water demands and projected future water demands. In summary, the Plan projects that the average day demand will increase from 9.7 MGD in 2019 to 16.3 MGD in 2029, and ultimately 31.6 MGD at full buildout. Table 2-1 contains a summary of information contained within the 2020 Water Master Plan.

Table 2-1: 2020 Water Master Plan Water Demand Forecast

Planning Year	No. Water Service Connections	Service Population	Average Day Demand (MGD)	Max Day Demand (MGD)	Total Water Demand (acre-feet per year)
2019	19,108	56,558	9.69	19.06	10,854
2024	25,570	75,687	12.53	24.75	14,035
2029	34,216	101,279	16.34	32.36	18,303
Buildout	67,812	200,724	31.56	62.81	35,352

2.1.2 TWDB Region K and Region G Water Plans

The Texas Water Development Board (TWDB) has divided the State of Texas into sixteen (16) water planning groups (WPG): A-P. The majority of the City of Pflugerville is in Region K, the Lower Colorado WPG, though a small portion in the northern part of the City is in Region G, the Brazos WPG. Figure 2-1 and Figure 2-2 depict the City of Pflugerville in relation to the TWDB Regional Planning Groups.

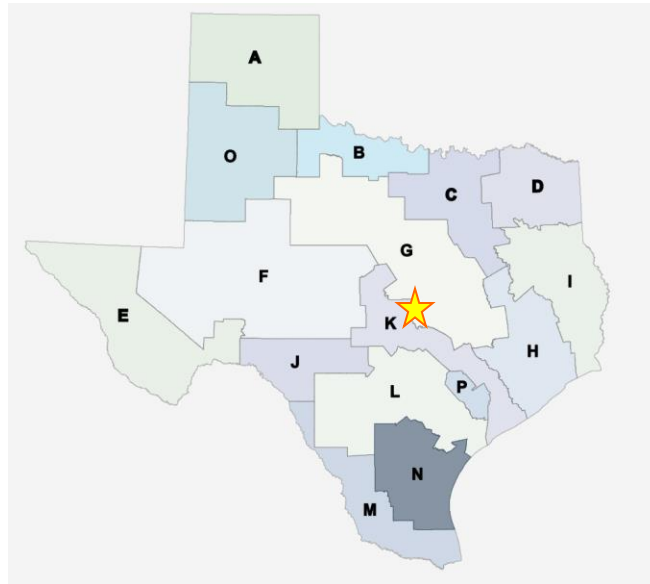


Figure 2-1: TWDB Regional Water Planning Groups

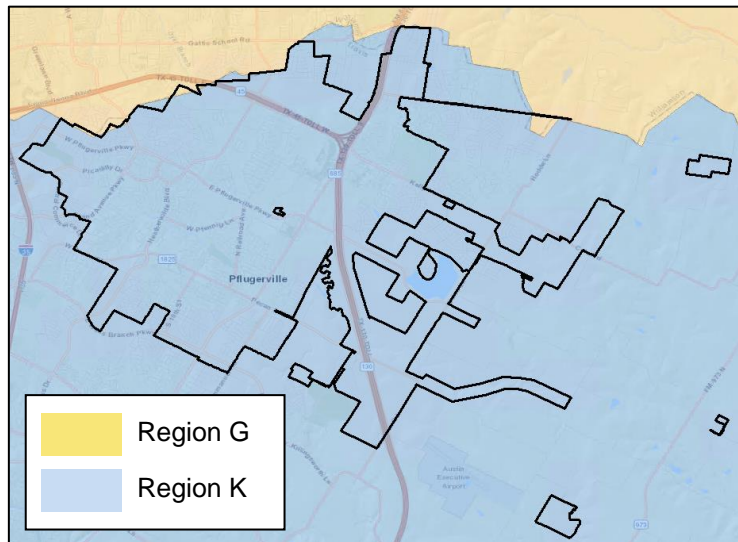


Figure 2-2: City of Pflugerville and the TWDB Regional Planning Groups K & G

Each of the WPG's are required to update their Regional Water Plans every 5 years. The current Water Plans for both regions were published in 2016; however, Water Plan Updates are to be published in 2021 and drafts are available through TWDB for both regions for review. Values from both the 2016 and 2021 versions of the Region Plans are included in this report for comparison purposes. Table 2-2 summarizes the population projections for the City of Pflugerville as outlined in the Region K and Region G Water Plans.



Table 2-2: TWDB Regions K & G City of Pflugerville Population Projections

Planning Year	2016 Regional Plans			2021 Regional Plans		
	Region K Population	Region G Population	Total Population (K + G)	Region K Population	Region G Population	Total Population (K + G)
2020	77,054	458	77,512	62,745	373	63,118
2030	104,405	576	104,981	78,245	469	78,714
2040	130,195	722	130,917	95,599	588	96,187
2050	159,073	880	159,953	112,807	717	113,524
2060	-	-	-	130,167	862	131,029
2070	-	-	-	130,167	1,013	131,180

The numbers outlined in Table 2-2 indicate that Region K anticipates the City of Pflugerville to reach full buildout in 2060, while Region G still anticipates some small growth from 2060-2070. Table 2-3 summarizes the anticipated water demand for the City of Pflugerville in the Region K and Region G Water Plans.

Table 2-3: TWDB Regions K & G City of Pflugerville Water Demand Projections (acre-feet per year)

Planning Year	2016 Regional Plans			2021 Regional Plans		
	Region K Water Demand	Region G Water Demand	Total Water Demand (K + G)	Region K Population	Region G Population	Total Population (K + G)
2020	12,775	76	12,851	10,403	62	10,465
2030	17,105	95	17,200	12,819	77	12,896
2040	21,243	118	21,361	15,598	96	15,694
2050	25,896	144	26,040	18,364	117	18,481
2060	-	-	-	21,167	140	21,307
2070	-	-	-	21,156	165	21,321

2.1.3 Demand Forecast Comparison

Figure 2-3 includes a comparison of the projected water demands for the City of Pflugerville from the 2020 Water Master Plan and the 2016 and 2021 Region K and G Regional Plans. The 2020 Water Master Plan far exceeds the projections for the both the 2016 and 2021 Regional Plans. To remain conservative, the projections forecast within the 2020 Water Master Plan are utilized for water rights planning. If the City is able to obtain a water rights supply that meets or exceeds the projections in the 2020 Water Master Plan, they can be assured that their water supply needs will be met.



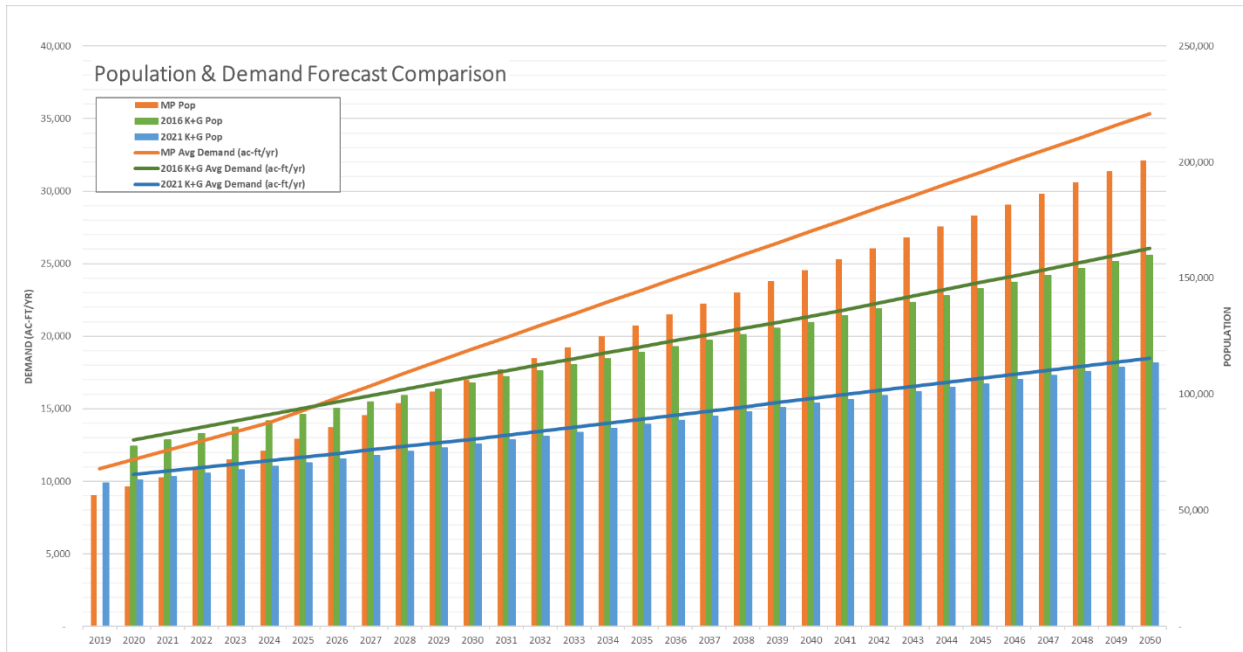


Figure 2-3: Comparison of Water Rights Demand Forecast Projections

2.2 Existing Water Rights

The City currently utilizes both surface and groundwater as components of its water supply system. The below sections outline the existing water rights owned by the City.

