

Water Treatment and Supply City of Killeen April 2022

Proposed Lake Belton Plant Expansion



Water Treatment and Supply

Proposed Lake Belton Plant Expansion

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 - water supply sources
 - contract components for Water Supply Contract
- Background
 - Completion of Stillhouse Water Treatment Plant
 - Status of water supply and water treatment capacity
 - Census update and growth
- Limited Opportunity for expansion
- Proposed Lake Belton Plant Expansion with cost
- Treatment Capacity Summary
- Questions



BACKGROUND

THE BEGINNING-FORT HOOD



Fort Hood

[Killeen, Texas](#)

The War Department announced the selection of Camp Hood in January 1942. Most utilities were in place by August 1942.

Type

Army post

Coordinates

[31°08'N 97°47'W / 31.13°N 97.78°W / 31.13; -97.78](#)
[Coordinates: 31°08'N 97°47'W / 31.13°N 97.78°W / 31.13; -97.78](#)

Built

1942

Camp received water from a transmission line on the Lampasas River near the Dam on Lake Stillhouse.



DISTRICT BACKGROUND

LAKE BELTON CONSTRUCTION

- Construction of the lake started in 1949 and was completed in 1954
- Cost to build-\$17 million
- Conservation pool level=594 feet above sea level
- Between 1949 and 1954, the Army constructed a 12 MGD treatment plant on Lake Belton because the water from the Lampasas River was not adequate to serve the Base and Killeen



CREATION OF DISTRICT

- City of Killeen needed water and Ft. Hood wanted to assist City
- Department of Army ruling prohibited Ft. Hood from being in the wholesale water business and selling water to any City
- Bell County WCID #1 was created in March 1952 to be the vehicle to sell water to Killeen and other area cities by leasing the plant from the Army.



Capacity

Water Rights Summary

Entity	Two Tier Water (Option/Election Use)	System Water	Other Water Rights	Total Water Rights
Killeen	29,964	10,000	-	39,964
Copperas Cove	7,824	1,000	-	8,824
Belton	4,966	1,000	2,500	8,466
Harker Heights	5,265	-	3,235	8,500
WCID #3	740	750	-	1,490
439	750	-	1,409	2,159
District	-	250	-	250
Totals	49,509	13,000	7,144	69,653



District Raw Water Contract

- From BRA's Adjudicated Water Right 12-5160 , the District has contracted for 49,509 Ac/Ft of the 100,257 Ac/Ft available in Lake Belton. This water is contracted through the District under Water Right 2328 issued to the District by the TCEQ from the BRA. This contract expires in 2042.



City of Killeen Raw Water Contracts

- Killeen has a 1992 agreement with the District for 39,964 Ac/Ft of the 49,509 Ac/Ft that belongs to the District.
- In this contract water is defined as either “Election-Use Water” or “Option-Use Water”
- Election-Use Water: Raw water that is actually used in a calendar year by Killeen.
- Option-Use Water: Raw water contracted for but not used in a calendar year and remains in the water pool in Lake Belton.



This water right # is for the Two Tier contract. It is 49,509 AC/FT. Killeen has 29,964 AC/FT. This water cost is currently \$15.08 for Option water and \$29.80 for Election water per AC/FT. Again, this water is a right issued to the District.

WSC/2328/CO

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
REPORT OF SURFACE WATER USED FOR THE YEAR ENDING DECEMBER 31, 2011

for
USE: 1 MUNICIPAL/DOMESTIC TYPE: 9 WATER RIGHT NO: **2328**

TWDB ACCT#: 378851

OWNER: BELL CO WCID 1
201 S 38TH ST
KILLEEN TX 76543-4673

B 12 / A 388

If you have a change in name, address or ownership, please indicate the changes on this form. NOTE: Changing ownership also requires recorded documents such as deed(s) and in case of inheritance, will, probate order, and will inventory. Per Texas statutes, a fee of \$100.00 will be charged for each transfer or name change.

