Water Conservation Plan

City of Fort Worth

Adopted April 8, 2014

Prepared by:

FREESE AND NICHOLS, INC.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109
817-735-7300

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APPENDICIES

APPENDIX A **List of References**

APPENDIX B **Texas Commission on Environmental Quality Rules on Water Conservation Plans for Municipal and Wholesale Water Providers**

- Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.1 – Definitions (Page B-1)
- Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.2 – Water Conservation Plans for Municipal Uses by Public Water Suppliers (Page B-5)
- Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.5 – Water Conservation Plans for Wholesale Water Suppliers (Page B-9)

APPENDIX C **City of Fort Worth Utility Profiles Based on TCEQ Format**

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1.0 INTRODUCTION AND OBJECTIVE

Water supply has always been a key issue in the development of Texas. In recent years, the increasing population and economic development of North Central Texas have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely already developed. Additional supplies to meet future demands will be expensive and difficult to secure. Severe drought conditions in recent years have highlighted the importance of the efficient use of our existing supplies to make them last as long as possible. Extending current supplies will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation plans.[1] The TCEQ guidelines and requirements are included in Appendix B. The City of Fort Worth has developed this water conservation plan in accordance with TCEQ guidelines and requirements. To develop a regional approach, Tarrant Regional Water District's Water Conservation and Drought Contingency Plan[2], of whom the City of Fort Worth is a customer, was consulted. This Water Conservation Plan replaces the previous plan dated March 2009.

The City of Fort Worth also recognizes that in order to achieve its goals of maximizing water conservation and efficiency, it is necessary to develop and implement a water conservation plan that goes beyond basic compliance with TCEQ guidelines and requirements. This plan reflects the City of Fort Worth's commitment to enhanced water conservation and efficiency strategies – particularly those best management practices established by the Water Conservation Implementation Task Force[3], which were incorporated, where practicable, in the development of these water conservation measures. The Water Conservation Implementation Task Force developed the Texas Water Development Board Report 362 Water Conservation Best Management Practices Guide in partial fulfillment of the Texas Legislature's charge to the TCEQ and Texas Water Development Board (TWDB) to develop recommendations for optimum levels of water use efficiency and conservation in the State.

[1] Superscripted numbers match references listed in Appendix A

The objectives of this Water Conservation Plan are as follows:

- 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.
- Encourage efficient outdoor water use.
- To document the level of recycling and reuse in the water supply.
- To extend the life of current water supplies by reducing the rate of growth in demand.

The City's plan will achieve significant conservation savings to help extend the life of existing supplies without burdening the customer with unnecessary additional costs.

3.0 DESCRIPTION OF SERVICE AREA AND UTILITY PROFILE

The City of Fort Worth provides retail water and sewer service to approximately 770,000 residents and wholesale water service to 30 wholesale customers listed below. Service through wholesale customers accounts for approximately 350,000 additional residents. In total, Fort Worth provides water directly or indirectly to over 1.1 million people in Tarrant, Denton, Johnson, Parker and Wise counties. Figure 3-1 shows Fort Worth's water service area. Fort Worth's wholesale customers include:

- Aledo
- Bethesda WSC
- Burleson
- Crowley
- DFW Airport
- Dalworthington Gardens
- Edgecliff Village
- Everman
- Forest Hill
- Grand Prairie
- Haltom City
- Haslet
- Hurst
- Keller
- Kennedale
- Lake Worth
- North Richland Hills
- Northlake
- Richland Hills
- River Oaks
- Roanoke
- Saginaw
- Sansom Park
- Southlake
- Trophy Club MUD #1
- Trinity River Authority (TRA)
- Westlake
- Westover Hills
- Westworth Village
- White Settlement

The City purchases raw water from the Tarrant Regional Water District (TRWD). This water is from five major sources, as seen in Figure 3-2:

1. The West Fork of Trinity River via Lake Bridgeport, Eagle Mountain Lake and Lake Worth;
2. Clear Fork of the Trinity River via Lake Benbrook; (A pipeline connects Lake Benbrook to the Rolling Hills Water Treatment Plant to supplement supply to that plant. A pump station on the Clear Fork of the Trinity River also supplies the Holly Water Treatment Plant.)
3. Cedar Creek Reservoir, located approximately 75 miles southeast of Fort Worth; and
4. Richland-Chambers Reservoir, located approximately 75 miles southeast of Fort Worth.

FIGURE 3-1: FORT WORTH'S WATER SERVICE AREA

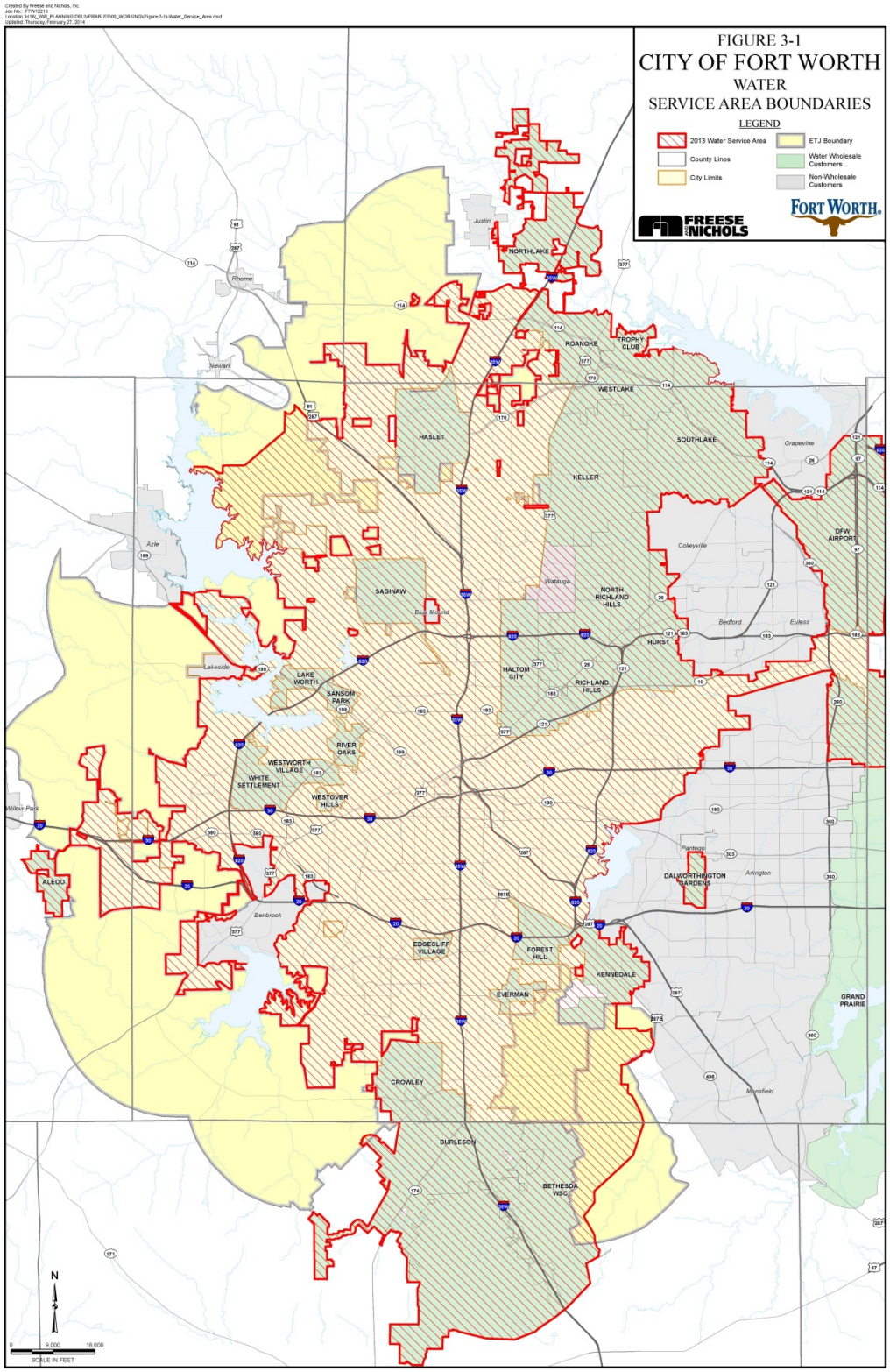
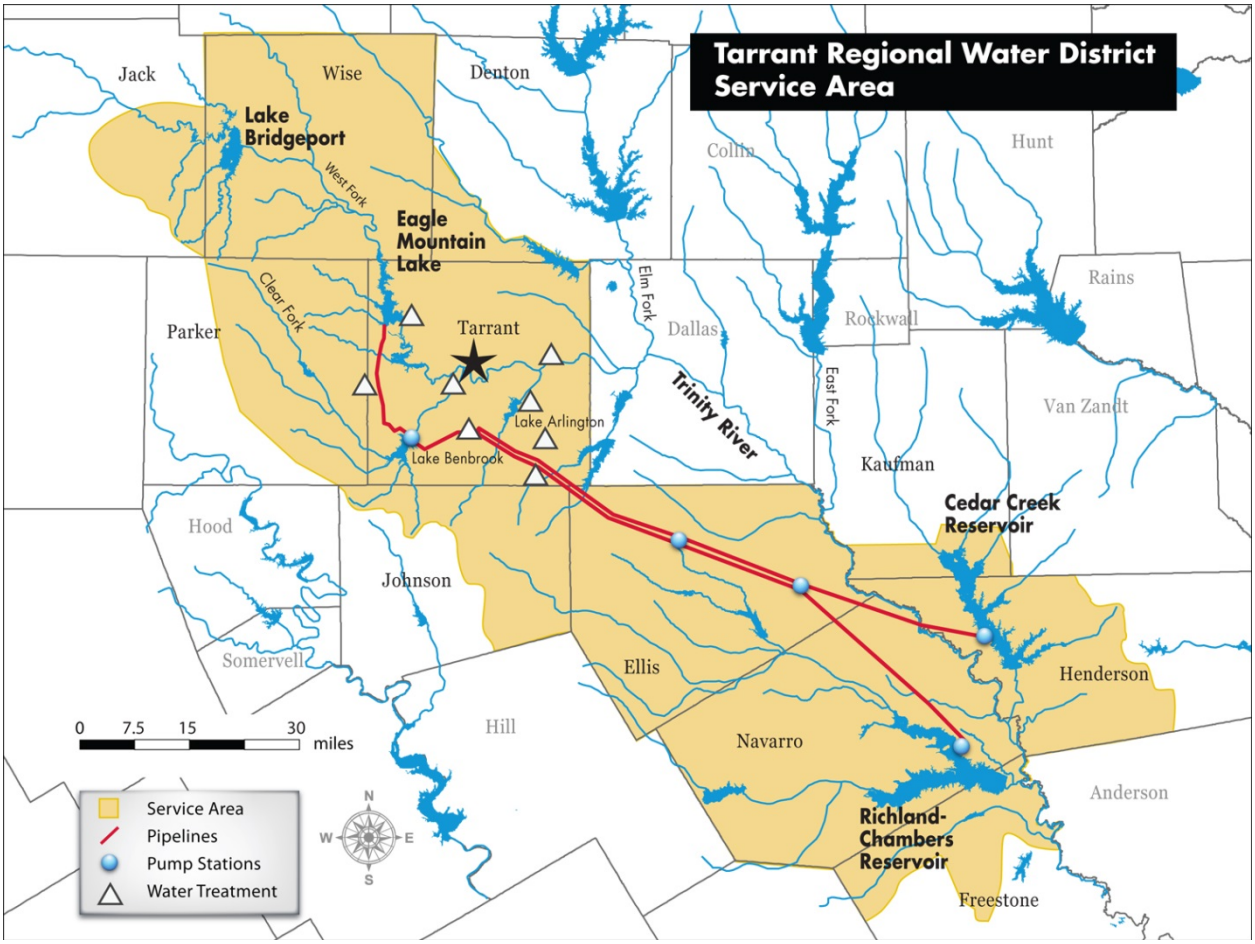