2.2.1 TWDB Region K and Region G Water Plans

The 2016 and 2021 TWDB Region K and Region G Water Plans outline existing water supplies, as currently utilized, for the City of Pflugerville as shown in Table 2-4. The City has a contract with the Lower Colorado River Authority (LCRA) for a total of approximately 12,000 acre-feet per year as run-of-river rights controlled from the Highland Lakes Reservoir System.

Table 2-4: TWDB Region K City of Pflugerville Existing Water Supplies (Current Utilization)

Source	Water Supply (acre-feet per year)
Edwards-BFZ Aquifer Travis County	2,531
Highland Lakes Lake/Reservoir System	9,513
Total	12,044 (AVG)

2.2.2 TCEQ Water Rights Database

The Texas Commission of Environmental Quality (TCEQ) compiles an up-to-date water rights database showing all active water rights in the State of Texas. The water rights for the City of Pflugerville contained in the database are shown in Table 2-5 and align with the water supply rights included within the 2016 and 2021 Region K and G Water Plans.





Table 2-5: TCEQ City of Pflugerville Existing Water Rights

Basin	Water Supply (acre-feet per year)	Use
Colorado River Basin	12,000	Municipal/Domestic

2.2.3 TWDB Groundwater Database

In addition to the surface water rights outlined in Sections 2.2.1 and 2.2.2, the City obtains groundwater from an unregulated portion of the Edwards Aquifer. Since the portion of the Aquifer is unregulated, the City is not required to obtain water rights and there are no limits on the quantity of water withdrawn. Based upon the TWDB Groundwater Database the City of Pflugerville currently owns six (6) groundwater wells, four (4) of which are stated to be capable of withdrawing water for public supply, while the other two (2) are for observation and testing. Only two (2) of the wells are currently active: Wells #6 and #7. Table 2-6 outlines the wells contained within the TWDB Groundwater Database.

Table 2-6: City of Pflugerville Groundwater Wells from TWDB Groundwater Database

State Well No.	Name	Year Installed	Capacity (gpm)
5835609	Test Well	1980	Inactive
5835617	Well #4	1980	Inactive
5835618	Well #5	1983	Inactive
5835619 ¹	Well #6	1984	2,800
5835624 ¹	Well #7	1992	1,500
5835626	Observation Well	1998	Inactive

¹Capacity determined from 2020 Water Master Plan.

2.3 Water Supply Gap

According to the 2020 Master Plan, it is the stated desire of the City to not rely upon groundwater resources past the planning year 2029 due to the unreliability of groundwater during droughts. The City's remaining water rights amount to 12,000 acre-feet per year or 10.71 MGD (3,909 MG annually). Based upon both the 2020 Water Master Plan and the Region K and G Water Plans, the City will need additional water resources online by 2030; however, the two sources differ on the quantity of water that the City will require. The calculated water gap using data from both sources is included within Table 2-7.



Table 2-7: City of Pflugerville Water Supply Gap

Year	Water Supply Gap (acre-feet per year)		
	2020 Water Master Plan	2016 Region K & G Water Plans	2021 Region K & G Water Plans
2019 / 2020	0	0	0
2024	0	-	-
2029 / 2030	6,303	5,200	896
2040	-	9,361	3,694
2050 ¹	23,352	14,040	6,481
2060	-	-	9,307
2070	-	-	9,321

¹Full Buildout value from the 2020 Master Plan is used.

The 2020 Water Plan suggests that the City of Pflugerville will require significantly more water supply than assumed within the Region K and G plans due to its more aggressive growth assumptions than the Regional plans. Utilizing the projections from the 2020 Master Plan, but accounting for the availability of groundwater resources, Figure 2-4 shows that demand will exceed supply in 2027.

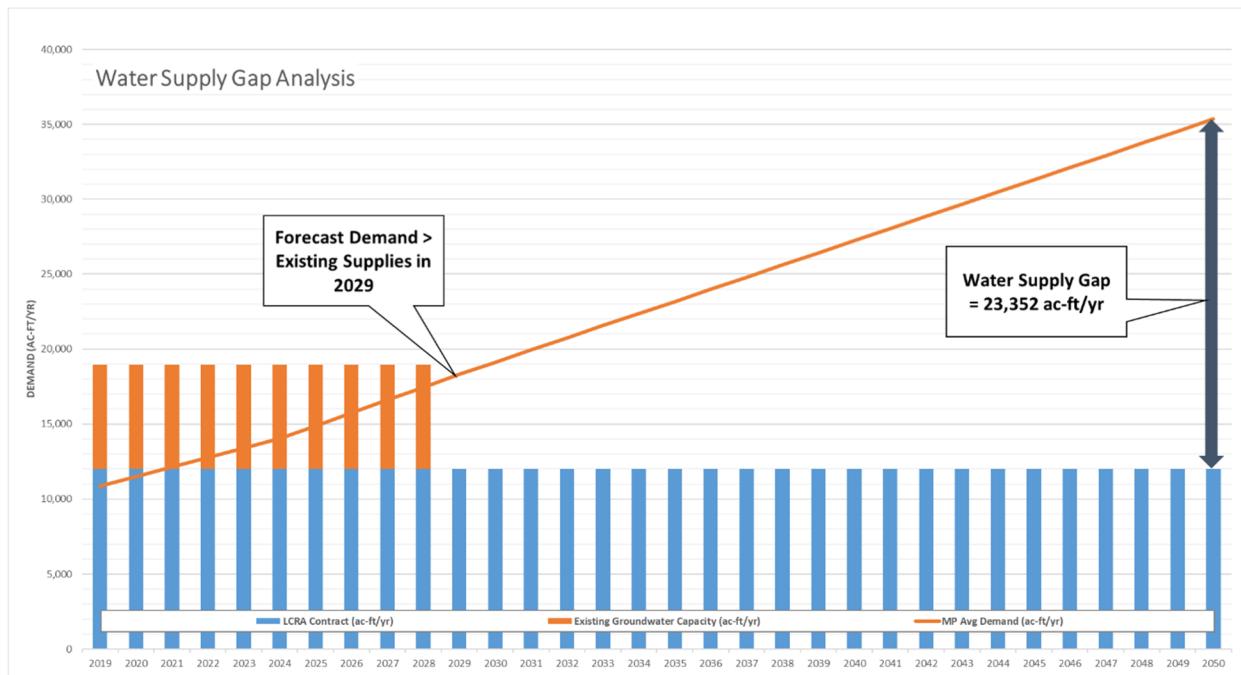


Figure 2-4: Water Supply Gap Analysis

Therefore, it will be assumed for the purposes of the water supply alternatives analysis that an additional 6,303 ac-ft/yr (or 5.63 MGD) will need to be available by 2029, and that the full buildout gap of 23,352 ac-ft/yr (or 20.85 MGD) will need to be available by 2050.





3.0 Water Supply Alternatives

The City has multiple options for reaching its water supply needs, and different water supply strategies yield different benefits. The water supply strategies presented below are generally broken into two categories: near-term supply relief and long-term permanent water rights. The sections below outline potential water supply alternatives for the City of Pflugerville along with associated necessary capital improvements.

3.1 Near-Term Water Supply Relief Strategies

Four options are identified for the City to obtain near-term water supplies. Three of these options are finished water wholesale agreements with nearby entities, which are presented below. Finished water purchase agreements are typically short-term in nature and the water rights are not guaranteed for perpetuity, but due to the nature of the water (purchased finished water) they do not generally require extensive capital improvements (e.g. expansion of water treatment). The fourth identified near-term water supply option is increasing the City's existing groundwater supplies.

