



# Water Conservation Plan

## Section 1. Minimum Requirements

### 1.0 Utility Profile

The City of Fort Worth Water Department served more than 686,850 residents in 2008, and this population is projected to grow to more than 850,000 by the year 2020. The City also provides treated water to 31 wholesale customers, which amounts to over 336,000 additional residents. This service area is currently served by four water treatment plants. The City is charged with the operations of these plants and the associated treated water pumping systems. The current treatment capacity for the year 2009 is outlined in Table 1-1 below:

**Table 1-1: 2009 Treatment Plant Capacity\***

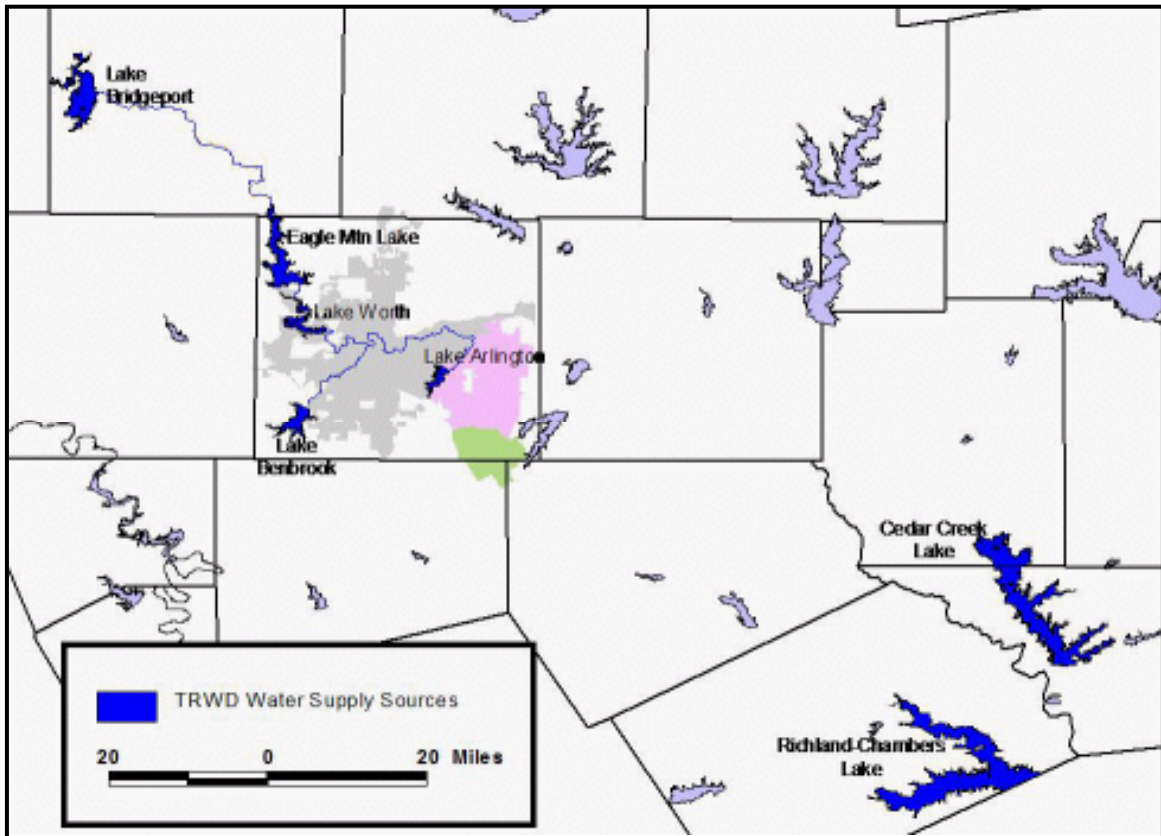
<b>Treatment Plant</b> (in million gallons per day (mgd) )	<b>Design Capacity</b> (mgd)	<b>Reliable Pumping Capacity</b> (mgd)
Rolling Hills, est. 1972	200	190
North Holly, est. 1918	80	75
South Holly, est. 1952	100	95
Eagle Mountain, est. 1992	105	100
<b>Total</b>	<b>485</b>	<b>460</b>

The City purchases water from the Tarrant Regional Water District (TRWD). This water is from four major sources, as seen in Figure 1.1 on the following page:

1. The West Fork of Trinity River via Lake Worth, Eagle Mountain Lake, and Lake Bridgeport;
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.