FIGURE 3-2: TARRANT REGIONAL WATER DISTRICT SUPPLY SOURCES



The City's service area is currently served by five water treatment plants. As of 2012, the total treatment capacity is 497 million gallons per day (MGD). A breakdown of treatment capacity by plant is provided in Table 3-1 below.

TABLE 3-1: 2012 TREATMENT PLANT CAPACITY

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
Rolling Hills, est. 1972	200	190
North Holly, est. 1918	80	75
South Holly, est. 1952	100	95
Eagle Mountain, est. 1992	105	100
Westside, est. 2012	12	12
Total	**497**	**472**

The City has a wastewater treatment capacity of 166 million gallons per day (MGD) at the Village Creek Water Reclamation Facility in east Fort Worth.

Appendix C contains Fort Worth's most recent water utility profiles based on the formats recommended by TCEQ for both retail suppliers and wholesale suppliers.

4.0 SPECIFICATION OF 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 5-year moving average total per capita water use below specified amount in Table 4-2.
- Maintain the level of water loss in the system below the specified amount in Table 5-3.
- Maintain the Infrastructure Leakage Index (ILI), as described in Section 5.3, below the specified amount in Table 5-3.
- Implement and maintain a program of universal metering and meter replacement and repair as discussed in Section 5.2.
- Increase efficient water usage and decrease waste in lawn irrigation by enforcement of landscape water management regulations as described in Section 7.3.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program as discussed in Section 6.1.

In the previous (2009) plan, total per capita use goals were 179 gpcd by 2015 and 170 gpcd by 2020 as outlined in Table 4-1 below. As of 2014, Fort Worth's five year average per capita use was 171 gpcd. This illustrates achieved conservation savings significantly ahead of the 2015 goal and very near to the year 2020 goal.

TABLE 4-1: PREVIOUS PLAN GPCD GOALS (2009)

Description	Units	2008	2015	2020
Total GPCD [a]	GPCD	192	179	170
Residential GPCD [b]	GPCD	93.10	87	83

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365
b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

As such, the 2020 and 2025 goals have been revised to reflect increased conservation as a result of measures included in this plan. Fort Worth has developed goals based on the recommendations of the Texas Water Conservation Implementation Task Force, which suggests a 1% reduction in gallons per capita per day per year. The current specific goals are outlined in Table 4-2. These goals were developed assuming a five year average per capita, and therefore some (dry) years will see higher per capita usage than these five year average goals. A series of dry years may lead to an average exceeding the goal. Figure

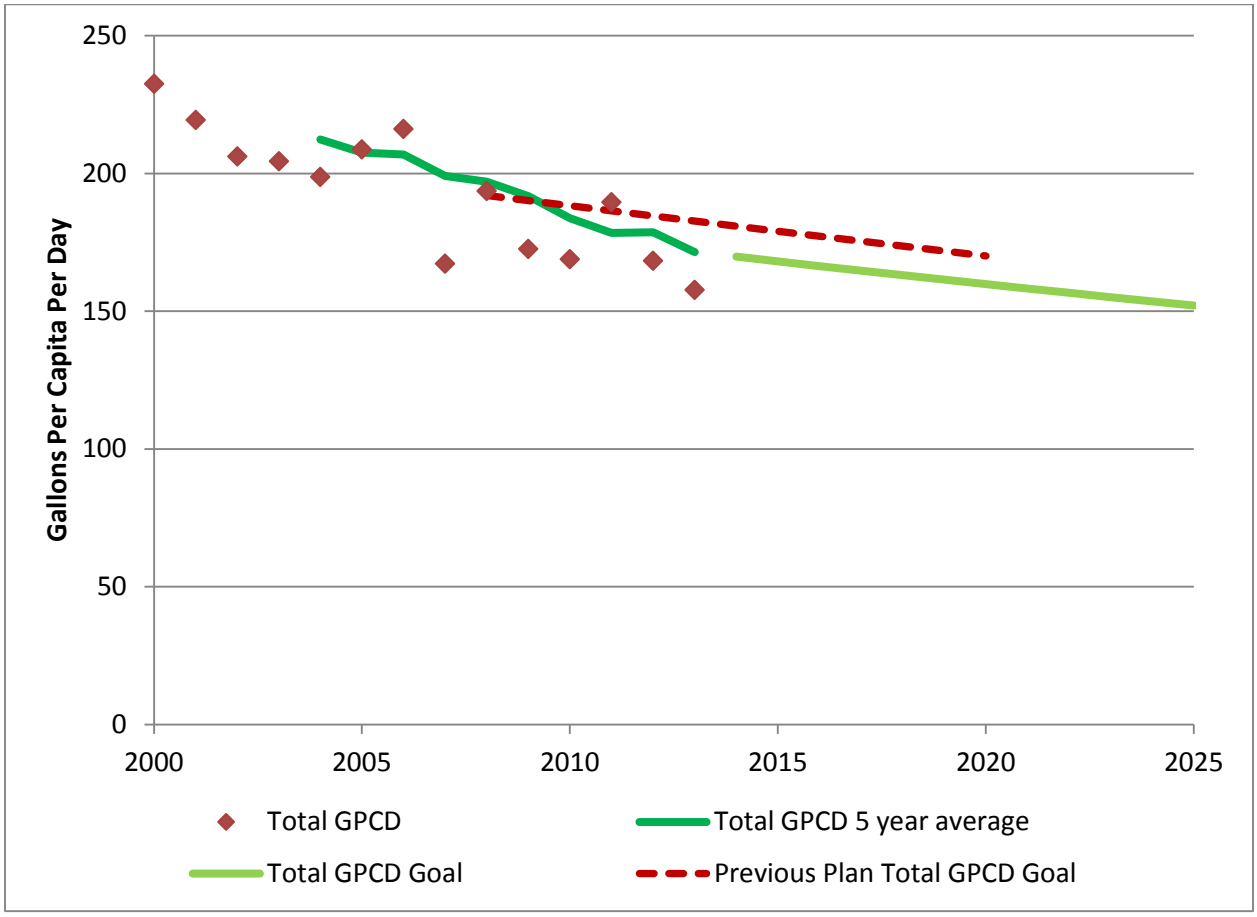
4-1 shows the total annual per capita since 2000, the five year average and the comparison between the previous goal and current goal.

TABLE 4-2: GPCD GOALS (2014)

Description	Units	2013	2020	2025
Total GPCD [a]	GPCD	171	160	152
Residential GPCD [b]	GPCD	81	76	72

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365
b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

FIGURE 4-1: FORT WORTH TOTAL PER CAPITA USE AND GOALS



4.1 ANALYSIS OF BEST MANAGEMENT PRACTICES

During each update of the Water Conservation Plan the City has evaluated the best management practices outlined in the Water Conservation Best Management Practices Guide[3]. For a complete analysis of the Best Management Practices (BMPs), refer to Tables 4-3 and 4-4 on the following pages. Table 4-3 looks at the implementation of the BMP's for the practices the City has implemented and the proposed implementation date for additional strategies. Table 4-4 looks at the potential savings in 2020 and 2025, the proposed cost in 2020 and 2025, the cost per thousand gallons, whether the practice will have an impact to revenues (low, medium or high) and whether the practice has other benefits such as additional supply sources, revenue recovery or education component.

It should also be noted that the Water Conservation Advisory Council is reviewing and updating these BMP's. At this point the Water Conservation Advisory Council has approved four BMPs for wholesale water providers.

1. Customer Contract Requirement for Water Conservation Plans and Drought Contingency Plans – It is a requirement of this plan that Fort Worth's wholesale customers complete water conservation plans and submit them to state agencies as well as the City of Fort Worth for review.

2. Technical Assistance and Outreach – The City holds regular meetings with its wholesale customers to update them on programs the City is implementing. Water conservation staff is available for wholesale customers to contact regarding their programs and to assist wholesale customers with implementing their own programs.

3. Wholesale Supplier Collective Purchase and Direct Distribution of Water Conservation Equipment – Since the City is both a retail and wholesale provider, it has conducted rebate and retrofit programs for retail customers. At this time the City does not intend to offer a collective purchase or direct distribution program for its wholesale customers.

4. Coordination with Customers on Cost Sharing Programs – While the City does not formally have a cost sharing program with its wholesale customers, the City does participate in the Water Efficiency Network of North Texas that organizes cooperative buying programs across the region.