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

Month	Maximum Diversion Rate (Specify: ☐ CFS or ☒ MGPM)	Monthly Diverted Amount ** (acre-feet)	Monthly Consumed Amount ** (acre-feet)	Monthly Return Flow (acre-feet)
January	15,645	2,143	2,108	22.5
February	17,749	2,196	2,164	19.7
March	18,118	2,482	2,444	25.7
April	24,929	3,305	3,258	33.4
May	25,745	3,527	3,490	34.8
June	35,267	4,675	4,613	50.1
July	40,316	5,345	5,283	49.5
August	40,387	5,533	5,464	53.1
September	35,003	4,640	4,577	48.5
October	25,873	3,544	3,490	39.7
November	21,234	2,815	2,775	21.9
December	17,647	2,418	2,386	17.1
Total:		40,023	39,112	415.7

** The Monthly Diverted Amount and Monthly Consumed Amount may be the same; if they are, record them under both the Monthly Diverted Amount and the Monthly Consumed Amount columns.

For Irrigation Use Only: Indicate the number of acres irrigated, the months and the type of crops grown in the space below:
Crop: _____ Months: _____ Acres: _____
Crop: _____ Months: _____ Acres: _____

ALL USERS MUST EXECUTE THE FOLLOWING

I, Jerry Atkinson, (print your name) hereby certify that the above is true and correct to the best of my knowledge and belief.

Jerry Atkinson
(Signature)

Joann Culp
Notary Public
STATE OF TEXAS
My Commission Expires 05/21/2012
(Signature)

Return this form by March 1, 2012 to:
Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Telephone: (512) 799-6911



City of Killeen Raw Water Contracts

- Current Election-Use Rate = \$29.80/ Ac/Ft
- Current Option Use Rate = \$15.08/Ac/Ft
- \$29.80/acre-foot x 16,783 Ac/Ft = \$500,134
- \$15.08/acre-foot x 13,181 Ac/Ft = \$198,770
- The Two-Tier Contract expires December 31, 2041



City of Killeen

Raw Water Contract

System Water

WSC/12094/CO

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
REPORT OF SURFACE WATER USED FOR THE YEAR ENDING DECEMBER 31, 2011

for **12094**

USE: 1 MUNICIPAL/DOMESTIC TYPE: 9 WATER RIGHT NO: 12094

TWDB ACCT#: 378851

OWNER: BELL CO WCID 1
201 S 38TH ST
KILLEEN TX 76543-4673

B 12 / A 388

If you have a change in name, address or ownership, please indicate the changes on this form. NOTE: Changing ownership also requires recorded documents such as deeds and in case of inheritance, will, probate order, and will inventory. For Texas statutes, a fee of \$100.00 will be charged for each transfer or name change.

Instructions for completing the form are enclosed. 1 Acre-Foot = 325,851 Gallons

Month	Maximum Diversion Rate (Specify: ☐ CFS or ☐ GPM)	Monthly Diverted Amount ** (acre-feet)	Monthly Consumed Amount ** (acre-feet)	Monthly Return Flow (acre-feet)
January	NO DIVERSION USED RIGHT NO. 2328			
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Total:		0	0	0

** The Monthly Diverted Amount and Monthly Consumed Amount may be the same; if they are, record them under both the Monthly Diverted Amount and the Monthly Consumed Amount columns.

For Irrigation Use Only: Indicate the number of acres irrigated, the months and the type of crops grown in the space below:

Crop:	Months:	Acres:
Crop:	Months:	Acres:

ALL USERS MUST EXECUTE THE FOLLOWING

I, Jerry Atkinson, (print your name) hereby certify that the above is true and correct to the best of my knowledge and belief.

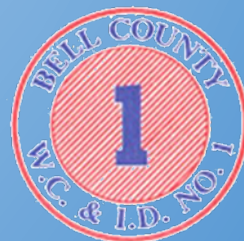
Jerry Atkinson
(Signature)

JOANN CULP
Notary Public
STATE OF TEXAS
My Commission Expires 05/21/2012

Texas, this the 5th day of January, 20 12

Joann Culp
(Signature)

Return this form by March 1, 2012 to:
Texas Commission on Environmental Quality ★ Water Rights Permitting MC 160 ★ PO Box 13087 ★ Austin TX 78711-3087
Telephone: (512) 792-2600



