

Water Conservation Plan



City of Wichita Falls

Adopted April 16, 2024

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1.0 INTRODUCTION AND OBJECTIVE

The City of Wichita Falls (City) is located in a semi-arid region, northwest of the Dallas-Fort Worth Metroplex. The City is the largest municipality in a radius of about 100 miles, and nearby communities are economically and culturally tied to the City. The major industries of the area include agriculture, cattle, oil and gas, government, and military facilities. Several small to medium manufacturing industries are located in the City and the surrounding areas. The City serves as a Major Water Provider for the region, serving wholesale customers and an area greater than its direct retail customers.

Water resources are an important element in the quality of life and economic wellbeing of the City and its citizens. Local bodies of water serve municipal, industrial, agricultural, and recreational purposes. Water use patterns have fundamentally changed within the City following the drought of 2011-2015. This reflects behavior changes first implemented as drought restrictions that have become the “new normal” for residents. As the memory of that drought fades, elements of this water conservation plan, including education, are intended to improve the efficiency in the use of water.

The City has developed the following Water Conservation Plan (subsequently referred to as the “Plan”) in accordance with the Texas Commission on Environmental Quality (TCEQ) guidelines and requirements.¹ The objectives of this Plan are as follows:

- To protect and preserve public health, welfare, and safety.
- To maintain water supplies for domestic and wholesale water use, sanitation, and fire protection.
- To minimize the adverse impacts of water supply shortages.
- To conserve the available water supply in times of drought and emergency.
- To minimize the adverse impacts of emergency water supply conditions.
- To reduce water consumption from the levels that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- To encourage efficient outdoor water use.

¹ Superscripted numbers correspond with the references listed in Appendix A.

Abbreviations

Abbreviation	Full Nomenclature
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
BMP	Best Management Practice
CCF	Hundred Cubic Feet = 748 gallons
City	City of Wichita Falls
EPA	Environmental Protection Agency
GPCD	Gallons Per Capita per Day
ICI	Industrial, Commercial, and Institutional
IPR	Indirect Potable Reuse
MG	Million Gallons
MGD	Million Gallons per Day
MWCPT	Municipal Water Conservation Planning Tool
NSRRF	Northside Resource Recovery Facility
OPS	Okaunion Power Station
RO	Reverse Osmosis
RRA	Red River Authority
RWPG	Regional Water Planning Group
SAFB	Sheppard Air Force Base
TCEQ	Texas Commission on Environmental Quality
TWDB	Texas Water Development Board
WCP or Plan	Water Conservation Plan
WCWID #2	Wichita County Water Improvement District #2
WFRRF	Wichita Falls Resource Recovery Facility
WRC	Wichita Falls Water Resources Commission
WTP	Water Treatment Plant

2.0 REGULATORY BASIS FOR WATER CONSERVATION PLANS

2.1 TCEQ RULES GOVERNING WATER CONSERVATION PLANS

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as “[a] strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water.” 30 Tex. Admin. Code § 288.1(24). The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans for Public Water Suppliers covered in this report are:

- 288.2(a)(1)(A) – Utility Profile – Section 3.0 and Appendix C
- 288.2(a)(1)(B) – Record Management System – Section 3.4.2
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 3.3
- 288.2(a)(1)(D) – Accurate Metering – Sections 3.4.1 and 3.4.2
- 288.2(a)(1)(E) – Universal Metering – Section 3.4.2
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Section 3.4.2 and 3.4.3
- 288.2(a)(1)(G) – Public Education and Information Program – Section 3.5.1
- 288.2(a)(1)(H) – Non-Promotional Water Rate Structure – Section 3.5.2
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 3.5.3
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 3.5.4
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Groups – Section 3.5.5 and Appendix D
- 288.2(c) – Review and Update of Plan – Section 3.7

Conservation Additional Requirements (Population over 5,000)

The Texas Administrative Code includes additional requirements for water conservation plans for drinking water suppliers serving a population over 5,000:

- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Section 3.4.3
- 288.2(a)(2)(B) – Requirement for Water Conservation Plans by Wholesale Customers – Section 4.4

Additional Conservation Strategies

The Texas Administrative Code lists additional conservation strategies, which may be adopted by suppliers but are not required. Additional strategies adopted by the City include the following:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 3.5.2
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 3.6.1
- 288.2(a)(3)(C) – Replacement or Retrofit of Water-Conserving Fixtures – Section 3.6.1
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 3.6.4
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 3.6.5

In addition to being a public water supplier under TCEQ rules, the City also acts as a wholesale provider to multiple wholesale customers; thus, the TCEQ water conservation rules for wholesale providers are also addressed.

The TCEQ rules governing development of water conservation plans for wholesale water suppliers are in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.5 of the Texas Administrative Code, which is included in Appendix B. The elements in the TCEQ water conservation rules for wholesale water suppliers addressed in this Water Conservation Plan are listed below.

Minimum Conservation Plan Requirements for Wholesale Water Suppliers

The minimum requirements in the Texas Administrative Code for water conservation plans for wholesale water suppliers are covered in this Plan as follows:

- 288.5(1)(A) – Description of Service Area – Section 3.0 and Appendix C
- 288.5(1)(B) – Specific, Quantified Goals – Section 3.3
- 288.5(1)(C) – Measure and Account for Water Diverted – Section 3.4.1
- 288.5(1)(D) – Monitoring and Record Management System – Section 3.4.2
- 288.5(1)(E) – Program of Metering and Leak Detection and Repair – Section 3.4.3
- 288.5(1)(F) – Requirement for Water Conservation Plans by Wholesale Customers – Section 4.4
- 288.5(1)(G) – Reservoir System Operation Plan – Section 3.5.3
- 288.5(1)(H) – Means of Implementation and Enforcement – Section 3.5.4
- 288.5(1)(I) – Documentation of Coordination with Regional Water Planning Groups – Section 3.5.5
- 288.5(3) – Review and Update of Plan – Section 3.7

Additional Conservation Strategies for Wholesale Water Suppliers

The Texas Administrative Code lists additional water conservation strategies that can be adopted by a wholesale supplier but are not required. Additional strategies adopted by the City include the following:

- 288.5(2)(C) – Program for Reuse and/or Recycling – Section 3.6.4

- 288.5(2)(D) – Other Measures - Section 3.5.1 (Public Education), and Section 3.6.5 (Landscape Water Management Measures)

The TCEQ rules governing development of water conservation plans submitted with a water right application for new or additional state water are in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.7 of the Texas Administrative Code, which is included in Appendix B. The elements in the TCEQ water conservation rules for plans submitted with a water right application addressed in this Water Conservation Plan are listed below.

Minimum Conservation Plan Requirements for Plans Submitted with a Water Right Application

The minimum requirements in the Texas Administrative Code for water conservation plans submitted with a water right application for new or additional state water are in Appendix F of this Plan as follows:

- 288.7(a)(1) – Support for Applicant's Proposed Water Use within Water Conservation Goals
- 288.7(a)(2) – Evaluation of Conservation as an Alternative
- 288.7(a)(3) – Evaluation of Other Feasible Alternatives
- 288.7(b) – Support for Requested Appropriation

The City also holds water right permits for four of its water supply reservoirs (Lakes Arrowhead, Kickapoo, Kemp, and Diversion) to divert water for industrial and mining use; thus, the TCEQ water conservation rules for industrial and mining use are also addressed.

The TCEQ rules governing development of water conservation plans for industrial and mining use are in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.3 of the Texas Administrative Code, which is included in Appendix B. The elements in the TCEQ water conservation rules for industrial and mining use addressed in this Water Conservation Plan are listed below.

Minimum Conservation Plan Requirements for Industrial or Mining Use

The minimum requirements in the Texas Administrative Code for water conservation plans for industrial and mining use are covered in this Plan as follows:

- 288.3(a)(1) – Description of Water Use – Section 5.1
- 288.3(a)(2) – Specific, Quantified Goals – Section 5.2
- 288.3(a)(3) – Measure and Account for Water Diverted – Section 5.3
- 288.3(a)(4) – Leak Detection, Repair, and Water Loss Accounting – Section 5.4
- 288.3(a)(5) – State of the Art Equipment/Processes to Improve Efficiency – Section 5.5
- 288.3(b) – Review and Update of Plan – Section 5.6

The City also holds water right permits for four of its water supply reservoirs (Lakes Arrowhead, Kickapoo, Kemp, and Diversion) to divert water for agricultural use. Although the City does not currently supply water to any customers for agricultural use, it could do so in the future under its current water rights. For this reason, the TCEQ water conservation rules for agricultural use are also addressed in this Plan.

The TCEQ rules governing development of water conservation plans for agricultural use are in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.4 of the Texas Administrative Code, which is included in Appendix B. The elements in the TCEQ water conservation rules for agricultural use addressed in this Water Conservation Plan are listed below.

Minimum Conservation Plan Requirements for Agricultural Use

The minimum requirements in the Texas Administrative Code for water conservation plans for systems providing agricultural water to more than one user are covered in this Plan as follows:

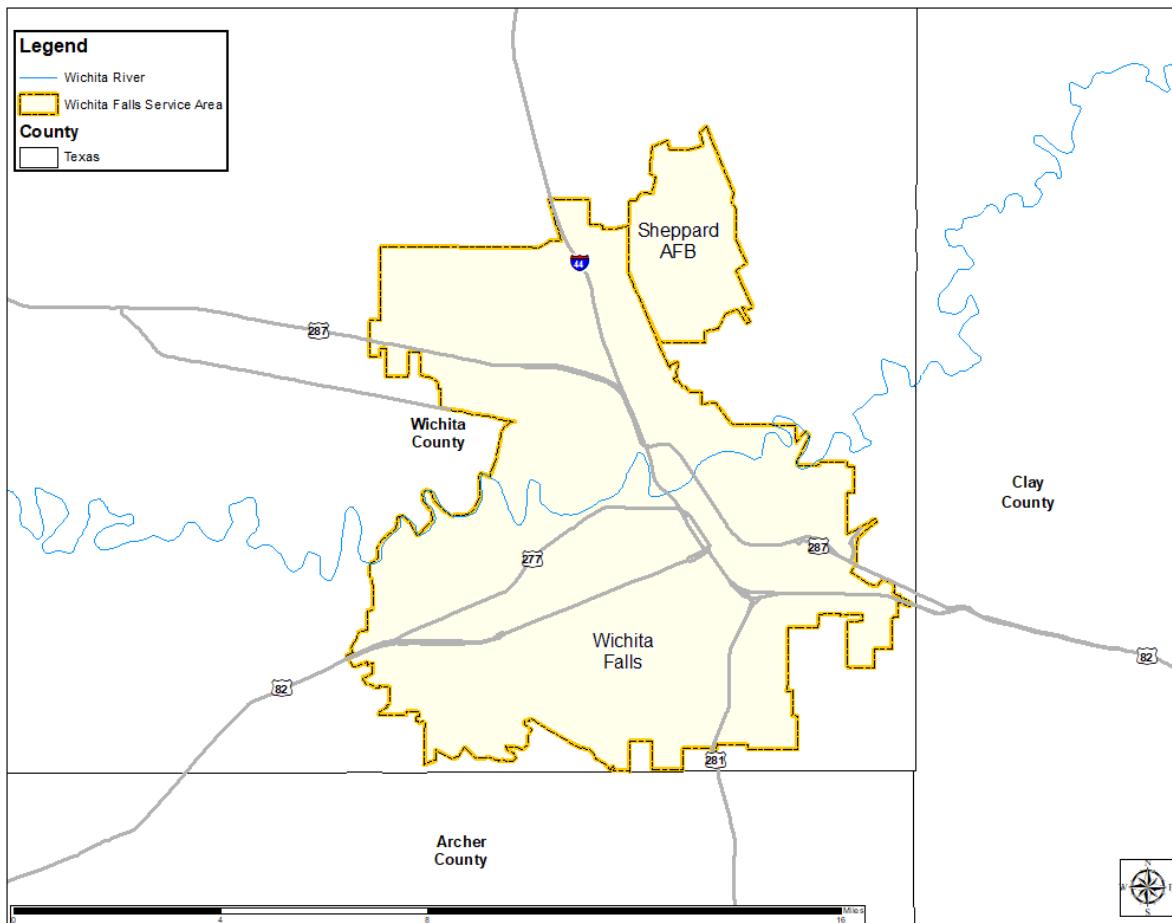
- 288.4(a)(3)(A) – System Inventory – Section 6.1
- 288.4(a)(3)(B) – Specific, Quantified Goals – Section 6.2
- 288.4(a)(3)(C) – Measure and Account for Water Diverted – Section 6.3
- 288.4(a)(3)(D) – Monitoring and Record Management System – Section 6.3
- 288.4(a)(3)(E) – Program of Metering and Leak Detection and Repair – Section 6.3
- 288.4(a)(3)(F) – Customer Assistance Program for On-Farm Water Conservation and Pollution Prevention Plans – Section 6.4
- 288.4(a)(3)(G) – Water Conservation Requirements for Wholesale Customers – Section 6.5
- 288.4(a)(3)(H) – Plan Adoption – Section 6.7
- 288.4(a)(3)(J) – Documentation of Coordination with Regional Water Planning Groups – Section 6.6
- 288.4(c) – Review and Update of Plan – Section 6.7

3.0 WATER CONSERVATION PLAN FOR PUBLIC WATER SUPPLIERS

3.1 DESCRIPTION OF SERVICE AREA

The City provides retail water and wastewater service to approximately 104,500 residents including Sheppard Air Force Base (SAFB), and wholesale water service to multiple wholesale customers (see Section 4.0). The City's retail service area (including SAFB) spans an area of approximately 72 square miles (**Figure 3-1**).

FIGURE 3-1: THE CITY'S WATER SERVICE AREA



3.2 UTILITY PROFILE

Appendix C contains the City's most recent water Utility Profile based on the format recommended by TCEQ for both retail and wholesale water suppliers. The following sections describe some of the City's different water related systems including supply, treatment, wastewater, and reuse.

3.2.1 Water Supply System

The City is the owner or co-owner of four reservoirs that are used as the City's principal source of water supply: Lakes Arrowhead, Diversion, Kemp, and Kickapoo (see **Figure 3-2**). The City holds water rights in Lake Wichita, but it is not used for water supply. The designed daily capacity of the City's water supply system is 77.2 MGD.

Lake Wichita

Lake Wichita is an impoundment of Holliday Creek located just south of the City. The lake was built in 1901 and was used for many years as the principal source of drinking water. The quality of the water is generally poor for drinking purposes. Due to the age of the reservoir, Lake Wichita does not offer a reliable or significant yield to meet the City's water supply requirements. Its major uses today are recreation and flood control.

Lakes Kemp & Diversion

Lakes Kemp and Diversion are jointly owned by the City and Wichita County Water Improvement District #2 (WCWID #2). Both lakes are located on the Wichita River, southwest of the City, with Lake Kemp located upstream of Lake Diversion. The reservoirs are operated as a system, with the majority of water supply diverted from Lake Diversion. Water released from Lake Kemp travels to Lake Diversion for distribution. Water supply from the Kemp-Diversion system is used for municipal, irrigation, mining, and recreational purposes. Irrigation water is diverted into canal systems that distribute water to customers in Archer, Clay, and Wichita Counties. Municipal water is diverted from the canal system to a reservoir with a pump station and transmission pipeline that delivers raw water to the City's Cypress Water Treatment Plant (WTP). Oklaunion Power Station (OPS) has a contract with the City to divert up to 20,000 acre-feet per year for industrial use in Wilbarger County. This water is diverted directly from Lake Diversion.

Due to high salinity loads in the tributaries that flow into Lake Kemp, the water use from Lake Kemp historically has been limited to irrigation and industrial purposes. The City completed a reverse osmosis

(RO) water treatment plant and infrastructure to utilize water from Lake Kemp for municipal purposes. To improve the water quality of the Wichita River, the Red River Authority sponsors a chloride control project that diverts saline water from the South Wichita River above Lake Kemp to Truscott Brine Reservoir in Knox County. Evaluations of the effectiveness of the chloride control project found these diversions reduce the total chloride load to Lake Kemp by approximately 25 percent. This results in a lower chloride concentration in the reservoir. However, a significant chloride load remains within the reservoir system from the North and Middle Wichita Rivers. Future proposed low flow diversions from these tributaries should further reduce the chloride loading into Lake Kemp.

Lakes Arrowhead & Kickapoo

Lakes Arrowhead and Kickapoo are the primary sources of municipal water supply for the City. The lakes are located on the Little Wichita River south of the City and provide a reliable, high quality water source. In addition to their primary purpose of providing a municipal water supply, Lakes Arrowhead and Kickapoo are important regional recreational facilities. The City has water rights of 45,000 acre-feet from Lake Arrowhead and 40,000 acre-feet from Lake Kickapoo. The City also supplies raw water from Lake Arrowhead and Lake Kickapoo to four wholesale customers.

Raw water is transmitted from Lake Kickapoo to the Secondary Reservoir in the City via transmission pipeline. Lake Kickapoo is higher in elevation than the Secondary Reservoir, so water can flow by gravity during months that require lower flows. Raw water from Lake Arrowhead is also transmitted to the Secondary Reservoir via transmission pipeline. Water from the two lakes is mixed in the 110 million-gallon (MG) capacity Secondary Reservoir and then is transmitted to the City's two water treatment plants. Water flows to the Jasper Water Treatment Plant (WTP) by gravity and is pumped to the Cypress WTP.

3.2.2 Water Treatment System

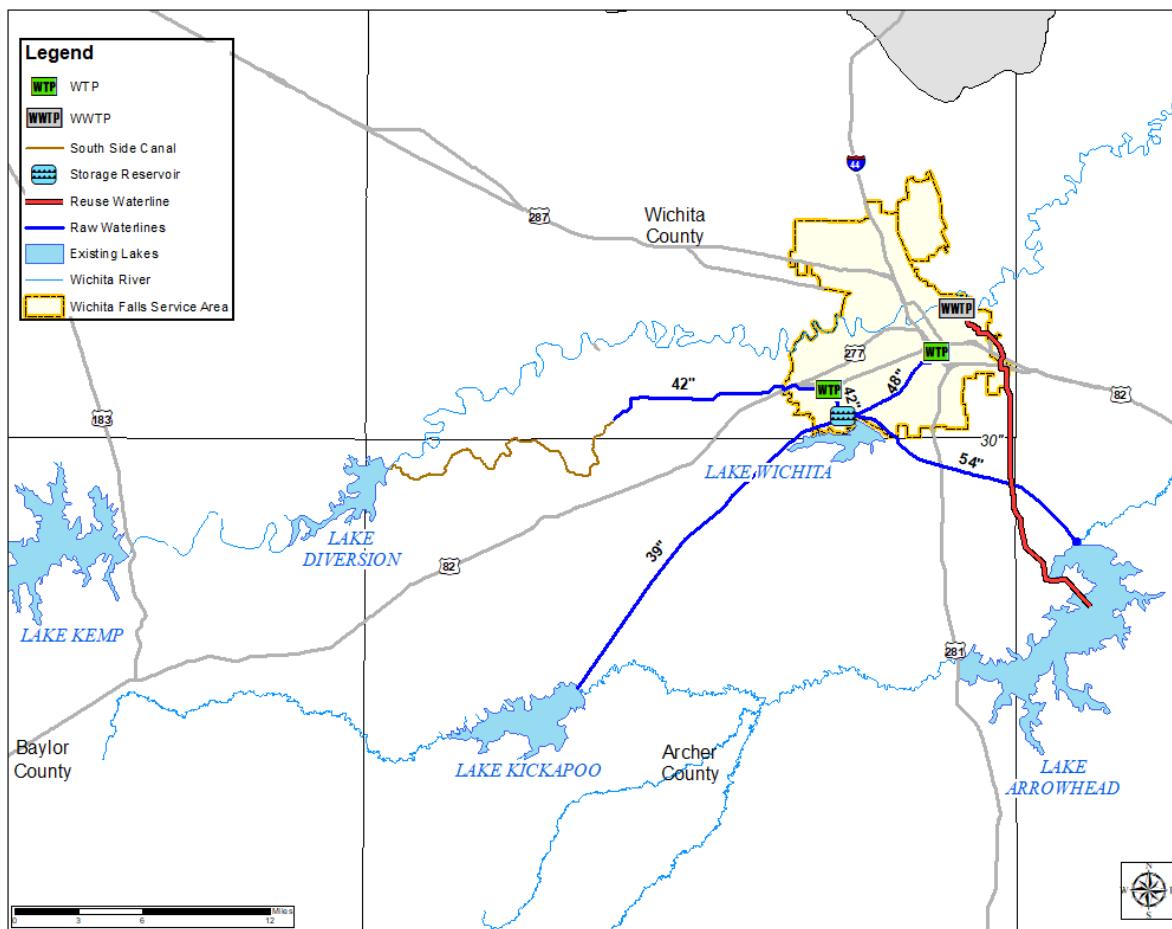
The City owns and operates two water treatment facilities: Jasper WTP and Cypress WTP. The Jasper WTP has a conventional treatment capacity of 25.2 MGD. The Cypress WTP has a total treatment capacity of 52 MGD including a 10 MGD RO system and 42 MGD conventional treatment system. The City has a total storage capacity of 37.6 MG comprised of 31.1 MG ground storage and 7.5 MG of elevated storage. All treatment, pumping, transmission, and storage facilities have redundancy to ensure reliability of water service to the City's customers.

3.2.3 Wastewater and Reuse System

The City operates two wastewater treatment facilities. The Northside Resource Recovery Facility (NSRRF) and the Wichita Falls Resource Recovery Facility (WFRRF). The NSRRF is the smaller of the two facilities and was primarily built to attract and serve major industries. NSRRF treats about 40 percent of the Sheppard Air Force Base sewage while the remaining 60 percent is treated at the WFRRF. The NSRRF has a capacity of up to 1.5 MGD. The WFRRF is the City's primary wastewater treatment facility and has a capacity of up to 19.9 MGD.

The City implemented an indirect potable reuse (IPR) system which takes treated wastewater effluent from the WFRRF and discharges it into Lake Arrowhead to augment water supplies. Refer to Section 3.6.4 for more information on the City's water reuse efforts.