TABLE 4-3: WATER CONSERVATION BEST MANAGEMENT PRACTICES IMPLEMENTATION SCHEDULE

BMP	Description	Implementation Schedule				
		Currently Implemented	Implemented By Code	Implemented before 2015	Implemented before 2020	Implemented before 2025
1	System Water Audit and Water Loss	2002				
2	Water Conservation Pricing	1994				
3	Prohibition on Wasting Water	1994				
4	Plumbing Code Showerhead, Aerator and Toilet Flapper Retrofit		1992			
4a	Additional Showerhead, Aerator and Toilet Flapper Retrofit Program			✓		
5	Plumbing Code Residential Toilet Replacement Programs		2014			
5a	Additional Residential and Commercial Toilet Replacement Programs	2009				
6	Residential Clothes Washer Incentive Program		1992			
6a	Additional Residential Clothes Washer Incentive Programs				✓	
7	School Education	1990				
8	Water Survey for Single-Family and Multi-Family Customers	2007 Irrigation Audits				
9	Landscape Irrigation Conservation and Incentives	2003				
10	Water Wise Landscape Design and Conversion Programs				✓	
11	Athletic Field Conservation	2006				
12	Golf Course Conservation				✓	
13	Metering of All New Connections and Retrofit of Existing Connections	1980				
14	Wholesale Agency Assistance Programs			✓		
15	Conservation Coordinator	1990				
16	Water Reuse	1999				
17	Public Information	1983				
18	Rainwater Harvesting and Condensate Reuse					✓
19	New Construction Graywater					✓
20	Park Conservation				✓	

BMP	Description	Implementation Schedule				
		Currently Implemented	Implemented By Code	Implemented before 2015	Implemented before 2020	Implemented before 2025
21	Conservation Programs for Industrial, Commercial, and Institutional Accounts	2010				
22	Cost-Effectiveness Analysis for Municipal Water Users					✓
	Twice Per Week Watering Schedule				✓	
	Landscape Ordinance				✓	

TABLE 4-4: BEST MANAGEMENT PRACTICE COST-EFFECTIVENESS ESTIMATES

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2020 (MGD)	2025 (MGD)	2020 ($ per Year)	2025 ($ per Year)	2020	2025			
	Plumbing Code*									
	Showerhead, Aerator and Toilet Flapper Retrofit	0.00	0.00	$0	$0	N/A	N/A	PL Code	Low	No
	Residential Toilet Replacement Programs	0.00	0.00	$0	$0	N/A	N/A	PL Code	High	No
	Residential Clothes Washer Incentive Programs	0.00	0.00	$0	$0	N/A	N/A	PL Code	High	No
	Necessary Programs - No Associated Savings									
14	Wholesale Agency Assistance Programs	0.00	0.00	$50,000	$50,000	N/A	N/A		High	Yes
15	Conservation Coordinator	0.00	0.00	$85,000	$95,000	N/A	N/A		Medium	Yes
17	Public Information BMP	0.00	0.00	$100,000	$100,000	N/A	N/A		Low	Yes
	Programs Not Recommended (RWPG)									
18	Rainwater Harvesting and Condensate Reuse	0.00	0.00	$0	$0	N/A	N/A		Low	No
19	New Construction Graywater BMP	0.00	0.00	$0	$0	N/A	N/A		Medium-High	No
	Cost for Existing and Additional Programs**									
	Twice per Week Watering Schedule	3.70	4.06	$100,000	$110,000	$0.07	$0.07	1	High	Yes
	Residential Landscape Ordinance	1.00	2.00	$60,000	$70,000	$0.16	$0.10	2	Low	No
2	Water Conservation Pricing*	0.56	0.97	$60,000	$70,000	$0.29	$0.20	3	Medium	No
3	Prohibition on Wasting Water	0.50	0.50	$60,000	$70,000	$0.33	$0.38	4	Medium	No

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2020 (MGD)	2025 (MGD)	2020 ($ per Year)	2025 ($ per Year)	2020	2025			
8	Water Survey for Single-Family and Multi-Family Customers (Irrigation Audit)	0.25	0.25	$40,000	$50,000	$0.44	$0.55	5	Medium	Yes
1	System Water Audit and Water Loss (Leak Detection Repair)	3.00	5.00	$800,000	$880,000	$0.73	$0.48	6	Low	Yes
	Intensified Water Loss and Water Line Replacement Program	4.50	6.00	$1,200,000	$1,320,000	$0.73	$0.60	6	Low	Yes
10	Water Wise Landscape Irrigation Conservation and Incentives	0.50	0.50	$200,000	$200,000	$1.10	$1.10	8	Low	No
9	Landscape Irrigation Conservation and Incentives	1.00	1.00	$400,000	$400,000	$1.10	$1.10	8	Medium	No
5	Additional Residential Toilet Replacement Programs	1.10	1.21	$450,000	$495,000	$1.12	$1.12	10	High	No
7	School Education	3.35	4.27	$150,000	$200,000	$1.14	$1.02	11	Low	Yes
6	Additional Residential Clothes Washer Incentive Programs	0.10	0.11	$50,000	$100,000	$1.37	$2.49	12	Medium	No
20	Park Conservation BMP	0.50	0.50	$250,000	$250,000	$1.37	$1.37	12	Low	No
12	Golf Course Conservation	0.50	0.50	$250,000	$250,000	$1.37	$1.37	12	Low	No
11	Athletic Field Conservation	0.80	0.80	$400,000	$400,000	$1.37	$1.37	12	Low	No
16	Water Reuse	30.15	30.15	$20,000,000	$20,000,000	$1.82	$1.82	16	Medium	Yes
4	Additional Showerhead, Aerator and Toilet Flapper Retrofit	0.10	0.10	$75,000	$75,000	$2.05	$2.05	17	Low	No

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2020 (MGD)	2025 (MGD)	2020 ($ per Year)	2025 ($ per Year)	2020	2025			
21	Conservation Programs for Industrial, Commercial and Institutional Accounts	0.22	0.24	$250,000	$275,000	$2.35	$2.59	18	Medium	Yes
13	Metering of all New Connections and Retrofit of Existing Connections	0.50	0.50	$500,000	$500,000	$2.74	$2.74	19	Low	Yes

* Based on *2016 Region C Water Plan*

** Based on savings and cost data from City of Fort Worth or published literature

5.0 METERING, WATER USE RECORDS, CONTROL OF UNACCOUNTED WATER, AND LEAK DETETECTION AND REPAIR

One of the key elements in water conservation is careful tracking of water use and control of losses. Programs for universal metering, meter testing, meter repair, and periodic meter replacement have been developed using American Water Works Association (AWWA) standards and are important elements in the City of Fort Worth's program to control losses.

5.1 PRACTICES TO MEASURE AND ACCOUNT FOR THE AMOUNT OF WATER DIVERTED FROM TRWD

Water deliveries from TRWD are metered by TRWD using meters with accuracy of at least ±5%. TRWD can access the meters at all reasonable times, and meters are calibrated to maintain the required accuracy.

5.2 MONITORING AND RECORD MANAGEMENT PROGRAM FOR DETERMINING DELIVERIES, SALES AND LOSSES

The City has an effective record management system in place. As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 (a)(2)(B), Fort Worth's record management system allows for the separation of water sales and uses into residential, commercial, municipal, and industrial categories. This information is included in the TCEQ required Water Conservation Implementation report, as described in Section 6.4.

The City of Fort Worth meters all of the connections in the distribution system. Meters range in size from 3/4" to 16". The meter size distribution is included in Table 5-1 below. All meters met AWWA accuracy standards when installed. In 2012, there were a total of 227,837 active retail customer meters in the City.

TABLE 5-1: METER SIZE DISTRIBUTION

Meter Size	Total Number
3/4"	193,240
1"	24,336
1 1/2"	3,608
2"	5,383
3"	684
4"	308
6"	199
8"	56
10"	22
12"	0
16"	1

The City has implemented a meter exchange program that provides for the annual replacement of meters in the system that do not register the correct amount of water flowing through them. This program has replaced more than 30,000 meters over the past five years.

5.3 LEAK DETECTION, REPAIR AND WATER LOSS ACCOUNTING

The system water audit is used annually to monitor the total level of non-revenue water. There are many variables which influence the revenue and non-revenue components of the City's water system including meter inaccuracy, data discrepancies, unauthorized consumption, reported breaks and leaks and unreported losses.

The City of Fort Worth uses gallons per connection per day as its preferred water loss metric as it is less variable than other metrics to climatic conditions. In the previous plan, water loss (gallons per connection per day) was 110 with a goal of 95 by 2015 and 75 by 2020 (Table 5-2). Due to the City's water loss reduction program, as of 2012, the City has reached 76 gallons of water loss per connection per day (Table 5-3). This is significantly ahead of the 2015 goal and nearly to the 2020 goal.

The Texas Water Development Board has also asked that cities begin to include their water loss in gallons per capita per day and as a percentage of the total water use in the system. These are additional performance indicators that can be used to determine the effectiveness of the water. The City will continue to reduce water losses throughout the system by analyzing and updating the targets and goals of this section annually in conjunction with the water audit.

TABLE 5-2: PREVIOUS PLAN WATER LOSS GOALS (2009)

Description	Units	2008	2015	2020
Water loss	Gallons/connection per day	110	95	75

TABLE 5-3: WATER LOSS GOALS (2014)

Description	Units	2012	2020	2025
Water Loss GPCD [a]	GPCD	27	25	23
Water Loss Percentage [b]	%	13%	12%	10%
Water Loss Per Connection	Gallons/connection per day	76	72.5	70
Real losses	ILI	4.08	3.75	3.5

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

The Infrastructure Leakage Index (ILI) is a calculation of the theoretical lowest leakage possible divided by existing calculated leakage. This is developed as a unique value for every city and includes variables such

as the distance from the curb stop to the meter boxes, the pressure in the system, and the number of service lines or connections per mile of main. Within Fort Worth, the theoretical lowest leakage is approximately 3 million gallons per day. This is the theoretical lowest leakage currently possible with the existing infrastructure and service connection density.

Fort Worth has an ILI of approximately 4.08, which means that theoretically the leakage could be reduced 4.08 times before reaching the lowest possible value. This puts Fort Worth in the average zone of ILIs within the United States. The City will continue to reduce leaks in the system through its state-of-the-art technologies that employ acoustic leak-noise detectors to target and locate suspected leaks. Its leak detection program includes continuously monitoring almost 230,000 linear feet of pipe in critical areas, as well as surveying over 2.5 million linear feet annually. Leaks detected and repaired through this program were estimated to have saved over 350 million gallons of water in fiscal year 2013. In addition, the City will continue to encourage customers and field operators to report visual leakage.

The City has also piloted District Metered Areas (DMAs) which are part of current Best Management Practice leakage control zones. DMAs are discrete metered areas within the distribution system, usually supplying 1,000 to 3,000 properties. The City has studied pressure surges within the system and will continue to review the possibilities of pressure control in pilot zones within the city limits. This will be conducted in combination with the water-loss control measures developed within the main pressure zones such as District Metered Areas (DMAs).