KEY COMPONENT

2. QUANTITY. (A) WATER QUANTITY AVAILABLE TO PURCHASER: Subject to (i) the terms and conditions hereinafter set forth, (ii) the acquisition of any necessary permits (water rights) (if any) from the Texas Commission on Environmental Quality and (iii) the availability to the District of an adequate supply of raw water, the District agrees to sell and deliver to the Purchaser at the delivery point or points hereinafter specified, and the Purchaser agrees to purchase and take at such delivery point or points, **all water required by the Purchaser** during the period of this Agreement for its own use and for distribution to all customers served by the Purchaser's water distribution system up to, but not to exceed, a total of 42* million gallons during any 24-hour period at a maximum instantaneous rate of delivery not to exceed 29,166 gallons per minute. *Per Addendum 5 executed February 20, 2014



Finished Water

A PHOTOGRAPHIC PROFILE
<https://doi.org/10.1002/opfl.tk>



A slanted tube intake assembly (inset) was installed at Stillhouse Hollow Lake, providing a new supply source for Bell County, Texas, residents with the completion of the new Lake Stillhouse Water Treatment Plant.

LAKE STILLHOUSE WATER PLANT PROVIDES ADDITIONAL WATER SOURCE FOR 300,000 TEXAS RESIDENTS

Bell County, Texas, located some 50 miles north of Austin, is fortunate to have not one but two water supply reservoirs that are part of the Brazos River system. Lake Belton lies to the northwest portion of the county and is one of the largest water supply reservoirs in the Brazos River Authority system. Lake Stillhouse is on the southwest quadrant of the county. The new Lake Stillhouse Water Plant represents a new supply source for the customers of Bell County Water Control & Improvement District #1 (WCID #1). Formed in 1952 to serve Fort Hood and "its surrounding civilian communities," WCID#1 serves about 310,000 people primarily in central and west Bell County. The cities of

Killeen, Harker Heights, Copperas Cove and Nolanville sponsored the construction of the Lake Stillhouse Water Plant to serve their growing populations.

PROJECT SPECIFICS

Project Name: Lake Stillhouse Water Plant

Operator/Contractor: CSA Construction, Houston, Texas

Designer: CDM-Smith, Austin, Texas

Completion Date: July 1, 2021

Water Source: Lake Stillhouse Hollow

Technology: Conventional Surface Water Treatment

Project Cost: \$39 million

Service: The plant delivers 17 mgd of

high-quality drinking water and was designed to expand to 34 mgd at build out.

Physical Size: The plant includes two sedimentation trains and four conventional dual media filters. The project also includes a dual slant tube intake and about 3,500 feet of 36-inch raw water line.

Staff Size: 5

Number of Operators: 4, including a chief plant operator

Special Features: The plant's slanted tube intake assembly and installation required a dive team, inflatable ballasts, and tremendous coordination between land and water crews.