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

Figure 1.1. Tarrant Regional Water District Supply Sources.



## 1.1 Conservation Goals

The City, led by its Conservation Team, will set the bar for conservation standards with its plan to achieve significant conservation savings without burdening the customer with extra costs while still generating enough water savings to extend the life of the existing supply. The initial demand reduction goals developed for 2008 are shown in Table 1-2 below. This table also includes additional goals for reducing system leakage and reflects residential and total system gallons per capita per day (GPCD).

**Table 1-2. Initial Performance Indicator Goals**

<b>Description</b>	<b>Units</b>	<b>2008</b>	<b>2015</b>	<b>2020</b>
Total water use	GPCD	192	179	170
Residential Water Use*	GPCD	93.10	87	83
Water loss	Gallons/connection per day	110	95	75
Real losses	ILI	4.7	4.25	3.5
Main line loss survey distance	Feet	500,000	5,000,000	10,000,000

\* includes irrigation use

The goals are 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. It should be noted that all the performance indicators outlined above are developed assuming a year of average rainfall.

For a complete analysis of the Best Management Practices (BMPs), refer to tables 1-3 and 1-4 on the following pages. It should be noted that all these guidelines are voluntary.

**Table 1.3 Water Conservation Best management Practices Implementation Schedule**

BMP	Description	Implementation Schedule				
		Currently Implemented	Implemented before 2015	Implemented before 2020	Not Implemented before 2020	Implemented Through Code
1	System Water Audit and Water Loss	2002				
2	Water Conservation Pricing	1994				
3	Prohibition on Wasting Water	1994				
4	Showerhead, Aerator and Toilet Flapper Retrofit					1992
	4a. Additional Programs		✓			
5	Residential Toilet Replacement Programs					1992
	5a. Additional Programs		✓			
6	Residential Clothes Washer Incentive Program					1992
	6a. Additional Programs			✓		
7	School Education	1990				
8	Water Survey for Single-Family and Multi-Family Customers		✓			
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 BMP	1983				
18	Rainwater Harvesting and Condensate Reuse				✓	
19	New Construction Graywater BMP				✓	
20	Park Conservation BMP		✓			
21	Conservation Programs for Industrial, Commercial and Institutional Accounts		✓			

BMP information source: Texas Water Conservation Implementation Task Force report to the 79th Legislature (November 2004)