3.1.1 Alternative 1 – Finished Water Wholesale Agreement – City of Round Rock

The City of Round Rock is adjacent to the City of Pflugerville to the northwest. It has a population of approximately 130,000 and, similar to the City of Pflugerville, is expanding rapidly. The City of Round Rock has its own water treatment and distribution system which it uses to serve its population. Through discussions with the City of Round Rock, there exists the potential for the City of Pflugerville to purchase a maximum of 5 MGD for less than 5-years from the City of Round Rock. Pflugerville's demand is not projected to exceed supply until 2027 (based upon 2020 Master Plan projections), so obtaining additional supply from 2027-2032 would have several benefits. Foremost among these is the supply could be used to supplement peak demand in the summer months during the expansion of the City's existing WTP. In addition, the added supply would allow the City to be less reliant on its existing groundwater supplies which are vulnerable to drought.

3.1.1.1 Required Capital Improvements

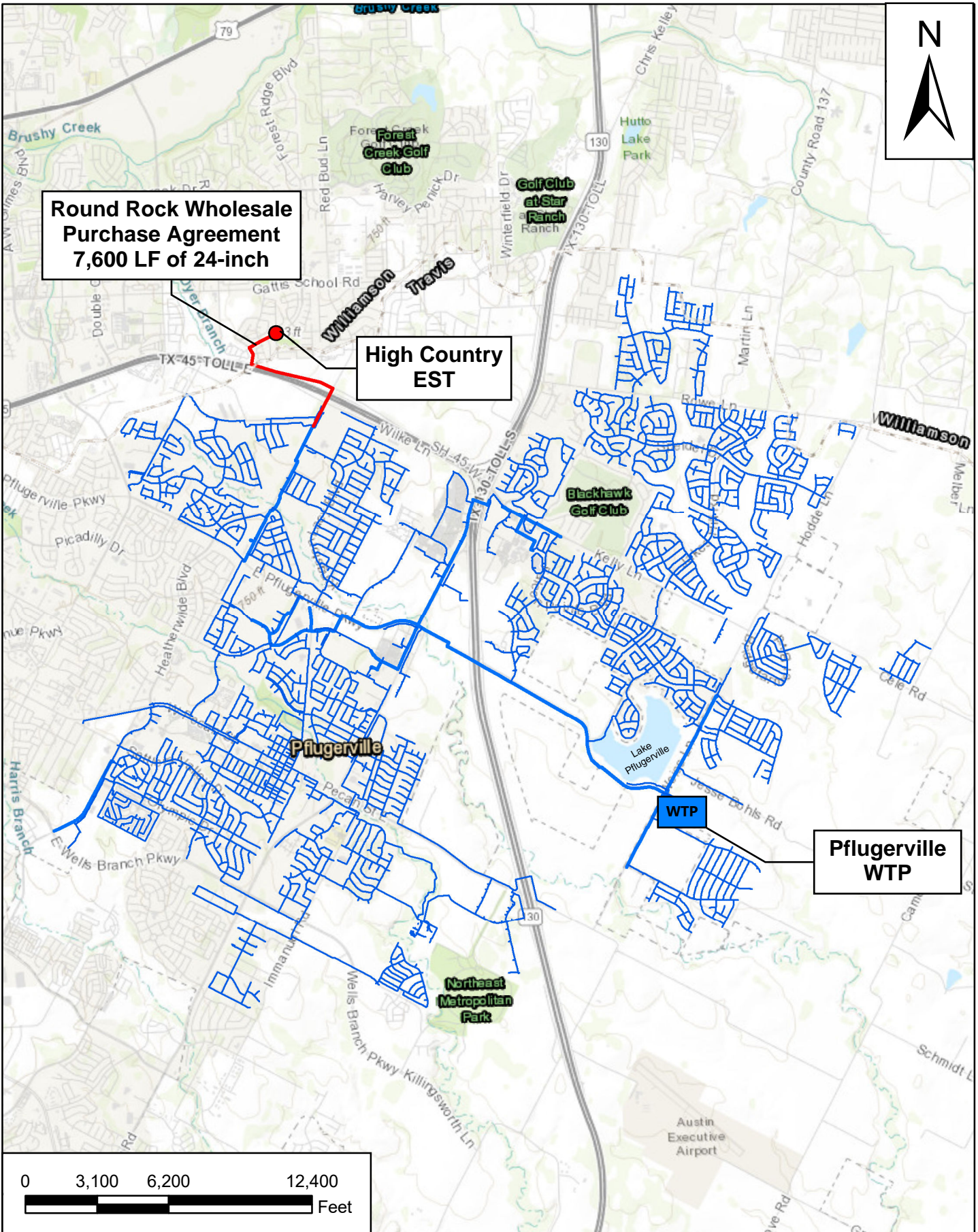
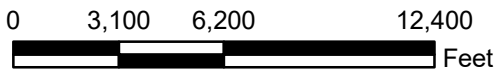
To obtain water from the City of Round Rock it is proposed to connect to the City of Round Rock's distribution system at the High Country Elevated Storage Tank (EST) located in southern Round Rock. The connection point would consist of an air-gapped takepoint and associated pump station. It is proposed to construct approximately 7,600 LF of 24-inch waterline leading from the High Country EST across SH 45 to connect in to an existing 24-inch waterline along Heatherwilde Boulevard. A map depicting the proposed connection route is included as Figure 3-1.



**Round Rock Wholesale
Purchase Agreement
7,600 LF of 24-inch**

**High Country
EST**

**Pflugerville
WTP**



PFLUGERVILLE WTP
PFLUGERVILLE, TEXAS
ALTERNATIVE 1- City of Round Rock
Wholesale Purchase Connection
FIGURE: 3-1



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Suite 325
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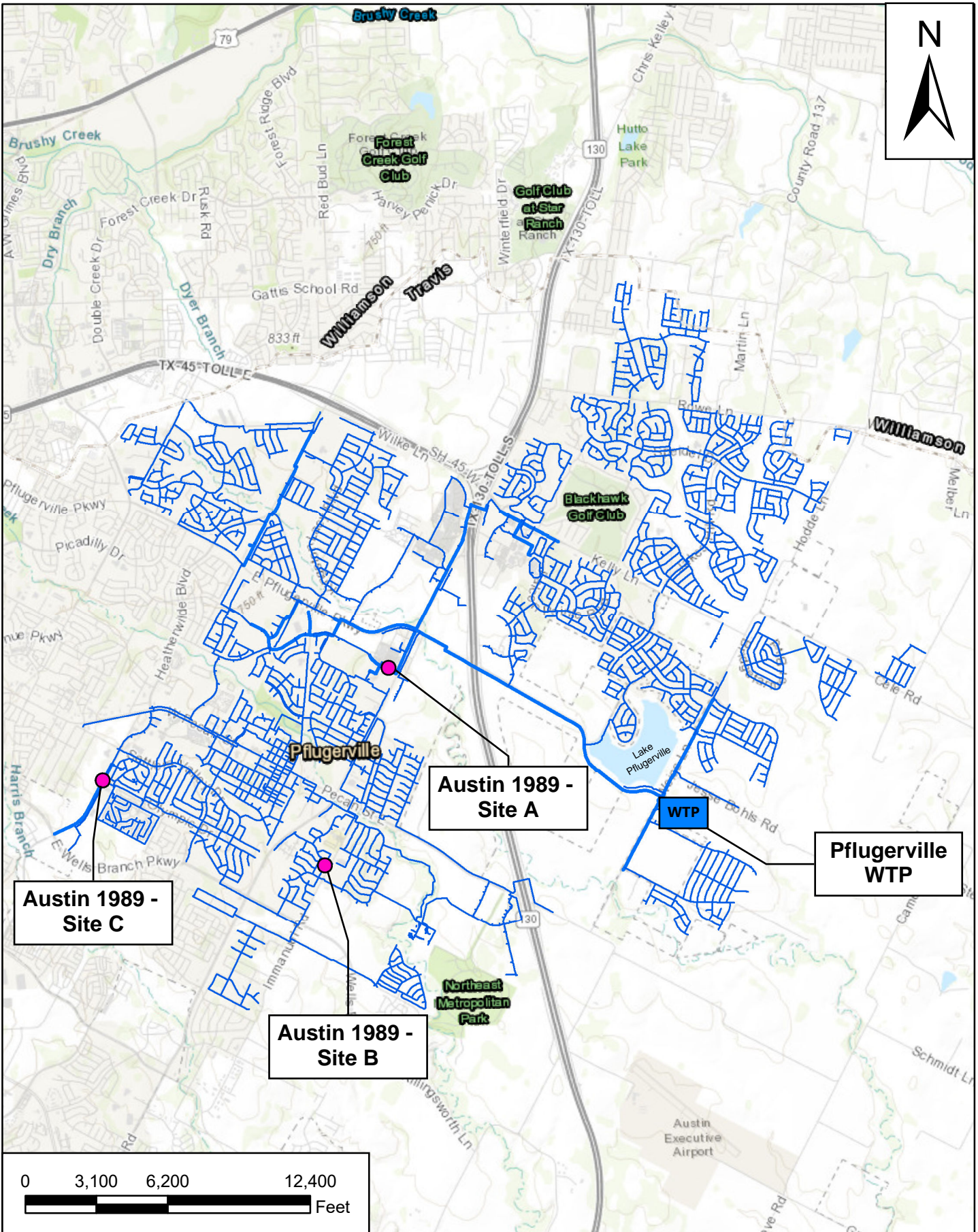
3.1.2 Alternative 2 – Finished Water Wholesale Agreement – City of Austin