PHOTOGRAPH BY



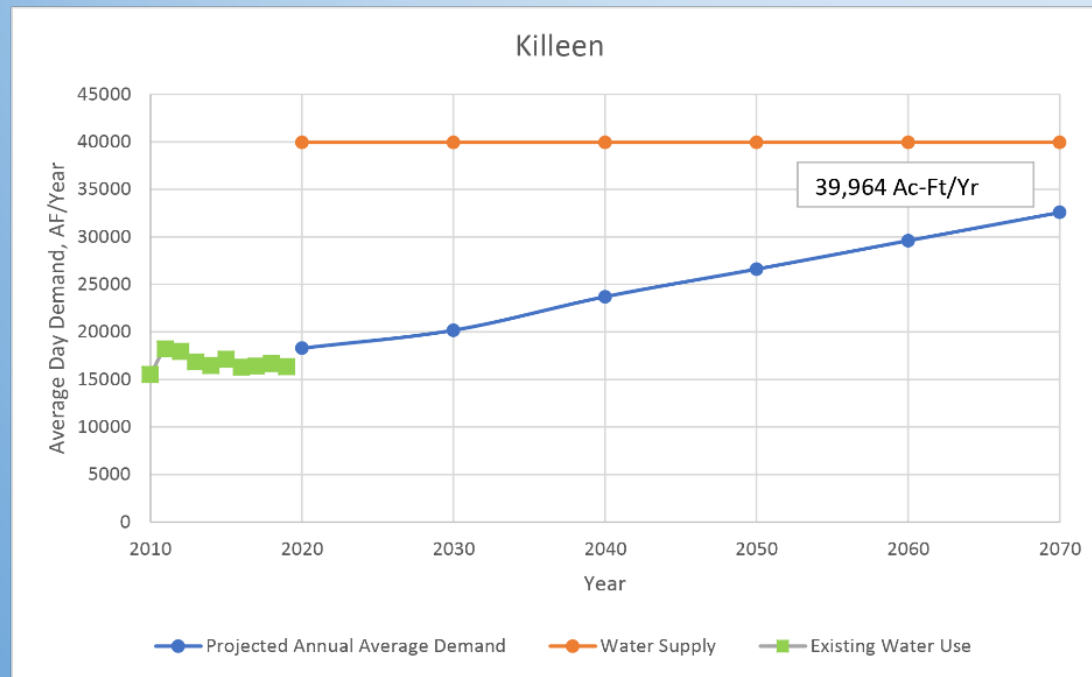
City of Killeen

TWDB Region G Population Projections

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	144,243	169,560	195,711	221,697	247,195	272,291

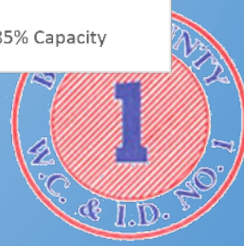
TWDB Region G Water Demand Projections (Ac-Ft/Year)

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	19,713	23,702	27,164	30,299	33,783	37,213



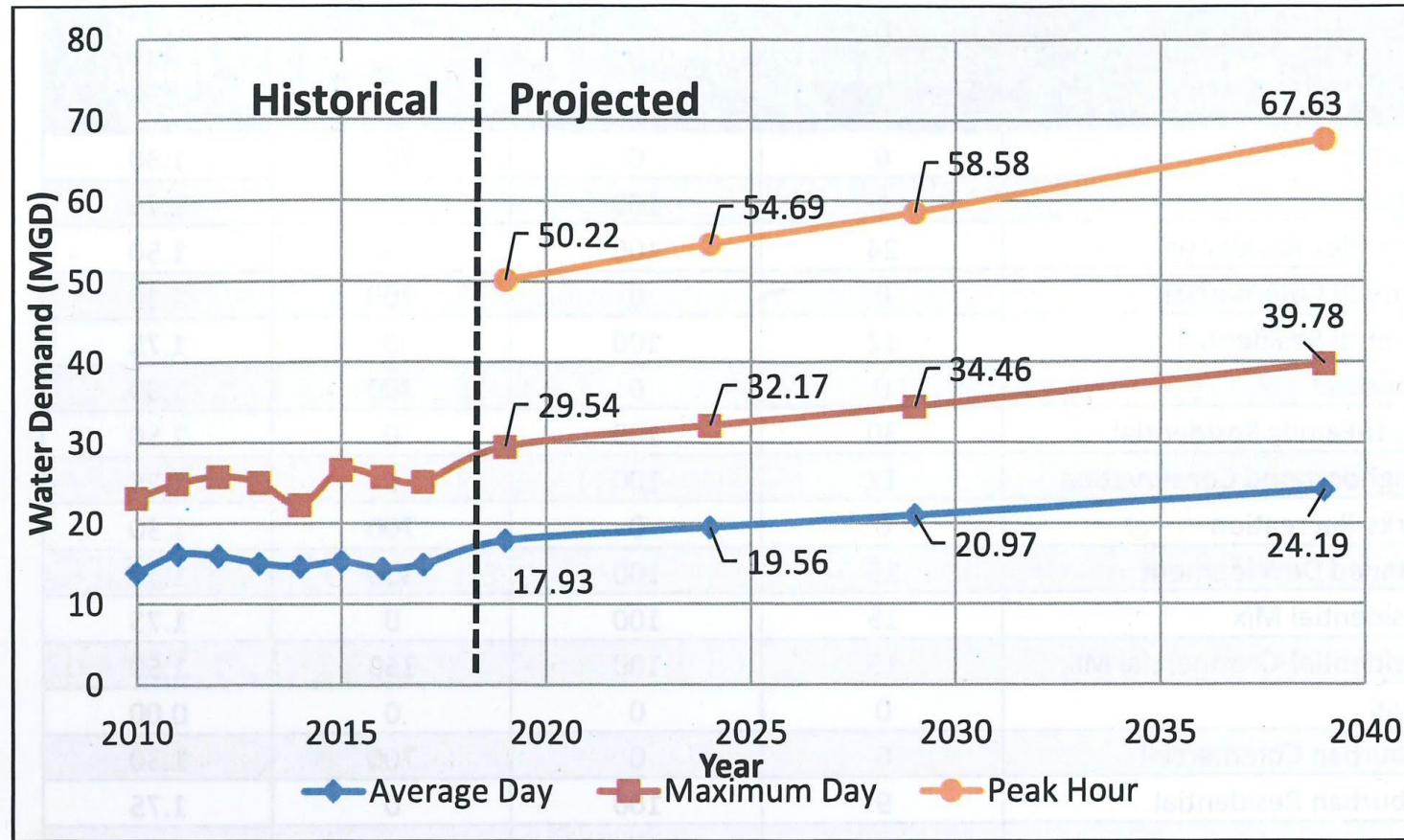
Max Day Water Demand Projections (MGD)