**Table 1.4 Best Management Practice Cost-Effectiveness Estimates**

BMP	Description	Estimates						Rank for Expenditure (2020)
		Est. Savings		Anticipated Costs		\$/1000 gallons		
		2015 (MGD)	2020 (MGD)	2015 (\$ per Year)	2020 (\$ per Year)	2015	2020	
	<b>Plumbing Code initiated</b>							
4	Showerhead, Aerator and Toilet Flapper Retrofit	0.1	0.1	\$0	\$0	\$0.00	\$0.00	PL code
4a	Additional Showerhead, Aerator and Toilet Flapper Retrofit Programs	0.1	0.1	\$75,000	\$75,000	\$2.05	\$2.05	
5	Residential Toilet Replacement Programs	1	0.5	\$0	\$0	\$0.00	\$0.00	PL code
5a	Additional Residential Toilet Replacement Programs	0.5	0.25	\$300,000	\$150,000	\$1.64	\$1.64	
6	Residential Clothes Washer Incentive Program	0	0	\$0	\$0	\$0.00	\$0.00	PL code
6a	Additional Residential Clothes Washer Incentive Programs	0	0.1	\$0	\$100,000	\$0.00	\$2.74	
<b>Cost for Existing and Additional Programs</b>								
2	Water Conservation Pricing	6	6	\$50,000	\$60,000	\$0.02	\$0.03	1
1	System Water Audit and Water Loss	3	5	\$800,000	\$1,200,000	\$0.73	\$0.66	2
21	Conservation Programs for Industrial, Commercial and Institutional Accounts	1	1	\$270,000	\$270,000	\$0.74	\$0.74	3
16	Water Reuse **	30.15	30.15	\$20,000,000	\$20,000,000	\$1.82	\$1.82	4
10	Water Wise Landscape Design and Conversion Programs	0.5	0.5	\$200,000	\$200,000	\$1.10	\$1.10	5
9	Landscape Irrigation Conservation and Incentives	1	1	\$400,000	\$400,000	\$1.10	\$1.10	5
20	Park Conservation BMP	0.5	0.5	\$250,000	\$250,000	\$1.37	\$1.37	7
12	Golf Course Conservation	0.5	0.5	\$250,000	\$250,000	\$1.37	\$1.37	7
11	Athletic Field Conservation	0.8	0.8	\$400,000	\$500,000	\$1.37	\$1.71	7
8	Water Survey for Single-Family and Multi-Family Customers	0.25	0.25	\$150,000	\$150,000	\$1.64	\$1.64	10
7	School Education	0.25	0.25	\$150,000	\$150,000	\$1.64	\$1.64	10
3	Prohibition on Wasting Water	0.4	0.4	\$240,000	\$240,000	\$1.64	\$1.64	10
13	Metering of all New Connections and Retrofit of Existing Connections	1	0.5	\$1,000,000	\$500,000	\$2.74	\$2.74	13
<b>Necessary Programs - no Associated Savings</b>								
14	Wholesale Agency Assistance Programs	0	0	\$50,000	\$50,000	\$0.00	\$0.00	
15	Conservation Coordinator	0	0	\$85,000	\$95,000	\$0.00	\$0.00	
17	Public Information BMP	0	0	\$100,000	\$100,000	\$0.00	\$0.00	
<b>Programs not recommended (RWPG)</b>								
18	Rainwater Harvesting and Condensate Reuse	0	0	\$0	\$0	\$0.00	\$0.00	
19	New Construction Graywater BMP	0	0	\$0	\$0	\$0.00	\$0.00	

BMP information source: Texas Water Conservation Implementation Task Force report to the 79th Legislature (November 2004)

\* Capital cost of program

\*\* Water reuse component not used to calculate reductions in GPCD

Although the industry standard for analysis of water consumption is GPCD, the preferred performance indicator for the whole system is gallons per connection per day. This is a more easily definable value and will not vary as greatly as GPCD if there are variations in climate, thereby allowing more accurate comparisons of data between years.

## 1.2 Water Savings Targets

Refer to Table 1-2 in the previous section for five- and 10-year water savings targets. The targets have been set to reduce maximum demand on the system. This maximum demand was projected during the recent Master Planning and is currently developed through 2018

## 1.3 Metering Issues

Programs for universal metering, meter testing, meter repair, and periodic meter replacement are already in place and have been developed using American Water Works Association (AWWA) standards. Meter size distribution in Fort Worth is broken down in Table 1-5. There are 229,346 retail customer meters within the Fort Worth system as of February 10, 2009.

**Table 1-5: Meter Size Distribution**

Meter Size	Total Number
.75"	192,373
1"	24,753
1.5"	4,005
2"	6,604
3"	719
4"	373
6"	337
8"	125
10"	48
12"	2
16"	5
18"	2

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 already replaced more than 49,000 meters since 2006.

