

Exhibit B

# 2019 MODEL WATER CONSERVATION PLAN FOR NORTH TEXAS MUNICIPAL WATER DISTRICT MEMBER CITIES AND CUSTOMERS

JANUARY 2019



FREESE AND NICHOLS, INC.  
TEXAS REGISTERED  
ENGINEERING FIRM  
F-2144

Prepared by:

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



## FOREWARD

This 2019 Model Water Conservation Plan (WCP) was prepared by Freese and Nichols for the North Texas Municipal Water District (NTMWD). It is intended to be used as a guide by NTMWD Member Cities and Customers as they develop their own water conservation plans. The model plan was prepared pursuant to Texas Commission on Environmental Quality (TCEQ) rules. Some material is based on the existing water conservation plans.

Questions regarding this Model Water Conservation plan should be addressed to the following:

Jeremy Rice  
Freese and Nichols, Inc.  
(817) 735-7300  
[jjr@freese.com](mailto:jjr@freese.com)

Denise Hickey  
North Texas Municipal Water District  
(972) 442-5405  
[dhickey@ntmwd.com](mailto:dhickey@ntmwd.com)

This 2019 Model Water Conservation Plan is based on the Texas Administrative Code in effect on January 18, 2019 and considers water conservation best management practices from Texas Water Development Board (TWDB) Report 362, *Water Conservation Best Management Practices Guide*. In 2007, the state legislature created the Water Conservation Advisory Council (WCAC) as a council with expertise in water conservation representing various interest with one of their charges to regularly review existing Best Management Practices (BMPs) and add additional new BMPs as appropriate. The draft WCAC BMPs available as of November 30, 2018 have also been considered in the preparation of this plan.

None of the currently proposed BMPs will cause this plan to be obsolete. The most current annual report form should be obtained from TCEQ when preparing the annual report to submit to the TCEQ. A copy of the annual report should be sent to the TWDB as well as to the TCEQ.



**WATER CONSERVATION PLAN  
FOR CITY OF MCKINNEY**

DATE  
APRIL 16, 2019



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## 1. INTRODUCTION AND OBJECTIVES

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 efficient use of our existing supplies to make them last as long as possible. This 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 TCEQ has developed guidelines and requirements governing the development of water conservation and drought contingency plans for municipal uses by public water suppliers. The North Texas Municipal Water District (“NTMWD or District”) has developed this Model Water Conservation Plan to be consistent with TCEQ guidelines and requirements. The best management practices established by the Water Conservation Implementation Task Force were also considered in the development of the water conservation measures.

This Model Water Conservation Plan includes measures that are intended to result in ongoing, long-term water savings. This plan replaces the previous plans dated August 2004, April 2006, March 2008 and April 2014.

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 maximize 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 water conservation plan presented in this document is a Model Water Conservation Plan intended for adoption by the NTMWD Member Cities and Customers. In order to adopt this plan, each Member City and Customer will need to do the following:



- Complete the water utility profile.
- Set five-year and ten-year goals for per capita water use.
- Adopt ordinance(s) or regulation(s) approving the model plan.
- Complete the annual water conservation implementation report.

The water utility profile, goals, and ordinance(s) or regulations should be provided to NTMWD in draft form for review and comments. Final adopted versions should also be provided to NTMWD, as well as TCEQ. This Model Water Conservation Plan includes all the elements of such plans required by TCEQ. Some elements of this model plan go beyond TCEQ requirements. Any water supplier wishing to adjust elements of the Model Water Conservation Plan should coordinate with NTMWD.



## 2. DEFINITIONS AND ABBREVIATIONS

1. **ATHLETIC FIELD** means a public sports competition field, the essential feature of which is turf grass, used primarily for organized sports practice, competition or exhibition events for schools; professional sports and league play sanctioned by the utility providing retail water supply.
2. **COOL SEASON GRASSES** are varieties of turf grass that grow best in cool climates primarily in northern and central regions of the U.S. Cool season grasses include perennial and annual rye grass, Kentucky blue grass and fescues.
3. **CUSTOMERS** include those entities to whom NTMWD provides wholesale water that are not members of NTMWD.
4. **DRIP IRRIGATION** is a type of micro-irrigation system that operates at low pressure and delivers water in slow, small drips to individual plants or groups of plants through a network of plastic conduits and emitters; also called trickle irrigation.
5. **EVAPOTRANSPIRATION (ET)** represents the amount of water lost from plant material to evaporation and transpiration. The amount of ET can be estimated based on the temperature, wind, and relative humidity.
6. **ET/SMART CONTROLLERS** are irrigation controllers that adjust their schedule and run times based on weather (ET) data. These controllers are designed to replace the amount of water lost to evapotranspiration.
7. **IRRIGATION SYSTEM** means a permanently installed, custom-made, site-specific system of delivering water generally for landscape irrigation via a system of pipes or other conduits installed below ground.
8. **LANDSCAPE** means any plant material on a property, including any tree, shrub, vine, herb, flower, succulent, ground cover, grass or turf species, that is growing or has been planted out of doors.
9. **MEMBER CITIES** include the cities of Allen, Farmersville, Forney, Frisco, Garland, McKinney, Mesquite, Plano, Princeton, Richardson, Rockwall, Royse City, and Wylie, Texas, which are members of NTMWD.