Customer Name	2020	2030	2040	2050	2060	2070
City of Killeen	29.04	34.92	40.02	44.64	49.77	54.82



FROM DRAFT MASTER PLAN

Figure 3-1 Historical and Projected Water Demands

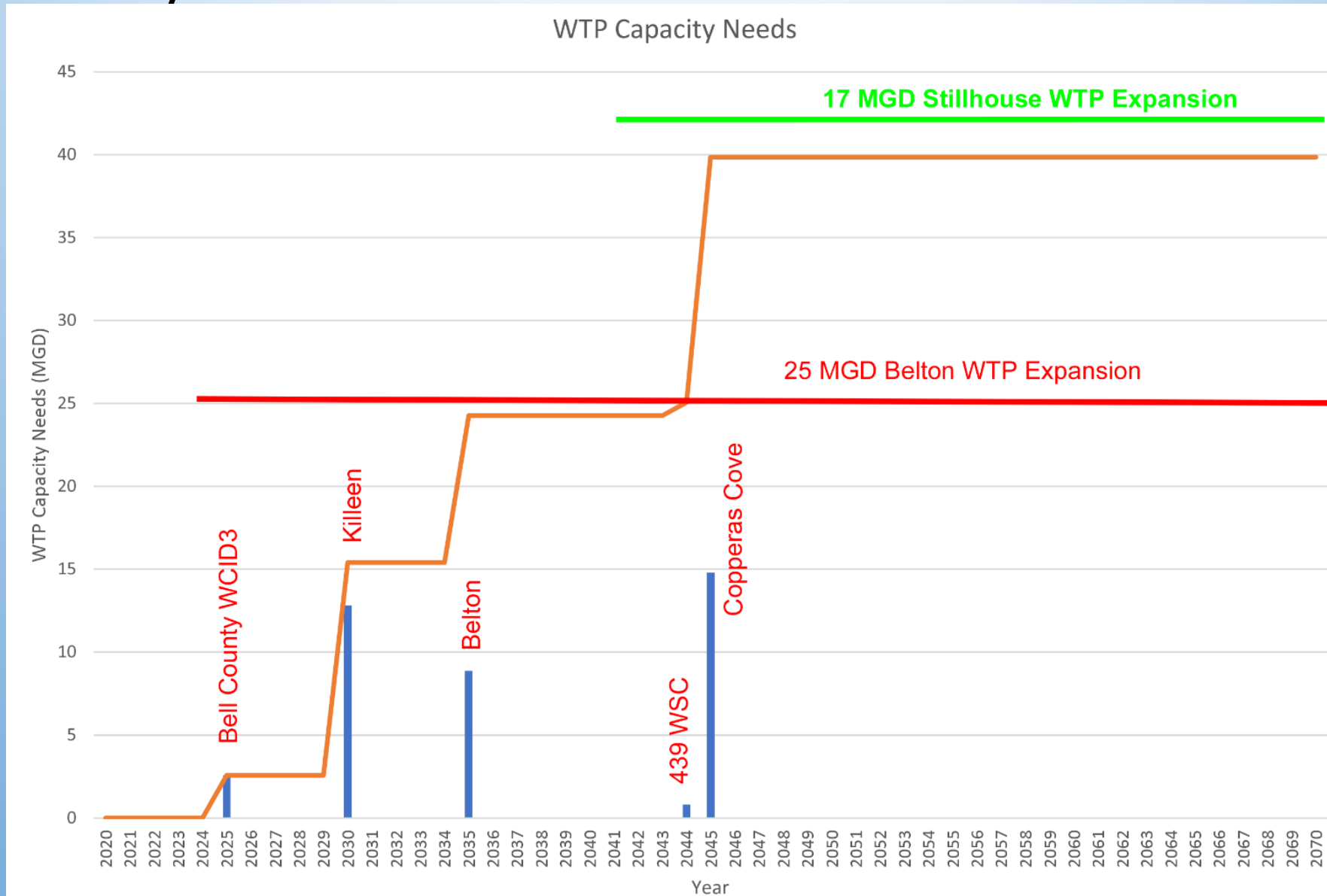


Comparison of Region G 2020 Population Projections and 2020 US Census Data

		Region G	
	2020 Census	2020 Population	
Utility	Population	Projection	Difference
Belton	27,411	21,841	5,570
Copperas Cove	39,340	36,989	2,351
Harker Heights	33,989	32,012	1,977
Killeen	157,807	153,371	4,436
Jonah	37,084	12,985	24,099
Taylor	16,755	17,209	(454)
Georgetown	133,582	72,507	61,075



Summary: Water Treatment



Proposed Lake Belton Plant Expansion

- To accomplish a 28 million gallon per day expansion, a 25 million gallon per day plant will have to be raised and a 53 million gallon per day plant built in its place.

Site Plan



Proposed Lake Belton Plant Expansion

Major Cost Components;

- Modify Raw Water Pump Station with new electrical building.
- New Raw Waterline
- 53 MGD Treatment Structure
- 4 Million Gallon Clearwell
- High Service Pump Station expansion
- Electrical Upgrades
- Minor filter upgrades



Proposed Lake Belton Plant Expansion

Project Costs

- Schedule
 - Start Design June 2022
 - Bid July 2023-September 2023
 - Construction September 2023 to September 2026

Item	Cost
Demolition and Sitework	\$1,800,000