## 1.4 System Water Audit (Non-Revenue or Unaccounted-For Water)

Fort Worth has conducted the first International Water Association (IWA) standard water audit in the state of Texas. The system water audit is the overall figure that can be used to monitor the total level of non-revenue water in the system. It is a complex and difficult task. There are many variables which influence the revenue and non-revenue components of Fort Worth's water system. The audit involves many of the Water Department divisions, including Engineering, Customer Services, and Operations. It evaluates the marginal costs (purchase of water from TRWD as well as treatment and distribution costs) and costs of service, so that the analyses have sound figures with which to develop the cost-benefit scenarios. The City conducts this audit annually.

### **1.4.1 Real Losses format**

Real losses are direct losses from the system through leakage from the infrastructure and overflows out of the system.

### **1.4.2 Apparent Losses**

Apparent losses are paper losses which result from meter error, billing errors, illegal use, and other unbilled uses such as Fire Department.

### **1.4.3 Indicators of Performance**

In the past, indicators of water system performance have generally been poor and incomplete. Most systems currently use only the percent-unaccounted-for water method to analyze their efficiency. This is not a good performance indicator.

The City has developed internal regulations and targets which match and exceed the new standards required by the TCEQ and proposed by the TWDB. Even more importantly, the performance indicator approach provides an internal accountability for specific water system tasks which will improve the performance and efficiency of the system in the long-term.

The audit and its associated performance indicators will be integrated into the City's conservation plan. The plan will be updated on a regular basis with specific portions such as the targets and goals being updated every year so that all the operational departments can begin to assess their water supply performance in a more quantitative way.

## **1.5 Public Education and Information**

In addition to its existing efforts to educate the public with both water bill inserts and educational events promoting water conservation, the City established a Customer Advisory Committee, with representation from a spectrum of customer classes and City departments. The goal of the committee is to promote community awareness of the City's plans.

The City currently provides education programs for grades 4 through 5 in schools within the Fort Worth Independent School District. The programs incorporate the following themes: Waterama for 4th Grade, Major Rivers for 4th Grade, and Waterwise for 5th Grade. The program is intended to increase use of these curricula not only among Fort Worth ISD schools but also among the 13 other school districts which operate within Fort Worth's city limits in addition to all the school districts within the wholesale customer boundaries.

It is intended that the program be incorporated regionally through interaction with the Tarrant Regional Water District and that large wholesale customers develop cost-effective public education programs.

The City has also formed a Customer Advisory Committee to discuss, assess and provide direction for the conservation programs outlined in this document. The committee includes customers from residential, commercial, industrial, institutional, irrigators, and wholesale customers.

## 1.6 Water Rate Structure

The City of Fort Worth has existing, conservation-oriented water rate structures in place. The City continues to refine rate structures to improve their impact on water conservation and to manage cost of service more effectively. This is done by analyzing the trends of use by customer class and associating increases in rates proportionally to those classes which place the most demands upon the water system.

In the next five years, the City will continue to conduct additional assessments and review the current four tier residential and two tier irrigation structures.

### 1.6.1 Current Rate Structures

The City’s current rate structure consists of the following five categories:

- ◆ Residential
- ◆ Commercial
- ◆ Industrial
- ◆ Irrigation
- ◆ Gas Well Use

Each customer is assessed a meter charge based on meter size. There is an additional usage charge. The rates adopted and implemented effective January 1, 2009 for the Residential customer class include a conservation rate structure. Fort Worth measures in hundred cubic feet (ccf). The City has continued to increase the conservation pricing by introducing a fourth tier within the residential rates and a second tier within the irrigation category.