FIGURE 3-2: EXISTING RAW WATER SYSTEM



3.3 SPECIFIC WATER CONSERVATION GOALS

TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. The goals for this Water Conservation Plan include the following:

- Maintain the five-year moving average total per capita and residential per capita water use below specified amount in **Table 3-2**.
- Maintain the level of water loss in the system below the specified amount in **Table 3-7**.
- Maintain a program of universal metering and meter replacement and repair as discussed in Section 3.4.1.
- Increase efficient water usage and decrease waste in outdoor irrigation through enforcement of reasonable landscape water management regulations as described in Section 3.6.5.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program as discussed in Section 3.5.1.

In the previous (2019) Plan,² total per capita use goals were 160 gallons per capita per day (GPCD) by 2024 and 155 GPCD by 2029. The City's residential per capita use goals were 69 GPCD by 2024 and 66 GPCD by 2029 (**Table 3-1**). The City's five-year average (2019-2023) was 105 GPCD for total per capita use and 66 GPCD for residential per capita use, showing that actual usage has already achieved results in line with the 2019 Plan.

TABLE 3-1: PREVIOUS PLAN GPCD GOALS (2019)

Description	2024	2029
Total GPCD ^a	160	155
Residential GPCD ^b	69	66

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

During the most severe years of the drought of record (2011-2015), the City significantly reduced its water usage through aggressive water conservation efforts and drought measures. Following the drought, the City's average water usage has remained below pre-drought levels (**Figure 3-3**). This can be attributed to the City's successful water conservation efforts, which have helped to instill an appreciation for water resources among the City's residents. However, the City acknowledges that public behavior may shift, and as such, it will continue to monitor and plan for future water supplies accordingly.

TABLE 3-2: UPDATED GPCD GOALS (2024)

Description	2029	2034
Total GPCD ^a	155	150
Residential GPCD ^b	66	63
Water Loss GPCD ^c	15	12

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

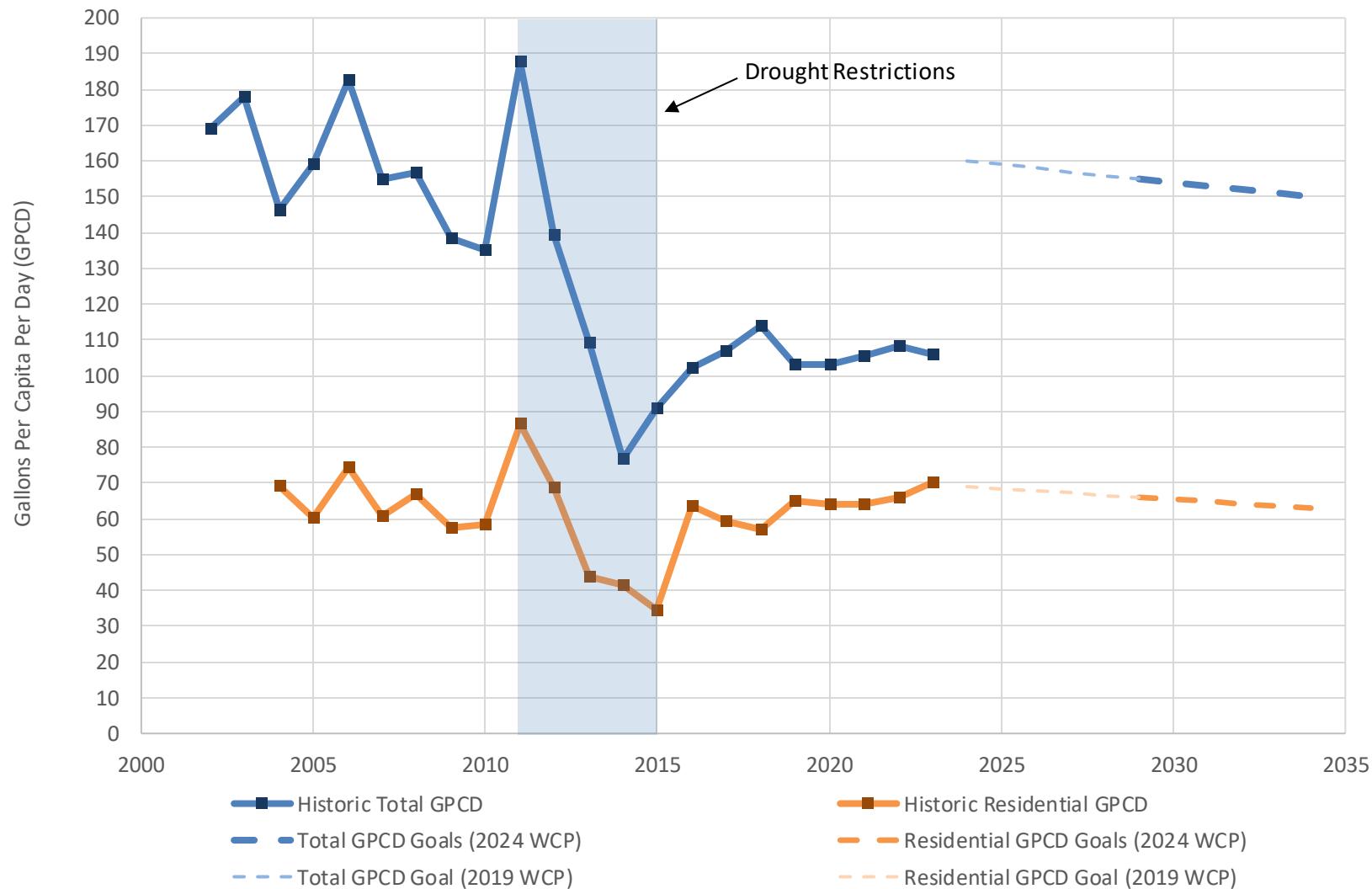
b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

c. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365

3.3.1 Analysis of Best Management Practices

The City has evaluated the best management practices (BMPs) provided by the Water Conservation Advisory Council and TWDB.³ **Table 3-3** lists the BMPs the City has implemented or may consider implementing in the future. The BMP list also includes estimated annual water savings for each BMP. The annual water savings were estimated using the TWDB Municipal Water Conservation Planning Tool (MWCPT). The City's BMPs are not listed in the "Pre-Defined Conservation Measures" with water savings estimates built into the MWCPT. Instead, water savings for the City's BMPs were estimated through "User-Defined Conservation Measures." Estimating annual savings for some BMPs, such as water reuse, is straightforward, while others, such as public education, are much more difficult to estimate. Thus, the City will take a conservative approach when considering such estimates for water supply planning purposes. Best engineering judgement and industry estimates were used to make assumptions for the annual water savings. The estimates provided in **Table 3-3** are high-level estimates and may not fully reflect the total amount of water savings provided by the BMPs.

FIGURE 3-3: THE CITY'S TOTAL AND RESIDENTIAL PER CAPITA USE AND GOALS



**TABLE 3-3: WATER CONSERVATION BEST MANAGEMENT PRACTICES
IMPLEMENTATION SCHEDULE**

BMP	Description	Implementation Status	Estimated Annual Water Savings (kGal)	Notes
Municipal BMPs				
2.1	Conservation Coordinator	Implemented	Unknown	Utilities Operations Manager serves as Conservation Coordinator. See section 3.6.1 for information on the role and responsibilities of the Conservation Coordinator.
3.1	Water Conservation Pricing	Implemented	100,000 - 200,000	The City has an increasing block rate structure for residential water customers.
4.1	Metering of All New Connections and Retrofit of Existing Connections	Implemented	100,000 - 200,000	The City replaced all meters with AMI system in 2017.
4.2	Utility Water Audit and Water Loss	Implemented	500 - 1,000	The City completes and submits annual Water Loss Audits to TWDB.
5.1	Athletic Field Conservation	Implemented	15,000 - 25,000	The City has installed artificial turf on some athletic fields to reduce irrigation demand.
5.4	Park Conservation	Implemented	Unknown	The City has the ability to use direct non-potable reuse water from the WFFRF for irrigation at Williams Park. Savings are not yet quantified because the BMP has yet to be utilized for a full year.
5.6	Outdoor Watering Schedule	Implemented	50,000 - 150,000	Landscape irrigation is prohibited from 10 a.m. to 7 p.m. year-round
6.1 and 6.3	Public Information, Outreach and Education	Implemented	50,000 - 100,000	See Section 3.5.1 for information on the City's public outreach and education.
6.2	School Education	Implemented	500 - 1,000	The City holds summer workshops and library reading programs for school aged children.

BMP	Description	Implementation Status	Estimated Annual Water Savings (kGal)	Notes
6.4	Partnerships with Nonprofit Organizations	Implemented or may implement in the future	200 - 400	The City partners with Riverbend Nature Center to hold summer water conservation workshops for children. The City may also consider partnering with the local Master Naturalist or other gardening organizations on landscape water conservation initiatives.
8.3	Water Reuse	Implemented	2,500,000 - 3,000,000	See Section 3.6.4 for the City's water reuse efforts.
9.1	Prohibition on Wasting Water	Implemented	40,000 - 70,000	The City has year-round water conservation measures which prohibit certain wasteful water use practices.
9.2	Conservation Ordinance Planning and Development	Implemented	Unknown	The City's Water Resources Commission assists the City with water conservation ordinance planning and development. See section 3.6.2.
9.3	Enforcement of TCEQ Irrigation Standards	Implemented	10,00 - 20,000	Adopted via ordinance.
Wholesale BMPs				
2.1	Customer Contract Requirement to Develop and Implement WCPs and Drought Contingency Plans (DCPs)	Implemented	Unknown	The City requires wholesale customers to develop and implement a WCP and DCP, by contract.

3.4 METERING, RECORD MANAGEMENT, CONTROL OF NONREVENUE WATER, AND LEAK DETECTION AND REPAIR

One of the key elements in water conservation is careful tracking of water use and control of losses. Reducing nonrevenue water is also one of the few water conservation programs that directly impacts rates. For these reasons, an aggressive metering and meter repair and replacement program is vital to the City. Such a program is one aspect of the efficient business operation of water and sewer service as a government function, and it preserves the financial integrity of the utility. From a water conservation perspective, universal metering ensures that customers are paying for services received and are sensitive to the waste of a product for which they have paid.

3.4.1 Practices to Measure and Account for the Amount of Water Diverted from Reservoir Sources

All diversions from the City's water supply reservoirs are metered at the point of discharge by devices with an accuracy of plus or minus five percent. The metering devices are calibrated annually by an independent contractor.

3.4.2 Monitoring and Record Management Program for Determining Deliveries, Sales and Losses

The City has an effective record management system in place. As required by Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2(a)(2)(B) of the Texas Administrative Code, the City's record management system allows for the separation of water sales and uses into residential (single-family and multi-family), commercial, irrigation, institutional, and industrial categories. This information is included in the TCEQ-required Water Conservation Implementation Report, as described in Section 3.5.4.

The City meters all service connections and operates a comprehensive meter repair and replacement program. Through a central database system, the City maintains a record of the installation and or calibration date of all meters, regardless of size or class of customer served. Meters range in size from 5/8" to 16". In 2023, there were a total of 35,391 active retail customer meters in the City. Of these, nearly 88% were single family residential connections. A full breakdown of active retail meters by water use type is shown in **Table 3-4**.

TABLE 3-4: METER DISTRIBUTION BY WATER USE TYPE

Water Use Type	Total Number	Percent of Total
Residential – Single Family	30,976	87.53%
Residential – Multi-Family	1,022	2.89%
Industrial	18	0.05%
Commercial	2,544	7.19%
Institutional	831	2.35
Agricultural	0	0%
TOTAL	35,391	100%

The City recently upgraded to an Advanced Metering Infrastructure (AMI) system, replacing all positive displacement meters with magnetic meters, and retrofitting the larger turbine meters with new components for the AMI system. Additional information about the AMI system is provided in Section 3.6.7. The Director of Public Works has established a schedule in **Table 3-5** for when existing meters are calibrated, or a new meter is installed depending on meter size.

TABLE 3-5: METER TEST AND REPLACEMENT INTERVALS

Meter Size	Test Interval	Replacement Interval
5/8" and 1"	N/A	20 Years
1 1/2" and 2"	4 Years	10 Years
3" and 4"	4 Years	10 Years
6" and larger	1 Year	10 Years

Any meter of any size is replaced when it is determined the meter is inaccurate and cannot be economically repaired, regardless of age. Master production meters at the raw water sources and at the water treatment plants are calibrated annually and repaired/replaced as necessary. Damaged or defective meters that are either detected through observation or by AMI report are reported and work orders are submitted to Water Distribution Division through the computerized work order system. The work orders are then managed, accounted for, and completed by a meter repair section of the Public Works Department. Defective meters can also be reported by citizens/customers, utility work crews, or others. These reports are also recorded as work orders and processed as indicated. Finally, defective meters are often found by reviewing customer use patterns and analyzing summary data on individual accounts.

The City also aggressively pursues action against the illegal use of water through "straight-line" connections (i.e., unmetered water connections). Such instances are filed with the Municipal Court for prosecution and recovery of revenue. This metering and meter replacement and repair program is

programmed and budgeted annually. The Public Works Department's management monitors the success of the program through submission of tailored monthly reports.

3.4.3 Leak Detection, Repair, and Water Loss Accounting

To achieve the objective of reducing the loss and waste of water due to leaks and other forms of unreported losses, the City has an effective water loss accounting program in place. Through its AMI system, the City is able to track water usage for each of its meters on a minute-by-minute basis. This allows both the City and its customers to detect potential water losses within 24 hours rather than waiting for the 30-day usage summary on the customer's monthly water bill. The ability to detect and address water loss issues much earlier allows the City to reduce unnecessary water waste and improve water use efficiency. The City also tracks the overall water loss or nonrevenue water for its system as the difference between total volume discharged from its treatment plants and the water metered and sold to customers.

Table 3-6 shows the past five years (2019-2023) of water loss for the City. The long-term water loss goal established in the previous plan (2019) was to maintain 15 percent or less of the total water production as nonrevenue water. This Plan establishes new five- and ten-year water loss goals in GPCD and percentage (**Table 3-7**). The City will continue to reduce water losses throughout the system by analyzing and updating the targets and goals of this section in conjunction with the annual water loss audits required by TWDB. Beginning in 2025, TWDB will require utilities to have their most recent water loss audit validated by the TWDB Executive Administrator within three months of submittal or prior to consideration of a request for financial assistance from TWDB.

TABLE 3-6: WATER LOSS (2019-2023)

Year	Total Water Loss (gallons)	Water Loss in GPCD	Percent
2019	103,639,306	2	3.3%
2020	84,924,826	2	2.7%
2021	302,464,067	8	6.5%
2022	233,924,835	6	7.2%
2023 ¹	-53,903,337	-2	-1.4%
AVG	134,209,339	3	4.3%

¹2023 water loss was negative due to the production meters at the plant showing a value that was discharged to the system that when adjusted for leaks, etc., is less than what Utility Collections billed for the year.

TABLE 3-7: WATER LOSS GOALS

Description	Units	2029	2034
Water Loss GPCD ^a	GPCD	15	12
Water Loss Percentage ^b	%	13%	12%

a. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365

b. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

3.5 OTHER REQUIRED CONSERVATION MEASURES

3.5.1 Public Education and Information

The City has an active, comprehensive water conservation public education program in place. The City communicates information regarding water conservation and current drought restrictions through its website (www.wichitafallstx.gov). The website has a “Water Conservation Tips” page with resources available to encourage citizens to conserve water. Some of the resources include:

- List of permanent water conservation measures included in the City’s Water Conservation Ordinance (Sec. 106-186).
- List of 100 ways to save water.
- List of water savings tips for general, bathroom/laundry, kitchen, and outdoor water use.
- Instructions to sign up for water restrictions and news updates through the City’s “Notify Me” service.
- Information on average household water use, common causes of water waste that can be avoided, and cost savings estimates for water and energy efficient appliances.

There is also a Watering Restrictions page which provides information on the current watering restrictions based on the drought stage in effect.

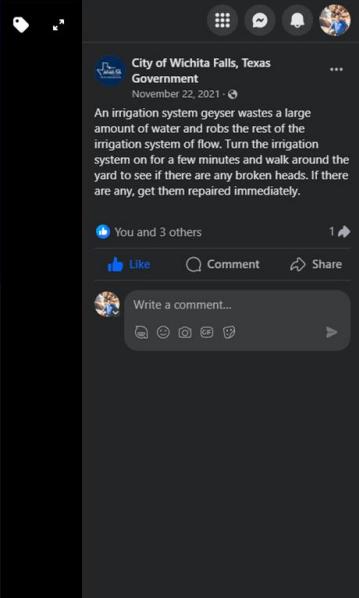
In addition to the website, the City has implemented or plans to implement the following public education efforts to communicate important water conservation information:

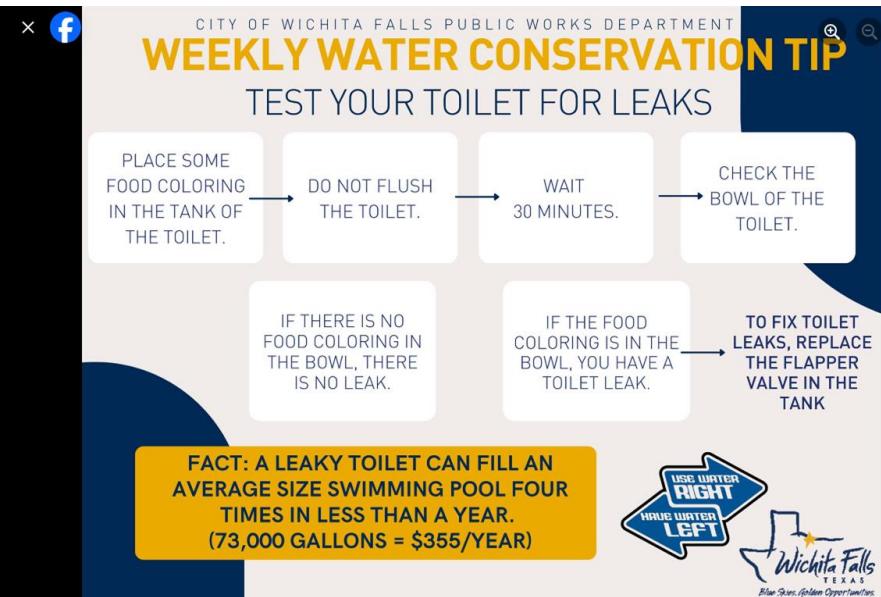
- Utilizing social media to communicate important information about current lake levels, water restrictions, water conservation tips, and local water conservation education activities. Examples of water conservation tips shared on social media are shown in Figure 3-4.
- Developed water conservation branding including the slogans “Use Water Right. Have Water Left” and “Be Water Wise” (Figure 3-5).
- Added water conservation messaging to the tailgates of 26 Utilities and Utility Collections department vehicles. The City estimates each of the 26 vehicles is seen by 20 citizens per day, equating to 135,200 views over the course of 260 workdays annually (Figure 3-6).

- Citizen Academy is held twice per year by the Public Works Department. Citizens are invited to attend to learn about all aspects of public works in the City. Water conservation education materials are distributed in the form of gift bags to citizens who attend.
- Partnership with the River Bend Nature Center to hold a weeklong summer camp for children dedicated to water education. The Conservation Coordinator works with the nature center to develop a curriculum centered around water resources and conservation. Typically, over 50 children attend the weeklong camps in the summer.
- Partnership with the Wichita Falls Public Library to sponsor an annual reading program. The program begins on Earth Day and ends during National Drinking Water Week. Students keep a log of water related books they read. At the end of the program, students receive a plush toy that represents a waterborne disease, a book worm, and a certificate (Figure 3-7). Other activities during the reading program include:
 - Encouraging students to fill up reusable water bottles at the library's water filling station and play the WaterSense game on the EPA website.
 - Students can track their reading progress through a maze challenge where kids are encouraged to read a water related book for at least 30 minutes per day. They can earn digital badges based on the number of minutes they read. Once they reach 630 minutes of reading, they complete the maze challenge and earn a prize.