The City of Austin is adjacent to the City of Pflugerville to the south with a population of approximately one million retail customers. The City of Austin has an extensive water treatment and distribution system including three treatment plants. Due to its size and redundant water supplies, the City of Austin has plenty of near-term capacity that the City of Pflugerville could buy into. However, in preliminary discussions with the City of Austin, no proposed purchase amounts or timeframes were specifically discussed.

A possible drawback to entering into a purchase agreement with the City of Austin, is the potential for a complicated contracting process. The City of Austin is currently entangled in a Public Utilities Commission rate case dispute with several wholesale customers rates which may present difficulties in reaching a quick and straightforward agreement.

3.1.2.1 Required Capital Improvements

The City of Pflugerville has entered into agreements with the City of Austin in the past in both 1989 and 2003, and therefore interconnects already exist between the City of Austin and the City of Pflugerville's distribution systems. These agreements are included in Appendix A. There are currently three interconnects (A, B, and C) all constructed in 1989 within the City of Pflugerville's city limits as shown in Figure 3-2. The presence of these interconnects means that limited additional capital improvements would be required. General rehabilitation of the takepoints would be recommended to bring equipment up-to-date, and the addition of pump stations may be required to accommodate changes in hydraulic conditions since their initial installment.

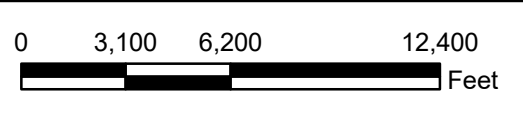


Austin 1989 - Site C

Austin 1989 - Site A

Austin 1989 - Site B

Pflugerville WTP



PFLUGERVILLE WTP
 PFLUGERVILLE, TEXAS
 ALTERNATIVE 2- City of Austin
 Wholesale Purchase Connection
 FIGURE: 3-2



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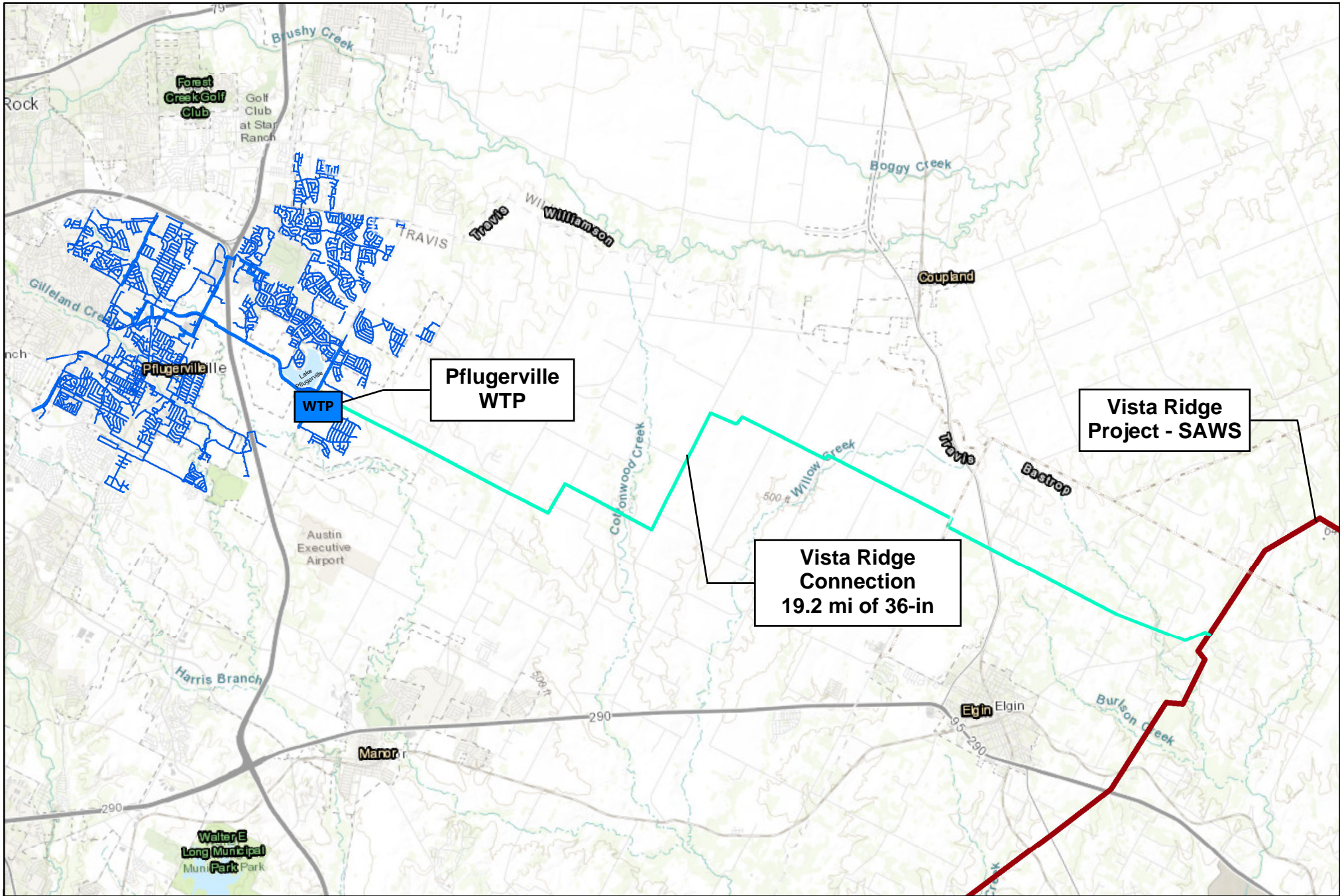


3.1.3 Alternative 3 – Finished Water Wholesale Agreement – SAWS Vista Ridge

The construction of a 142-mile pipeline connecting a water well field in Burleson County to San Antonio in Bexar County was recently completed for San Antonio Water Systems (SAWS). The project is called the Vista Ridge Pipeline and is slated to convey 50,000 acre-feet per year to provide for increased demand in the City of San Antonio over the next 30 years. The Vista Ridge pipeline is sized to provide adequate water supply to City of San Antonio in 30 years, but the City's demands are currently lower than the pipeline's capacity. Therefore, there is additional capacity available in the pipeline in the near-term. The SAWS 2017 Water Management Plan includes up to 15,000 acre-feet per year of excess supply over the next 10-15 years leaving the possibility open for short-term water supply acquisition by the City of Pflugerville. An additional 15,000 acre-feet would meet the City of Pflugerville's projected water demands through the 15-year time frame until 2035.

3.1.3.1 Required Capital Improvements

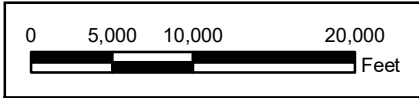
Obtaining water from the SAWS Vista Ridge pipeline would require the construction of approximately 19.2 miles of 36-inch waterline to convey 15,000 acre-feet (approx. 13.4 MGD) from the Vista Ridge pipeline near Elgin, TX to the existing Pflugerville WTP. A pump station would be necessary at the takepoint to convey water to the plant. Cooling and water softening would be required at the plant prior to mixing the Vista Ridge water and water from the City's existing water supply.