6.0 OTHER REQUIRED CONSERVATION MEASURES

6.1 PUBLIC EDUCATION AND INFORMATION

The City of Fort Worth has an active, comprehensive water conservation public education program in place. The City coordinates with Tarrant Regional Water District (TRWD) to provide a regionally consistent message on the importance of water conservation.

The City has established a representative Customer Advisory Committee to promote community awareness of the City's conservation efforts. The Committee is also responsible for reviewing, assessing and providing direction for all of the City's conservation programs. The committee includes customers from residential, commercial, industrial, institutional, irrigators, and wholesalers. Under direction of this Committee, important components of the City's current program include:

- Brochure distribution.
- Over 2.7 million water bill inserts annually.
- Notification of local organizations, schools, and civic groups that the City of Fort Worth staff is available to make presentations on the importance of water conservation and ways to save water. In 2012, the City participated in 47 community events and provided support for displays, exhibits and presentations in the community on water conservation reaching over 11,300 people.
- Water conservation information on Fort Worth's website (fortworthtexas.gov, savefortworthwater.org).
- Encouragement of local media coverage of water conservation issues and the importance of water conservation.
- Education programs not only for schools within the Fort Worth Independent School District, but also for schools within the 13 other districts which operate within the wholesale customer boundaries. The program targets elementary and reached more 23,000 students in 2012.

6.2 WATER RATE STRUCTURE

The City of Fort Worth has conservation-oriented water rate structures in place. The City's current rate structure consists of the following six classes:

- Residential
- Commercial
- Industrial

- Super User
- Irrigation
- Gas Well Use

Each customer is first charged a flat rate based on meter size as outlined in Table 6-1. Usage charges are then assessed according to customer class as show in Table 6-2 to Table 6-7. An increasing block rate structure is in place for residential and irrigation classes to encourage water conservation. The City analyzes each customer class and sets rates in proportion to those classes which place the most demands upon the water system. The rates shown in the tables below were effective as of January 1, 2014 and 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 6-1: MONTHLY METER CHARGES

Meter Size	Service Charge
5/8" or ¾"	$9.00
1"	$14.75
1½"	$26.00
2	$29.50
3	$93.50
4	$161.25
6	$345.00
8	$596.75
10	$911.25

TABLE 6-2: RESIDENTIAL WATER RATES

First 8 CCF	**$1.97 per CCF**
8 CCF to 20 CCF	**$2.80 per CCF**
20 CCF to 30 CCF	**$3.55 per CCF**
Above 30 CCF	**$4.40 per CCF**

Note: 1 CCF (hundred cubic feet) = 748.05 gallons

TABLE 6-3: COMMERCIAL WATER RATES

All volumes	**$2.30 per CCF**

TABLE 6-4: INDUSTRIAL WATER RATES

All volumes	**$2.25 per CCF**

TABLE 6-5: SUPER USER WATER RATES

All volumes	**$1.85 per CCF**

TABLE 6-6: IRRIGATION WATER RATES

First 50 CCF	**$2.80 per CCF**
50 to 100 CCF	**$3.55 per CCF**
Above 100 CCF	**$4.40 per CCF**

TABLE 6-7: GAS WELL RATES

Gas Well Use	**$4.79 per CCF**

6.3 RESERVOIR SYSTEM OPERATION

Fort Worth is a raw water customer of Tarrant Regional Water District (TRWD). As such, TRWD is responsible for operation of their reservoir system which consists of seven major reservoirs – Lake Bridgeport, Eagle Mountain Lake, Lake Worth, Cedar Creek Reservoir, Richland-Chambers Reservoir, Lake Arlington and Lake Benbrook. TRWD's reservoir system operation plan seeks to maximize efficiency of water withdraws within the constraints of existing water rights. Other priorities include maintaining water quality and minimizing potential impacts on recreational users, fish, and wildlife. Each reservoir is operated on a policy of flood release above the conservation elevation. TRWD coordinates its Operation Plan with all of its water customers and provides recommendations for the operations of regional treatment systems including the City of Fort Worth. For more information regarding TRWD's Reservoir System Operation please refer to TRWD's Water Conservation Plan.

6.4 IMPLEMENTATION AND ENFORCEMENT

The City of Fort Worth completes the TCEQ required Water Conservation Implementation Report 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, Fort Worth must document why not. The amount of water saved is also documented in this report.

6.5 REQUIREMENT FOR WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

The wholesale service area includes 30 customers. In 2012 there were estimated to be approximately 350,000 people within the combined wholesale customer service area. Table 6-8 shows each wholesale customer, the amount of water purchased from the City in 2013 and whether they are also a wastewater customer.

TABLE 6-8: WHOLESALE CUSTOMERS

Wholesale Customer	2013 Usage (MG)	Wastewater Customer
Aledo	69.6	No
Bethesda WSC	939.4	Yes
Burleson	1,666.2	Yes
Crowley	576.6	Yes
DFW Airport	400.3	No
Dalworthington Gardens	159.2	No
Edgecliff Village	141.2	Yes
Everman	0.0	Yes
Forest Hill	440.4	Yes
Grand Prairie	679.8	No
Haltom City	1,766.7	Yes
Haslet	157.9	No
Hurst	1,938.9	Yes
Keller	2,579.1	No
Kennedale	171.8	Yes
Lake Worth	258.0	Yes
North Richland Hills	2,653.6	Yes
Northlake	75.1	Yes
Richland Hills	257.7	Yes
River Oaks	0.0	Yes
Roanoke	500.3	No
Saginaw	1,042.8	Yes
Sansom Park	0.0	Yes
Southlake	3,551.8	No
Trophy Club MUD #1	793.6	No
Trinity River Authority (TRA)	0.0	Yes
Westlake	401.5	No
Westover Hills	210.6	Yes
Westworth Village	112.1	Yes
White Settlement	424.7	Yes
Total	**21,969**	

Each of the City's wholesale customers is contractually obliged to develop, implement, and update Water Conservation Plans or conservation measures using the applicable requirements of TCEQ Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Texas Administrative Code 30 TAC Chapter 288(a)(2)(C). Each of the City's wholesale customers are also contractually obligated to adopt any mandatory measures in this plan such as time of day restrictions and the twice per week watering schedule. The City has sent a copy of its Water Conservation and Drought Contingency plans to each of its wholesale customers to aid with the development of their plans.

The conservation goals as outlined in this section of the Water Conservation Plan are intended as guides for the wholesale customers. When existing contracts are renewed, 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 6-9 below are recommended for each wholesale customer. The City encourages each wholesale customer to implement conservation plans which reduce water use within 10% of the target goals.

TABLE 6-9: WHOLESALE CUSTOMER TARGETS

	Total GPCD	Residential GPCD	Unaccounted-For Water Per Connection Per Day
By 2020	168	85	105*
By 2025	159	80	100*

** Unaccounted-for water targets are based on the new AWWA water audit practices which approve the performance indicator for water losses as gallons lost per connection per day. This includes real and apparent losses. The commonly used percentage is not recommended as it is too variable depending on usage. These are guidelines and are related to the average wholesale customer in a year of average rainfall. These are voluntary guidelines.*

The City requests that each wholesale customer provide a copy of their Water Conservation Plan and required water system audit (as required by the Texas Water Development Board water audit reporting requirement as specified by House Bill 3338) to the City of Fort Worth. This will be required in any new contracts developed with wholesale customers as specified in 30 TAC Chapter 288.

In 2000 the City of Fort Worth's Wholesale customers accounted for slightly over a quarter of the raw water pumped. In 2013 the wholesale customers accounted for approximately a third of the raw water pumped. Fort Worth will hold quarterly meetings with their wholesale customers to provide information on Fort Worth's program and conservation best management practices.

6.6 COORDINATION WITH REGIONAL WATER PLANNING GROUPS

The City has been working with the local Regional Water Planning Groups (Region C and G) to help develop the water conservation plan documents. This Water Conservation Plan has been discussed with Regional Water Planning Group consultants and is consistent with their methodology and structure. Letters documenting that a copy of the Water Conservation Plan was sent to the Chairs of the Region C and G Water Planning Groups are attached in Appendix D.

7.0 ADDITIONAL CONSERVATION EFFORTS

7.1 WATER-CONSERVING PLUMBING FIXTURES

The City of Fort Worth should adopt new plumbing code standards to be consistent with the 1.28 gallon toilet requirement of the Texas Health and Safety Code, Title 5, Subtitle B, Chapter 372 effective January 1, 2014. This code should be formally adopted by the City Council and included in the Code of Ordinances. This code encourages water conservation through the requirement that all toilets sold, offered for sale or distributed must be a dual flush toilet that may not exceed 1.28 gallons per flush on average or for one full flush. The projected demands for Fort Worth that will be included in the *2016 Region C Water Plan* will account for the new plumbing code requirement. The City routinely inspects new construction, remodeling, add-ons, etc., through building permits to ensure installation of fixtures adheres to current codes.

The City has several programs to encourage the replacement of high water use fixtures, the SmartFlush voucher program and SmartFlush commercial program. The City also has the CARE program for low income and elderly customers for toilet replacement. Since 2009 these programs combined to distribute over 30,000 toilets.

7.2 REUSE

The City of Fort Worth currently has a direct reuse program in place at its Village Creek Water Reclamation Facility which supplies reuse water to Dallas-Fort Worth Airport, Arlington and Euless. Expansion of the reuse program is a major component of the City's vision to manage its water resources in the most efficient manner. The City is currently conducting a feasibility study to expand its direct reuse program to potentially supply the central part of the City. The feasibility study is looking to identify customers currently using potable water for irrigation or other purposes that could convert to reuse.

TRWD has a Texas water right allowing the diversion of return flows of treated wastewater from the Trinity River. The water will be pumped from the river into constructed wetlands for treatment and then pumped into Richland-Chambers Reservoir and Cedar Creek Reservoir. The wetlands project will ultimately provide 115,500 acre-feet per year, of which 10,000 acre-feet per year can be supplied from existing facilities. A portion of this indirect reuse is provided to the City of Fort Worth.

7.3 LANDSCAPE WATER MANAGEMENT

The City has an existing ordinance which prohibits wasting water. This ordinance prohibits watering between 10 a.m. and 6 p.m. year round. In addition the Irrigation ordinance requires that only licensed irrigators alter existing or install new irrigation systems within Fort Worth. The City has adopted ordinances to require rain and freeze sensors on new irrigation systems.