FIGURE 3-4: THE CITY'S WATER CONSERVATION TIPS ON SOCIAL MEDIA







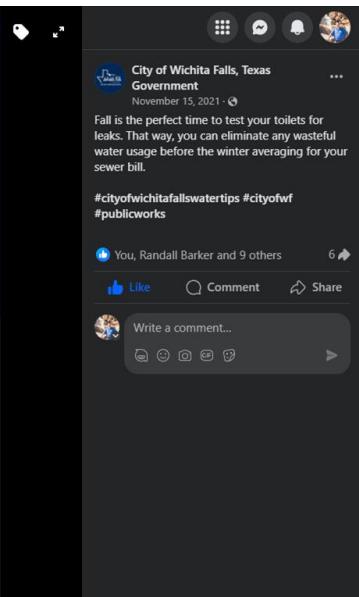


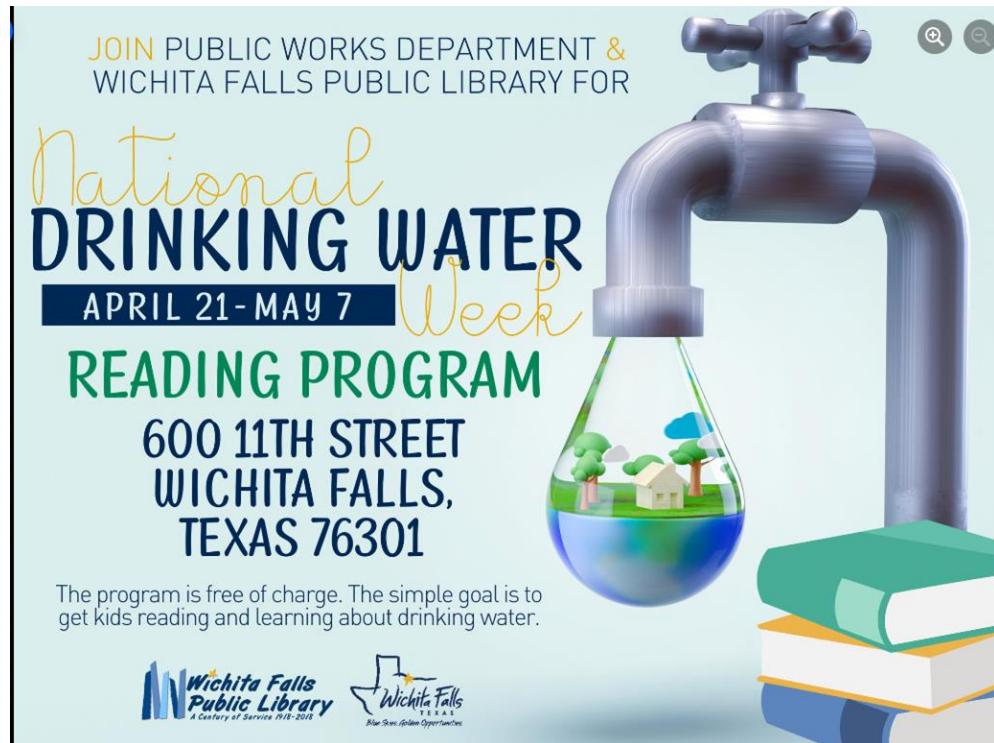
FIGURE 3-5: THE CITY'S WATER CONSERVATION SLOGANS



FIGURE 3-6: WATER CONSERVATION MESSAGING ON CITY VEHICLES



FIGURE 3-7: PROMOTIONAL MATERIAL FOR READING PROGRAM



3.5.2 Water Rate Structure

The City has an increasing block rate structure for its residential customers, and a flat rate structure for its non-residential customers (commercial, industrial, irrigation, agricultural, and institutional). Each customer is first charged a minimum rate based on meter size as outlined in **Table 3-8**. Usage charges are then assessed based on monthly water usage volumes (**Table 3-9**). For residential customers, water rates increase as total usage increases to encourage water conservation and decrease peak usage. For non-residential customers, a flat rate of \$4.31 per hundred cubic feet (1 CCF = 748 gallons) is charged for all usage volumes. The rates shown in this Plan are subject to change as the City continues to refine its rate structures to improve the impact on water conservation and manage the cost of service most effectively.

TABLE 3-8: MONTHLY METER BASE RATES

Meter Size	Minimum Base Rate
¾"	\$19.75
1"	\$39.99
1½"	\$73.74
2"	\$114.24
3"	\$208.78
4"	\$343.80
6"	\$681.35
8"	\$1,207.94
10"	\$1,883.19

TABLE 3-9: RESIDENTIAL WATER RATES

Monthly Volume	Water Rates (per CCF)
First 2 CCF	\$4.01
2 CCF to 10 CCF	\$4.20
10 CCF to 20 CCF	\$4.40
20 CCF to 40 CCF	\$4.81
40 CCF to 60 CCF	\$5.08
Above 60 CCF	\$5.39

Note: 1 CCF (hundred cubic feet) = 748 gallons

TABLE 3-10: COMMERCIAL WATER RATES

	Water Rate (per CCF)
All volumes	\$4.31

3.5.3 Reservoir System Operation

The City owns and operates Lakes Arrowhead, Kickapoo, and Wichita. The City also co-owns and operates Lakes Kemp and Diversion with WCWID #2. The City operates and maintains its reservoirs in accordance with State and Federal regulations and coordinates regularly with the appropriate agencies. More information about the operation of these reservoirs for the City's water supply can be found in Section 3.2.1.

As further described in Section 3.6.4, the Lake Arrowhead IRP augments natural inflows to the reservoir. The City has a policy of when to pump reuse to Lake Arrowhead to minimize spills from the reservoir. This also allows the City the opportunity to pump additional supplies from Lake Arrowhead in lieu of pumping from Lakes Kickapoo or Kemp.

3.5.4 Implementation and Enforcement

Implementation of the Water Conservation Plan is a matter of cooperative effort between the various departments of the City and its Water Resources Commission (WRC). The Director of Public Works coordinates the implementation and enforcement of the Plan through existing ordinances and adopted budgets. The City completes the TCEQ-required Water Conservation Implementation Report⁴ by May 1 of each year. The report includes various water conservation strategies that have been implemented, including the date of implementation. Additionally, the report includes progress made on the five- and ten- year per capita water use goals from this Plan. If the goals are not being met, the City will provide an explanation of why the goals are not being met. The amount of water saved is also documented in this report.

3.5.5 Coordination with Regional Water Planning Group

The City has been working with the Region B Regional Water Planning Group (RWPG) to help develop the water conservation plan documents. This Water Conservation Plan has been discussed with the RWPG consultants and is consistent with their methodology and structure. A letter documenting that a copy of the Water Conservation Plan was sent to the Chair of the Region B RWPG is attached in Appendix D.

3.6 ADDITIONAL CONSERVATION EFFORTS

3.6.1 Conservation Coordinator

The Utilities Operations Manager serves as the City's Conservation Coordinator. The Conservation Coordinator is responsible for preparation and implementation of the City's water conservation and drought contingency plans, preparation, and submittal of annual conservation status reports to utility management, and implementation of the City's conservation program. Other duties of the Conservation Coordinator may include promotion of water conservation programs, developing marketing strategies for conservation programs, coordination with other utility staff and promoting the value of conservation programs within the utility, participation in regional water planning conservation and drought period initiatives and management of conservation staff, consultants and contractors when appropriate.

3.6.2 Water Resources Commission

WRC is a group of citizen volunteers who are responsible for analyzing and recommending strategies for efficient water use and practical water management. The WRC consists of five members appointed by the City Council to alternating two-year terms. Each member has a professional interest in the efficient use of water. The WRC meets periodically and prepares a report with observations and recommendations to be submitted to City Council. The City coordinated with the WRC for the development of this Plan. The process for updating the Plan was presented at the WRC meeting on November 6, 2023. The draft Plan was provided to the WRC for review and feedback was received on March 20, 2024.

3.6.3 Water-Conserving Plumbing Fixtures

The City adopted the 2015 International Plumbing Code, which is included in the City's code of ordinances. The code encourages water conservation through the requirement for new construction or renovation to include water efficient plumbing fixtures and facilities.

3.6.4 Water Reuse

As mentioned in Section 3.2.3, the City implemented an IPR system in 2018 to transport treated wastewater effluent from the WFRRF to Lake Arrowhead for future water supply use. The IPR system is permitted to supply up to 16 MGD and is currently supplying an average of eight MGD to Lake Arrowhead which would otherwise be discharged into the Wichita River downstream of the City's water supply system and become unavailable. The IPR system reduces the demand for new water on Lake Arrowhead and Lake Kickapoo. The City's IPR system received the 2019 Outstanding Civil Engineering Achievement

Award from the Texas chapter of the American Society of Civil Engineers and has been recognized for excellence by several organizations, including the Texas Municipal League, the Water Environment Association of Texas, the Texas Public Works Association, and the U.S. Environmental Protection Agency.

The City also provides up to 0.25 MGD of direct non-potable reuse water to the Vitro manufacturing facility for use as cooling water. Both the NSRRF and WFRRF utilize wastewater effluent for on-site irrigation, reducing the need for potable water. The City also has the ability to use reuse water from the WFRRF for irrigation purposes at nearby Williams Park.

3.6.5 Landscape Water Management

The City has an existing ordinance (Appendix E) which includes permanent water conservation measures that are effective at all times. These measures include the following landscape watering restrictions that make it unlawful to:

- Run outside spray-type irrigation on any day of the week between 10:00 a.m. and 7:00 p.m. unless one is using a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket, watering can, bubbler or drip irrigation system.
- Fail to repair a controllable leak, including but not limited to a broken sprinkler head, a broken pipe or a leaking valve.
- Operate an irrigation system with a broken or missing head, or a head that is out of adjustment and the arc of the spray head is over a street, parking area, or other impervious surface.
- Allow water flow during irrigation that runs, flows, or streams in a way that extends a distance of 100 feet or greater from the area being irrigated.
- Operate a soaker hose, bubbler or drip irrigation system in a manner that causes the delivery of more water than the hose, bubbler, or system was intended by the manufacturer to deliver, or that allows water to run for a distance of five feet or greater from the area being irrigated.

The City may implement further landscape water restrictions depending on the current drought stage conditions. These restrictions are outlined in the City's Drought Contingency Plan.

3.6.6 Conservation Programs for Industrial, Commercial, and Institutional Accounts

The City will work closely with its Industrial, Commercial, and Institutional (ICI) water users to track their water use and look for ways to conserve water. Water conservation efforts for Industrial and Mining use are described in Section 5.0.

3.6.7 Advanced Metering Infrastructure

The City has fully upgraded its water meters to an AMI system. The main components of the AMI system include:

- Equipment enabling meters to be read remotely rather than physically;
- A communications network delivering the meter data to a central database; and
- Software systems allowing City staff and customers to view water usage data collected from the AMI smart meters.

The AMI system allows both the City and its customers to see the water usage data on a minute-by-minute basis, rather than just the 30-day usage summary available with the City's previous positive displacement system. This gives the City and its customers the ability to detect irregularities in water usage much earlier, which can help reduce the volume of water lost to leaks or other causes of water loss.

Every customer can access their AMI data through an online portal called "MyH2O." Through the portal, customers can monitor their water usage and set up text or email alerts to be sent if their water usage exceeds a certain daily, weekly, or monthly usage amount set by the customer. The MyH2O system will notify the customer within 24 hours of exceeding their set water usage limit. The system also has a vacation alert setting that allows customers to set limits based on specific dates and notify them if their water usage is higher than expected when they are not home using water. The MyH2O dashboard allows users to see their current water bill cycle, the previous month, and a comparison to previous years usage. Water use data can be viewed in increments of 24 hours, seven days, 30 days, or by specific dates. The data is available in gallons, cubic feet, or CCF, and can be downloaded in multiple formats. Users can also add multiple meters under one account and give them custom nicknames. The City has information and resources about the AMI system and the MyH2O portal available on its website.

The City's AMI system supports water conservation by allowing customers to view their daily water usage online. This helps keep customers more aware of their water use and how their habits affect their water bill. Using the detailed water use data that AMI provides, the City can better manage its water system by identifying and responding to issues sooner. More frequent data analysis such as comparing produced

water volumes to metered water volumes sold to customers could help the City identify and address sources of water loss.

3.6.8 Additional Permanent Water Conservation Measures

In addition to the permanent landscape watering measures described in Section 3.6.5, the City's water conservation ordinance includes permanent water conservation measures for several other types of water uses that are effective at all times. These use types include:

- Car washing;
- Restaurants/Bars/Clubs/School Cafeterias;
- Ice machines; and
- Hotels/Motels/Short-Term Lodging.

The full ordinance with the permanent water conservation measures is provided in Appendix E.

3.7 ADOPTION OF WATER CONSERVATION PLAN; PERIODIC REVIEW AND UPDATE OF PLAN

Opportunity for public comment on the Plan was provided at a City of Wichita Falls City Council meeting on April 16, 2024. Appendix E contains a copy of the minutes of the April 16, 2024 City Council meeting at which this Water Conservation Plan was adopted.

TCEQ requires that water conservation plans be reviewed and, if necessary, updated every five years to coincide with the regional water planning process. This Water Conservation Plan was updated as required by TCEQ and will be continually reassessed for opportunities to improve water efficiency and conservation based on new or updated information.

4.0 WATER CONSERVATION PLAN FOR WHOLESALE WATER SUPPLIERS

4.1 DESCRIPTION OF WHOLESALE SERVICE AREA

The wholesale service area includes multiple wholesale customers. Most customers purchase only treated water; however, three customers purchase only raw water, and two customers have purchased both raw and treated water in the past five years (Wichita Valley Water Supply Corporation (WSC) and Red River Authority). **Table 4-1** shows each wholesale customer and their annual contract amounts with City. Figure

4-1 shows a map of the City's wholesale water service area. The City's wholesale customers account for about 20% of the total raw water demand.

TABLE 4-1: WHOLESALE CUSTOMERS

Wholesale Customer	Annual Contract Amount (MG)	Raw or Treated Water
Archer City	155	Raw
Archer County MUD #1	168	Treated
Holliday	80	Treated
Lakeside City	60	Treated
Scotland	67	Treated
Windthorst WSC	274	Raw
Dean Dale WSC	301	Treated
Red River Authority ¹	136	Treated
Burkburnett	608	Treated
Friberg Cooper WSC	55	Treated
Iowa Park ²	456	Treated
Pleasant Valley	38	Treated
Sheppard A.F.B. ³	N/A	Treated
Wichita Valley WSC ⁴	369	Both
Olney	360	Raw

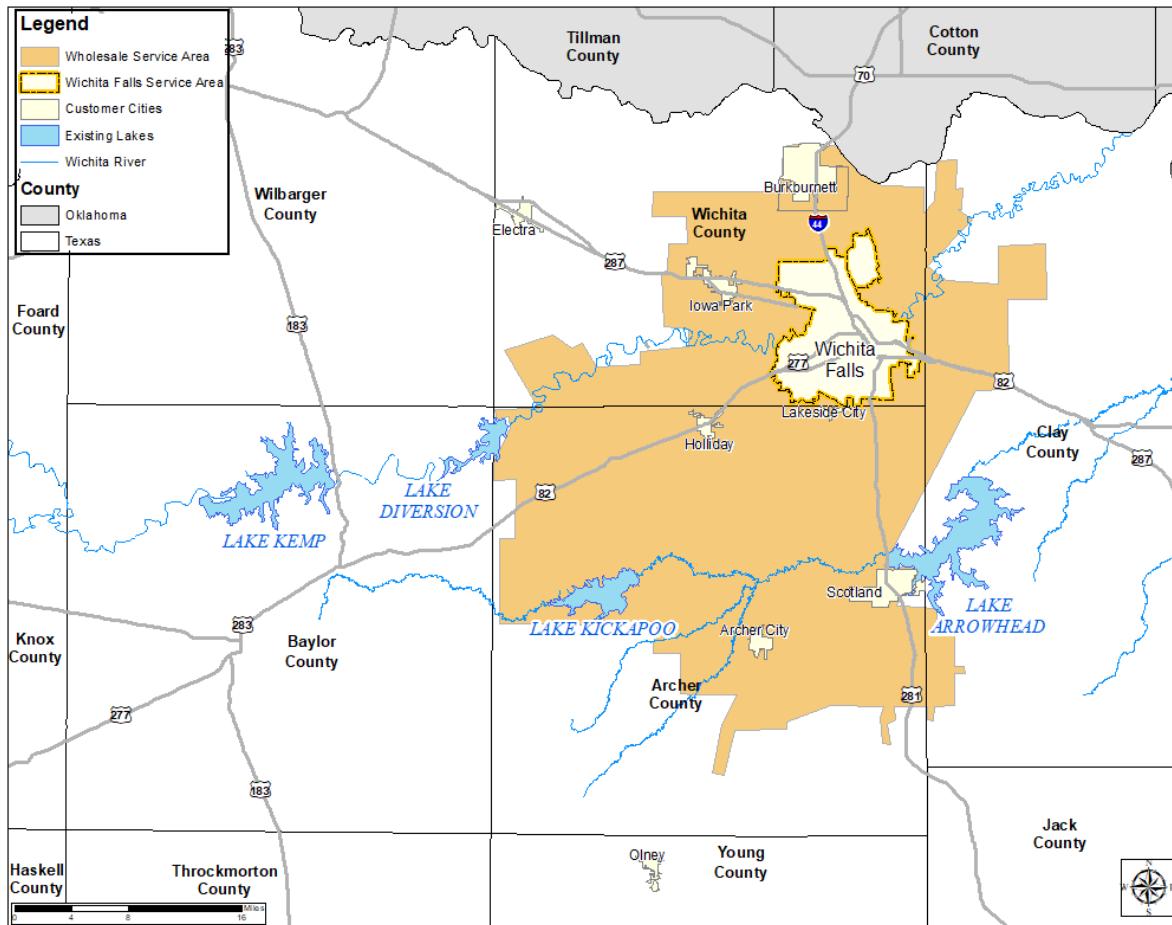
¹Red River Authority switched from raw to treated water in April 2021.

²Iowa Park's contract is a max day amount of 2.5 MGD. A peaking factor of 2 was assumed to convert to an annual amount in MG. Iowa Park also sells water to Electra and Wichita Valley WSC.

³SAFB does not have a set contract amount with the City.

⁴Wichita Valley WSC buys both raw and treated water.

FIGURE 4-1: WHOLESALE SERVICE AREA



4.2 SPECIFIC WHOLESALE WATER CONSERVATION GOALS

The conservation goals as outlined in this section of the Plan are intended as guides for the wholesale customers. When existing contracts are renewed and new contracts are signed, requirements for implementation of water conservation plans will be incorporated into the respective wholesale customer contracts.

The City expects each wholesale customer to voluntarily reduce its water use through conservation practices. The targets in **Table 4-2** below are recommended for each wholesale customer. The water conservation goals for wholesale customers match the conservation goals for the City for total GPCD, residential GPCD, and water loss percentage. The City requires each wholesale customer to implement water conservation plans that reduce water use to meet the target goals.

TABLE 4-2: WHOLESALE CUSTOMER WATER CONSERVATION GOALS

	Total GPCD	Residential GPCD	Water Loss Percentage
By 2029	155	66	13%
By 2034	150	63	12%

4.3 METERING, WATER USE RECORDS, CONTROL OF NONREVENUE WATER, AND LEAK DETECTION AND REPAIR

The City has a comprehensive metering and record management system in place to measure and account for all water diverted from water supply sources and delivered to wholesale customers. The City has meters for each of its connections with wholesale customers to accurately account for all water sent to wholesale customers. More information about metering, record management, control of nonrevenue water, and leak detection and repair can be found in Section 3.4.

4.4 WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

In every water supply contract entered into or renewed after official adoption of the Plan, and including any contract extension, the City will include a provision requiring each successive wholesale customer to develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of Chapter 288. 30 Tex. Admin. Code § 288.5.

The City requests that each wholesale customer provide a copy of its Water Conservation Plan and required water system audit (pursuant to the TWDB water audit reporting requirement specified by House Bill 3338) to the City. This will be required in any new contracts developed with wholesale customers as specified in Chapter 288. 30 Tex. Admin. Code § 288.5(1)(F).

4.5 RESERVOIR SYSTEM OPERATION

Please refer to Sections 3.2.1 and 3.5.3 for information about the City's water supply reservoir system operations.

4.6 MEANS OF IMPLEMENTATION AND ENFORCEMENT

Please refer to Section 3.5.4 for information about the implementation and enforcement of the Water Conservation Plan.

4.7 COORDINATION WITH REGIONAL WATER PLANNING GROUP

Please refer to Section 3.5.5 for information about coordination with the Region B RWPG.

4.8 REVIEW AND UPDATE OF PLAN

Please refer to Section 3.7 for information about the review and update of the Water Conservation Plan.

4.9 ADDITIONAL WHOLESALE CONSERVATION EFFORTS

4.9.1 Program for Water Reuse and/or Recycling

As described in Section 3.6.4, the City's IPR program is permitted for up to 16 MGD and currently supplies an average of 8 MGD of reuse water to Lake Arrowhead. The City treats water from Lake Arrowhead and distributes it to its retail and wholesale customers. The City's wholesale customers benefit from the IPR program as it provides the City with an independent and reliable water supply to continue delivering to its wholesale customers under normal conditions. During drought restrictions, IPR supplies may be reduced which in turn could reduce the available supply for the City's wholesale customers. The City also encourages its customers to practice reuse and recycling where feasible.

5.0 WATER CONSERVATION PLAN REQUIREMENTS FOR INDUSTRIAL AND MINING USE

5.1 DESCRIPTION OF INDUSTRIAL AND MINING WATER USE

The City holds water right permits for four of its water supply reservoirs (Lakes Arrowhead, Kickapoo, Kemp, and Diversion) to divert water for industrial and mining use. The City is actively working with local industries for current and future developments. Recently, WCWID #2 and the City entered into an agreement with an industrial facility in Wilbarger County for water from Lake Kemp. The City does not have any mining customers at this time, but it may provide water for future mining needs that would likely be associated with oil and gas development.

5.2 INDUSTRIAL AND MINING WATER CONSERVATION GOALS

The City has established a water conservation goal for industrial and mining water use of achieving a specific percentage of water reused by industrial and mining operations. The specific five- and ten-year targets are to reuse at least five percent of the total water used by industrial and mining operations.

5.3 PRACTICES TO MEASURE AND ACCOUNT FOR THE AMOUNT OF WATER DIVERTED FROM RESERVOIR SOURCES

The City has a comprehensive metering and record management system in place to measure and account for all water diverted from water supply sources. Please refer to **Section 3.4.1** for more information about these practices.

5.4 LEAK DETECTION, REPAIR AND WATER LOSS ACCOUNTING

The City's leak detection, repair and water loss accounting program is described **in Section 3.4.3**. The City's industrial and mining customers are responsible for detecting and repairing leaks and accounting for water losses in its water distribution system that occur after the City has delivered the water.

5.5 STATE OF THE ART EQUIPMENT/PROCESSES TO IMPROVE EFFICIENCY

The City suggests that each industrial and mining customer provide a description of existing water-efficient equipment or processes to demonstrate any water conservation savings that are already being achieved. Customers should also describe any plans to implement state-of-the-art equipment and/or process modifications to improve water use efficiency.

5.6 REVIEW AND UPDATE OF PLAN

Please refer to Section 3.7 for information about the review and update of the Water Conservation Plan.

6.0 WATER CONSERVATION PLAN REQUIREMENTS FOR AGRICULTURAL USE

The City holds water right permits for four of its water supply reservoirs (Lakes Arrowhead, Kickapoo, Kemp, and Diversion) to divert water for agricultural use. The City does not currently supply water to any customers for agricultural use, but the TCEQ requirements for systems providing agricultural water to more than one user [30 Tex. Admin. Code § 288.4(a)(3)] are provided in this section as the City could begin providing water for agricultural uses in the future under its current water right permits.