Yard Pipe	\$2,000,000
Treatment Structure	\$24,100,000
4MG Clearwell	\$7,300,000
Plant 3 Chemical Storage and Feed Facilities	\$2,200,000
Chlorine Building	\$1,600,000
Finished Water Pump Station	\$800,000
Raw Water Pump Upgrades	\$900,000
Maintenance / Storage Building	\$1,400,000
Site Electrical Improvements	\$22,400,000
Indirect Construction cost	\$26,600,000
Construction Sub-Total	\$92,700,000
Contingency (40%)	\$37,100,000
Escalation (4% per year for 3 years to Construction Mid-Point)	\$15,600,000
Construction Total	\$145,400,000
Professional Services (15%)	\$21,800,000
Total Project Costs	\$167,200,000



Proposed Lake Belton Plant Expansion

Capacity Interest in Expansion

	MGD	% of Total	Cost
Killeen	14	50.0%	\$76,280,000.00
Copperas Cove	7	25.0%	
Belton	4	14.3%	
WCID 3	2	7.1%	
<u>439 WSC</u>	<u>1</u>	<u>3.6%</u>	
	28	100%	



Treatment Capacity Summary

- An opportunity exists to expand the Belton Water Treatment Plant by virtue of the Stillhouse Plant coming online and taking some existing burden from the Belton Plant
- This window of opportunity will close once growth to the south and west of Killeen begins to dominate the Stillhouse WTP
- Unless a new source of water becomes available at a later date, the Belton Water Treatment plant expansion opportunity may be lost



Questions?