The City has conducted pilot programs to assess different water-saving methodologies and technologies at City athletic fields. The Gateway Park development includes synthetic turf on soccer and rugby fields to improve levels of water conservation at this facility. The best, most effective methods will be considered for all appropriate City facilities. Once it has been determined that specific landscape water management techniques are effective, they will be presented to private facilities such as golf courses and to customers with significant irrigated areas.

The City and other regional water providers (North Texas Municipal Water District, Tarrant Regional Water District, Upper Trinity Regional Water District, the Trinity River Authority and the city of Dallas) have collaborated and agreed upon implementing a year round no more than twice per week watering schedule. The City will have a mandatory twice per week water schedule similar to Stage 1 of its drought plan. The schedule is included as Table 7-1. The two instances when this schedule has been implemented during Stage 1 drought (in 2011 and currently in 2013-2014) it has shown to have savings of 8 percent and 9 percent respectively.

TABLE 7-1: TWICE PER WEEK WATERING SCHEDULE

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
No outdoor watering	Non-residential	Residential addresses ending in (0,2,4,6,8)	Residential addresses ending in (1,3,5,7,9)	Non-residential	Residential addresses ending in (0,2,4,6,8)	Residential addresses ending in (1,3,5,7,9)

7.4 CONSERVATION PROGRAMS FOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL ACCOUNTS

The City contracts with a vendor to offer comprehensive audits to these customers. These audits generally consist of a review of the current water use for the customer, their processes, and an audit of their irrigation system (if applicable). All of the analysis from the report is then summarized into a report detailing recommended improvements, the cost, savings and return on investment. Based on analysis

performed by the vendor the program can account for savings of approximately 65-80 million gallons annually at an approximate cost of $2.35 per thousand gallons.

7.5 ADDITIONAL PRACTICES, METHODS, AND TECHNIQUES

7.5.1 Internal City Water Conservation Effort

The City has implemented water conservation measures internally within City Hall and a number of its other buildings and parks and will continue to do so over the next five-year planning period. This includes retrofits of toilets, faucets, and showerheads, and development of a landscape program in conjunction with the Parks and Community Services Department. The City will also continue to analyze water savings from these measures. The City will also promote demonstration gardens such as the Water Conservation Garden at the Fort Worth Botanic Gardens.

7.5.2 Water Conservation Advisory Committee

The Water Conservation Advisory Committee was formed in August of 2005 to review the current outlook for water supply in North Central Texas, evaluate potential conservation strategies and make recommendations to the Water Director. The Committee comprises a diverse cross section of customer classes and interests. This committee provides review of specific water conservation measures.

7.5.3 Graywater

Residential graywater use (i.e., recycling water within the home using a dual plumbing system) is another potential water supply. The Texas Administrative Code Chapter 210 has rules governing the use of graywater for domestic purposes, industrial, commercial or institutional purposes and irrigation. At this time this practice is not considered economically feasible on a large residential scale, however it may be evaluated on a case-by-case basis for other customer classes.

7.5.4 Rainwater Harvesting and Condensate Reuse

Rainwater harvesting and condensate reuse provide a potential source of supply that could be used for non-potable purposes such as landscape irrigation. Large properties with this potential supply could offset a portion of their irrigation demand depending on the storage capacity. Rainwater and condensate reuse should be evaluated on a case-by-case basis to determine if it is cost effective for large properties. At this time the City will not implement a rebate/giveaway program, but the City will continue to educate the

public about the possibility of rain water harvesting and direct them to classes such as the Master Gardner's.

The Water department has partnered with the Storm water Department for the past three years to offer a rain barrel distribution program. The program works with a direct supplier to offer customers rain barrels at the direct. Then City staff works to advertise the program, register customers and provide a distribution date for customers to pick up their rain barrel. The program has minimal cost for the City to implement.

7.5.5 Weather Stations

TRWD is developing an interactive weather station program to install weather stations throughout its service area to provide consumers with a weekly e-mail and information through a website in determining an adequate amount of supplemental water that is needed to maintain healthy grass in specific locations. This service will provide the public advanced information regarding outdoor irrigation needs, thereby reducing water use. Through a series of selections on the type of irrigation system a consumer has, a weekly email that will tell the customer how long (in minutes) an irrigation system needs to run based on the past seven days of weather. This recommendation provides the actual amount of supplemental water that is required for a healthy lawn based on research of the Texas A&M Agrilife Extension Service and proven technologies. Fort Worth will promote this program, encourage its retail and wholesale customers to participate in the program, and make the information available through its website.

7.5.6 Residential Landscape Ordinance

The City of Fort Worth is projected to have substantial population growth in the next fifty years. The additional population will require additional housing. A residential landscape ordinance could impact the landscaping of future homes. The residential landscape ordinance should be crafted in conjunction with the City Planning and Development Department to identify drought tolerant turf, groundcover, shrubs and trees that are allowed to be planted at new homes. Once an ordinance is crafted it should be reviewed by the Water Conservation Advisory Committee. It is recommended that the City consider adopting a residential landscape ordinance in the next five years.

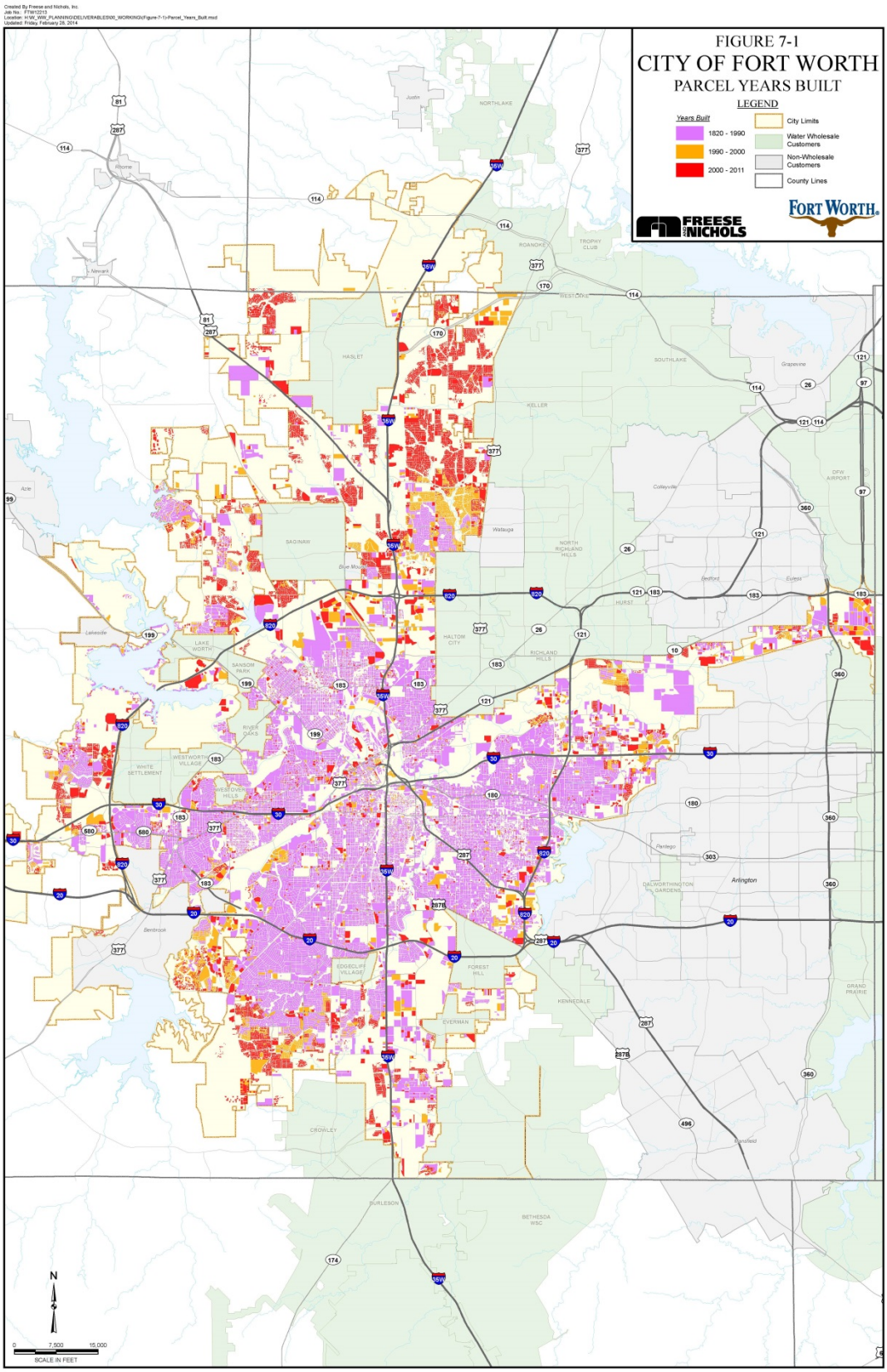
7.5.7 GIS tools

GIS is a powerful analysis tool to analyze data with a spatial component. Conservation staff will begin working with GIS staff in the water department to build a database for water conservation (including program participation, water use, violations etc.). The GIS tools available could be as simple as identifying

target areas for retrofit program based on the Tarrant County Appraisal District data, to as detailed as tying water use to each individual parcel within the City. Figure 7-1 shows the year built of homes within the Fort Worth city limits. Those areas shaded in purple represent homes that were built prior to 1990 and potentially to have older high use plumbing fixtures. Areas shaded in orange were built between 1990-2000, while those shaded in red were built after 2000.

As the amount of data continues to increase and with the possibility of smart meters, GIS is a potential tool to manage the data and identify where water conservation, leak detection and meter replacement programs should be targeted to achieve the greatest savings.

FIGURE 7-1 – CITY OF FORT WORTH PARCEL YEAR BUILT



7.5.8 Smart Meters

New technology known as smart meters or Advanced Metering Infrastructure (AMI) has the potential to change the way water consumption is measured. Many cities have begun to test these meters through pilot programs to determine if they should begin to use these meters as part of their meter replacement program. The advantages of these meters are that they can be read remotely reducing staff cost and provide real time meter readings to identify leaks or other anomalies in water use. Smart meters also have the potential to provide a valuable education component where a customer could view a "dashboard" of their previous, current and projected water use. Some of the disadvantages of these meters are the capital cost to convert to these systems including the additional cost to manage the data they provide. City staff will develop a pilot program to determine the cost effectiveness and potential savings of using smart meters in the next five years.

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

Opportunity for public comment on the plan was provided at a City of Fort Worth public meeting on February 27, 2014. Appendix E contains a copy of the minutes of the April 8, 2014 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 will be updated as required by TCEQ and, in addition, will be continually reassessed for opportunities to improve water efficiency and conservation based on new or updated information.