6.1 SYSTEM INVENTORY

Please refer to Section 3.2.1 for information about the City's water supply system. The City has not established management practices for agricultural water use as it does not currently provide agricultural water to any customers. The City uses meters, as described in Section 3.4, to account for all water delivered to its customers. A user profile is not provided because the City does not currently have any agricultural water customers.

6.2 AGRICULTURAL WATER CONSERVATION GOALS

The City has not established water conservation goals for agricultural use since it does not currently have any agricultural water customers. Please refer to **Section 3.3** for information on the City's overall water conservation goals.

6.3 METERING, RECORD MANAGEMENT, CONTROL OF NONREVENUE WATER, AND LEAK DETECTION AND REPAIR

The City has a comprehensive metering and record management system in place to measure and account for all water diverted from water supply sources and delivered to all customers. More information about metering, record management, control of nonrevenue water, and leak detection and repair can be found in Section 3.4.

6.4 CUSTOMER ASSISTANCE PROGRAM FOR ON-FARM WATER CONSERVATION AND POLLUTION PREVENTION PLANS

The City shares two water supply reservoirs (Lakes Kemp and Diversion) with WCWID #2, and the City's water right permit to use water from Lakes Kemp and Diversion for agricultural purposes is jointly owned by WCWID #2 and the City. WCWID #2 is familiar with BMPs for agricultural water conservation. The City will coordinate with WCWID #2 to implement a customer assistance program for on-farm water conservation and pollution prevention plans, if necessary.

6.5 WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

Please refer to Section 4.0 for information about the City's Water Conservation Plan for wholesale customers.

6.6 COORDINATION WITH REGIONAL WATER PLANNING GROUP

Please refer to Section 3.5.5 for information about coordination with the Region B RWPG.

6.7 ADOPTION OF WATER CONSERVATION PLAN; PERIODIC REVIEW AND UPDATE OF PLAN

Please refer to Section 3.7 for information about the review and update of the Water Conservation Plan.

APPENDIX A
LIST OF REFERENCES



1. Title 30 of the Texas Administrative Code, Part 1, Chapter 288, Subchapter A, Rules 288.1, 288.2, 288.3, 288.4, 288.5, and 288.7, downloaded from:
[https://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=288](https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=288),
January 2023.
2. City of Wichita Falls, "Water Conservation and Drought Contingency Plans" August 2018.
https://www.wichitafallstx.gov/DocumentCenter/View/37252/Water-Conservation-Plan_2019-Update_Council-Approved?bidId=
3. Texas Water Development Board, Water Conservation Advisory Council, "Water Conservation Best Management Practices" available from:
<https://www.twdb.texas.gov/conservation/BMPs/index.asp>
4. Texas Commission on Environmental Quality Implementation Report.
<https://www.tceq.texas.gov/downloads/permitting/water-rights/water-conservation/20645.pdf>

APPENDIX B

TEXAS COMMISSION OF ENVIRONMENTAL QUALITY RULES ON WATER CONSERVATION PLANS

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
<u>PART 1</u>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<u>CHAPTER 288</u>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.1</u>	Definitions

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Agricultural or Agriculture--Any of the following activities:

- (A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;
- (B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;
- (C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;
- (D) raising or keeping equine animals;
- (E) wildlife management; and
- (F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

(2) Agricultural use--Any use or activity involving agriculture, including irrigation.

(3) Best management practices--Voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specific time frame.

(4) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

(5) Commercial use--The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial, or institutional users.

(6) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).

(7) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric, but does not include agricultural use.

(8) Institutional use--The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison, or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.

(9) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water from a public water supplier.

(10) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

(11) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field re-pressuring.

(12) Municipal use--The use of potable water provided by a public water supplier as well as the use of sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.

(13) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(14) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(15) Public water supplier--An individual or entity that supplies water to the public for human consumption.

(16) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(17) Residential gallons per capita per day--The total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.

(18) Residential use--The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor uses.

(19) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(20) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

(21) Total use--The volume of raw or potable water provided by a public water supplier to billed customer sectors or nonrevenue uses and the volume lost during conveyance, treatment, or transmission of that water.

(22) Total gallons per capita per day (GPCD)--The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in this chapter shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.

(23) Water conservation coordinator--The person designated by a retail public water supplier that is responsible for implementing a water conservation plan.

(24) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(25) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

(26) Wholesale use--Water sold from one entity or public water supplier to other retail water purveyors for resale to individual customers.

Source Note: The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective January 10, 2008, 33 TexReg 193; amended to be effective December 6, 2012, 37 TexReg 9515; amended to be effective August 16, 2018, 43 TexReg 5218

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<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.2</u>	Water Conservation Plans for Municipal Uses by Public Water Suppliers

(a) A water conservation plan for municipal water use by public water suppliers must provide information in response to the following. If the plan does not provide information for each requirement, the public water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for municipal uses by public water suppliers must include the following elements:

(A) a utility profile in accordance with the Texas Water Use Methodology, including, but not limited to, information regarding population and customer data, water use data (including total gallons per capita per day (GPCD) and residential GPCD), water supply system data, and wastewater system data;

(B) a record management system which allows for the classification of water sales and uses into the most detailed level of water use data currently available to it, including, if possible, the sectors listed in clauses (i) - (vi) of this subparagraph. Any new billing system purchased by a public water supplier must be capable of reporting detailed water use data as described in clauses (i) - (vi) of this subparagraph:

- (i) residential;
- (I) single family;
- (II) multi-family;
- (ii) commercial;
- (iii) institutional;
- (iv) industrial;
- (v) agricultural; and,
- (vi) wholesale.

(C) specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use in total GPCD and residential GPCD. The goals established by a public water supplier under this subparagraph are not enforceable;

(D) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;

(E) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;

(F) measures to determine and control water loss (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.);

(G) a program of continuing public education and information regarding water conservation;

(H) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;

- (I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and
- (J) a means of implementation and enforcement which shall be evidenced by:
 - (i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and
 - (ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and
- (K) documentation of coordination with the regional water planning groups for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next ten years subsequent to the effective date of the plan must include the following elements:

- (A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system;
- (B) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.
- (3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:
 - (A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;
 - (B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;
 - (C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;
 - (D) reuse and/or recycling of wastewater and/or graywater;
 - (E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;
 - (F) a program and/or ordinance(s) for landscape water management;
 - (G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and
 - (H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.
- (b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements

of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.

(c) A public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.2 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.3</u>	Water Conservation Plans for Industrial or Mining Use

(a) A water conservation plan for industrial or mining uses of water must provide information in response to each of the following elements. If the plan does not provide information for each requirement, the industrial or mining water user shall include in the plan an explanation of why the requirement is not applicable.

(1) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;

(2) specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by industrial or mining water users under this paragraph are not enforceable;

(3) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;

(4) leak-detection, repair, and accounting for water loss in the water distribution system;

(5) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and

(6) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) An industrial or mining water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The industrial or mining water user shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.3 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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GUIDELINES AND REQUIREMENTS****SUBCHAPTER A****WATER CONSERVATION PLANS****RULE §288.4****Water Conservation Plans for Agricultural Use**

(a) A water conservation plan for agricultural use of water must provide information in response to the following subsections. If the plan does not provide information for each requirement, the agricultural water user must include in the plan an explanation of why the requirement is not applicable.

(1) For an individual agricultural user other than irrigation:

(A) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;

(B) specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by agricultural water users under this subparagraph are not enforceable;

(C) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;

(D) leak-detection, repair, and accounting for water loss in the water distribution system;

(E) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and

(F) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(2) For an individual irrigation user:

(A) a description of the irrigation production process which shall include, but is not limited to, the type of crops and acreage of each crop to be irrigated, monthly irrigation diversions, any seasonal or annual crop rotation, and soil types of the land to be irrigated;

(B) a description of the irrigation method, or system, and equipment including pumps, flow rates, plans, and/or sketches of the system layout;

(C) a description of the device(s) and/or methods, within an accuracy of plus or minus 5.0%, to be used in order to measure and account for the amount of water diverted from the source of supply;

(D) specific, quantified five-year and ten-year targets for water savings including, where appropriate, quantitative goals for irrigation water use efficiency and a pollution abatement and prevention plan. The goals established by an individual irrigation water user under this subparagraph are not enforceable;

- (E) water-conserving irrigation equipment and application system or method including, but not limited to, surge irrigation, low pressure sprinkler, drip irrigation, and nonleaking pipe;
- (F) leak-detection, repair, and water-loss control;
- (G) scheduling the timing and/or measuring the amount of water applied (for example, soil moisture monitoring);
- (H) land improvements for retaining or reducing runoff, and increasing the infiltration of rain and irrigation water including, but not limited to, land leveling, furrow diking, terracing, and weed control;
- (I) tailwater recovery and reuse; and
- (J) any other water conservation practice, method, or technique which the user shows to be appropriate for preventing waste and achieving conservation.

(3) For a system providing agricultural water to more than one user:

- (A) a system inventory for the supplier's:
 - (i) structural facilities including the supplier's water storage, conveyance, and delivery structures;
 - (ii) management practices, including the supplier's operating rules and regulations, water pricing policy, and a description of practices and/or devices used to account for water deliveries; and
 - (iii) a user profile including square miles of the service area, the number of customers taking delivery of water by the system, the types of crops, the types of irrigation systems, the types of drainage systems, and total acreage under irrigation, both historical and projected;
- (B) specific, quantified five-year and ten-year targets for water savings including maximum allowable losses for the storage and distribution system. The goals established by a system providing agricultural water to more than one user under this subparagraph are not enforceable;
- (C) a description of the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply;
- (D) a monitoring and record management program of water deliveries, sales, and losses;
- (E) a leak-detection, repair, and water loss control program;
- (F) a program to assist customers in the development of on-farm water conservation and pollution prevention plans and/or measures;
- (G) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;
- (H) official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier;
- (I) any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation; and
- (J) documentation of coordination with the regional water planning groups, in order to ensure consistency with appropriate approved regional water plans.

(b) A water conservation plan prepared in accordance with the rules of the United States Department of Agriculture Natural Resource Conservation Service, the Texas State Soil and Water Conservation Board, or other federal or state agency and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and that agency.

(c) An agricultural water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. An agricultural water user shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.4 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.5</u>	Water Conservation Plans for Wholesale Water Suppliers

A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale water supplier shall include in the plan an explanation of why the requirement is not applicable.

- (1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:
 - (A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;
 - (B) specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;
 - (C) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;
 - (D) a monitoring and record management program for determining water deliveries, sales, and losses;
 - (E) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;
 - (F) a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;
 - (G) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;

(H) a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(I) documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) a program to assist agricultural customers in the development of conservation pollution prevention and abatement plans;

(C) a program for reuse and/or recycling of wastewater and/or graywater; and

(D) any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(3) Review and update requirements. The wholesale water supplier shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.5 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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<u>SUBCHAPTER A</u>	WATER CONSERVATION PLANS
<u>RULE §288.7</u>	Water Conservation Plan Requirements for Plans Submitted with a Water Right Application

(a) A water conservation plan submitted with an application for a new or additional appropriation of water must include data and information which:

(1) supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan;

(2) evaluates conservation as an alternative to the proposed appropriation; and

(3) evaluates any other feasible alternative to new water development including, but not limited to, waste prevention, recycling and reuse, water transfer and marketing, regionalization, and optimum water management practices and procedures.

(b) It shall be the burden of proof of the applicant to demonstrate that no feasible alternative to the proposed appropriation exists and that the requested amount of appropriation is necessary and reasonable for the proposed use.

Source Note: The provisions of this §288.7 adopted to be effective May 3, 1993, 18 TexReg 2558

APPENDIX C

CITY OF WICHITA FALLS UTILITY PROFILE BASED ON TCEQ FORMAT

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

CONTACT INFORMATION

Name of Utility: CITY OF WICHITA FALLS

Public Water Supply Identification Number (PWS ID): TX2430001

Certificate of Convenience and Necessity (CCN) Number: P0856

Surface Water Right ID Number: 5122, 5144-B, 5150-B

Wastewater ID Number:

Contact: First Name: Mark Last Name: Southard

Title: Water Source/Purification Superintendent

Address: P.O. Box 1431 City: Wichita Falls State: TX

Zip Code: 76307 Zip+4: Email: Mark.Southard@wichitafallstx.gov

Telephone Number: 9406911153 Date:

Is this person the designated Conservation Coordinator?

Yes No

Regional Water Planning Group: B

Groundwater Conservation District:

Our records indicate that you:

Received financial assistance of \$500,000 or more from TWDB

Have 3,300 or more retail connections

Have a surface water right with TCEQ

A. Population and Service Area Data

1. Current service area size in square miles: 72

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

2. Historical service area population for the previous five years, starting with the most current year.

Year	Historical Population Served By Retail Water Service	Historical Population Served By Wholesale Water Service	Historical Population Served By Wastewater Water Service
2023	96,836	68,585	102,664
2022	104,553	35,837	104,553
2021	104,683	35,837	104,683
2020	104,000	46,000	104,000
2019	104,000	46,000	104,000

3. Projected service area population for the following decades.

Year	Projected Population Served By Retail Water Service	Projected Population Served By Wholesale Water Service	Projected Population Served By Wastewater Water Service
2030	102,308	46,455	108,213
2040	104,299	46,459	110,204
2050	106,290	46,482	112,195
2060	107,285	46,524	113,190
2070	108,280	46,569	114,185

4. Described source(s)/method(s) for estimating current and projected populations.

From the 2022 Region B RWPG adopted projections.

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

B. System Input

System input data for the previous five years.

Total System Input = Self-supplied + Imported – Exported

Year	Water Produced in Gallons	Purchased/Imported Water in Gallons	Exported Water in Gallons	Total System Input	Total GPCD
2023	4,781,188,000	0	1,038,350,209	3,742,837,791	106
2022	5,347,400,000	0	1,208,308,823	4,139,091,177	108
2021	5,008,491,000	0	983,004,668	4,025,486,332	105
2020	4,940,420,000	0	1,016,701,016	3,923,718,984	103
2019	4,895,510,000	0	981,435,080	3,914,074,920	103
Historic Average	4,994,601,800	0	1,045,559,959	3,949,041,841	105

C. Water Supply System

1. Designed daily capacity of system in gallons	74
2. Storage Capacity	
2a. Elevated storage in gallons:	6,500,000
2b. Ground storage in gallons:	31,100,000

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

D. Projected Demands

1. The estimated water supply requirements for the next ten years using population trends, historical water use, economic growth, etc.

Year	Population	Water Demand (gallons)
2025	147,687	12,018,095,027
2026	147,902	12,030,521,034
2027	148,117	14,649,755,042
2028	148,332	14,662,181,050
2029	148,548	14,674,607,058
2030	148,763	14,687,033,066
2031	148,963	15,358,137,814
2032	149,162	15,367,765,033
2033	149,362	15,377,392,251
2034	148,561	15,387,019,469

2. Description of source data and how projected water demands were determined.

For the 2025-2034 population, we used the baseline 2020 population and the 2030 and 2040 projections for Wichita Falls and its wholesale customers, then used linear interpolation to estimate the years in between. Used the same approach for the demand projections for Wichita Falls, SAFB, and any of its wholesale customers without contract amounts. For the customers with set contract amounts, we kept the contractual demand the same for 2025-2034.

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

E. High Volume Customers

1. The annual water use for the five highest volume
RETAIL customers.

Customer	Water Use Category	Annual Water Use	Treated or Raw
Allred Prison	Institutional	242,851,664	Treated
Vitro	Industrial	138,907,340	Treated
City of Wichita Falls Parks Department	Institutional	80,742,112	Treated
Midwestern State University	Institutional	42,398,884	Treated
Wichita Falls ISD	Institutional	20,771,960	Treated

2. The annual water use for the five highest volume
WHOLESALE customers.

Customer	Water Use Category	Annual Water Use	Treated or Raw
Iowa Park	Municipal	421,537,728	Treated
Sheppard Air Force Base	Municipal	245,621,508	Treated
City of Olney	Municipal	154,570,000	Raw
Wichita Valley WSC	Municipal	97,948,000	Raw
City of Windthorst	Municipal	93,067,000	Raw

F. Utility Data Comment Section

Additional comments about utility data.

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

Section II: System Data

A. Retail Water Supplier Connections

1. List of active retail connections by major water use category.

Water Use Category Type	Total Retail Connections (Active + Inactive)	Percent of Total Connections
Residential - Single Family	30,976	87.53 %
Residential - Multi-Family	1,022	2.89 %
Industrial	18	0.05 %
Commercial	2,544	7.19 %
Institutional	831	2.35 %
Agricultural	0	0.00 %
Total	35,391	100.00 %

2. Net number of new retail connections by water use category for the previous five years.

Year	Net Number of New Retail Connections						
	Residential - Single Family	Residential - Multi-Family	Industrial	Commercial	Institutional	Agricultural	Total
2023	30,976	1,022	18	2,544	831	0	35,391
2022	30,956	1,025	18	2,519	843	0	35,361
2021	30,285	1,001	18	2,405	830	0	34,539
2020	30,726	1,030	18	3,455	835	0	36,064
2019	30,558	1,041	18	2,435	835	0	34,887

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

B. Accounting Data

The previous five years' gallons of RETAIL water provided in each major water use category.

Year	Residential - Single Family	Residential - Multi-Family	Industrial	Commercial	Institutional	Agricultural	Total
2023	2,394,272,538	390,595,128	145,266,836	875,351,026	281,093,915	0	4,086,579,443
2022	2,126,681,437	366,849,868	154,594,396	896,007,846	281,518,776	0	3,825,652,323
2021	1,926,577,224	406,088,452	159,297,820	919,760,696	297,209,572	0	3,708,933,764
2020	2,040,983,824	393,555,712	191,320,448	888,528,868	250,577,008	0	3,764,965,860
2019	1,980,579,084	380,568,936	149,939,592	945,998,356	276,439,108	0	3,733,525,076

C. Residential Water Use

The previous five years' residential GPCD for single family and multi-family units.

Year	Total Residential GPCD
2023	70
2022	66
2021	64
2020	64
2019	65
Historic Average	66

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

D. Annual and Seasonal Water Use

1. The previous five years' gallons of treated water provided to RETAIL customers.

Month	Total Gallons of Treated Water				
	2023	2022	2021	2020	2019
January	254,147,185	258,392,600	189,466,630	258,207,903	245,847,512
February	231,207,767	245,299,217	298,711,859	239,124,766	222,342,781
March	259,676,635	283,020,993	286,817,546	249,695,455	232,949,208
April	283,854,684	246,787,851	267,458,290	297,994,857	270,371,409
May	308,022,280	311,373,811	265,241,558	335,968,117	278,755,973
June	299,404,035	436,846,493	331,377,293	401,921,396	333,024,419
July	431,669,528	477,477,919	370,527,577	429,814,396	443,313,884
August	433,974,946	331,398,213	414,030,129	390,315,980	449,061,674
September	366,326,786	382,992,259	412,818,415	259,909,324	418,092,131
October	314,382,048	327,164,860	302,830,175	284,352,038	343,347,964
November	273,401,791	260,340,742	269,887,286	263,993,273	232,808,216
December	239,916,630	264,557,365	299,767,006	273,717,627	263,511,661
Total	3,695,984,315	3,825,652,323	3,708,933,764	3,685,015,132	3,733,426,832

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

2. The previous five years' gallons of raw water provided to RETAIL customers.

Month	Total Gallons of Raw Water				
	2023	2022	2021	2020	2019
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
Total	0	0	0	0	0

3. Summary of seasonal and annual water use.

	Summer RETAIL (Treated + Raw)	Total RETAIL (Treated + Raw)
2023	1,165,048,509	3,695,984,315
2022	1,245,722,625	3,825,652,323
2021	1,115,934,999	3,708,933,764
2020	1,222,051,772	3,685,015,132
2019	1,225,399,977	3,733,426,832
Average in Gallons	1,194,831,576.40	3,729,802,473.20

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

E. Water Loss

Water Loss data for the previous five years.

Year	Total Water Loss in Gallons	Water Loss in GPCD	Water Loss as a Percentage
2023	-53,903,337	-2	1.44 %
2022	233,924,835	6	7.23 %
2021	302,464,067	8	6.51 %
2020	84,921,826	2	2.74 %
2019	103,639,306	2	3.31 %
Average	134,209,339	3	4.25 %

F. Peak Day Use

Average Daily Water Use and Peak Day Water Use for the previous five years.

Year	Average Daily Use (gal)	Peak Day Use (gal)	Ratio (peak/avg)
2023	10,125,984	12663570	1.2506
2022	10,481,239	13540463	1.2919
2021	10,161,462	12129728	1.1937
2020	10,095,931	13283171	1.3157
2019	10,228,566	13319564	1.3022

G. Summary of Historic Water Use

Water Use Category	Historic Average	Percent of Connections	Percent of Water Use
Residential - Single Family	2,093,818,821	87.53 %	54.76 %
Residential - Multi-Family	387,531,619	2.89 %	10.13 %
Industrial	160,083,818	0.05 %	4.19 %
Commercial	905,129,358	7.19 %	23.67 %
Institutional	277,367,675	2.35 %	7.25 %
Agricultural	0	0.00 %	0.00 %

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

H. System Data Comment Section

Percent Water Loss is calculated from Water Loss Audit Reports
 Water Losses (Line 22) / Total System Input (Line 16)

Section III: Wastewater System Data

A. Wastewater System Data

1. Design capacity of wastewater treatment plant(s) in gallons per day: 21,410,000

2. List of active wastewater connections by major water use category.

Water Use Category	Metered	Unmetered	Total Connections	Percent of Total Connections
Municipal	0	31,998	31,998	90.41 %
Industrial	0	18	18	0.05 %
Commercial	0	2,544	2,544	7.19 %
Institutional	0	831	831	2.35 %
Agricultural	0	0	0	0.00 %
Total	0	35,391	35,391	100.00 %

3. Percentage of water serviced by the wastewater system: 100.00 %

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

4. Number of gallons of wastewater that was treated by the utility for the previous five years.

Month	Total Gallons of Treated Water				
	2023	2022	2021	2020	2019
January	270,040,000	285,450,000	330,550,000	297,780,000	453,280,000
February	263,460,000	260,610,000	320,810,000	312,020,000	305,160,000
March	297,190,000	296,550,000	318,400,000	389,920,000	381,130,000
April	274,020,000	288,540,000	380,960,000	320,070,000	385,740,000
May	286,600,000	292,110,000	407,760,000	357,350,000	486,370,000
June	278,620,000	279,150,000	377,860,000	325,020,000	369,530,000
July	277,840,000	264,290,000	351,080,000	316,910,000	304,990,000
August	277,350,000	287,390,000	320,820,000	300,960,000	288,560,000
September	254,430,000	261,420,000	273,810,000	318,150,000	283,490,000
October	280,120,000	286,450,000	285,440,000	319,670,000	274,870,000
November	244,500,000	268,280,000	268,280,000	28,070,000	283,310,000
December	249,080,000	276,660,000	269,920,000	275,740,000	277,540,000
Total	3,253,250,000	3,346,900,000	3,905,690,000	3,561,660,000	4,093,970,000

5. Could treated wastewater be substituted for potable water?

Yes No

B. Reuse Data

1. Data by type of recycling and reuse activities implemented during the current reporting period.

Type of Reuse	Total Annual Volume (in gallons)
On-site Irrigation	1,538,861
Plant wash down	
Chlorination/de-chlorination	
Industrial	4,714,644
Landscape irrigation (park,golf courses)	
Agricultural	
Discharge to surface water	2,648,670,000
Evaporation Pond	
Other	
Total	2,654,923,505

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

C. Wastewater System Data Comment

Additional comments and files to support or explain wastewater system data listed below.