10. MUNICIPAL USE means the use of potable water provided by a public water supplier as well as the use of treated wastewater effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.
11. REGULATED IRRIGATION PROPERTY means any (customer class, i.e. commercial) property that uses (over a certain amount) of water or more for irrigation purposes in a single calendar year or is greater than (certain size).
12. RESIDENTIAL GALLONS PER CAPITA PER DAY means (Residential GPCD) the total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.
13. RETAIL CUSTOMERS include those customers to whom the utility provides retail water from a water meter.
14. TOTAL GALLONS PER CAPITA PER DAY (Total GPCD) means the total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in TAC 288.1 shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.
15. WATER CONSERVATION PLAN means the Member City or Customer water conservation plan approved and adopted by the utility.

**Abbreviations**

<b>Abbreviation</b>	<b>Full Nomenclature</b>
BMP	Best Management Practices
NTMWD or District	North Texas Municipal Water District
TCEQ	Texas Commission on Environmental Quality
TWDB	Texas Water Development Board
WCAC	Water Conservation Advisory Council
WCP	Water Conservation Plan





### **3. REGULATORY BASIS FOR WATER CONSERVATION PLAN**

#### **3.1 TCEQ Rules Governing Conservation Plans**

The TCEQ rules governing development of water conservation plans for municipal uses by public water suppliers are contained in Title 30, Chapter 288, Subchapter A, Section 288.2 of the Texas Administrative Code. For the purpose of these rules, a water conservation plan is defined as “[a] strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water.” The water conservation plan elements required by the TCEQ water conservation rules that are covered in this water conservation plan are listed below.

##### Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans for Municipal Uses by Public Water Suppliers are covered in this water conservation plan as follows:

- 288.2(a)(1)(A) – Utility Profile – Section 4
- 288.2(a)(1)(B) – Record Management System – Section 6.1.5
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 5
- 288.2(a)(1)(D) – Accurate Metering – Section 6.1.1
- 288.2(a)(1)(E) – Universal Metering – Section 6.1.2
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Sections 6.1.3 and 6.1.4
- 288.2(a)(1)(G) – Public Education and Information Program – Section 6.2
- 288.2(a)(1)(H) – Non-Promotional Water Rate Structure – Section 6.6
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 6.3
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 8
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Group – Section 6.4
- 288.2(c) – Review and Update of Plan – Section 9



Conservation Additional Requirements (Population over 5,000)

- The Texas Administrative Code includes additional requirements for water conservation plans for drinking water supplies serving a population over 5,000
- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Sections 6.1.4
- 288.2(a)(2)(B) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.5

Additional Conservation Strategies

The TCEQ requires that a water conservation implementation report be completed and submitted on an annual basis.

In addition to the TCEQ required elements of a water conservation plan, NTMWD also requires the following water conservation strategies to be included in the Member City and Customer water conservation plans:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 6.6
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.4

TCEQ rules also include options of, conservation measures that may be adopted by public water suppliers but are not required. NTMWD recommends that the following strategies be included in Member City and Customer water conservation plans:

- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 7.1
- 288.2(a)(3)(C) – Replacement or Retrofit of Water-Conserving Plumbing Fixtures – Section 7.5
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 7.2
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.3, 7.4
- 288.2(a)(3)(G) – Monitoring Method – Section 7.6
- 288.2(a)(3)(H) – Additional Conservation Practices – Section 7.5

### **3.2 Guidance and Methodology for Reporting on Water Conservation and Water Use**

In addition to TCEQ rules regarding water conservation, this plan also incorporates elements of the Guidance and Methodology for Reporting on Water Conservation and Water Use developed by TWDB and TCEQ, in consultation with the WCAC (the “Guidance”). The Guidance was developed in response to a charge by the 82<sup>nd</sup> Texas Legislature to develop water use and calculation methodology and guidance for preparation of water use reports and water conservation plans in accordance with TCEQ rules.



#### **4. WATER UTILITY PROFILE**

In adopting this Model Water Conservation Plan, each Member City and Customer will provide a draft water utility profile to NTMWD for review and comment. A final water utility profile will be provided to NTMWD as well as to TCEQ.