APPENDIX A

LIST OF REFERENCES

APPENDIX A

LIST OF REFERENCES

1. Title 30 of the Texas Administrative Code, Part 1, Chapter 288, Subchapter A, Rules 288.1 and 288.5, and Subchapter B, Rule 288.22, downloaded from http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=288, June 2013.

2. Tarrant Regional Water District, "Water Conservation and Drought Contingency Plan", prepared by the Tarrant Regional Water District, April 2009

3. Water Conservation Implementation Task Force: "Texas Water Development Board Report 362, Water Conservation Best Management Practices Guide," prepared for the Texas Water Development Board, Austin, November 2004.

4. Water Conservation Advisory Council: Guidance and Methodology for Reporting on Water Conservation and Water Use, December 2012

5. Texas Commission on Environmental Quality Annual Report. http://www.tceq.texas.gov/permitting/water_rights/conserve.html#imple

APPENDIX C

CITY OF FORT WORTH UTILITY PROFILES BASED ON TCEQ FORMAT

TCEQ logo would appear here.

Texas Commission on Environmental Quality

UTILITY PROFILE AND WATER CONSERVATION PLAN REQUIREMENTS FOR MUNICIPAL WATER USE BY RETAIL PUBLIC WATER SUPPLIERS

This form is provided to assist retail public water suppliers in water conservation plan development. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resources Protection Team in the Water Availability Division at (512)239-4691.

City of Fort Worth- Utility Profile Based on TCEQ Format

Name:	City of Fort Worth, TX	
Address:	908 Monroe Street, Fort Worth, TX 76102	
	P.O. Box 870, Fort Worth, TX 76101	
Telephone Number:	(817) 395-4477	Fax: (xxx) xxx-xxxx
Water Right No.(s):	3340, 3366	
Regional Water Planning Group:	Region C	
Form Completed by:	Jeremy Rice	
Title:	Freese and Nichols	
Person responsible for implementing conservation program:	Micah Reed	Phone: (817) 392-8211
Signature:	Micah S. Reed	Date: 4/30/2014

NOTE: If the plan does not provide information for each requriement, include an explanation of why the requirement is not applicable.

UTILITY PROFILE

I. POPULATION AND CUSTOMER DATA

A. Population and Service Area Data

1. Attach a copy of your service-area map, and if applicable, a copy of your Certificate of Convenience and Necessity (CCN).

   See Figure 3-1.

2. Service area size (square miles): 435 *Note: this is retail service area only.*

3. Current population of service area: 767,560 *Note: this is retail service area only.*

4. Current population served for:
   a. water: 767,560
   b. wastewater: 767,560

5. Population served by utility for the previous five years:

Year	*Population*
2009	720,250
2010	741,206
2011	748,450
2012	757,810
2013	767,560

6. Projected Population for service area in the following decades:

Year	*Population*
2020	953,971
2030	1,206,920
2040	1,490,815
2050	1,659,683
2060	1,806,476

7. List source or method for the calculation of current and projected population size.

   Information provided in this section is for City of Fort Worth only and does not include wholesale customers; Projected Population is from the 2016 Region C Plan (currently underway).

B. Customers Data

Senate Bill 181 requires that uniform consistent methodologies for calculating water use and conservation be developed and available to retail water providers and certain other water use sectors as a guide for preparation of water use reports, water conservation plans, and reports on water conservation efforts. A water system must provide the most detailed level of customer and water use data available to it, however, any new billing system purchased must be capable of reporting data for each of the sectors listed below. http://www.tceq.texas.gov/assets/public/ permitting/watersupply/water_rights/sb181_guidance.pdf

1. Current number of active connections. Check whether multi-family service is counted as
Residential ☑ or Commercial? ☐

Treated Water Users	*Metered*	*Non-Metered*	**Totals**
Residential	211,790		211,790
Single-Family	*209,528*		*209,528*
Multi-Family	*2,262*		*2,262*
Commercial	15,292		15,292
Industrial/Mining	388		388
Institutional			0
Agriculture			0
Other/Wholesale	78	6,397	6,475
TOTAL	**227,548**	**6,397**	**233,945**

2. List the number of new connections per year for most recent three years.

Year	*2011*	*2012*	*2013*
Treated Water Users			
Residential	3,625	7,474	8,428
Single-Family	*3,594*	*7,419*	*8,339*
Multi-Family	*31*	*55*	*89*
Commercial	822	916	1,200
Industrial/Mining	9	11	14
Institutional			
Agriculture			
Other/Wholesale	5	0	3
TOTAL	**4,461**	**8,401**	**9,645**

3. List of annual water use for the five highest volume customers.

Customer	*Use (1,000 gal/year)*	*Treated or Raw Water*
1. MILLER BREWING COMPANY	894,896,162	Treated
2. ALCON LABORATORIES	358,237,859	Treated
3. FWISD	282,591,259	Treated
4. LOCKHEED MARTIN CORP AIRCRAFT	271,399,234	Treated
5. TARRANT COUNTY	218,355,578	Treated

II. WATER USE DATA FOR SERVICE AREA

A. Water Accounting Data

1. List the amount of water use for the previous five years (in 1,000 gallons.)

Indicate whether this is ☐ diverted or ☑ treated water.

NOTE: This is the total treated water produced by all of Ft Worth's Water Treatment Plants. This water is sold/distributed to FW retail customers and wholesale customer.

Year / *Month*	*2009*	*2010*	*2011*	*2012*	*2013*
January	4,424,730	4,085,920	4,189,390	4,059,580	4,278,690
February	4,235,010	3,457,320	4,134,400	3,547,350	3,712,960
March	4,978,610	4,036,840	5,312,300	4,140,210	4,565,160
April	5,151,060	4,833,270	5,661,680	4,751,490	4,662,710
May	5,148,420	6,051,134	5,555,020	6,626,730	5,713,220
June	6,711,880	7,722,540	8,287,450	7,010,530	5,931,590
July	8,372,690	7,021,250	10,492,800	8,857,530	7,303,330
August	7,876,840	8,969,130	10,379,940	8,212,290	8,156,910
September	5,646,460	6,347,450	7,929,690	7,305,060	7,303,870
October	4,464,460	6,182,200	6,003,070	6,028,510	5,764,790
November	4,274,000	4,784,950	4,980,200	5,396,510	4,515,730
December	4,150,930	4,511,520	4,337,300	4,653,130	4,272,210
Totals	65,435,090	68,003,524	77,263,240	70,588,920	66,181,170

Describe how the above figures were determined (e.g, from a master meter located at the point of a diversion from the source, or located at a point where raw water enteres the treatment plant, or from water sales).

Use this space to include description of methods

2. Amount of water (in 1,000 gallons) delivered/sold as recorded by the following account types for the past five years.

Year / *Account Types*	*2009*	*2010*	*2011*	*2012*	*2013*
Residential	21,398,639	20,739,284	24,689,332	22,525,598	21,884,223
Single-Family	*18,470,156*	*17,070,108*	*20,852,146*	*18,755,729*	*18,049,472*
Multi-Family	*2,928,483*	*3,669,176*	*3,837,186*	*3,769,869*	*3,834,751*
Commercial	9,799,619	8,206,306	8,702,875	6,891,152	6,839,980
Industrial/Mining	4,135,130	3,325,028	4,100,462	4,182,420	3,368,662
Institutional					
Agriculture					
Other/Wholesale	24,690,763	25,621,346	32,594,213	28,284,935	26,080,799
TOTAL	60,024,151	57,891,964	70,086,882	61,884,105	58,173,664

3. List the previous records for water loss for the past five years (the difference between water diverted or treated and water delivered or sold).

Year	*Amount (gallons)*	*Percent %*
2009	7,986,583,664	17%
2010	6,948,574,158	15%
2011	7,029,194,240	13%
2012	6,233,176,958	13%
2013	7,080,282,620	15%

B. Projected Water Demands

If applicable, attach or cite projected water supply demands from the applicable Regional Water Planning Group for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirements from such growth.

Year	**Projected Demand (AF/Y)**	**Source of data**
2013	203,258	Historical Demand
2014	215,001	*Interpolated*
2015	226,744	*Interpolated*
2016	238,487	*Interpolated*
2017	250,230	*Interpolated*
2018	261,974	*Interpolated*
2019	273,717	*Interpolated*
2020	285,460	2016 Region C Plan
2021	291,073	*Interpolated*
2022	296,685	*Interpolated*
2023	302,298	*Interpolated*

Note: Projections are for retail and wholeale customers (both current and potential customers). Projections include TWDB estimated reductions for plumbing fixtures. Projections are from Region C Water Planning Group information for the 2016 Plan, as approved by TWDB.

III. WATER SUPPLY SYSTEM DATA

A. Water Supply Sources

List all current water supply sources and the amounts authorized (in acre feet) with each.

Water Type	*Source*	*Amount Authorized*
Surface Water		
Groundwater		
Contracts	Tarrant Regional Water District	No set Contract amount; TRWD will supply amount equal to Demand
Other		
Total		

B. Treatment and Distribution System

1. Design daily capacity of system:

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
Rolling Hills WTP	200	190
North Holly WTP	80	75
South Holly WTP	100	95
Eagle Mountain WTP	105	100
Westside WTP	12	12
Total	497	472

2. Storage capacity:

a. Elevated 19.2 MG
b. Ground 71.2 MG

3. If surface water, do you recycle filter backwash to the head of the plant?
☑ Yes ☐ No If yes, approximate amount (MGD):

IV. WASTEWATER SYSTEM DATA

A. Wastewater System Data (if applicable)

1. Design capacity of wastewater treatment plant(s) (MGD): 166.0

2. Treated effluent is used for:
☐ on-site irrigation,
☑ off-site irrigation,
☑ plant wash-down, and or
☐ chlorination/dechlorination.
If yes, approximate amount (in gallons per month): 3,009,056,600

3. Briefly describe the wastewater system(s) of the area serviced by the water utility. Describe how treated wastewater is disposed. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and the receiving stream if wastewater is discharged.