**Pflugerville
WTP**

**Vista Ridge
Project - SAWS**

**Vista Ridge
Connection
19.2 mi of 36-in**



PFLUGERVILLE WTP
PFLUGERVILLE, TEXAS
ALTERNATIVE 3- Vista Ridge Wholesale Purchase
Connection

FIGURE: 3-3



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3.2 Permanent Water Supply Strategies

3.2.1 Alternative 4 – Groundwater Well Rehabilitation

The City of Pflugerville has an existing operational groundwater supply of approximately 6.2 MGD, per TCEQ records. The groundwater is supplied through two wells (Well #6 and Well #7). The City has additional wells which are inactive and could be rehabilitated to provide additional water supply capacity if needed. In addition, the two existing operational wells could be expanded. Benefits of expanding the existing groundwater supply are the relative low capital cost, and short construction timeframe allowing the water to be online earlier than many other options. However, groundwater supplies are generally less reliable long-term as they are vulnerable to drought.

3.2.1.1 Required Capital Improvements

A benefit of expanding the City's existing groundwater supplies is that the required infrastructure is largely pre-existing. Proposed capital improvements would include the installation of additional pumps, or upsizing of existing pumps at Wells #6 and #7. Depending upon the desired groundwater capacity, new pumps could be installed at Wells #4 and #5 to make them operational.

3.2.2 Alternative 5 – BRA Alcoa Lake

The Brazos River Authority (BRA) handles water rights within TWDB Region G. Region G includes nearby cities such as Georgetown, Round Rock, Leander, Cedar Park, and Hutto. These Cities are all a component of the Central Texas corridor and are expanding rapidly along with the City of Pflugerville. Due to explosive growth, existing water rights in Region G as handled by the Brazos River Authority are generally fully allocated.

While the existing water supplies are fully allocated, there is a potential new water supply within Region G at Alcoa Lake which is a component of the Carrizo Aquifer. Alcoa Lake was initially constructed for use by the Aluminum Company of America (Alcoa), a private aluminum manufacturing company. The company maintained an aluminum smelting facility in Rockdale, TX for which Alcoa Lake was used as a water supply. The smelting facility has since been decommissioned, and the water rights at the property are now available for other uses. The property has a permitted groundwater capacity of 50,000 ac-ft/yr, which is all currently available for purchase.

3.2.2.1 Required Capital Improvements

Alcoa Lake is approximately 30 miles from Lake Pflugerville as the crow flies. Over 30-miles of piping and associated pump stations would be required to convey flow from Alcoa Lake to Lake Pflugerville.

3.2.3 Alternative 6 – LCRA Expanded Colorado River Rights

The Lower Colorado River Authority (LCRA) handles water rights within TWDB Region K which include both the City of Pflugerville and the City of Austin. The City of Pflugerville currently contracts with the LCRA for a total of 12,000 acre-feet per year from the Colorado River. The City owns and maintains a pump station and approximately 14.8 miles of 30-inch waterline conveying the water from the Colorado River to Lake Pflugerville.

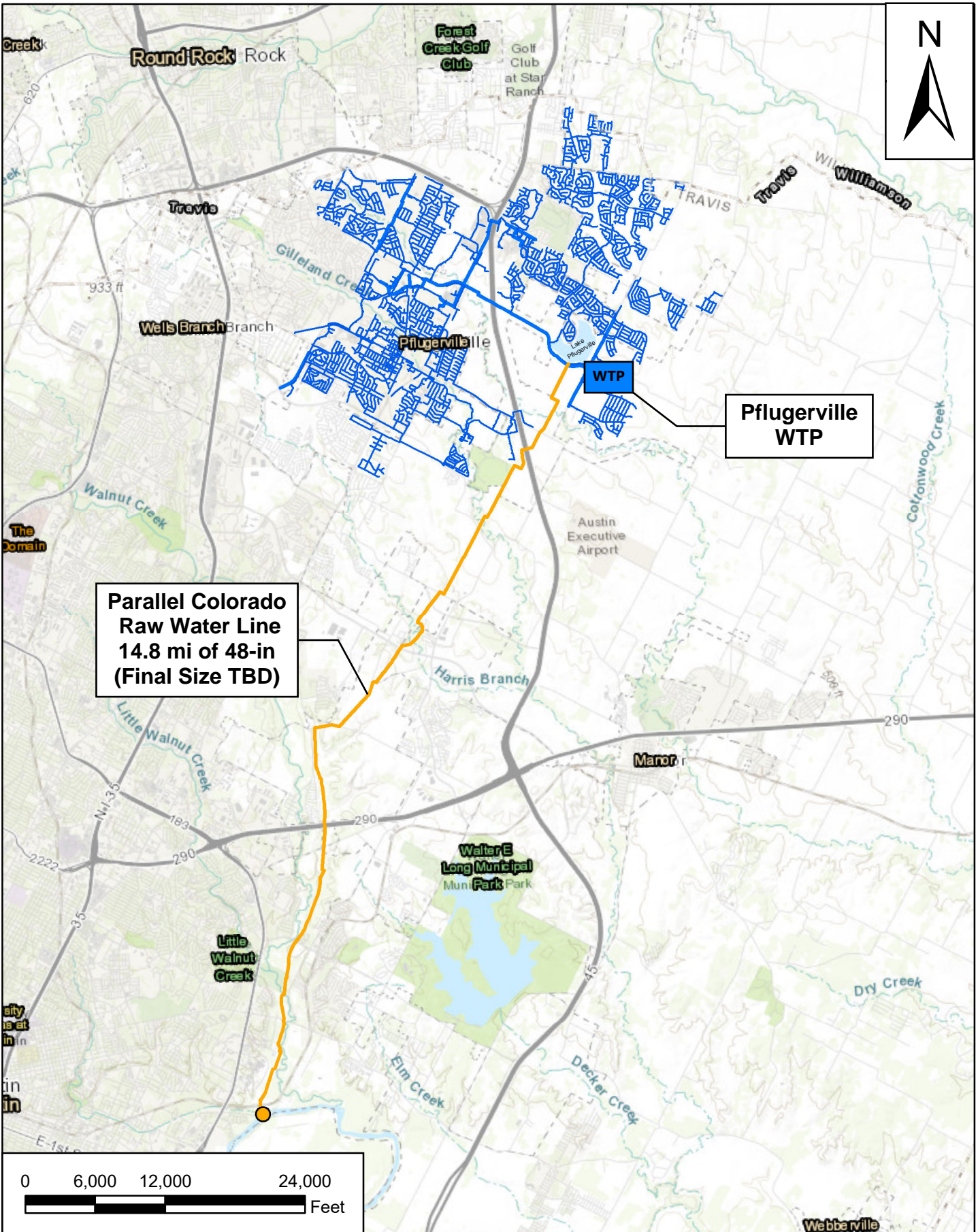


Through preliminary discussions with LCRA, it was determined that starting in 2023 there will be an additional 9,000 acre-feet/year available through the Arbuckle Reservoir project. An additional 9,000 acre-feet per year would provide adequate water supply for the City of Pflugerville through 2033, assuming that the City's existing groundwater supplies remain online.

Beyond this timeframe, LCRA has several other mid-basin reservoir projects that will increase the general yield of the Colorado River system beyond that provided by the Arbuckle Reservoir project. LCRA has indicated that there would be adequate available water supply in the Colorado River system to provide the full allocation to meet the City's buildout needs.

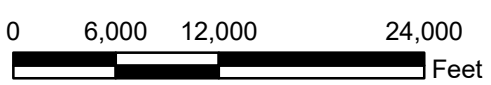
3.2.3.1 Required Capital Improvements

To obtain additional water from the Colorado River, it is proposed to upsize the City's existing Raw Water Pump Station along the banks of the Colorado River and install a parallel waterline adjacent to the City's existing 30-inch water line between the Colorado River and Lake Pflugerville. The final size of this waterline would need to be determined relative to other water supply alternatives under consideration, but the 2020 WMP identifies a parallel 48-inch line be installed along this route to provide full water supply from the Colorado River. A benefit of this alternative is that the parallel water line could likely be installed within existing easements. Figure 3-4 depicts the proposed capital improvements necessary to obtain additional water from the Colorado River.