**Table 1-6: Residential Water Rates**

<b>First 8 ccf</b>	<b>\$1.90 per CCF</b>
<b>8 ccf to 20 ccf</b>	<b>\$2.66 per CCF</b>
<b>20 ccf to 30 ccf</b>	<b>\$3.28 per CCF</b>
<b>Above 30 ccf</b>	<b>\$3.94 per CCF</b>
<b>Irrigation first 100 ccf</b>	<b>\$2.56 per CCF</b>
<b>Irrigation above 100 ccf</b>	<b>\$3.01 per CCF</b>
<b>Gas Well Use</b>	<b>\$3.58 per CCF</b>

Note: 1 CCF = 748.05 gallons

**Table 1-7: Commercial Water Rates**

<b>All volumes</b>	<b>\$2.15 per CCF</b>
<b>Irrigation first 100 ccf</b>	<b>\$2.56 per CCF</b>
<b>Irrigation above 100 ccf</b>	<b>\$3.01 per CCF</b>

**Table 1-8: Industrial Water Rates**

<b>All volumes</b>	<b>\$1.80 per CCF</b>
<b>Irrigation First 100 ccf</b>	<b>\$2.56 per CCF</b>
<b>Irrigation above 100 ccf</b>	<b>\$3.01 per CCF</b>
<b>Gas Well Use</b>	<b>\$3.58 per CCF</b>

**Table 1-9: Monthly Meter Charges**

<b>Meter Size</b>	<b>Service Charge</b>
5/8" or 3/4"	\$6.50
1"	\$9.00
1½"	\$15.50
2	\$23.00
3	\$47.50
4	\$83.50
6	\$182.00
8	\$310.00
10	\$490.00

## **1.6.2 Cost-Based Rate Structure**

Currently, the City bases its rates on cost of service for each customer class. To realize the true cost of service, the peaking factors for each customer class need to be analyzed. The current structure does use basic peaking factors, but this does not yet fully account for the peaking characteristics. The higher the peak, the more that class will be required to pay because they are the ones driving the need for the new infrastructure which is sized to meet peak day demands.

Both residential (either through irrigation meters, or the normal domestic water meter) customers, and the wholesale customers have the greatest peaking factors within the Fort Worth system.

## **1.7 Reservoir Systems**

TRWD, as Fort Worth's raw water supplier, is responsible for operations of the reservoir system described in the Utility Profile of this Plan. TRWD coordinates its Operations Plan with all of its water customers and provides recommendations for the operations of regional treatment systems.

## **1.8 Implementation and Enforcement**

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 only licensed irrigators to alter existing, or install new irrigation systems within Fort Worth.

By the year 2020, the City will have in place all other actions described in this Water Conservation Plan. The annual audit will act as a guide for internal performance, and goals will be set each year following the audit. Implementation of the City's Water Conservation Plan is by resolution adopted by the Fort Worth City Council.

## **1.9 Regional Water Planning Groups**

The City has been working with the local Regional Water Planning Group (Region C) to help develop this group's example 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. A letter documenting that a copy of the Water Conservation Plan sent to the Chair of the Region C Water Planning Group is attached in Appendix A.

## Section 2. Additional Conservation Efforts

### 2.0 Leak Detection and Repair

The current leakage detection program uses state-of-the-art technologies and techniques to search for leaks. In addition to customer and field operations visual leakage reports, the City utilizes field technicians and acoustic leak-noise detectors to target suspected leaks and correlators to define leak locations.

In addition, the City has 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 leakage detection and repair studies and implementation are used to evaluate the correct level of expenditure for leakage detection and repair programs as well as an economic level of leakage. Performance measures are being developed so that there is accountability and transparency within the system. These performance indicators include the amount of pipe surveyed each year, real losses (leakage) in gallons per connection per day, and Infrastructure Leakage Index (ILI). The City uses these performance indicators in preference to GPCD because they are not affected as significantly by climatic variations. The ILI is the ratio of the actual leakage within a utility system and the theoretical lowest possible level of leakage. Therefore - an ILI of 1.0 would mean that the system is being run perfectly and the losses from the pipes equal the theoretical lowest level of leakage.

#### 2.0.1 Real Losses (Leakage)

Leakage from the system is generally regarded as a real loss. This is currently grouped in with all other non-revenue water in most system audits. To more accurately define real losses, specific performance measures must be developed. These should be related to real data such as miles of main or number of services so that they can be analyzed year to year.