APPENDIX D
LETTER TO REGION B WATER PLANNING GROUP



PUBLIC WORKS DEPARTMENT

April 9, 2024

Mr. Kyle Miller
Chair, Region B Water Planning Group
Wichita County Water Improvement District #2
402 E Scott Ave
Wichita Falls, TX 76301

Dear Mr. Miller,

The enclosed 2024 Water Conservation and Drought Contingency Plans for the City of Wichita Falls are provided to you to meet the requirements set forth by the Texas Administrative Code. These plans are being submitted to coordinate water conservation and drought planning with the Region B Water Planning Group, and ensure consistency with the approved regional water plans.

If you have any questions on the enclosed plans or would like additional conservation planning information, please let me know.

Sincerely,

Mark Southard
Utilities Operations Manager
City of Wichita Falls

CC: Water Conservation Plan and Drought Contingency Plan Appendix D

Enclosure: City of Wichita Falls 2024 Water Conservation Plan and Drought Contingency Plan

CITY OF WICHITA FALLS

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www.wichitafallstx.gov

APPENDIX E
ADOPTION OF WATER CONSERVATION PLAN

Ordinance No. 12-2024

Ordinance adopting the Water Conservation and Drought Contingency Plans, and amending Chapter 106 of the Code of Ordinances by amending Article II; providing the updated water conservation and drought restrictions

WHEREAS, state law requires specified water providers to adopt water conservation and drought contingency plans at Texas Water Code §§ 11.1271 and 11.272, and the rules of the Texas Commission on Environmental Quality (TCEQ) require adoption of water conservation and drought contingency plans at 30 TAC §§ 288.2 & 288.20; and,

WHEREAS, water conservation and drought contingency plans must be updated on a 5-year interval; and,

WHEREAS, the City Council finds the attached Water Conservation and Drought Contingency Plan complies with all state laws and regulations relating thereto, including, but not limited to Texas Water Code §§ 11.1271 & 11.127 and 30 TAC §§ 288.2 & 288.20.

NOW, THEREFORE, BE ORDAINED BY THE CITY COUNCIL OF THE CITY OF WICHITA FALLS, TEXAS, THAT:

The City of Wichita Falls hereby:

1. adopts the Water Conservation and Drought Contingency Plans for the City of Wichita Falls, and
2. amends Chapter 106 of the Code of Ordinances by amending Article II Division 6 Section 106-186, as shown via yellow highlight for demonstrative purposes only. Such modifications are to be codified. The Director of Public Works is authorized to modify formatting and pagination prior to submission to the TCEQ.

PASSED AND APPROVED this the 16th day of April, 2024.



M A Y O R

ATTEST:



Marie Babthorpe
City Clerk

DIVISION 6. WATER CONSERVATION / DROUGHT CONTINGENCY

§ 106-185. Definitions

Unless otherwise expressly stated or the context clearly indicates a different intention, the following terms shall, for the purpose of this division, have the meanings indicated in this section:

Automatic Sprinkler System: a system of irrigation components made up of permanently installed underground PVC lines and spray irrigation devices that are controlled from an automatic irrigation controller.

Auxiliary Water: water from a source other than the City of Wichita Falls water supply.

Bucket: a deep, cylindrical container holding five (5) gallons or less, designed to be used by one person.

Car Wash: a place or business equipped for washing cars, trucks, motorbikes, boats, airplanes, other motor vehicles and trailers.

Drip Irrigation: a method of irrigation that applies water in a dropwise fashion directly to the soil beneath rather than projecting the water in a stream away from its orifice. To be classified in this category, the maximum allowable flow is 6 gallons per hour per emitter.

Drought: for this division “drought” is not intended to be limited to any meteorological definition of the term. “Drought” is intended to have broad meaning and refers to any condition, whether manmade or natural, where the available water supply or resources are not meeting the water demand, or if the water supply or resources are being depleted at a faster rate than they are being replenished.

Essential Water Use: water that is required by Federal, State, or Local regulation and/or is attributed to the health and safety of the citizens of Wichita Falls.

Fleet: A group of commercial motor vehicles owned by a single entity that totals more than five (5) vehicles.

Foundation Watering: the application of water using a hand-held hose, soaker hose or drip irrigation system placed within 24 inches of the foundation, which does not produce a spray above ground or result in water run-off.

Graywater: wastewater from showers, bathtubs, hand washing lavatories, sinks that are not used for the preparation/disposal of food or hazardous/toxic ingredients, and clothes-washing machines. It does not include wastewater from washing of material, including diapers soiled with human excreta or wastewater that has come into contact with toilet waste.

Hose-end sprinkler system: a device on the end of a garden hose that can be set in place and can periodically be moved from one location to another.

Impervious surface: any structure or any street, driveway, sidewalk, patio, or other surface area covered with asphalt, concrete, brick, paving, tile, or other material preventing water from penetrating the ground.

Indoor Pool: pool located entirely within a fully enclosed, climate-controlled structure.

MGD: Million gallons per day.

Non-Essential Water Use: water use that does not directly impact the health or safety of the citizens of Wichita Falls, or is a requirement of a Federal, State, or Local regulation.

Non-Potable Water: water that is not intended or suitable for drinking and has not been approved for human consumption.

Owner/Operator of a pool: Fee title holder of the property upon which the pool is located, and/or business manager, complex manager, property owners, association manager, rental agent or other individual who is in charge of the day-to-day operation or maintenance of the property.

Positive Shut-Off: a valve or nozzle that is held in a closed position by system pressure until overridden by an outside force.

Potable Water: water that is suitable for drinking by the public.

Rain Water Harvesting: the practice of capturing, infiltrating or utilizing rainfall from roofs, constructed catchment surfaces, driveways, sidewalks, parking lots and streets.

Residential Pool: A pool that is located on private property under the control of the property owner or the owner's tenant and that is intended for use by not more than two residential families and their guests. It includes a pool serving only a single-family home or duplex.

Single –Pass: A cooling system that removes heat by transferring it to a supply of clean water, once, and releasing it down the drain.

Soaker hose: an irrigation device made of permeable rubber hose that allows water to be applied slowly and directly to the soil without being sprayed up into the air. Soaker hoses fall into the drip irrigation category. A soaker hose will not spray water regardless of its orientation.

Spa and/or Hot-Tub: a structure that is intended to be filled with water that circulates through an on-site filtration system and is not intended to be drained or refilled after each use.

Spray Irrigate or Spray Irrigation: a category of irrigation method that utilizes devices that spray water away from the device orifice(s). These include, but are not limited to, pop-up sprays, rotors, oscillating sprinklers, and impact sprinklers. A hand-held hose is not Spray Irrigation.

Vehicle: A motor vehicle, car, truck, motorcycle, bicycle, boat, trailer, or other conveyance.

Water Well: water that has been, or is, obtained from the ground by digging, boring, or drilling to access an underground aquifer.

§ 106-186. Water shortage; authority of department

(a) These are *water conservation measures that are in effect at all times*. It shall be unlawful for any person, firm, corporation, or other entity, at any time of the year, to:

(1) Irrigation:

- a) run outside spray-type irrigation on any day of the week between 10:00 a.m. and 7:00 p.m. unless one is using a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket, watering can, bubbler or drip irrigation system;
- b) fail to repair a controllable leak, including but not limited to a broken sprinkler head, a broken pipe, or a leaking valve;

- c) operate an irrigation system with a broken or missing head, or a head that is out of adjustment and the arc of the spray head is over a street, parking area, or other impervious surface;
- d) allow water flow during irrigation that runs, flows, or streams in a way that extends a distance of 100 feet or greater from the area being irrigated; and/or
- e) operate a soaker hose, bubbler or drip irrigation system in a manner that causes the delivery of more water than the hose, bubbler, or system was intended by the manufacturer to deliver, or that allows water to run for a distance of five feet or greater from the area being irrigated.

(2) Car Washing:

- a) wash a vehicle at any location other than a commercial car wash, car dealership, detail shop or automotive shop unless the hose is equipped with a positive shut-off nozzle that stops the flow of water through the hose when released by the operator; and/or
- b) allow a customer to use a nozzle at a commercial car wash, car dealership, detail shop or automotive shop that discharges more than 3.0 gallons per minute.

(3) Restaurants/Bars/Clubs/School Cafeterias:

- a) provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
- b) use a pre-rinse nozzle that discharges more than 1.6 gallons per minute; and/or
- c) use a hand-held pre-rinse or rinsing nozzle without a positive shut-off.

(4) Ice Machines:

- a) install new ice machines that are single-pass, water cooled.

(5) Hotels/Motels/Short-Term Lodging:

- a) Owners or operators of a hotel, motel short term rental, or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement and to offer the opportunity for guest participation.

(b) Discretionary Drought Restrictions

The Director of Public Works may declare any stage of drought restrictions described in this ordinance to be effective if:

- (1) the water supply system demand exceeds 90% design treatment capacity for three or more consecutive days;
- (2) the water supply system is unable to deliver water due to mechanical failure or damage of major water system components that is expected to require more than 72 hours to repair; or

- (3) the water system is contaminated either accidentally or intentionally, or the water system fails from acts of nature or man.

The establishment of a discretionary drought restriction will be effective when publicized in the media and upon the filing of a written declaration with the City Manager and City Clerk. Upon any declaration of such drought stage, it shall be unlawful for a person to fail to comply with the restrictions applicable to that stage. The Director of Public Works may terminate any of the aforementioned discretionary drought restrictions by filing a written notice of termination with the City Manager and City Clerk.

(c) Stage 1: Drought Watch

- (1) The Director of Public Works shall declare a Stage 1 Drought Watch when the levels of Lakes Arrowhead and Kickapoo reach a combined capacity of 65 percent.
- (2) The following actions shall occur under the direction of the Director of Public Works, with the goal of reducing the amount of water used by five percent:
 - a) The City Council and other City Departments will be notified of the impending problem and the proposed immediate and future actions.
 - b) The City shall initiate an education program through all available media to:
 - i) Alert the public to the depletion of the reservoirs; current rate of withdrawals and the effect of such withdrawals; current treatment rates; current meteorological conditions; and the long-range weather forecast from the National Weather Service.
 - ii) Alert the public to the drought management program, the various stages and measures, and the possibility of implementation.
 - iii) Keep a constant flow of information to the public to condition them for more stringent measures.
 - c) The Public Works Department will coordinate with other departments on the structure of a program to implement water restrictions.
 - d) The Public Works Department will conduct any training necessary to implement the water restriction program.
 - i) The Public Works Department will prepare all administrative processes (forms, affidavits, maps, offices, etc.) for the drought restriction program.

(3) Irrigation (**requires notification to TCEQ**):

- a) It shall be unlawful to:
 - i) run outside irrigation systems (including sprinklers, automatic sprinkler systems, and unattended hoses) except for two days a week, based on the following physical address schedule where the sprinkler system is located:

Addresses ending in an Even Number = Mondays and Thursdays

Addresses ending in an Odd Number = Tuesdays and Friday

- ii) utilize spray irrigation between the hours of 10:00 a.m. to 7:00 p.m., unless one is using a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket, watering can, bubbler or drip irrigation system;
- iii) fail to repair a controllable leak, including but not limited to a broken sprinkler head, a broken pipe, or a leaking valve;
- iv) operate an irrigation system with a broken or missing head, or a head that is out of adjustment and the arc of the spray head is over a street, parking area, or other impervious surface;
- v) allow water flow during irrigation that runs, flows, or streams in a way that extends for a distance of 100 feet or greater from the area being irrigated; and/or
- vi) operate a soaker hose, bubbler or drip irrigation system in a manner that causes the delivery of more water than the hose, bubbler, or system was intended by the manufacturer to deliver, or that allows water to run for a distance of five feet or greater from the area being irrigated.

- b) Landscape watering is permitted any day at any time with a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket (five gallons or less), watering can, bubbler or drip irrigation system.
- c) On days other than the days of the week established in Section (c)(3)(a)(i), testing and troubleshooting of irrigation systems that involve the release of water is permissible any time, including between the hours of 10:00 a.m. to 7:00 p.m., as long as a licensed plumber or irrigator is present on location during testing (and available to the ticket writer). Testing and troubleshooting of irrigation systems by other than a licensed plumber or irrigator that involves the release of water is otherwise permissible only on the days of the week established in Section (c)(3)(a)(i) and time of day established in Section (c)(3)(c)(ii).
- d) *New Landscape Waiver.* A waiver of this subsection may be granted for the irrigation of new landscaping plants whereby watering would be permitted to maintain adequate growth until the plants are established but not to exceed a 30-day time period. Any person wishing such a waiver must make an application to the City Public Works Department and pay a nonrefundable fee as set by separate ordinance. The water rate during this stage shall be the same as the normal rate for that customer for all consumption over 10 CCF as registered by residential meters and all consumption as registered by irrigation meters or commercial meters.

- e) *Public and Private Golf Courses.*
 - i) Greens: Golf Courses may utilize Spray Irrigation on greens at any time for the purpose of cooling golf course greens when warranted by weather conditions and only with run cycles of less than 5 minutes every 60 minutes. Golf course greens are exempt from the Spray Irrigation days established in Section (c)(3)(a)(i), and greens may be Spray Irrigated any day of the week, but will be subject to the prohibition of Spray Irrigation during the daylight hours between 10:00 a.m. and 7:00 p.m.

- ii) All other Golf Course Features: It shall be unlawful for golf courses to Spray Irrigate Tee-Boxes, Fairways, Roughs, Trees, Shrubs, etc., except on the day of the week permitted for the area as established in Section (c)(3)(a)(i), and will be subject to the prohibition of Spray Irrigation during the daylight hours between 10:00 a.m. and 7:00 p.m.
- f) Nursery Plant Stock is exempt from the irrigation and landscape watering restrictions of this subsection.

(4) **Car Washing (requires notification to TCEQ):**

- a) It shall be unlawful to:
 - i) to wash a vehicle at your residence or place of business, unless the hose is equipped with a positive shut-off nozzle that stops the flow of water through the hose when released by the operator; and/or
 - ii) for the owner or operator of a commercial business to allow a customer to use a nozzle at a commercial car wash, car dealership, detail shop or automotive shop that discharges more than 3.0 gallons per minute.

(5) **Restaurants/Bars/Clubs/School Cafeterias (requires notification to TCEQ):**

- a) It shall be unlawful to:
 - i) provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
 - ii) use a pre-rinse nozzle that discharges more than 1.6 gallons per minute; and/or
 - iii) use a hand-held pre-rinse or rinsing nozzle without a positive shut-off.

(6) **Ice Machines (requires notification to TCEQ):**

- a) It shall be unlawful for any person, firm, corporation, or other entity, to install new ice machines that are single-pass, water cooled.

(7) **Hotels/Motels/Short-Term Lodging (requires notification to TCEQ):**

- a) It shall be unlawful, as the owner or operator of a hotel, motel, short-term rental, or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement, and to offer the opportunity for guest participation.

(d) Stage 2: Drought Warning

- (1) The Director of Public Works shall declare a Stage 2 Drought Warning when levels of Lakes Arrowhead and Kickapoo reach a combined capacity of 50 percent.

(2) The following actions shall occur under the direction of the Director of Public Works, with the goal of reducing the amount of water used by 15%:

- a) Form a Drought Emergency Task Force for guidance through the remainder of the drought and to interface with the public.
- b) Suspend all non-essential operational use of water by City, such as flushing water mains, street sweeping, water jet cleaning of sanitary sewer mains, fire fighter training, etc.), except where such use of water is critical to the health and safety of the citizens.
- c) Notify all wholesale (raw and treated) customers of the situation and inform them of their specific mandatory reduction goals in accordance with Texas Water Code § 11.039.

(3) Irrigation (**requires notification to TCEQ**):

a) It shall be unlawful to:

- i) run outside irrigation systems (including sprinklers, automatic sprinkler systems and unattended hoses) except on the day of the week based on the following physical address schedule where the sprinkler system is located:

Addresses ending in 0 or 1 = Monday

Addresses ending in 2 or 3 = Tuesday

Addresses ending in 4 or 5 = Wednesday

Addresses ending in 6 or 7 = Thursday

Addresses ending in 8 or 9 = Friday

Saturday and Sunday irrigation is prohibited.

- ii) utilize spray irrigation between the hours of 10:00 a.m. and 7:00 p.m., unless one is using a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket, watering can, bubbler or drip irrigation system;
- iii) fail to repair a controllable leak, including but not limited to a broken sprinkler head, a broken pipe, or a leaking valve;
- iv) operate an irrigation system with a broken or missing head, or a head that is out of adjustment and the arc of the spray head is over a street, parking area, or other impervious surface;
- v) allow water flow during irrigation that runs, flows, or streams in a way that extends for a distance of 100 feet or greater from the area being irrigated; and
- vi) Operate a soaker hose, bubbler or drip irrigation system in a manner that causes the delivery of more water than the hose, bubbler, or system was intended by the manufacturer to deliver; or that allows water to run for a distance of five feet or greater from the area being irrigated.

- b) Landscape watering is permitted any day at any time with a hand-held hose that is equipped with a positive shut-off nozzle, soaker hose, bucket (five gallons or less), watering can, bubbler or drip irrigation system.
- c) On days other than the day of the week established in Section (d)(3)(a)(i), testing and troubleshooting of irrigation systems that involve the release of water is permissible any time, including between the hours of 10:00 a.m. to 7:00 p.m., as long as a licensed plumber or irrigator is present on location during testing (and available on site to the ticket writer). Testing and troubleshooting of irrigation systems by other than a licensed plumber or irrigator that involves the release of water is otherwise permissible only on the day of week established in Section (d)(3)(a)(i) and time of day established in Section (d)(3)(a)(ii).
- d) *New Landscape Waiver.* A waiver of this subsection may be granted for the irrigation of new landscaping plants whereby watering would be permitted to maintain adequate growth until the plants are established but not to exceed a 30-day time period. Any person wishing such a waiver must submit an application to the City Public Works Department and pay a nonrefundable fee as set by separate ordinance. The applicant must agree to pay a water rate that is three (3) times the normal rate for that customer for all consumption over 10 CCF as registered by residential meters and all consumption as registered by Irrigation meters or commercial meters.
- e) *Public and Private Golf Courses.*
 - i) Greens: Golf Courses may utilize Spray Irrigation on greens at any time for the purpose of cooling golf course greens when warranted by weather conditions and only with run cycles of less than 5 minutes every 60 minutes. Golf course greens are exempt from the Spray Irrigation days established in Section (d)(3)(a)(i), and greens may be Spray Irrigated any day of the week, but will be subject to the prohibition of spray irrigation during the daylight hours between 10 a.m. and 7 p.m.
 - ii) Tee Boxes and Fairways: It shall be unlawful for golf courses to Spray Irrigate Tee-Boxes and Fairways, except on the day of the week permitted for the area as established in Section (d)(3)(a)(i) and will be subject to the prohibition of spray irrigation during the daylight hours between 10:00 a.m. and 7:00 p.m.
 - iii) All other Golf Course Features: It shall be unlawful for golf courses to Spray Irrigate any other landscape features, such as roughs, trees, shrubs, etc.
- f) Nursery plant stock is exempt from the irrigation and landscape watering restrictions of this subsection.

(4) **Car Washing (requires notification to TCEQ):**

- a) It shall be unlawful to:
 - i) to wash a vehicle at your residence or place of business, unless the hose is equipped with a positive shut-off nozzle that stops the flow of water through the hose when released by the operator; and/or
 - ii) for the owner or operator of a commercial business to allow a customer to use a nozzle at a commercial car wash, car dealership, detail shop or automotive shop that discharges more than 3.0 gallons per minute.

(5) Restaurants/Bars/Clubs/School Cafeterias (**requires notification to TCEQ**):

- a) It shall be unlawful to:
 - i) provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
 - ii) use a pre-rinse nozzle that discharges more than 1.6 gallons per minute; and/or
 - iii) use a hand-held pre-rinse or rinsing nozzle without a positive shut-off.

(6) Ice Machines (**requires notification to TCEQ**):

- a) It shall be unlawful for any person, firm, corporation, or other entity, to install new ice machines that are single-pass, water cooled.

(7) Hotels/Motels/Short-Term Lodging (**requires notification to TCEQ**):

- a) It shall be unlawful, as the owner or operator of a hotel, motel, short-term rental or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement, and to offer the opportunity for guest participation.

(8) Washing sidewalks, driveways, buildings, or concrete slabs (**requires notification to TCEQ**):

- a) It shall be unlawful to wash sidewalks, driveways, buildings, or concrete slabs unless an immediate health or safety risk is present.