**Parallel Colorado
Raw Water Line
14.8 mi of 48-in
(Final Size TBD)**

**Pflugerville
WTP**



PFLUGERVILLE WTP
PFLUGERVILLE, TEXAS
ALTERNATIVE 6- Colorado River



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FIGURE: 3-4



3.2.4 Alternative 7 – HB1437 Brushy Creek Intake

In 1999, the Texas Legislature passed House Bill 1437 (HB1437) which authorized the Lower Colorado River Authority (LCRA) to provide water to entities in Williamson County in some circumstances even if they are outside of the Lower Colorado watershed. The bill authorizes LCRA to contract up to 25,000 acre-feet of water annually to BRA to sell to Williamson County municipalities if the transfer results in “no net loss” of water to the Lower Colorado River Basin. The “no net loss” condition requires LCRA to conserve, replace, or offset an amount of water within the Lower Colorado River Basin equal to the amount contracted to Williamson County.

LCRA currently is contracted with BRA to provide water to multiple Williamson County entities. To fulfill the “no net loss” condition, water purchasers in Williamson County pay a surcharge to finance a Water Conservation Fund. The fund is used to pay for water conservation efforts in the Lower Colorado Basin that offset increased out-of-basin transfer sales, and is administered and allocated by LCRA. According to LCRA’s HB1437 2019 Annual Report (included in Appendix B), the current (2020) allocation of offset credits is set to be exceeded by forecast water sales in 2032, as shown in Figure 3-5:

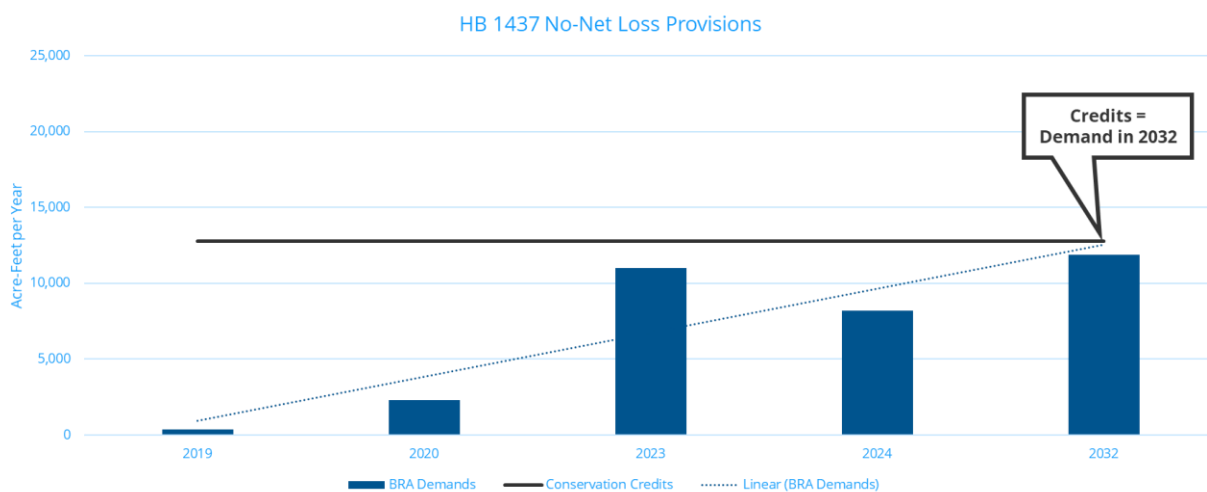
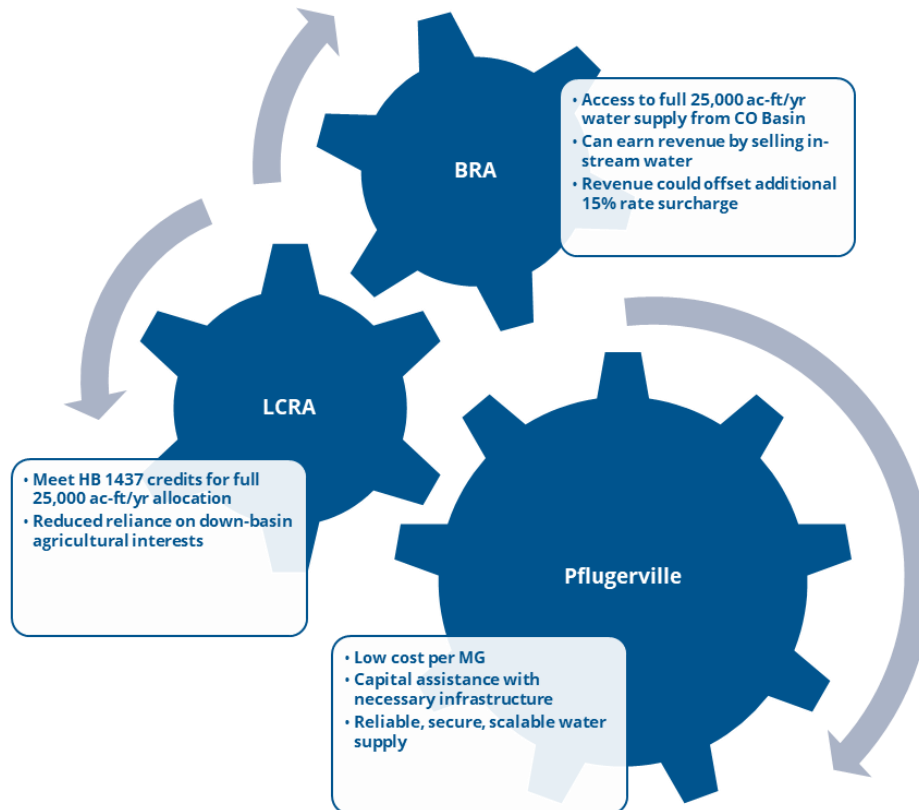


Figure 3-5: Forecast Demands and Offset Credits for HB1437

The provisions in HB1437 provide a unique opportunity for the City of Pflugerville to secure a long-term, low-cost water supply. Currently, entities including Round Rock, Leander, and Cedar Park are purchasing water from the Lower Colorado Basin which, upon use, is discharged into their wastewater distribution systems and routed to the Brushy Creek Regional WWTP for treatment. The Brushy Creek WWTP then discharges effluent into Brushy Creek which is located outside of the Lower Colorado watershed. It is proposed to route effluent from the Brushy Creek WWTP, either directly from the plant’s discharge or from Brushy Creek downstream of the plant’s discharge, to Lake Pflugerville. Routing flow from Brushy Creek to Lake Pflugerville places the water back in the Lower Colorado Basin and could provide LCRA and BRA with a solution to meeting the “no net loss” requirements of HB1437. Therefore, this arrangement holds benefits for multiple entities, providing an avenue for LCRA to sell the additional water to BRA while meeting the conditions of the governing legislation.