Initial recommendations for real loss performance indicators are:

- ◆ Gallons per connection per day;
- ◆ Gallons per connection per day per pounds per square inch (psi);
- ◆ Infrastructure Leakage Index (ILI).



## **2.0.2 Infrastructure Leakage Index (ILI)**

The Infrastructure Leakage Index (ILI) is a more complex calculation of the theoretical lowest leakage possible divided by existing calculated leakage. This is developed as a unique value for every city and includes 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 4.7, which means that theoretically the leakage could be reduced 4.7 times before reaching the lowest possible value. This puts Fort Worth in the average zone of ILIs within the United States.

All leak management improvements will result in reduction of non-revenue (unaccounted-for) water loss reported in the annual water audit.

## **2.1 Record Management System**

The City has an effective record management system in place with its existing billing system and the annual statistical report. This system includes data analysis of additional subclasses beyond the four traditional customer classes.

## **2.2 Wholesale Water Supply**

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. 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. Further information regarding wholesale customers is detailed in Section 3.

## **2.3 Water-Conserving Plumbing Fixtures**

The City complies with the U.S. Energy Policy Act of 1992 (Public Law 102-486, 106 Stat. 2776, 102D Congress, Oct. 24, 1992), which includes requirements for maximum water use allowed for toilets, urinals, showerheads, and faucets.

## **2.4 Gray Water**

Residential gray water use (i.e., recycling water within the home using a dual plumbing system) has been evaluated by the Region C Water Planning Group and was determined at this time not to be a cost-effective conservation strategy at the water utility scale. The City's Building Official is updating policies to provide guidance and set standards for customers who wish to pursue the use of residential- and commercial-scale gray water systems.

## **2.5 Reuse**

Reuse is a major component of the City's vision to manage its water resources in the most efficient manner. Fort Worth already conducts a small amount of reuse from its Village Creek Wastewater treatment plant and is currently investigating a number of other plans. This will be developed in more detail by 2015. The City is also currently constructing a pipeline to serve customers for limited uses.

## **2.6 Pressure Control and Pressure Reduction**

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).

## **2.7 Landscape Water Management**

The existing City landscape ordinance will be evaluated to review its water use efficiency potential. This will include incentives for using native and adapted flora which require less water. The City has adopted ordinances to promote working 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 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.

## **2.8 Yearly Audit**

The City will continue to conduct a yearly water system audit using the IWA standard water audit methodology to monitor the effectiveness and efficiency of the Water Conservation Plan.

## **2.9 Conservation Programs for Industrial, Commercial, and Institutional Accounts**

Water system audits (including cooling system audits), and a pre-rinse spray valve retrofit will be the first conservation measures developed and offered to these customers. The first pilot programs related to these users will be in place by 2010.

## **2.10 Miscellaneous Practices, Methods, Techniques**

Other practices, methods, and techniques — in addition to those outlined in this document — are shown in the details of the City's goals for Best Management Practices as developed by the Texas Water Development Board. These are outlined in Tables 1-3 and 1-4.

### **2.10.1 Internal City Water Conservation Effort**

The City will implement water conservation measures internally within City Hall and a number of its other buildings and parks within the next five-year planning period. This will include retrofits of toilets, faucets, and showerheads, and development of a landscape program in conjunction with the parks Department, as well as analysis of water savings from these measures.

The City has also set up an internal water conservation user group involving all relevant departments to oversee and evaluate the progress of the Water Conservation Plan. A dedicated Water Conservation Section was also initiated in 2008.

### **2.10.2 Rainwater Harvesting and Condensate Reuse**

Regional Water Planning Group C has advised the City that this is not economically viable therefore this Best Management Practice is not currently being evaluated.

## Section 3. Wholesale Water Suppliers

### 3.1 Wholesale Customer Information

Most of the relevant data for this section is described in the previous sections with relevance to 30 Texas Administrative Code (TAC) Chapter 288.2 - Municipal Water Suppliers.