(9) During a Stage 2 Drought Warning, the following surcharges will be applied to all applicable accounts (**requires notification to TCEQ**):

- a) For Residential Water Meters:

\$0.50 per hundred cubic feet (CCF) between ten CCF and 20 CCF;

\$1.00 per CCF between 20 CCF and 40 CCF; and

\$2.00 per CCF over 40 CCF.

- b) For Irrigation Water Meters:

\$0.50 per CCF between 0 CCF and 10 CCF;

\$1.00 per CCF between ten CCF and 20 CCF;

\$2.00 per CCF between 20 CCF and 40 CCF; and

\$4.00 for each CCF over 40 CCF.

(e) Stage 3: Drought Emergency

(1) The Director of Public Works shall declare a Stage 3 Drought Emergency when the levels of Lakes Arrowhead and Kickapoo reach a combined capacity of 40 percent.

(2) The following actions shall occur under the direction of the Director of Public Works, with the goal of reducing the amount of water used by 35%:

- a) Monitor all Fire Hydrant Meters that are for contractor use to determine what conservation can be achieved through this type of water usage;
- b) Notify all wholesale (raw & treated) water customers of the situation and inform them of their specific mandatory reduction goals in accordance with Texas Water Code § 11.039; and
- c) Begin establishing a program for a Drought Disaster, which will allow restriction on the essential uses of water and prepare for implementation.

(3) Irrigation (**requires notification to TCEQ**):

a) It shall be unlawful to:

- i) run outside irrigation systems (including sprinklers, automatic sprinkler systems and unattended hoses) except on the day of the week established in Section (d)(3)(a)(i);
- ii) utilize spray irrigation during the day specified in Section (d)(3)(a)(i), except for the following hours:

2:00 a.m. to 7:00 a.m. for Automatic Sprinkler Systems

7:00 p.m. to 11:00 p.m. for Hose-End Sprinkler Systems

- iii) fail to repair a controllable leak, including but not limited to a broken sprinkler head, a broken pipe, or a leaking valve;
- iv) operate an irrigation system with a broken or missing head, or a head that is out of adjustment and the arc of the spray head is over a street, parking area, or other impervious surface;
- v) allow water flow during irrigation that runs, flows, or streams in a way that extends for a distance of 100 feet or greater from the area being irrigated; and/or
- vi) operate a soaker hose, bubbler or drip irrigation system in a manner that causes the delivery of more water than the hose, bubbler, or system was intended by the manufacturer to deliver, or that allows water to run for a distance of 5 feet or greater from the area being irrigated.

b) New Landscape Waiver: The Public Works Department will not issue any waivers during a Stage 3 Drought Emergency.

c) *Public and Private Golf Courses.*

- i) Greens: Golf Courses may utilize Spray Irrigation on greens at any time for the purpose of cooling golf course greens when warranted by weather conditions and only with run cycles

of less than 5 minutes every 60 minutes. Golf course greens are exempt from the Spray Irrigation times, and greens may be Spray Irrigated any day of the week, but will continue to be subject to the prohibition of spray irrigation during the daylight hours between 10:00 a.m. and 7:00 p.m.

- ii) Tee Boxes: It shall be unlawful for golf courses to Spray Irrigate Tee-Boxes, except on the day of the week established in Section (d)(3)(a)(i) and will continue to be subject to the prohibition of spray irrigation during the daylight hours between 10:00 a.m. and 7:00 p.m.
- iii) All other Golf Course Features: It shall be unlawful for golf courses to Spray Irrigate any other landscape features, such as fairways, roughs, trees, shrubs, etc.
- d) Nursery Plant Stock is exempt from the irrigation and landscape watering restrictions of this subsection.

(4) Car Washing (requires notification to TCEQ):

- a) It shall be unlawful:
 - i) to wash a vehicle at your residence or place of business, unless the hose is equipped with a positive shut-off nozzle that stops the flow of water through the hose when released by the operator;
 - ii) for the owner or operator of a commercial car wash, detail shop or automotive shop to utilize Potable Water for its operations on the day of the week that coincides with the day of the week established in Section (d)(3)(a)(i), that the car wash was allowed to irrigate;
 - iii) for the owner or operator of a commercial business to allow a customer to use a nozzle at a commercial car wash, car dealership, detail shop or automotive shop that discharges more than 3.0 gallons per minute; and/or
 - iv) for a car wash to wash any of its bays with water, except on Sunday.

(5) Car Dealers/Fleets (requires notification to TCEQ):

- a) It shall be unlawful:
 - i) for a car dealer or an entity that maintains a fleet of motor vehicles to wash its inventory of cars on any day other than the day the property is authorized to spray irrigate in accordance with the days established in Section (d)(3)(a)(i);
 - ii) to wash Fleets at any location used for residential purposes;
- b) If a car dealer or car rental is preparing a car for pickup, it can wash that vehicle (and only that vehicle) on the day of pick up by the customer. Otherwise, all vehicles are subject to Section (e)(5)(a)(i) above.
- c) The washing of any vehicle in a fleet may take place only at a commercial car wash or at a location owned by the fleet's owner and that is used solely for commercial uses.

(6) Restaurants/Bars/Clubs/School Cafeterias (requires notification to TCEQ):

- a) It shall be unlawful:
 - i) to provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
 - ii) to use a pre-rinse nozzle that discharges more than 1.6 gallons per minute;
 - iii) to use a hand-held pre-rinse or rinsing nozzle without a positive shut-off;
 - iv) for a food establishment to thaw food with water (food must be thawed by another legal method, such as Refrigeration or Cooking Process); and/or
 - v) for a food establishment to clean kitchen or food handling areas with spray hoses.

(7) Ice Machines (**requires notification to TCEQ**):

- a) It shall be unlawful, for any person, firm, corporation, or other entity, to install new ice machines that are single-pass, water cooled.

(8) Pools (**requires notification to TCEQ**):

- a) It shall be unlawful:
 - i) to operate a water feature on a Residential Pool, including, but not limited to, fountains, waterfalls, descents, arcs, and slides;
 - ii) if repairing a pool, to drain the water below a level necessary to affect the repair, and no further. Owners of pools that follow this restriction will be allowed to re-fill their pool after the repair; and/or
 - iii) for Owners Operators of pools to drain the pool once it closed for the season.

(9) Hotels/Motels/Short-Term Lodging (**requires notification to TCEQ**):

- a) It shall be unlawful, as the owner or operator of a hotel, motel, short-term rental, or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement, and to offer the opportunity for guest participation.

(10) Washing sidewalks, driveways, buildings, or concrete slabs (**requires notification to TCEQ**):

- a) It shall be unlawful to wash sidewalks, driveways, buildings, or concrete slabs unless an immediate health or safety risk is present.

(11) During a Stage 3 Drought Emergency, the following surcharges will be applied to all applicable accounts (**requires notification to TCEQ**):

- a) For Residential Water Meters:

\$1.00 per CCF between 10 CCF and 20 CCF;

\$2.00 per CCF between 20 CCF and 40 CCF; and

\$4.00 per CCF over 40 CCF.

b) For Irrigation Water Meters:

\$1.00 per CCF between 0 CCF and 10 CCF;

\$2.00 per CCF between 10 CCF and 20 CCF;

\$4.00 per CCF between 20 CCF and 40 CCF; and

\$8.00 per CCF over 40 CCF.

(f) Stage 4: Drought Disaster

(1) The Director of Public Works shall declare a Stage 4 Drought Disaster when the levels of Lakes Arrowhead and Kickapoo reach a combined capacity of 30 percent.

(2) The following actions shall occur under the direction of the Director of Public Works, with the goal of reducing the amount of water used by 45%.

a) Impose further mandatory restrictions on non-essential uses of water and essential uses of water.

b) Pull Hydrant Meters and suspend service thereon until conditions return to a Drought Emergency status.

c) Continue the aggressive public relations and education program.

(3) Irrigation (**requires notification to TCEQ**):

a) *Irrigation Prohibited.* It shall be unlawful to utilize any type of irrigation using potable water produced by the City that is distributed through the City's distribution system on any day at any time. This restriction includes all forms of irrigation, including spray, bubbler, drip, hand-watering, etc.

b) *Public and Private Golf Courses.* It shall be unlawful to irrigate any and all vegetated landscape areas on the golf course including greens, tee boxes, fairways, roughs, trees, shrubs, etc. Golf Courses will be allowed to utilize the remaining water within their pond system, as they see fit; but will not be allowed to refill the ponds from the City potable or raw water system while in a Stage 4 Drought Disaster.

c) *Nursery Plant Stock.* Nursery Plant Stock is exempt from the irrigation and landscape watering restrictions of this subsection.

(4) Car Washing (**requires notification to TCEQ**):

a) It shall be unlawful:

- i) to wash a vehicle at any location other than a commercial car wash, car dealership, detail shop or automotive shop;
- ii) for the owner or operator of a commercial car wash, detail shop or automotive shop to utilize Potable Water for its operations on the day of the week that coincides with the day of the week established in Section (d)(3)(a)(i), that the car wash was allowed to irrigate;
- iii) for the owner or operator of a commercial business to allow a customer to use a nozzle at a commercial car wash, car dealership, detail shop or automotive shop that discharges more than 3.0 gallons per minute;
- iv) to conduct a Fundraising car wash; and/or
- v) for a car wash to wash any of its bays with water, except on Sundays.

b) It shall be an affirmative defense to prosecution pursuant to this subsection (i) if that person was washing a vehicle for health and safety reasons, only to an extent sufficient to remove the hazard, and is permitted at any time.

(5) Car Dealers/Fleets (requires notification to TCEQ):

- a) It shall be unlawful:
 - i) for a car dealer or an entity that maintains a fleet of vehicles to wash its inventory of cars on any day other than the day the property was authorized to Spray Irrigate in accordance with the days established in Section (d)(3)(a)(i)
 - ii) to wash Fleets at any location used for residential purposes.
- b) If a car dealer or car rental is preparing a car for pickup, it can wash that vehicle (and only that vehicle) on the day of pick up by the customer. Otherwise, all vehicles are subject to Section 4.7(5)(a)(i) above.
- c) The washing of any vehicle in a fleet may take place only at a commercial car wash or at a location owned by the fleet's owner and that is used solely for commercial uses.

(6) Restaurants/Bars/Clubs/School Cafeterias (requires notification to TCEQ):

- a) It shall be unlawful:
 - i) to provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
 - ii) use a pre-rinse nozzle that discharges more than 1.6 gallons per minute;
 - iii) use a hand-held pre-rinse or rinsing nozzle without a positive shut-off;
 - iv) thaw food at a food establishment with water (food must be thawed by another legal method, such as Refrigeration or Cooking Process); and/or
 - v) clean kitchen or food handling areas at a food establishment with spray hoses.

(7) Ice Machines (**requires notification to TCEQ**):

- a) It shall be unlawful for any person, firm, corporation, or other entity, to install new ice machines that are single-pass, water cooled.

(8) Pools (**requires notification to TCEQ**):

- a) It shall be unlawful:
 - i) to operate a water feature on a Residential Pool, including, but not limited to, fountains, waterfalls, descents, arcs, and slides; and/or
 - ii) to fill, refill or add potable water to a private or public swimming or wading pool that is not located entirely within a fully-enclosed, climate-controlled structure.
- b) Indoor pools are exempt from the restrictions of Section (f)(7)(a)(i).

(9) Hotels/Motels/Short-Term Lodging (**requires notification to TCEQ**):

- a) It shall be unlawful, as the owner or operator of a hotel, motel, short-term rental or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement, and to offer the opportunity for guest participation.

(10) Large Industries (**requires notification to TCEQ**):

- a) Large Industries will be notified by the City to initiate a Water Audit of their facilities.
- b) The Water Audit will include where water is being used within the facilities and where reductions in water usage can be made.
- c) Large Industries will have 60 days to conduct the Water Audit and submit a written report to the Director of Public Works detailing the findings of the Water Audit and the percent reduction in water consumption that can be achieved.
- d) Each Large Industry will be required to have all internal modifications to implement the water reduction completed and functioning by the time a Combined Lake Level of 20% is reached.

(11) Watering Structures (**requires notification to TCEQ**):

- a) The watering of Home Foundations is restricted to once a week, on the day the property was authorized to irrigate established in Section (d)(3)(a)(i).
 - i) Foundations may only be watered between the hours of 7:00 p.m. and 11:00 p.m.; and/or
 - ii) Foundations may only be watered with Soaker Hoses.
- b) It shall be unlawful to wash sidewalks, driveways, buildings, concrete slabs, any structure, or any part of a structure during Stage 4 restrictions.

(12) During a Stage 4 Drought Disaster the following surcharges will be applied to all applicable accounts (**requires notification to TCEQ**):

a) For Residential Water Meters;

\$3.00 per CCF between 10 CCF and 20 CCF;

\$6.00 per CCF between 20 CCF and 40 CCF; and

\$12.00 per CCF over 40 CCF.

b) For Irrigation Water Meters;

\$3.00 per CCF between 0 CCF and 10 CCF;

\$6.00 per CCF between 10 CCF and 20 CCF;

\$12.00 per CCF between 20 CCF and 40 CCF; and

\$24.00 per CCF over 40 CCF.

(g) Stage 5: Drought Catastrophe

(1) The Director of Public Works shall declare a Stage 5 Drought Catastrophe when the levels of Lakes Arrowhead and Kickapoo reach a combined capacity of 25 percent.

(2) The following actions shall occur under the direction of the Director of Public Works, with the goal of reducing the amount of potable water provided by the City to less than 14 MGD:

a) Impose further mandatory restrictions on non-essential uses of water and essential uses of water.

b) Continue the aggressive public relations and education program.

(3) Irrigation (**requires notification to TCEQ**):

a) *Irrigation Prohibited.* It shall be unlawful to utilize any type of irrigation using potable water produced by the City that is distributed through the City's distribution system on any day at any time. This restriction includes all forms of irrigation, including spray, bubbler, drip, hand-watering, etc.

b) *Public and Private Golf Courses.* It shall be unlawful to irrigate any and all vegetated landscape areas on the golf course including greens, tee boxes, fairways, roughs, trees, shrubs, etc. The Golf Courses will be allowed to utilize the remaining water within their pond system, as they see fit; but will not be allowed to refill the ponds from the City system while in a Stage 5 Drought Disaster.

c) *Nursery Plant Stock.* Nursery Plant Stock is exempt from the irrigation and landscape watering restrictions of this subsection.

(4) Car Washing (**requires notification to TCEQ**):

a) It shall be unlawful:

- i) for any person to wash a vehicle at any location other than a commercial car wash, car dealership, detail shop, automotive shop, or commercial property that is owned by the owner of a Fleet of vehicles;
- ii) for the owner or operator of a commercial car wash, car dealership, detail shop or automotive shop to utilize potable water for its operations on Sunday or Monday;
- iii) for the owner or operator of a commercial business to allow a customer to use a nozzle that discharges more than 3.0 gallons per minute;
- iv) for a car wash to wash any of its bays with water, except on Fridays; and/or
- v) to conduct a Fundraising car wash.

- b) It shall be an affirmative defense to prosecution pursuant to this subsection if that person was washing a vehicle for health and safety reasons, only to an extent sufficient to remove the hazard, and is permitted at any time.
- c) It shall be an affirmative defense to prosecution pursuant to this subsection that a car dealer or car rental company was preparing a vehicle for pickup and washed that vehicle on the day of pick up by the customer.

(5) Restaurants/Bars/Clubs/School Cafeterias (**requires notification to TCEQ**):

- a) It shall be unlawful:
 - i) to provide drinking water to customers of restaurants, bars, or clubs unless the customer requests such water;
 - ii) use a pre-rinse nozzle that discharges more than 1.6 gallons per minute;
 - iii) use a hand-held pre-rinse or rinsing nozzle without a positive shut-off;
 - iv) for a food establishment to thaw food with water (food must be thawed by another legal method, such as Refrigeration or Cooking Process); and/or
 - v) for a food establishment to clean kitchen or food handling areas with spray hoses.

(6) Ice Machines (**requires notification to TCEQ**):

- a) It shall be unlawful for any person, firm, corporation, or other entity, to install new ice machines that are single-pass, water cooled.

(7) Pools (**requires notification to TCEQ**):

- a) It shall be unlawful:
 - i) to operate a water feature on any pool, including, but not limited to, fountains, waterfalls, descents, arcs, and slides; and/or
 - ii) to fill, refill or add potable water to a private or public swimming or wading pool that is not located entirely within a fully-enclosed, climate-controlled structure.

b) Indoor pools are exempt from the restrictions of Section (g)(7).

(8) Hotels/Motels/Short-Term Lodging (**requires notification to TCEQ**):

a) It shall be unlawful, as the owner or operator of a hotel, motel, short-term rental or other establishment that offers or provides lodging or rental accommodations for compensation, to fail to offer a towel and linen reuse water conservation option to its lodgers, renters, or customers, and maintain in each applicable guest room, suite, or property, informational signage to communicate information relating to this requirement, and to offer the opportunity for guest participation.

(9) Watering Structures (**requires notification to TCEQ**):

a) The watering of Home Foundations is restricted to once a week on the day the property was authorized to irrigate established in Section (d)(3)(a)(i).

- i) Foundations may only be watered between the hours of 7:00 p.m. and 11:00 p.m.
- ii) Foundations may only be watered with Soaker Hoses.

b) It shall be unlawful to wash sidewalks, driveways, buildings, concrete slabs, any structure, or any part of a structure.

(10) During a Stage 5 Drought Catastrophe the following surcharges will be applied to all applicable accounts (**requires notification to TCEQ**):

a) For Residential Water Meters:

\$6.00 per CCF between 10 CCF and 20 CCF;

\$12.00 per CCF between 20 CCF and 40 CCF; and

\$24.00 per CCF over 40 CCF.

b) For Irrigation Water Meters:

\$6.00 per CCF between 0 CCF and 10 CCF;

\$12.00 per CCF between 10 CCF and 20 CCF;

\$24.00 per CCF between 20 CCF and 40 CCF; and

\$48.00 per CCF over 40 CCF.

(h) Restrictions for Raw Water Wholesale Industrial Customers

(1) The following water use restrictions shall be placed on any wholesale customers that purchase raw water from the Lake Kemp/ Lake Diversion System for industrial purposes under the City's jointly owned water right with WCWID #2. The restrictions are based on the storage capacity in Lake Kemp. Wholesale industrial customers (Customers) are required to achieve the following water use

percentage reductions corresponding to different thresholds for the reservoir capacity in Lake Kemp:

- a) Customers must reduce their water usage by 10 percent if Lake Kemp reaches a storage capacity of 50 percent or less.
- b) Customers must reduce their water usage by 25 percent if Lake Kemp reaches a storage capacity of 40 percent or less.
- c) Customers must reduce their water usage by 50 percent if Lake Kemp reaches a storage capacity of 30 percent or less.
- d) Customers must halt all water use from Lake Kemp if the storage capacity reaches 20 percent or less.

(2) In addition to the restrictions stated above, wholesale customers that purchase raw water for industrial use from the Lake Kemp/ Lake Diversion System must agree that once the storage capacity reaches 50,000 acre-feet or less in the Lake Kemp/ Lake Diversion System, that 50,000 acre feet is solely for the purpose of use by the City for municipal purposes.

(i) **Surcharges.** Surcharges will remain in effect until the City Council announces the end to the restrictions. Water utilized by commercial nurseries for plant stock production shall not be subject to the surcharges established herein.

(j) **Triggering & Terminating Drought Stages**

- (1) The Director of Public Works shall declare that each "trigger level" has been reached and that the water use restrictions for each respective stage are in effect. The water restrictions will remain in effect until the lakes rise to a level that, when combined with the long-term forecast, assures the City an adequate supply of water.
- (2) When an adequate supply of water is available, the City Council, by majority vote, and after consultation with the Director of Public Works, shall announce the termination of each respective stage of the restrictions that are triggered by lake levels.

(k) **Exemption for Non-City-Supplied Water.** Water supplied from sources other than the City's water delivery system, including private water wells, aerobic septic systems, wastewater effluent, and potable water imported from other areas, is intended to be exempt from the restrictions of this section. Residents with non-city-supplied water sources are required to register any such water sources with the Department of Public Works, as described in Section (l). Accordingly, it shall be an affirmative defense to prosecution for violation of any provision of this section that the water used in the alleged violation was not from the City's water delivery system.

(l) **Wells and Auxiliary Water Sources**

(1) Registration:

- a) In an effort to protect the City's potable Water System from contamination, any person or property receiving water or wastewater services from the City must register any and all non-

potable, wells and auxiliary water sources, used for any purpose, with the Department of Public Works.

- b) Non-Potable, Auxiliary Water Sources include, but are not limited to:
 - i) Existing, new or planned Water Wells;
 - ii) Hauled water from Surface or Groundwater sources;
 - iii) Rainwater Harvesting storing more than 3,000 gallons; and
 - iv) Graywater systems producing more than 400 gallons per day.
- c) The City Department of Public Works shall be responsible for developing and maintaining a governing manual that regulates the permitting, construction and registration of all water wells and Auxiliary Water Sources.

(2) Systems must comply with all Federal, State, and City requirements for the following:

- a) Cross-Connection Control / Backflow Prevention Devices;
- b) Building, Plumbing and Electrical Codes; and/or
- c) Setback requirements from Sewers and Septic Systems.

(3) The City public water supply system may not be held liable for any adverse health effects allegedly caused by the consumption of water collected by wells or auxiliary water sources.

(m) Defenses to Prosecution

(1) It shall be a defense to prosecution that:

- a) The use of water is necessary to protect the health, safety, or welfare of the public;
- b) The use of water was necessary for lawful repair of a water distribution facility, flushing of utility lines or residential or commercial plumbing lines;
- c) The use of water was necessary to meet express requirements of federal, state, or local laws and requirements;
- d) The use of water was necessary to wash or sanitize to prevent disease transmission risk associated with liquid, solid, or particulate residue in or on emergency vehicles, or vehicles, containers or equipment lawfully used to maintain, process, or transport food, perishables, garbage, liquid or solid waste, organic materials, or recyclables; or
- e) The use of water was immediately necessary for or related to firefighting, fire prevention, or fire suppression activities or operations conducted because of actual risk to the public or environmental health, safety, or welfare, life, or property associated with the presence of an uncontrolled fire on or approaching any person or property.