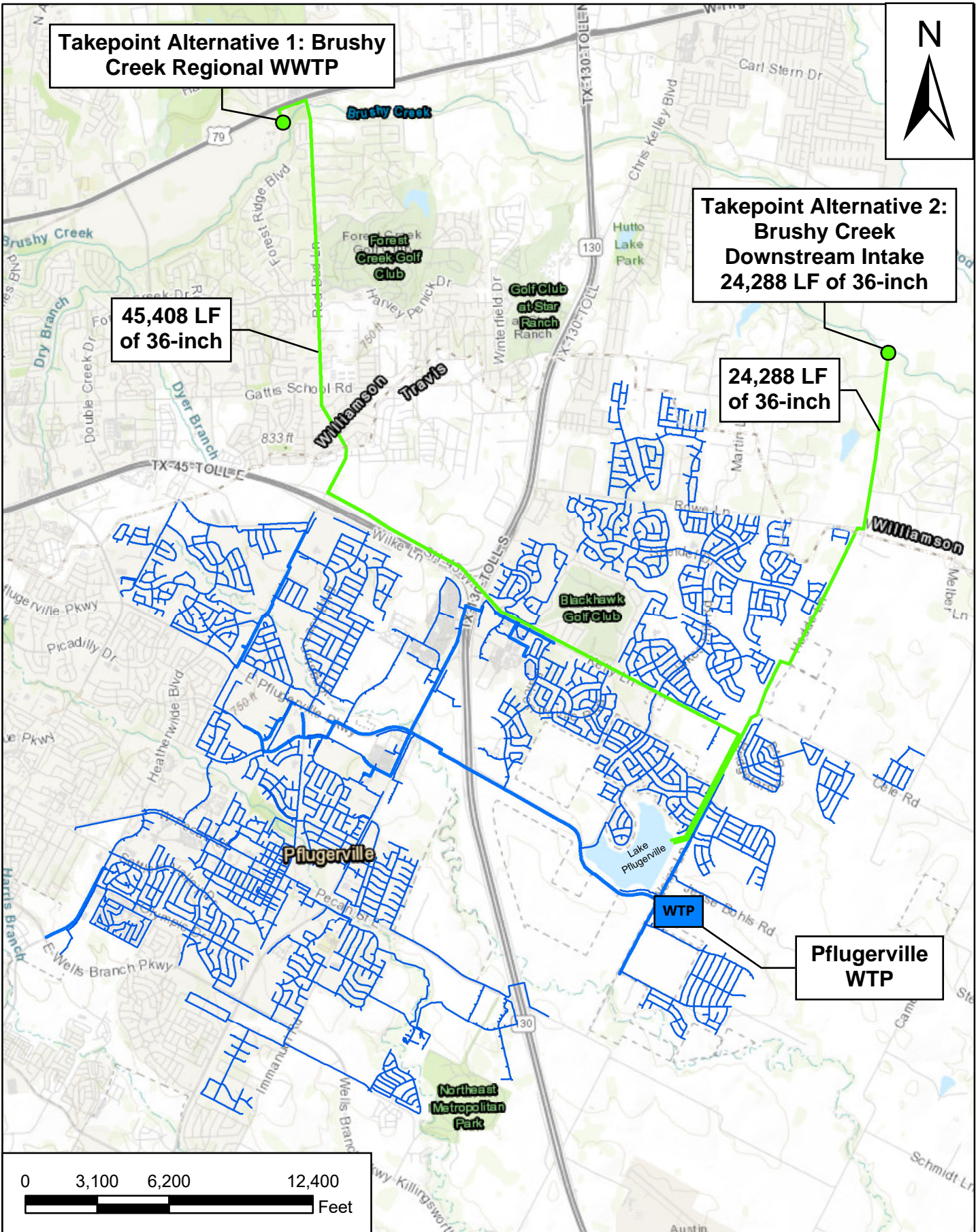
Obtaining water supply from Brushy Creek has multiple benefits including providing a water supply that will scale with population growth in the Central TX area. In addition, the nature of the “no net loss” provision and the presence of a fund dedicated to supporting projects that aid in meeting that condition promises community support and potential for funding collaboration. **It is important to note, however, that in initial discussions with LCRA on this topic, LCRA made no commitments or allowances for these funds to be applied to the project; this would need to be evaluated and discussed with the parties engaged in the HB1437 arrangement.**

3.2.4.1 Required Capital Improvements

Two options are identified for routing flow from the Brushy Creek WWTP to Lake Pflugerville. The first option is to route flow directly from the Brushy Creek WWTP discharge to Lake Pflugerville. This option may require additional treatment at the Pflugerville WTP such as reuse filtration or UV disinfection. In addition, it would require coordination with all entities who have a stake in the Brushy Creek WWTP including the Cities of Round Rock, Leander, Cedar Park, and Austin. Required capital improvements would consist of a new pump station at the Brushy Creek WWTP, approximately 8.6 miles of 36-inch pipeline, and any necessary treatment upgrades at the Pflugerville WTP to ensure adequate water quality. Proposed improvements are outlined in Figure 3-6.



The second option is to route flow from a location along Brushy Creek that is downstream of the Brushy Creek WWTP discharge, and closer to Lake Pflugerville. The location identified for a water intake is approximately 6.5 river miles downstream of the Brushy Creek WWTP discharge. This option may also require additional treatment at the Pflugerville WTP such as reuse filtration or UV disinfection, though upgrades are likely less extensive than those identified in Option 1 due to the increased treatment through natural attenuation along Brushy Creek. It is anticipated that, with this option, all contract negotiations would take place with a single entity: BRA. Required capital improvements would consist of a new intake and pump station along Brushy Creek, approximately 4.6 miles of 36-inch pipeline, and any necessary treatment upgrades at the Pflugerville WTP to ensure adequate water quality. Proposed improvements are outlined in Figure 3-6.



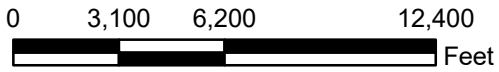
Takepoint Alternative 1: Brushy Creek Regional WWTP

45,408 LF of 36-inch

**Takepoint Alternative 2: Brushy Creek Downstream Intake
24,288 LF of 36-inch**

24,288 LF of 36-inch

Pflugerville WTP



PFLUGERVILLE WTP
PFLUGERVILLE, TEXAS
ALTERNATIVE 7- House Bill 1437

FIGURE: 3-6



3755 S Capital of Texas Hwy
Suite 325
Austin, TX 78704
(512) 485-0009





3.2.5 Alternative 8 – Central WWTP Indirect Potable Reuse

The City of Pflugerville currently owns and operations the Central Wastewater Treatment Plant (WWTP) which is approximately 3 miles from the Pflugerville WTP. Effluent from the plant is proposed to be routed to Lake Pflugerville for a closed-loop indirect potable reuse system. Additional treatment would likely be required at the Pflugerville WTP such as reuse filtration or UV disinfection. Minimal external coordination would be required, with the exception of any additional necessary permitting.

3.2.5.1 Required Capital Improvements

Required capital improvements would consists of a new pump station at the Central WWTP, approximately 3.0 miles of 36-inch pipeline, and any necessary treatment upgrades at the Pflugerville WTP to ensure adequate water quality.

3.2.6 Alternative 9 – Lower Colorado River Authority Bastrop County Groundwater Development

The Lower Colorado River Authority (LCRA) is in the process of permitting a new groundwater development with an available water supply of 50,000 acre-feet per year. The groundwater development has the benefit of being a large water supply source with the potential to fill the entire identified water gap for the City of Pflugerville through full buildout. However, the distance of the water supply from Lake Pflugerville indicates that initial capital costs to obtain the water would be high.

3.2.6.1 Required Capital Improvements

The proposed groundwater development is approximately 26 miles from Lake Pflugerville as the crow flies. Over 26-miles of piping and associated pump stations would be required to convey flow from the groundwater development to Lake Pflugerville.



4.0 Conclusions and Recommendations

4.1 Comparison of Alternatives

Short and long-term alternatives are compared in Table 4-1 for the following items:

- Potential yield
- Required capital improvements
 - Pipeline
 - Pumping
 - Treatment
- Agency/Entity Coordination
- Reliability
- Drought Resiliency

Table 4-1: Comparison of Water Supply Alternatives

No.	Alternative Name	Potential Yield	Pipeline Required	P.S. Required	Treatment Required	Coordination Effort	Long-Term Reliability	Drought Resiliency
1	RR Wholesale	<5,600 ac-ft/yr	~7,600 LF of 24-in	Yes (air gap)	No	Medium	Low/None	Low (curtailment)
2	AW Wholesale	TBD	Potentially little	Yes (air gap)	No	Challenging	Low/None	Low (curtailment)
3	Vista Ridge Wholesale	Up to 15,000 ac-ft/yr	~19.2 mi of 36-in	Yes	Yes	Medium	Low/Mid	Resilient
4	Expanded Local Groundwater Supplies	TBD	Potentially Little	Wells	No	Low	Low/Mid	Low/Mid
5	BRA Alcoa Lake Groundwater	TBD (In Permitting)	~30 mi (Milam County)	Yes	Yes	Medium	Mid/High	Resilient
6	LCRA Colorado River Rights	>9,000 ac-ft/yr	~14.8 mi of 48-in	Expand Existing	No	Low	Mid/High	Impacted (Surface)
7	LCRA HB 1437-Brushy Creek	>25,000 ac-ft/yr (Scalable)	~4.6-8.6 mi of 36-in	Yes – River Intake	Yes	Challenging	High	Highly Resilient
8	Local Central WWTP IPR	Scalable	~3 mi of 36-in	Yes	Yes	Challenging	High	Highly Resilient
9	LCRA Bastrop County GW	~50,000 ac-ft/yr	>26 mi (Bastrop County)	Yes	TBD	Low	High	Resilient



4.2 Recommended Approach

It is recommended that the City of Pflugerville pursue a combination of short and long-term water supply options, with an emphasis on building multi-source redundancy into its water supply portfolio. The City is growing rapidly and needs to ensure adequate water supply for its customers within the next five to ten years as well as prepare for expansive future growth by full buildout. The coordination and effort required to obtain permanent water rights can often take years, and the City may require additional water supply to meet projected demands prior to when permanent water supply rights are able to be obtained. In addition to obtaining the additional water rights, the design and construction of necessary capital improvements also need to be completed which further lengthens the timeline.