A copy of the City of Fort Worth Municipal Retail Water Conservation Plan will be forwarded to each wholesale customer each time the plan is updated. The wholesale service area includes 31 customers which adjoin the Fort Worth city boundaries. In 2008 there were estimated to be 336,972 people within the combined wholesale customers. The customers affected by this plan are shown on the following table. The most recent water use records of each of the wholesale customers are also annotated in this table.

**Table 1-10: Wholesale Customers**

<b>Wholesale Customer</b>	<b>2007-08 Usage (MG)</b>	<b>Wastewater Customer</b>
Aledo	0.0	No
Benbrook	0.0	Yes
Bethesda	774.4	Yes
Burleson	1439.7	Yes
Crowley	466.9	Yes
DFW	515.6	No
Dalworthington	151.6	No
Edgecliff Village	118.8	Yes
Everman	-0.4	Yes
Forest Hill	423.7	Yes
Grand Prairie	615.9	No
Haltom City	1585.8	Yes
Haslet	155.2	No
Hurst	1788.8	Yes
Keller	2102.0	No
Kennedale	3.3	Yes
Lake Worth	242.1	Yes
NRH	2807.5	Yes
Northlake	51.4	Yes
Richland Hills	227.6	Yes
River Oaks	0.0	Yes
Roanoke	364.5	No
Saginaw	965.5	Yes
Sansom Park	0.0	Yes
Southlake	3334.5	No
Trophy Club	455.9	No
TRA	0.0	Yes
Westlake	324.0	No
Westover Hills	227.3	Yes
Westworth Village	79.7	Yes
White Settlement	324.2	Yes

### 3.2 Conservation Goals

The conservation goals as outlined in Section 1.1 of this 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 discussed and incorporated into the respective wholesale customer contracts.

The City encourages each wholesale customer to develop and implement conservation plans which reduce water use at least in line with or within 10% of those developed by Fort Worth. The basis for the development of these goals is that the City does not expect wholesale customers to implement conservation water saving plans to exceed those developed by itself. The City does, however, expect each wholesale customer to voluntarily reduce its water use through conservation practices. The targets in Table 1-11 below are recommended for each wholesale customer.

**Table 1-11: Wholesale Customer Targets**

	<b>Total GPCD</b>	<b>Residential GPCD</b>	<b>Unaccounted-For Water</b>
By 2015	180	90	110*
By 2020	175	85	105*

*\* 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.*

### 3.3 Measurement, Monitoring, and Metering

The City will keep a database of this information for each wholesale customer and will continue with its program of metering and recording all wholesale customers' usage at point of sale. The City already has an ongoing program of proactive leak detection, meter testing and replacement to improve the level of service and cost of service to both retail and wholesale customers.

### 3.4 New Wholesale Contracts

The City requests that each wholesale customer provide copies 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). This will be required in any new contracts developed with wholesale customers as specified in 30 TAC Chapter 288.

### **3.5 Reservoir Operations Plan**

Tarrant Regional Water District manages and operates all of the reservoirs supplying water to the City, with the exception of Lake Worth, which the City owns and operates.

### **3.6 Implementation and Enforcement**

A copy of the resolution indicating official adoption of this Water Conservation Plan is attached to this document.

## **Section 4: Coordination**

### **4.0 Coordination with RWPG, TRWD, and Wholesale Customers**

Appendix A is a copy of a letter sent to the chair of the Region C Water Planning Group along with this Water Conservation Plan.

Appendix B includes copies of letters sent to each of the City's wholesale customers along with copies of this Water Conservation Plan.

Appendix C is a copy of a letter sent to the Tarrant Regional Water District along with this Water Conservation Plan.

Wholesale customers are requested to send a draft of their ordinances and other regulations implementing their water conservation plans to the City of Fort Worth Water Department.