(n) Variance

- (1) The Director of Public Works shall develop specific criteria to be used for the granting of variances from the provisions of this Ordinance, which are appropriate to the provisions for which a variance is being sought. Such criteria shall be applied equally to each request for variance under a particular provision.
- (2) The Director, or his/her designee, may grant a variance from a requirement of this Chapter if the Director, or designee, determines that strict compliance with the provisions at issue adversely affects the health, safety, welfare or sanitation of the public, the applicant, or the environment.
- (3) Persons requesting a variance from the provisions of this Drought Ordinance shall file a written request for variance with the Director of Public Works. All written requests for variances shall be reviewed by the Director, or his/her designee, and shall include the following:
 - (a) Name and address of the petitioner(s);
 - (b) Purpose of water use;
 - (c) Specific provision(s) of the Drought Ordinance from which the petitioner is requesting relief;
 - (d) Detailed statement as to how the specific provision of the Drought Ordinance adversely affects the health, safety, welfare, or sanitation of the public, or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance;
 - (e) Description of the relief requested;
 - (f) Period of time for which the variance is sought;
 - (g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Ordinance and the compliance date; and
 - (h) Any other pertinent or requested information.
- (4) A variance following its approval by the Director may be immediately suspended or revoked if the Director, or Director's designee, determines any of the following:
 - (a) a violation of the terms of the variance occurs at the location during the effective period of the variance;
 - (b) the application submitted to the Director upon which the variance approval was based included false, misleading, incomplete, or inaccurate information or attachments; or
 - (c) the Director declares an emergency recall of variances to control use or preserve supply based on protracted drought, unusual operational event, or other public necessity.
- (5) All variances are only in effect during the Drought Plan Stage for which the variance was issued.
- (6) No variance shall be retroactive or otherwise justify any violation of this Drought Plan, occurring prior to the issuance of the variance.
- (7) A variance from a requirement of this chapter expires immediately upon the termination, completion, or resolution of the event, occurrence, condition, or activity for which the variance is granted or at a time specified by the Director or Director's designee.

- (o) Access to Premises. All persons or agents employed by the Department of Public Works shall, at all responsible hours, have access to premises to ascertain if water is being wasted within the corporate city limits of the city or the extraterritorial jurisdiction or the extent of the jurisdictional authority and whether provisions of the Drought Ordinance have been, and are being, complied with in all respects.
- (p) Violation; penalty. Any person, firm, corporation, or other entity found in violation of any provision of this section shall be punished by a fine of \$25.00 for the first offense; not more than \$500.00 for the second offense; and not more than \$2,000.00 for each offense thereafter. Each day of violation of this section shall constitute a separate offense. Proof of a culpable mental state shall not be required for the first or second offense. In the event that this section is violated by repeated offenses, the Director of Public Works is authorized to order the locking or removal of the customer's meter until all fees and fines are paid.

APPENDIX F

DATA REQUIREMENTS FOR WATER RIGHT APPLICATIONS FOR NEW OR ADDITIONAL STATE WATER

DATA REQUIREMENTS FOR WATER RIGHT APPLICATIONS FOR NEW OR ADDITIONAL STATE WATER – LAKE RINGGOLD RESERVOIR

Texas Administrative Code (TAC) Title 30, Part 1, Rule 288.7(a) addresses water conservation plans that accompany an application for a water right:

§288.7. Plans Submitted with a Water Right Application for New or Additional State Water.

(a) A water conservation plan submitted with an application for a new or additional appropriation of water must include data and information which:

(1) supports the applicant's proposed use of water with consideration of the water conservation goals of the water conservation plan;

(2) evaluates conservation as an alternative to the proposed appropriation; and

(3) evaluates any other feasible alternative to new water development including, but not limited to, waste prevention, recycling and reuse, water transfer and marketing, regionalization, and optimum water management practices and procedures.

The City of Wichita Falls (City) filed an application for water use permit no. 13404 for Lake Ringgold with TCEQ on June 27, 2017, and TCEQ declared the application administratively complete on August 10, 2017. TCEQ completed its technical review of the application on August 8, 2019. A contested case hearing on the application was held in August 2023. The application is now under consideration for approval by TCEQ.

Lake Ringgold is a proposed reservoir with a surface area of 15,500 acres located in Clay County, Texas. The proposed dam would be located on the Little Wichita River, approximately 0.5 miles upstream of its confluence with the Red River and would impound 275,000 acre-feet (ac-ft) of water at the normal pool elevation of 844 feet-mean sea level (msl). The proposed project would include construction of the Lake Ringgold dam, intake pump station and a transmission system to move the water to the City. The water would be treated at an existing water treatment plant. This appendix addresses the requirements of 30 TAC § 288.7(a) for the Lake Ringgold water use permit application.

Consideration of Water Conservation Goals - 288.7(A)(1)

The City provides water to its retail customers and 16 wholesale customers. The City's wholesale service area includes portions of Archer, Clay, Wichita, and Young Counties. According to population projections for the upcoming 2026 Region B Water Plan, the City will be providing water to a total estimated population of over 148,000 by 2030. As a Major Water Provider identified in the Region B Water Plan, the City has made significant efforts to promote water conservation and efficiency in recent years. Water conservation is especially important to the City given its experience during the recent drought of record. From 2011-2015, the Wichita Falls area experienced a severe drought that caused water levels in the City's water supply reservoirs to drop to record lows. In response, the City enacted extreme water use restrictions through its Drought Contingency Plan (DCP) and even added a fifth, more restrictive drought stage. The City reduced its water use to 50 percent of its typical average through aggressive water conservation and drought stage measures. Despite these efforts, the City's reservoirs declined to a record low level of 19 percent combined capacity. The most recent drought of record ended in 2015, but the City must find an additional water supply to better prepare the City's water resources for the next drought.

Achieving Highest Practicable Levels of Conservation and Efficiency

The City's Water Conservation Plan (WCP) includes a variety of different water conservation programs and measures the City has currently implemented. The City continues to look for new ways to improve its water conservation and efficiency.

The City's water conservation efforts go above and beyond the minimum State requirements it must meet as both a public and wholesale water provider. According to 30 TAC § 288.2, the minimum requirements for public water providers with populations over 5,000 are:

- Utility profile;
- Monitoring and record managing program;
- Specification of quantifiable conservation goals;
- Accurate metering program;
- Universal metering program;
- Determination and control of water losses;
- Public education and information program;
- Non-promotional water rate structure;
- Reservoir systems operation plan;
- Means for implementing and enforcing the plan;

- Coordination with associated regional water planning groups;
- Leak detection, repair, and water loss accounting;
- Requirement that new wholesale customers develop a water conservation plan; and
- Review and update of plan every five years.

In addition to these requirements for public water suppliers, the City must also meet the minimum requirements for wholesale water suppliers listed in 30 TAC § 288.5, which are:

- Description of the wholesaler's service area;
- Specification of quantifiable conservation goals;
- Description of the means to measure the amount of water from a source;
- Monitoring and record managing program;
- Metering, leak detection, and repair program;
- Requirement that wholesale customers must develop and implement a water conservation plan that incorporates the measures in the wholesale water provider plan;
- Reservoir systems operation plan;
- Means for implementing and enforcing the plan;
- Coordination with associated regional water planning groups; and
- Review and update of plan every five years.

The City's WCP also addresses the minimum requirements for industrial or mining use because its water right permits include the option to divert water for industrial and mining use. According to 30 TAC § 288.3, the minimum requirements for industrial and mining use are:

- Description of water use;
- Specification of quantifiable conservation goals;
- Description of the means to measure the amount of water diverted from a source;
- Metering, leak detection, repair, and water loss accounting program;
- State of the art equipment and processes to improve efficiency; and
- Review and update of plan every five years.

The City's WCP also addresses the minimum requirements for agricultural use because its water right permits include the option to divert water for agricultural use. According to 30 TAC § 288.4, the minimum requirements for industrial and mining use are:

- Suppliers system inventory;
- Specification of quantifiable conservation goals;
- Description of the means to measure the amount of water diverted from a source;

- Monitoring and record managing program;
- Metering, leak detection, and repair;
- Customer assistance program for on-farm water conservation and pollution prevention plans;
- Requirement that wholesale customers must develop and implement a water conservation plan that incorporates the measures in the wholesale water provider plan;
- Official adoption of the plan;
- Coordination with associated regional water planning groups; and
- Review and update of plan every five years.

The City's WCP meets the minimum requirements listed above and includes additional conservation strategies that the City has implemented to achieve a greater level of water conservation. These additional strategies include:

- A Conservation Coordinator to manage the City's water conservation program and update of the WCP and DCP;
- The City's Water Resources Commission made up of citizen volunteers responsible for recommending water conservation strategies and reviewing the WCP update every five years;
- A plumbing code that encourages water-conserving plumbing fixtures;
- Water reuse efforts including indirect potable and direct non-potable reuse;
- Landscape water management measures;
- Advanced Metering Infrastructure (AMI) system; and
- Permanent conservation measures for the following water use types:
 - Car washing;
 - Restaurants/Bars/Clubs/School Cafeterias;
 - Ice machines; and
 - Hotels/Motels/Short-Term Lodging.

Each of these measures is described in Section 3.6 of the City's WCP. A list of all municipal and wholesale Best Management Practices (BMPs) currently implemented by the City is provided in Section 3.3.1 of the WCP.

The City achieves additional water conservation and efficiency through its water reuse program. The City implemented an indirect potable reuse (IPR) system in 2018 to transport wastewater effluent from the Wichita Falls Resource Recovery Facility (WFRRF) to Lake Arrowhead. This treated wastewater effluent is blended with the existing Lake Arrowhead water supply for future municipal use by the City and its wholesale customers. The IPR system can supply up to 8 MGD per day (8,968 ac-ft/year) to Lake Arrowhead that would otherwise be discharged into the Wichita River downstream of the City's water

supply system and become unavailable. The IPR system reduces the demand for new water on Lake Arrowhead and the Little Wichita River system, which includes Lake Kickapoo. The City's IPR system received the 2019 Outstanding Civil Engineering Achievement Award from the Texas Chapter of the American Society of Civil Engineers and has been recognized for excellence by several organizations, including the Texas Municipal League, the Water Environment Association of Texas, the Texas Public Works Association, and the U.S. Environmental Protection Agency. The water supplies realized from the City's IPR program must be blended and are significantly reduced during drought stage restrictions. Thus, while the City is proud of its reuse efforts, it must factor these limitations into its water supply planning efforts

Conservation Water Savings Realized by the City

Through the strategies listed above as well as an increased awareness and appreciation of the City's water resources following the worst years of the drought of record (2011-2015), the City is on pace to achieve its water conservation goals from the 2019 WCP and the new 2024 WCP. The City's goals for total and residential per capita water use in gallons per capita per day (GPCD) are shown in Table F-1 below. Figure F-1 below shows the City's total and residential per capita water use from before, during, and following the 2011-2015 drought. The total per capita water use has remained below pre-drought levels. The City's five-year average (2019-2023) was 105 GPCD for total water use and 66 GPCD for residential water use.

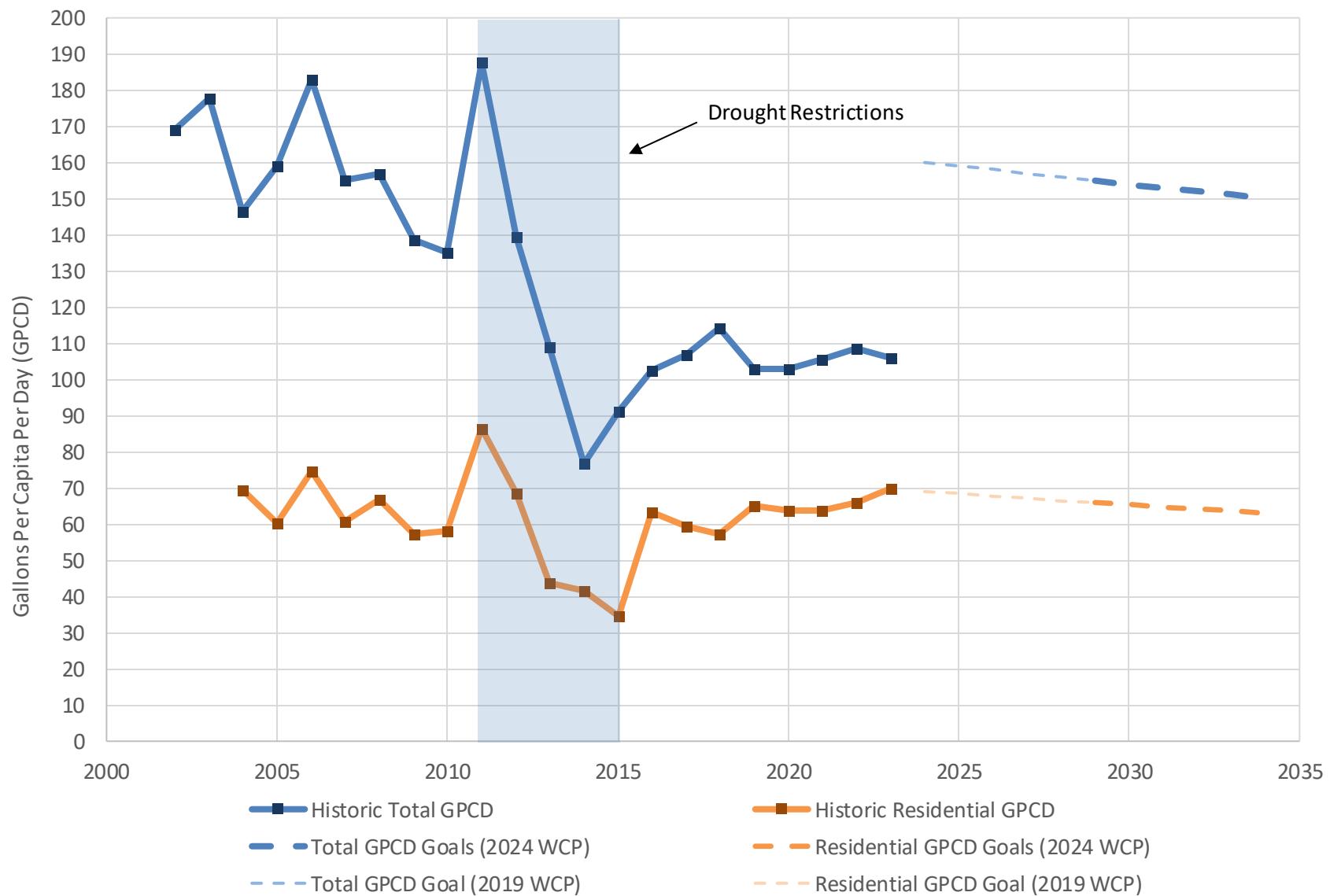
Table F-1: The City's GPCD Goals

Description	2024	2029	2034
Total GPCD ^a	160	155	150
Residential GPCD ^b	69	66	63

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

Figure F-1: The City's Total and Residential Per Capita Water Use and Goals



Conservation as an Alternative to the Proposed Appropriation - 288.7(a)(2)

Raw water use for the City totaled 27,000 ac-ft in 2022. This includes water that was sold to wholesale customers, and all water losses during transmission, treatment, and distribution. Water demand projections for the upcoming 2026 Region B Water Plan show the City's total demand, including wholesale customer contractual demand, to be nearly 31,200 ac-ft/year in 2030, and nearly 32,500 ac-ft/yr in 2080. The City is also projected to have an additional 13,880 ac-ft/year of demand for Lake Kemp water from industrial customers in Wilbarger County. The water supply for this demand comes from its Lake Kemp water right permit for industrial use that it shares jointly with WCWID #2. Draft water supply estimates for the upcoming 2026 Region B Water Plan show the City will have a water shortage of nearly 2,600 ac-ft/year in 2030 and nearly 9,750 ac-ft/year in 2080 to meet its retail and wholesale demands. The 2026 Region B Water Plan draft estimates also shows a shortage of nearly 7,060 ac-ft/year in 2030 and nearly 8,680 ac-ft/year in 2080 to meet industrial demands in Wilbarger County from Lake Kemp.

Water supply savings through conservation have not yet been estimated for the 2026 Region B Water Plan, but the 2021 Region B Water Plan estimated that water conservation would provide just 340 ac-ft/year of additional supplies for the City in 2030 and 884 ac-ft/year in 2080. These additional supplies would only account for a small fraction of the projected water needs for the City. Additional strategies will be required to provide the City with additional water supplies to meet its projected water needs.

Feasible Alternatives to New Water Development – 288.7(a)(3)

During the most severe years of the recent drought of record (2011-2015), the City recognized that even with extreme water use restrictions during drought stages, its current water supplies would not be sufficient to meet its long-term future water needs if a similar or more intense drought occurred in the future. The City developed a Long Range Water Supply Plan (LRWSP) in 2015 to evaluate potential future water supply options. The LRWSP considered many new water supply strategies, and after an initial screening of 22 strategies, the City selected 12 strategies for further evaluation. The City's evaluation of the selected strategies considered several factors, including water quantity, water quality, reliability, regulatory requirements, environmental impacts, potential cost, time to implement, development obstacles, supply independence, and competition for water supply. Of these factors, water quantity, reliability, and potential cost were selected to have a greater weight in the analysis.

Table F-2 shows the list of 12 selected strategies evaluated in the LRWSP. The strategies were ranked based on its composite score which considered the factors listed above.

Table F-2: Selected Strategies from 2015 the City's Long Range Water Supply Plan

Alternative	Composite Score (max 80)	Rank
Indirect Reuse	72	1
Water Conservation	67	2
Lake Ringgold Water	58	3
Groundwater HFSJ (Local Seymour Aquifer)	50	4
Groundwater From Wilbarger County	49	5
Groundwater From Roberts County	47	6
Groundwater From Donley & Gray County	45	7
Wichita River Supply	45	7
Lake Kemp Water Right Amendment	43	9
Groundwater From Denton County	41	10
Lake Texoma Water	41	10
Lake Bridgeport Water	40	12

As discussed in the sections above, the City has implemented various water conservation strategies that have successfully reduced the City's per capita water use from pre-drought levels. The City has also implemented the IPR project which supplies up to 8 MGD of additional water supply to Lake Arrowhead. With these two strategies already implemented, the City is still projected to have significant water supply shortages if another drought of record occurs. Therefore, the City must pursue the Lake Ringgold project. The other strategies above were determined to not provide sufficient water to meet the projected water need or the water supplies were too uncertain and/or expensive.

The 2021 Region B Water Plan estimates the proposed reservoir would provide the City with 23,450 ac-ft/year of additional water supply. This additional supply would meet the City's projected future municipal water supply needs, and potentially make more supply from Lake Kemp available for industrial use to help meet the projected needs of the City's industrial wholesale customers.

The discussion in this section focuses on the potential alternative strategies to the Lake Ringgold project that have not already been implemented by the City. The IPR and water conservation strategies are not discussed as alternatives to Lake Ringgold because both strategies have been implemented. Descriptions of the potential project alternatives are presented below. All these alternatives were evaluated as part of the LRWSP, and some strategies were also evaluated during the Lake Ringgold water use permit

application process, and in the 2021 Region B Water Plan. A summary of the potential strategies and its feasibility as alternatives to the Lake Ringgold project is shown in **Table F-3**.

The City's evaluation of the potential alternatives considered several factors, including water quantity, water quality, reliability, regulatory requirements, environmental impacts, potential cost, time to implement, development obstacles, supply independence and competition for water supply. A comparison of the capital and unit costs for the alternative strategies, including Lake Ringgold, is shown on **Table F-4** and on Figure F-2. Capital cost, unit cost (\$ per 1,000 gallons) with debt service, and unit cost without debt service were estimated for each alternative strategy in the LRWSP. These costs were presented in September 2014 dollars. Cost estimates for the Lake Ringgold, Groundwater HFSJ, and Wichita River Supply strategies were developed and published in the 2021 Region B Water Plan. These costs were presented in September 2018 dollars. To allow for more accurate cost comparison between the potential strategies, cost estimates for the strategies from the LRWSP without cost estimates from the 2021 Region B Water Plan were updated from September 2014 to September 2018 to account for increased cost during the four-year period. September 2014 costs were increased by 13% to match the increase in the Engineering News Record Construction Cost Index (CCI) from September 2014 to September 2018. The conjunctive use strategy cost was updated using the 2021 Region B costs for the two components (Groundwater HFSJ and Wichita River Supply). A comparison of the potential available water supply for each strategy is shown in **Table F-5**.

Table F-3: List of Potential Water Supply Alternatives to Lake Ringgold

Alternative Strategy	Feasible Alternative	Comment
	(Yes/No)	
Groundwater HFSJ (Local Seymour Aquifer)	No	Does not provide the amount of supply needed. High unit cost of water.
Groundwater From Wilbarger County	No	Does not provide the amount of supply needed long-term. High competition for water supply.
Groundwater From Roberts County	No	CRMWA and the City of Amarillo hold most of the water rights in Roberts County, and there is not enough water long-term for the City.
Groundwater From Donley & Gray County	No	High capital and unit cost of water. Potential difficulty in acquiring land and groundwater rights to develop the water supply.
Groundwater From Denton County	No	Current and projected future groundwater usage exceed MAG estimates. There is no groundwater available for the City.
Wichita River Supply	No	Does not provide the amount of supply needed. Little to no supply during drought. High unit cost of water.
Conjunctive Use - Wichita County Supplies	No	Does not provide the amount of supply needed. Uncertainty regarding the reliability of the water supply during drought.
Lake Texoma Water	No	All the water is currently under contract to others. No known willing seller. High unit cost of water.
Lake Bridgeport Water	No	All the water is currently under contract to others. Tarrant Regional Water District (TRWD) is not interested in selling water to the City.
Lake Kemp Water Right Amendment	No	Will not provide additional supply during drought.