Based upon the comparison of alternatives as outlined in Section 4.1, the recommended short-term water supply alternative is Alternative 1, a finished wholesale water agreement with the City of Round Rock. The short-term agreement could provide the necessary water to tie the City over during the design and construction of the expansion of the Pflugerville WTP and provide additional water during the time frame while the City is obtaining permanent future water rights. Alternative 1 has low required capital improvements and less challenging coordination than would be required to contract with the City of Austin. In addition, this Alternative would provide a future emergency water source from a neighboring utility that could be used by the City in the event of a significant service interruption, providing additional system redundancy beyond the near-term supply benefit. It is recommended that the City plan on developing the capital improvements necessary to have this water supply online by the time current water resources are exhausted, in the 2026 timeframe.

In addition to the Round Rock wholesale option, it is recommended that the City retain and investigate the enhancement of its existing groundwater supplies. The option is also a permanent water supply option and could give the City a longer buffer for arranging permanent future additional water supply rights. These groundwater supplies could then be phased out in the future, once more permanent and multi-layered water supply redundancies are brought online. Maintaining these active facilities also leaves the door open for a potential future aquifer storage and recovery (ASR) application in the City of Pflugerville – depending on aquifer conditions – which could further buffer out water supply variability in the primarily surface water sources recommended herein.

The recommended long-term permanent water supply alternative is Alternative 7, the construction of an intake along Brushy Creek as related to the “no net loss” provisions of HB1437. The project has high resiliency and the potential to scale with future growth which cannot be as readily, or inexpensively, obtained with any of the other identified alternatives. The project would be able to meet projected full buildout demands for the City of Pflugerville with minimal capital improvements as compared to other alternatives, and would likely be supported by surrounding communities due to its facilitation of the requirements of HB1437 on water sales by LCRA to BRA and its Williamson County customer utilities.

The secondary recommended long-term permanent water supply alternative is Alternative 6, the expansion of existing water supply rights from the Colorado River through LCRA. Alternative 6 would increase the City’s existing water supply rights from 12,000 acre-feet per year to 21,000 acre-feet per year, with the ability to scale up in the future. Alternative 6 could easily be coordinated with LCRA and capital improvements could be constructed on existing easements which would allow for a quicker construction



timeframe. This would also allow the two sources of LCRA water rights, the Brushy Creek and Colorado River intakes, to be balanced against each other to buffer out fluctuations in surface water availability (which adds drought resilience), and to allow flexibility in scaling up water availability to meet future demands.

It is recommended that the various water supply alternatives recommended above be phased in the following sequence, as shown in Figure 4-1:

1. Round Rock Wholesale Supply – Bring 5 MGD of additional supply online in the 2027 timeframe, with a planned usage for approximately 5-years. Once this near-term need is no longer needed, the facilities should be maintained on an emergency-use basis under an agreement with the City of Round Rock.
2. HB1437 Water Rights – Construct the Brushy Creek intake to begin supplying water to Lake Pflugerville at an initial phase of 12,500 ac-ft/yr in 2029. This will allow necessary operational adjustments to take place to integrate the new influent water quality at the WTP.
3. Groundwater Supply – Once the Brushy Creek supply is online, the groundwater supplies could be phased out, but kept active as a backup, drought-resilient water supply.
4. In 2033, the HB1437 supply could be ramped up to the full 25,000 ac-ft/yr allotment with LCRA's decreased reliance on downstream agricultural offsets for “no net loss” credits. The operational wholesale purchase agreement with the City of Round Rock could then be made dormant, with arrangements made for a contractual emergency backup agreement.
5. In 2048, as demands continue to rise, the City would expand its existing Colorado River intake system with a pump station expansion and a parallel pipeline. Figure 4-1 shows an increase of 9,000 ac-ft/yr to a total of 21,000 ac-ft/yr from the river, which would cover the additional demand and be available with only the Arbuckle Reservoir project online – reducing the City's dependence on the construction of additional mid-basin reservoirs in the future to be able to provide adequate water.

This sequence of water supplies would allow the City to have scalable, redundant supplies from both the Brushy Creek and Colorado River sources – both of which would be ultimately sourced from LCRA – and would provide for operational flexibility to fill Lake Pflugerville from either or both sources. In addition, the existing groundwater supply and the City of Round Rock emergency connection would provide reliable backups if needed, further bolstering the City's multi-layered water supply portfolio.

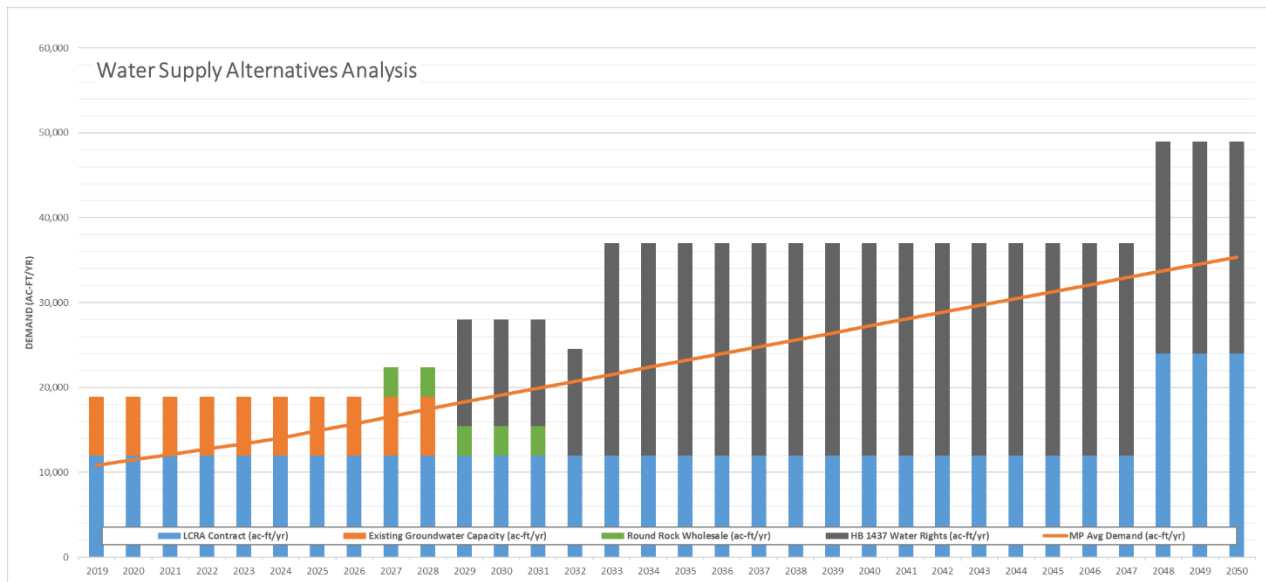


Figure 4-1: Phased Water Supply Alternatives

4.3 Next Steps

The following next steps are recommended, once the City confirms the desired alternatives to procure additional water rights:

1. Garver will summarize the intended projects and communicate them to the relevant Region K and G planning group teams, in order for them to be included in the 2021 Regional Water Plans. This will aid in project funding through programs such as TWDB State Water Implementation Fund of Texas, which requires projects it funds to be reflected in the State Water Plan.
2. The City should retain specialized legal water rights/water supply counsel to represent them in negotiations with relevant parties, such as LCRA, Round Rock, and BRA. This representation should be coordinated through the City Attorney.
3. Garver, under a supplemental agreement, will facilitate meetings with relevant parties, provide technical information, and generally participate in discussions with project stakeholders to further negotiations of water rights within the timeframes provided.
4. Garver, under a supplemental agreement, will support the City in the definition of capital projects necessary to implement the selected alternatives in the timeframes provided. This would include preliminary modeling and cost estimation for budgetary purposes.
5. These capital projects would then be executed by the City's preferred mechanism.