Treatment Plant Name	TCEQ Number	Permitted Discharge (MGD)	Operator	Owner	Receiving Stream
Village Creek Water Reclamation Facility	WQ-001049013	166.0	City of Fort Worth	City of Fort Worth	Village Creek

B. Wastewater Data for Service Area (if applicable)

1. Percent of water service area served by wastewater system: 100% *Note: this is not considering wholesale water service area.*

2. Monthly volume treated for previous three years (in 1,000 gallons):

Year	*2009*	*2010*	*2011*	*2012*	*2013*
Month					
January	2,953,980	4,129,614	3,441,150	4,342,756	3,814,604
February	2,650,228	5,353,375	3,378,023	3,892,234	3,119,456
March	3,379,453	5,157,822	3,256,400	4,432,577	3,398,676
April	3,201,359	4,324,337	3,220,971	3,656,042	3,675,755
May	3,652,385	3,609,231	3,750,600	3,073,450	3,409,421
June	3,496,454	3,301,267	3,104,313	2,913,499	3,486,792
July	3,091,845	3,660,629	3,016,048	2,758,842	2,860,810
August	3,142,029	3,209,065	3,032,004	2,712,828	2,643,720
September	3,898,762	4,038,574	2,880,447	3,442,338	2,513,630
October	5,522,626	3,303,836	3,316,661	3,031,876	2,895,930
November	4,133,446	3,195,471	2,958,887	2,805,306	2,955,010
December	3,970,669	3,214,740	3,578,725	3,150,321	3,403,790
Totals	**43,093,237**	**46,497,961**	**38,934,229**	**40,212,070**	**38,177,593**

TCEQ logo would appear here.

Texas Commission on Environmental Quality

PROFILE AND WATER CONSERVATION PLAN REQUIREMENTS FOR WHOLESALE PUBLIC WATER SUPPLIERS

This form is provided to assist retail public water suppliers in water conservation plan development. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resources Protection Team in the Water Availability Division at (512)239-4691.

City of Fort Worth- Utility Profile Based on TCEQ Format

Name:	City of Fort Worth, TX
Address:	908 Monroe Street, Fort Worth, TX 76102
	P.O. Box 870, Fort Worth, TX 76101
Telephone Number:	(817) 395-4477 Fax: (xxx) xxx-xxxx
Water Right No.(s):	3340, 3366
Regional Water Planning Group:	Region C
Form Completed by:	Jeremy Rice
Title:	Freese and Nichols
Person responsible for implementing conservation program:	Micah Reed Phone: (817) 392-8211
Signature:	Micah D. Reed Date: 4/30/2014

NOTE: If the plan does not provide information for each requriement, include an explanation of why the requirement is not applicable.

UTILITY PROFILE

I. WHOLESALE SERIVCE AREA POPULATION AND CUSTOMER DATA

A. Population and Service Area Data

1. Service area size (square miles): 272 *Note: this is wholesale service area only. Does not include Fort Worth's retail service area.*
   (Please attach a copy of service-area map)
   See Figure 3-1.

2. Current population of service area: 400,000

3. Current population served for:
   a. water: 400,000
   b. wastewater:

4. Population served for the previous five years:

Year	*Population*
2009	358,470
2010	345,618
2011	360,699
2012	380,000
2013	400,000

5. Projected Population for service area in the following decades:

Year	*Population*
2020	404,324
2030	450,395
2040	489,852
2050	535,421
2060	587,520

6. List source or method for the calculation of current and projected population size.

These values represent wholesale customers only and do not include City of Fort Worth; in addition they are only the portion of wholesale customer populations estimated to be supplied by Ft Worth.
Ex, if Fort Worth only supplies half of a customer's water demand (the customer has another source of supply besides FW), then only half of the customer's population is included in this total. Projected Population is from the 2016 Region C Plan.

B. Customers Data

List (or attach) the names of all wholesale customers, amount of annual contract, and amount of annual use for each customer for the previous year:

	Wholesale Customer	Contracted Amount (acre-feet)	Previous Year Amount of Water Delivered (acre-feet)
1	Aledo	No set Contract amount; Ft Worth will supply amount equal to	214
2	Bethesda Water Supply		2,885
3	Burleson		5,117
4	Crowley		1,771
5	D/FW Airport		1,229
6	Dalworthington Gardens		489
7	Edgecliff Village		434
8	Everman		0
9	Forest Hill		1,353
10	Grand Prairie		2,088
11	Haltom City		5,426
12	Haslet		485
13	Hurst		5,955
14	Keller		7,921
15	Kennedale		528
16	Lake Worth		792
17	North Richland Hills		8,150
18	Northlake		231
19	Richland Hills		791
20	Ridglea County Club Estates		10
21	River Oaks		0
22	Roanoke		1,537
23	Saginaw		3,203
24	Sansom Park		0
25	Southlake		10,908
26	Trinity River Authority (Mosier Valley)		0
27	Trophy Club Municipal Utility District No. 1		2,437
28	Westlake		1,233
29	Westover Hills		647
30	Westworth Village		344
31	White Settlement		1,304
	TOTAL	0	67,482

II. WATER USE DATA FOR SERVICE AREA

A. Water Delivery

Indicate if the water provided under wholesale contracts is treated or raw water and the annual amounts for the previous five years (in acre-feet):

Year	*Treated Water*	*Raw Water*
2009	64,953	Treated
2010	64,191	Treated
2011	78,497	Treated
2012	79,852	Treated
2013	82,923	Treated
Totals	370,416	

B. Water Accounting Data

1. Total amount of water diverted at the point of diversion(s) for the previous five years (in acre-feet) for all water uses:

NOTE: This is the total purchase amount from Tarrant Regional Water District.This water is treated and then sold/distributed to FW retail customers and wholesale customers

Year / *Month*	*2009*	*2010*	*2011*	*2012*	*2013*
January	4,424,730	4,085,920	4,189,390	4,059,580	4,278,690
February	4,235,010	3,457,320	4,134,400	3,547,350	3,712,960
March	4,978,610	4,036,840	5,312,300	4,140,210	4,565,160
April	5,151,060	4,833,270	5,661,680	4,751,490	4,662,710
May	5,148,420	6,051,134	5,555,020	6,626,730	5,713,220
June	6,711,880	7,722,540	8,287,450	7,010,530	5,931,590
July	8,372,690	7,021,250	10,492,800	8,857,530	7,303,330
August	7,876,840	8,969,130	10,379,940	8,212,290	8,156,910
September	5,646,460	6,347,450	7,929,690	7,305,060	7,303,870
October	4,464,460	6,182,200	6,003,070	6,028,510	5,764,790
November	4,274,000	4,784,950	4,980,200	5,396,510	4,515,730
December	4,150,930	4,511,520	4,337,300	4,653,130	4,272,210
Totals	65,435,090	68,003,524	77,263,240	70,588,920	66,181,170

2. Wholesale population served and total amount of water diverted for municipal use for the previous five years (in acre-feet):

Year	*Total Population Served*	*Total Annual Water*
2009	358,470	62,163,336
2010	345,618	64,603,348
2011	360,699	73,400,078
2012	380,000	67,059,474
2013	400,000	62,872,112

* NOTE: It is estimated that 95% of all water used for Municipal Purposes. This amount is 95% of totals from Question B.1.

If applicable, project and attach water supply demands for the next ten years using information such as population trends,

C. Projected Water Demands

Year	Projected Demand (AF/Y)	Source of data
2013	203,258	Historical Demand
2014	215,001	*Interpolated*
2015	226,744	*Interpolated*
2016	238,487	*Interpolated*
2017	250,230	*Interpolated*
2018	261,974	*Interpolated*
2019	273,717	*Interpolated*
2020	285,460	2016 Region C Plan
2021	291,073	*Interpolated*
2022	296,685	*Interpolated*
2023	302,298	*Interpolated*

Note: Projections are for retail and wholeale customers (both current and potential customers). Projections include TWDB estimated reductions for plumbing fixtures. Projections are from Region C Water Planning Group information for the 2016 Plan, as approved by TWDB.

III. WATER SUPPLY SYSTEM DATA

A. Water Supply Sources

List all current water supply sources and the amounts authorized (in acre feet) with each.

Water Type	*Source*	*Amount Authorized*
Surface Water		
Groundwater		
Contracts	Tarrant Regional Water District	No set Contract amount;
Other		TRWD will supply amount
Total		equal to Demand

B. Treatment and Distribution System

1. Design daily capacity of system:

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
Rolling Hills WTP	200	190
North Holly WTP	80	75
South Holly WTP	100	95
Eagle Mountain WTP	105	100
Westside WTP	12	12
Total	497	472

2. Storage capacity:
   a. Elevated 19.2 MG

   b. Ground 71.2 MG

3. *5 Water Treatment Plants; No groundwater Wells; 13 elevated storage tanks, 14 ground storage tanks.*

IV. WASTEWATER SYSTEM DATA

A. Wastewater System Data (if applicable)

1. Design capacity of wastewater treatment plant(s) (MGD): 166.0
2. Briefly describe the wastewater system(s) of the area serviced by the wholesale public water supplier.

Treatment Plant Name	TCEQ Number	Permitted Discharge (MGD)	Operator	Owner	Receiving Stream
Village Creek Water Reclamation Facility	WQ-001049013	166.000	City of Fort Worth	City of Fort Worth	Village Creek

B. Wastewater Data for Service Area (if applicable)

1. Percent of water service area served by wastewater system:
2. Monthly volume treated for previous three years (in 1,000 gallons):

Year	*2009*	*2010*	*2011*	*2012*	*2013*
Month					
January	2,953,980	4,129,614	3,441,150	4,342,756	3,814,604
February	2,650,228	5,353,375	3,378,023	3,892,234	3,119,456
March	3,379,453	5,157,822	3,256,400	4,432,577	3,398,676
April	3,201,359	4,324,337	3,220,971	3,656,042	3,675,755
May	3,652,385	3,609,231	3,750,600	3,073,450	3,409,421
June	3,496,454	3,301,267	3,104,313	2,913,499	3,486,792
July	3,091,845	3,660,629	3,016,048	2,758,842	2,860,810
August	3,142,029	3,209,065	3,032,004	2,712,828	2,643,720
September	3,898,762	4,038,574	2,880,447	3,442,338	2,513,630
October	5,522,626	3,303,836	3,316,661	3,031,876	2,895,930
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December	3,970,669	3,214,740	3,578,725	3,150,321	3,403,790
Totals	**43,093,237**	**46,497,961**	**38,934,229**	**40,212,070**	**38,177,593**

APPENDIX D

LETTERS TO REGION C AND REGION G WATER PLANNING GROUPS

April 14, 2014

Mr. Jim Parks
Chair, Region C Water Planning Group
North Texas Municipal Water District
P.O. Box 2408
Wylie, Texas 75098

Dear Mr. Parks,

Enclosed is a copy of the City of Fort Worth's amended Water Conservation Plan. This document became effective on April 8, 2014.