Table F-4: Costs for Potential Water Supply Alternatives to Lake Ringgold (Sept 2018 dollars)

Strategy ¹	Capital Cost (Million \$)	Unit Cost (\$/1000 gal)	
		With Debt Service	After Debt Service
Lake Ringgold	\$443	\$4.47	\$1.18
Groundwater HFSJ (Local Seymour Aquifer)	\$14.8	\$14.34	\$7.93
Groundwater From Wilbarger County	\$122	\$7.39	\$3.53
Groundwater From Roberts County ²	\$1,058	\$10.90	\$4.24
Groundwater From Donley & Gray County	\$711	\$12.26	\$4.75
Groundwater From Denton County	\$421	\$7.77	\$3.33
Wichita River Supply	\$20.6	\$22.94	\$13.06
Conjunctive Use - Wichita County Supplies	\$35.4	\$18.16	\$10.21
Lake Kemp Water Right Amendment	\$47.8	\$2.84	\$2.08
Lake Texoma Water	\$454	\$8.67	\$3.87
Lake Bridgeport Water	\$266	\$5.73	\$2.92

¹Cost estimates for Lake Ringgold, Groundwater HFSJ, and Wichita River Supplies come from the 2021 Region B Water Plan. All other cost estimates come from the City's 2015 LRWSP and were updated from Sept. 2014 to Sept. 2018 dollars.

²Water supply and cost information for the Roberts County groundwater strategy may no longer be realistic due to the unavailability of water rights.

Figure F-2: Unit Cost Comparison of Potential Water Supply Alternatives to Lake Ringgold

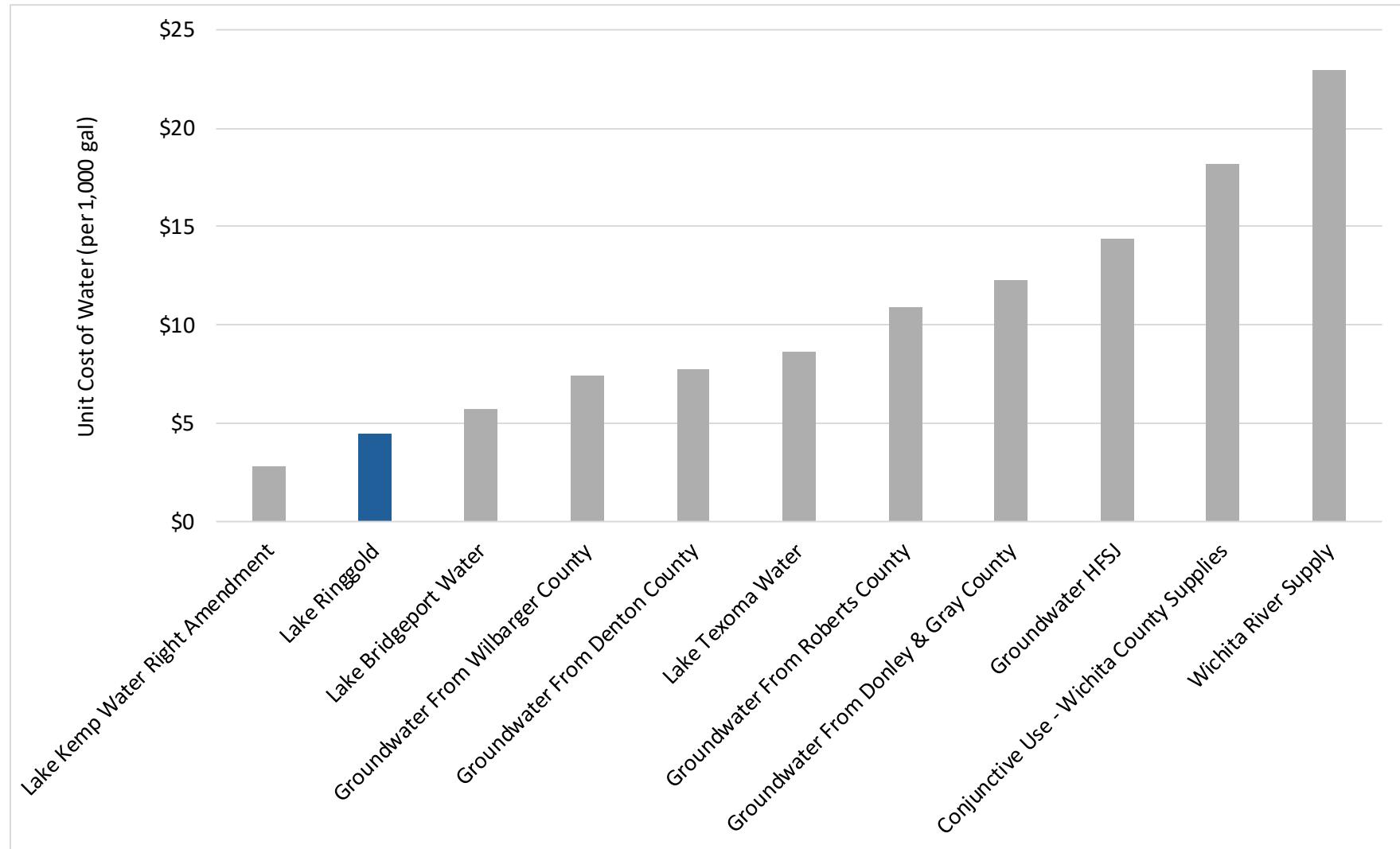


Table F-5: Comparison of Water Supply for Potential Alternatives to Lake Ringgold

Alternative Strategy	Potential Water Supply	
	ac-ft/yr	MGD
Lake Ringgold	23,450	16.9
Groundwater HFSJ	500	0.45
Groundwater From Wilbarger County	5,600	5.00
Groundwater From Roberts County	26,900	24.0
Groundwater From Donley & Gray County	16,800	15.0
Groundwater From Denton County	16,800	15.0
Wichita River Supply	400	0.36
Conjunctive Use - Wichita County Supplies	900	0.80
Lake Kemp Water Right Amendment	11,200	10.0
Lake Texoma Water	16,800	15.0
Lake Bridgeport Water	16,800	15.0

Alternative Long-Term Strategies to Lake Ringgold

Groundwater from HFSJ (Local Seymour Aquifer Supply)

This strategy includes the development of groundwater supply wells in the Seymour Aquifer in Wichita County along the Wichita River. The proposed well field site is primarily located on private land owned by HFSJ Property Holdings, but some of the land is owned by the City or others. A previous study estimated that the site could potentially provide up to 500 ac-ft/yr (0.45 MGD) of water supply to the City for a limited period. The long-term reliability of the groundwater supply is unknown. The quality of the water supply is poor and would need to be treated by Reverse Osmosis (RO) to meet drinking water quality standards. Treatment losses of 25% were assumed. This strategy assumed the groundwater would be pumped from the wells to an on-site treatment plant via collection lines. After treatment, the water would

be pumped directly into the City's distribution system. The RO concentrate would be discharged to the Wichita River.

Due to the unknown reliability of the groundwater supply, the strategy would need to be phased with continuous onsite evaluation conducted as additional wells are developed. The Seymour Aquifer is unconfined, meaning the water supply is dependent upon direct recharge and may be less during drought. The strategy has one of the highest unit costs of water among the potential strategies. There are also potential environmental impacts associated with the discharge of RO concentrate into the Wichita River. The City would need to negotiate with landowners for groundwater rights and property acquisition and obtain a RO discharge permit from TCEQ.

The Groundwater from HFSJ strategy is not a feasible alternative to the Lake Ringgold project because it does not provide the amount of water needed, the long-term reliability of the supply is unknown, and the unit cost of water is much higher.

Groundwater from Wilbarger County

This strategy includes the development of groundwater supply wells in the Seymour Aquifer along the Red River in northwestern Wilbarger County. Groundwater from each well would be conveyed via a 75-mile transmission pipeline to the Cypress WTP in the City for enhanced treatment due to the poor water quality (elevated total dissolved solids and nitrates). The Cypress WTP would potentially need to be expanded to treat the additional water supply from this strategy.

This strategy would provide the City with an estimated 5 MGD or 5,600 ac-ft/year of additional water supply. The groundwater supply was determined to be moderately reliable based on historical data, but the water table at the proposed site would need to be continually monitored and evaluated on an annual basis, and especially during periods of drought. It may also be difficult to identify sufficient groundwater resources to produce 5,600 ac-ft/year. Based on the Modeled Available Groundwater (MAG) estimates, nearly all the groundwater in Wilbarger County is currently used by existing users, and there are no known water right holders in Wilbarger County willing to sell groundwater to the City. Groundwater from this source is currently being heavily used for agricultural irrigation purposes, so the City would be facing competition from the agricultural community for this water supply.

The Groundwater from Wilbarger County strategy is not a feasible alternative to the Lake Ringgold project because it does not meet the projected need, the amount and reliability is uncertain due to high competition for the groundwater supply, and the unit cost of water is high.

Groundwater from Roberts County

This strategy includes the development of groundwater supply wells in the Ogallala Aquifer in eastern Roberts County and southern Lipscomb County. Since this strategy was evaluated for the City's LRWSP, the City of Amarillo has secured water rights for a considerable portion of the groundwater supplies in Roberts County. This means the information from the LRWSP strategy evaluation is no longer accurate, and the potential water supply available to the City through this strategy has significantly decreased since it was originally evaluated. The premise of this strategy is that the City could secure sufficient water rights in Roberts County (and possibly Lipscomb County) to provide 24 MGD for at least 100 years. However, the Canadian River Water Authority (CRMWA) holds nearly 457,000 acres of water rights and Amarillo holds over 82,800 acres of water rights in Roberts County. The total amount of available groundwater in Roberts County is approximately 455,000 acre-feet. Between CRMWA and Amarillo's water right holdings and local needs, there is little to no groundwater available to the City. This strategy is not a feasible alternative water supply to Lake Ringgold.

Groundwater from Donley County and/or Gray County

This strategy includes the development of groundwater supply wells in the Ogallala Aquifer in eastern Donley and Gray Counties. The strategy assumes the wells could provide 15 MGD or 16,800 ac-ft/year of additional water supply to the City for at least 100 years. Collection lines would transport the pumped groundwater to storage facilities, then the groundwater would gravity flow via a 185-mile transmission pipeline directly into the City's existing storage facilities in the City. Based on historical data, the water quality from the Ogallala Aquifer in the two counties will likely meet regulatory requirements but require disinfection prior to distribution.

The City would need to identify landowners in the area willing to sell its land for groundwater development or purchase water from landowners with existing groundwater rights. Currently there are no known willing sellers. Greenbelt Municipal and Industrial Water Authority has recently secured groundwater rights in Donley County and would be competing for supplies with the City. The distance between the water supply and the City also presents challenges associated with development of the

transmission system for this strategy. Routing the 185-mile transmission pipeline and purchasing the required easements will be a challenge for the City, and costs will be substantial. Additional studies are required to validate the long-term supply availability of groundwater. The City would also need to obtain approval from the Panhandle Groundwater Conservation District (PGCD) who manages the Ogallala Aquifer in the two counties before developing any wells in the area.

The Groundwater from Donley and/or Gray County strategy is not a feasible alternative to the Lake Ringgold project because there is uncertainty of the long-term supply, the capital cost and unit cost of water are nearly twice the cost of Lake Ringgold, and there is uncertainty regarding the difficulty of acquiring the land and water rights required for this strategy.

Groundwater from Denton County

This strategy includes the development of groundwater supply wells in the Trinity Aquifer in northwest Denton County. When the strategy was originally evaluated for the LRWSP, it was assumed there would be a substantial amount of available groundwater in the area. However, based on current and projected future usage and MAG estimates for the Trinity Aquifer in Denton County, it is highly unlikely that new groundwater of any significant quantity could be permitted in Denton County.

The strategy originally assumed the City could develop up to 15 MGD of groundwater supplies from the area for a long-term reliable water supply. At the time of evaluation, it was determined that the amount of groundwater available for permitting was likely much less than 15 MGD, based on the Modeled Available Groundwater (MAG) and Desired Future Conditions (DFCs) from the North Texas Groundwater Conservation District (NTGCD). The available supply for new permits is likely even lower now.

To develop this supply, the City would need to identify landowners in the area willing to sell their land for groundwater development or purchase water from landowners with existing groundwater rights. The City would also need to obtain approval from the NTGCD who manages the Trinity Aquifer in Denton County before developing any wells in the area. With the competition for groundwater in the county, the long-term reliability is uncertain and authorized pumping may be subject to reductions to meet the DFC.

The Groundwater from Denton County strategy is not a feasible alternative to the Lake Ringgold project because of the uncertainty of the availability and reliability of the supply based on current groundwater usage and MAG estimates.

Wichita River Supply

This strategy includes the direct diversion of water supplies from the Wichita River, just upstream of the City's Cypress WTP. The water would be pumped directly to the Cypress WTP for treatment. The City's joint water right with WCWID #2 for Lake Kemp allows diversion of up to 16,600 ac-ft/year (14.8 MGD) for irrigation purposes from the Wichita River. Currently, there is no infrastructure in place to use the supply for irrigation purposes. This strategy assumes the Lake Kemp water right would be amended to allow the permitted supply from the Wichita River to be used for municipal purposes from a different diversion point just upstream of the Cypress WTP discharge location. This strategy was evaluated for both the LRWSP and the 2021 Region B Water Plan.

Currently there is very little unappropriated water in the Wichita River basin. There is an instream flow bypass requirement associated with the Lake Kemp water right for the Wichita River supply. Considering the limitations associated with moving the diversion point downstream and the bypass requirement, there is little reliable supply from the Wichita River for this strategy. The strategy was designed for 2 MGD for the LRWSP to provide supplemental water supply to the City when there was adequate flow in the river. However, the most recent version of the TCEQ Red River Basin Water Availability Model (WAM) shows a minimum available supply of about 725 ac-ft/year during the recent drought of record. Based on an analysis of the historical flows at the Wichita Falls gage, it appears that the base flow in the river may be dependent on upstream overflows and return flows from WCWID #2. Reduction of irrigation through curtailment or conservation strategies may reduce the reliable flows in the river. Flows measured at the Wichita Falls gage after 2009 also include discharges from the Cypress WTP. The assumed available supply for this strategy was 400 ac-ft/year (0.36 MGD).

The Wichita River Supply strategy is not a feasible alternative to the Lake Ringgold project because the supply is not sufficient to meet the City's future water needs, there is uncertainty with the reliability of the water supply, and the unit cost of water is very high.

Conjunctive Use – Supplies in Wichita County

This strategy is a combination of two previously discussed strategies: Ground HFSJ and Wichita River Supply. The two strategies were evaluated together and designed for conjunctive use in the City's LRWSP. The combined strategy would allow the City to use surface water when available from the Wichita River, and reserve the groundwater for times when there is less surface water available. The strategy assumes

each component could provide 2 MGD for a total of 4 MGD of water supply. However, a more recent evaluation of the local groundwater supply strategy from the 2021 Region B Water Plan estimated the available supply to be only 1 MGD. There is some uncertainty regarding the long-term reliability of the groundwater supply. The Wichita River supply would be very limited during periods of drought.

Due to the different length of time, it may take to develop both components of this strategy, it is assumed that the strategy is developed in stages. The groundwater component would be developed first, followed by the Wichita River supply strategy component. Instead of treating the groundwater on-site as discussed in the Groundwater HFSJ strategy, the RO treatment facility would be relocated to the City's Jasper WTP. The Wichita River water supply would also be pumped to the Jasper WTP. The Wichita River supply component would require a channel dam, pump station, and transmission pipeline to move diverted river water to the WTP. The water quality from both sources is poor, so advanced treatment would be needed to treat the combined water supply. Other development impacts and obstacles associated with this conjunctive use strategy are the same as described for the individual strategies.

The Conjunctive Use – Supplies in Wichita County strategy is not a feasible alternative to the Lake Ringgold project because the amount of water supply is not sufficient to meet the City's future water needs, and there is uncertainty with the reliability of the water supply.

Lake Texoma Water

This strategy assumes that the City enters into an agreement with an existing water right holder to purchase water from Lake Texoma and transport it to the City. Raw water from Lake Texoma would be transported via a 120-mile transmission pipeline to the City's Cypress WTP for treatment. The strategy would require the City to expand the RO treatment capacity at the Cypress WTP. The strategy would also require the City to construct an intake structure at Lake Texoma to divert the water.

Storage in Lake Texoma is allocated to both Texas and Oklahoma. Texas has permitted nearly all its share of the reservoir's storage. The LRWSP identified the City of Denison and Greater Texoma Utility Authority as existing water rights holders that could potentially be willing to sell water to the City. However, both entities do not have sufficient supplies to meet the needs of their existing customers. It is highly unlikely these two entities would be willing to sell any Lake Texoma water to the City. Red River Authority also owns water rights in Lake Texoma, but the available quantity is less than the amount needed by the City. Oklahoma is currently using only a small portion of its allocated supply from Lake Texoma. If Oklahoma

began using more of its supply, there would be additional competition for Lake Texoma water supplies. The 2015 LRWSP estimated the potential available supply from this strategy was 15 MGD or 16,800 ac-ft/year for at least 50 years. The distance between the water supply and the City also presents challenges associated with development of the transmission system for this strategy. Routing the 120-mile transmission pipeline and purchasing the required easements will be a challenge for the City, and costs will be substantial.

The Lake Texoma strategy is not a feasible alternative to the Lake Ringgold project because there is no willing seller of the water and the high unit cost of water.

Lake Bridgeport Water

This strategy assumes that the City enters into an agreement with Tarrant Regional Water District (TRWD) to purchase water from Lake Bridgeport and transport the water to Lake Arrowhead. The strategy would include construction of an intake pump station, two booster pump stations, and a 75-mile transmission pipeline. Lake Bridgeport water would be stored in Lake Arrowhead, then pumped via the City's existing transmission system at Lake Arrowhead to the City's secondary reservoir, and eventually to be treated at the City's two WTPs. The water from Lake Bridgeport is anticipated to be of similar quality to Lake Arrowhead, making it compatible for storage there.

When the strategy was evaluated for the 2015 LRWSP, previous discussions with TRWD indicated that there would be up to 15 MGD or 16,800 ac-ft/year of available supply from Lake Bridgeport during normal rainfall years. During periods of drought, TRWD would not allow the City to divert any water from Lake Bridgeport once the water falls below a certain level set by TRWD. So, it is anticipated that this strategy would not benefit the City during drought conditions. Currently, Lake Bridgeport is fully contracted to existing customers with requests for water from other nearby water providers. TRWD is unable to fulfill all the contract requests within its current service area.

The Lake Bridgeport strategy is not a feasible alternative to the Lake Ringgold project because TRWD has fully committed the water to other users, and TRWD is unwilling to sell water to the City during drought.

Lake Kemp Water Right Amendment

The water right for Kemp, Certification of Adjudication 02-5123, authorizes diversion and use of up to 193,000 acre-feet per year (172 MGD) for multiple purposes, which is significantly more than the available yield of the reservoir. Of this amount, 25,150 acre-feet per year (22 MGD) is for municipal and 40,000

acre-feet per year (36 MGD) for industrial purposes. The water right also includes the option to divert up to 16,660 acre-feet per year (15 MGD) of the 120,000 acre-feet per year authorized for irrigation directly from the Wichita River downstream of the reservoir. This strategy would amend the Lake Kemp permit to change individual use amounts to multiple purposes, which could provide a greater portion of the allocated water rights to the City if the water is available.

When the strategy was evaluated for the 2015 LRWSP, the recent drought of record was ongoing, and the estimated available supply from Lake Kemp was 44,600 ac-ft/year (40 MGD). Now that the drought of record has ended, and a new version of the TCEQ Red River WAM has been released, the estimated available supply from Lake Kemp is 32,900 ac-ft/year (29 MGD) in 2030, which includes a 20 percent reserve supply in the lake during the drought of record, as required for operational purposes. This is the reserve supply used for planning purposes by the Region B Regional Water Planning Group. The amount of this available to the City for municipal purposes would be 3,350 ac-ft/year (3 MGD) or about 10 percent of the total supply. This volume assumes treatment losses of 25 percent associated with the RO treatment required to use Lake Kemp water for municipal purposes. This strategy considers several elements designed to protect the City's ability to divert an annual average of 10 MGD from the reservoir as long as possible. These elements include:

- Changing the operation of Lake Kemp to prevent excessive use during drought.
- Obtaining additional supplies from the reservoir from other users as existing contracts expire or through direct purchase.
- Implementation of irrigation conservation measures (this portion of the strategy may impact Wichita River supplies if that strategy is also implemented).

The strategy includes a 10 MGD expansion of the Cypress WTP to be able to treat the additional supplies from Kemp with advanced treatment.

This strategy was originally evaluated for the 2015 LRWSP. Since then, several factors have introduced additional uncertainty with this strategy. The worst years of the most recent drought of record (2011-2015) have concluded, and the reliable supply of Lake Kemp for planning purposes is now lower than what was assumed for this strategy. The City has also agreed to sell additional Lake Kemp water from the industrial water right allocation to a new industrial facility in Wilbarger County under its existing contract with the Oklaunion Power Generation Facility. This agreement had not been finalized when this strategy

was originally evaluated for the LRWSP. Another major obstacle for the City with this strategy would be negotiating with existing water users to purchase its Lake Kemp water rights, and/or changing the operations of the reservoir.

The Lake Kemp Water Right Amendment strategy is not a feasible alternative to the Lake Ringgold project because changes in operation would significantly impact agricultural and industrial uses, making agreements unlikely. The estimated available supply for water supply planning purposes is lower than when the strategy was last evaluated, which further limits the available supply from this strategy. The Lake Kemp Amendment is not a feasible alternative to Lake Ringgold because it cannot meet the projected need during drought, there is significant competition for water from Lake Kemp, and there are concerns of its usability during drought due to very poor water quality and water loss during treatment.

Conclusion

Based on the information and analysis of the strategies discussed above, there are no feasible alternatives to the Lake Ringgold project that could provide enough reliable water supply to meet the City's projected water needs. The strategies the City has currently implemented, including water conservation and indirect potable reuse, are insufficient to meet the City's water needs. The Lake Ringgold project is the only feasible water supply strategy available to the City.