This plan was prepared in accordance with Chapter 288 of Title 30, Texas Administrative Code, "Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements".

If you have any questions about these documents, please contact me at 817-392-8211 or micah.reed@fortworthtexas.gov.

Sincerely,

Micah D. Reed

Micah Reed
Water Conservation Manager

cc: Richard Talley, Regulatory/Environmental Coordinator
File

April 14, 2014

Mr. Wayne Wilson
Chair, Region G Water Planning Group
P.O. Box 7555
Waco, Texas 76714

Dear Mr. Wilson,

Enclosed is a copy of the City of Fort Worth's amended Water Conservation Plan. This document became effective on April 8, 2014.

This plan was prepared in accordance with Chapter 288 of Title 30, Texas Administrative Code, "Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements".

If you have any questions about these documents, please contact me at 817-392-8211 or micah.reed@fortworthtexas.gov.

Sincerely,

Micah Reed
Water Conservation Manager

cc: Richard Talley, Regulatory/Environmental Coordinator
File

WATER CONSERVATION
The City of Fort Worth,*1130 Fournier Street * Fort Worth, Texas 76102
817-392-8740 * Fax 817-392-8735

APPENDIX E

ADOPTION OF WATER CONSERVATION PLAN

ORDINANCE NO. 21194-04-2014

AN ORDINANCE AMENDING CHAPTER 35, "WATER AND SEWERS", OF THE CODE OF THE CITY OF FORT WORTH (1986), AS AMENDED BY AMENDING ARTICLE I, "GENERAL", SUBSECTION (b) OF SECTION 23 "EMERGENCY AUTHORITY" BY REPLACING EXHIBIT A ATTACHED AND ADOPTING A REVISED DROUGHT CONTINGENCY/EMERGENCY WATER MANAGEMENT PLAN; BY AMENDING ARTICLE VI "LAWN AND LANDSCAPE IRRIGATION CONSERVATION", SECTION 35-151 "LAWN AND LANDSCAPE IRRIGATION RESTRICTIONS" TO MANDATE TWICE PER WEEK WATERING AND IRRIGATION AND TO PROVIDE FOR A VARIANCE PROCESS; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A PENALTY CLAUSE; PROVIDING FOR PUBLICATION; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council finds that conservation of water and protection of water supplies are in the best interest of its citizens; and

WHEREAS, the City is required to submit updated water conservation and drought contingency and emergency water management plans to the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board by May 1, 2014 in accordance with Title 30 of the Texas Administrative Code, Chapter 288; and

WHEREAS, staff recommends that the City Council adopt the amended drought contingency and emergency water management plan referenced in Section 35-23(b) of the City Code; and

WHEREAS, in an effort to increase water conservation efforts and at the request of Tarrant Regional Water District, staff also recommends amending the Water and Sewers Code, Article VI Lawns and Landscape Irrigation Conservation, Section 35-151, to provide for permanent, year round twice per week watering and irrigation restrictions and a variance procedure; and

WHEREAS, the Water Conservation Plan proposes a goal of reducing the rolling five year average water consumption to a level of 160 gallons per capita per day by 2020 and 152 gallons per capita per day by 2025; and

WHEREAS, securing future water supplies will require proving to state permitting agencies that existing water supplies are being used efficiently.

NOW THEREFORE BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS:

SECTION 1.

Part II of the Code of the City of Fort Worth, Texas (1986), as amended, Chapter 35, "Water and Sewers", Article I, "In General", is hereby further amended to replace the Drought Contingency/Emergency Water Management Plan adopted in Section 23 "Emergency Authority", Subsection (b) as **Exhibit A** with the revised **Exhibit A** attached to this ordinance and incorporated herein for all purposes.

SECTION 2.

Part II of the Code of the City of Fort Worth, Texas (1986), as amended, Chapter 35, "Water and Sewers", Article VI, "Lawn and Landscape Irrigation Conservation", Section 35-151, "Lawn and Landscape Irrigation Restrictions" is hereby further amended to read and be as follows:

SECTION 35-151. Lawn and Landscape Irrigation Restrictions.

(a) Lawns and landscaping may be watered on any day, at any time, by handheld hose, drip irrigation, a soaker hose or tree bubbler. (The intent of this measure is to allow for the protection of structural foundations, trees, and other high value landscape materials).

Except for hand watering, drip irrigation and the use of soaker hoses, a Person may only irrigate, water, or cause or permit the irrigation or watering of any lawn or landscape, inclusive of structural foundations, trees, and other high value landscape materials, located on premises owned, leased, or managed by that Person (i) on a day designated as an outdoor water use day for the property's address as shown below; and (ii) between the hours of 12 midnight to 10 a.m. and 6 p.m. to 11:59 p.m. on such day.

(1) Residential addresses ending in an even number (0, 2, 4, 6 or 8) may water on Wednesdays and Saturdays.

(2) Residential addresses ending in an odd number (1, 3, 5, 7 or 9) may water on Thursdays and Sundays.

(3) All non-residential locations (apartment complexes, businesses, industries, parks, street and/or roadway medians, etc.) may water on Tuesdays and Fridays.

(b) Except for hand watering, drip irrigation and the use of soaker hoses, a Person commits an offense if that Person irrigates, waters, or causes or permits the irrigation or watering of any lawn or landscape located on premises owned, leased, or managed by that Person between the hours of 10:00 a.m. and 6:00 p.m.

(c) Except for hand watering, drip irrigation and the use of soaker hoses, a Person commits an offense if that Person irrigates, waters, or causes or permits the irrigation or watering of any lawn or landscape located on premises owned, leased, or managed by that Person on a day that is not designated as an outdoor water use for that property address as shown in subsection (a) above.

(d) A Person commits an offense if a Person knowingly or recklessly irrigates, waters, or causes or permits the irrigation or watering of a lawn or landscape located on premises owned, leased or managed by the Person in a manner that causes:

(1) a substantial amount of water to fall upon impervious areas instead of a lawn or landscape, such that a constant stream of water overflows from the lawn or landscape onto a street or other drainage area; or

(2) an irrigation system or other lawn or landscape watering device to operate during any form of precipitation.

(e) A Person commits an offense if, on premises owned, leased, or managed by that Person, a Person operates a lawn or landscape irrigation system or device that:

(1) has any broken or missing sprinkler head; or

(2) has not been properly maintained in a manner that prevents the waste of water.

(f) Affirmative Defenses

(1) It shall be an affirmative defense to prosecution of an offense in section 35-151 (a) that at the time such Person irrigates, waters, or causes or permits the irrigation or watering of any lawn or landscape, such activity was for the purpose of:

(A) dust control of a sports field; or

(B) the maintenance, repair, or testing of an irrigation system.

(2) The activity described in subsection f (1) (A) and (B) may only occur within a period of two (2) days no more than once every thirty (30) days. Any such activity requiring a longer period or greater frequency shall require a variance as provided by subsection (g).

(g) Variances

(1) The water department director or official designee may grant variances to the twice per week watering and irrigation restrictions and schedule, if one or more of the following conditions are met:

(A) Failure to grant such a variance would cause an emergency condition adversely affecting health, sanitation, or fire safety for the public or the Person requesting the variance;

(B) Compliance with the watering and irrigation restrictions and/or schedule cannot be accomplished due to technical or other limitations; or

(C) Alternative methods that achieve the same level of reduction in water use can be implemented.

(2) The water department director or official designee may grant variances to allow for establishment of hydromulch, grass sod, or grass seed for new lawns.

(3) Variances shall be granted or denied at the discretion of the water department director or official designee. All petitions for variances shall be in writing and shall include the following:

(A) Name and address of the petitioner(s);

(B) Purpose of the water use;

(C) Specific provisions from which relief is requested;

(D) Detailed statement of the adverse effect of the provision from which relief is requested;

(E) Description of the relief requested;

(F) Period of time for which the variance is sought;

(G) Alternative measures that will be taken to reduce water use; and

(H) Other pertinent information requested.

(h) A Person who irrigates, waters, or causes or permits the irrigation or watering by use of an alternative water source such as a well, reclaimed or reused water, or water from the Trinity River is exempt from prosecution if that Person has:

(1) Registered such alternative water source with the City;

(2) Provided sufficient proof to the water department director that the alternative water source is from a well, reclaimed or reused water or from the Trinity River and has allowed inspection by the water department director if deemed necessary; and

(3) Complied with the City's Backflow and Cross-connection Control Program and City Code Sections 12.5-525 through 12.5-599.

SECTION 3.
CUMULATIVE PROVISIONS

This ordinance shall be cumulative of all provisions of ordinances and of the Code of the City of Fort Worth, Texas (1986), as amended, except where the provisions of this ordinance are in direct conflict with the provisions of such ordinances and such Code, in which event conflicting provisions of such ordinances and such Code are hereby repealed.

SECTION 4.
SEVERABILITY CLAUSE

It is hereby declared to be the intention of the City Council that the phrase, clause, sentence, paragraph or section of this ordinance are severable and, if any phrase, clause, sentence, paragraph or section of this ordinance shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such unconstitutional phrase, clause, sentence, paragraph or section.

SECTION 5.
PENALTY CLAUSE

Any person, firm or corporation who violates, disobeys, omits, neglects or refuses to comply with or who resists the enforcement of any of the provisions of this ordinance shall be fined not more than two thousand dollars ($2,000.00) for each offense. Each day that a violation is permitted to exist shall constitute a separate offense.

SECTION 6.
RIGHTS AND REMEDIES

All rights and remedies of the City of Fort Worth, Texas, are expressly saved as to any and all violations of the provisions of the ordinances amended herein, which have accrued at the time of the effective date of this ordinance and, as to such accrued violations and all pending litigation, both civil and criminal, whether pending in court or not, under such ordinances, same shall not be affected by this ordinance but may be prosecuted until final disposition by the courts.

SECTION 7.
PUBLICATION

The City Secretary of the City of Fort Worth, Texas, is hereby directed to publish the caption of this ordinance for two (2) days in the official newspaper of the City of Fort Worth, Texas, as authorized by Section 2, Chapter XXV of the Charter of the City of Fort Worth, Texas and by Section 52.013, Texas Local Government Code.

SECTION 8.
EFFECTIVE DATE

This Ordinance shall take effect upon adoption and publication as required by law.

APPROVED AS TO FORM AND LEGALITY:

By: Christa R. Lopez-Reynolds
Christa R. Lopez-Reynolds
Senior Assistant City Attorney

Mary J. Kayser, City Secretary

ADOPTED: April 8, 2014

EFFECTIVE: April 16, 2014