## 5. SPECIFICATION OF WATER CONSERVATION GOALS

TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. As part of plan adoption, each Member City and Customer must develop 5-year and 10-year goals for water savings, including goals for per capita municipal use and for water loss programs. These goals should be submitted to NTMWD in draft form for review. The goals for this water conservation plan include the following:

- Maintain the total and residential per capita water use below the specified amount in gallons per capita per day in a dry year, as shown in the completed Table 5-1. NTMWD will publish the amount of reuse to be is calculating the credit for reuse.
- Maintain the water loss percentage in the system below 12 percent annually in 2018 and subsequent years, as discussed in Section 6.1.3. (The 12 percent goal for water loss is recommended but is not required. Systems with long distances between customers, such as rural systems, may adopt a higher percent nonrevenue water goal.)
- Implement and maintain a program of universal metering and meter replacement and repair, as discussed in Section 6.1.2.
- Increase efficient water usage through a water conservation ordinance, order or resolution as discussed in Section 7.4. (This ordinance is required by NTMWD.)
- Decrease waste in lawn irrigation by implementation and enforcement of landscape water management regulations, as discussed in Section 7.5. (These landscape water management regulations are recommended but are not required.)
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program, as discussed in Section 6.2.
- Develop a system specific strategy to conserve water during peak demands, thereby reducing the peak use.



**Table 5-1 Five-Year and Ten-Year Per Capita Water Use Goals (GPCD)**

Description	Historic 5-Year Average (GPCD)	Baseline	5-Year Goal (GPCD)	10-Year Goal (GPCD)
Current 5-Year Average Total Per Capita Use with Credit for Reuse	169	169	167	165
Current 5-Year Average Residential Per Capita Use	91	91	89	87
Water Loss (GPCD)	39	39	34	29
Water Loss (Percentage)	23	23	17	12

1. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365
2. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365
3. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365
4. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

## **6. BASIC WATER CONSERVATION STRATEGIES**

### **6.1 Metering, Water Use Records, Control of Water Loss, and Leak Detection and Repair**

One of the key elements of water conservation is tracking water use and controlling losses through illegal diversions and leaks. It is important to carefully meter water use, detect and repair leaks in the distribution system and provide regular monitoring of real losses.

#### **6.1.1 Accurate Metering of Treated Water Deliveries from NTMWD**

Water deliveries from NTMWD are metered by NTMWD using meters with accuracy of  $\pm 2\%$ . These meters are calibrated on an annual basis by NTMWD to maintain the required accuracy.

#### **6.1.2 Metering of Customer and Public Uses and Meter Testing, Repair, and Replacement**

The provision of water to all customers, including public and governmental users, should be metered. In many cases, Member Cities and Customers already meter retail and wholesale water users. For those Member Cities and Customers who do not currently meter all internal water uses, as well as all subsequent users. (These entities should implement a program to meter all water uses).

Most Member Cities and Customers test and replace their customer meters on a regular basis. All customer meters should be replaced on a minimum of a 15-year cycle. Those who do not currently have a meter testing and replacement program should implement such a program.

#### **6.1.3 Determination and Control of Water Loss**

Total water loss is the difference between the water delivered to a Member City or Customer from NTMWD (and other supplies, if applicable) and the metered water sales to customers plus water authorized for use but not sold. (Authorized for use but not sold would include use for firefighting, releases for flushing of lines, uses associated with new construction, etc.) Total water loss includes two categories:

- Apparent Losses – Includes inaccuracies in customer meters (customer meters tend to run more slowly as they age and under-report actual use); Losses due to

illegal connections and theft; accounts that are being used but have not yet been added to the billing system.

- Real Losses – Includes physical losses from the system or mains, reported breaks and leaks, storage overflow and unreported losses.

Measures to control water loss should be part of the routine operations of Member Cities and Customers. Maintenance crews and personnel should look for and report evidence of leaks in the water distribution system. A leak detection and repair program is described in Section 6.1.4 below. Meter readers should watch for and report signs of illegal connections so that they can be quickly addressed.

Total water loss should be calculated in accordance with the provisions of TCEQ. With the measures described in this plan, Member Cities and Customers should maintain a water loss percentage below 12 percent in 2018 each year. If total water loss exceeds this goal, the Member City or Customer should implement a more intensive audit to determine the source(s) of loss and to reduce the water loss. The annual conservation report described below is the primary tool that should be used to monitor water loss.

As advance metering technology advances utilities that have these systems should consider as a BMP utilizing the capabilities of these system to provide leak alerts. Retail customers whose accounts demonstrate leaks can be notified by their water provider of potential leak situations for account holder remediation.

#### **6.1.4 Leak Detection and Repair**

As described above, water utility crews and personnel should look for and report evidence of leaks in the water distribution system. Areas of the water distribution system in which numerous leaks and line breaks occur should be targeted for replacement as funds are available.

#### **6.1.5 Record Management System**

As required by TAC Title 30, Chapter 288, Section 288.2(a)(1)(B), a record management system should allow for the separation of water sales and uses into residential, commercial, public/institutional, and industrial categories. This information should be included in an annual water conservation report, as described in Section 7.6 below. Those



entities whose record management systems do not currently comply with this requirement should move to implement such a system within the next five years.

## **6.2 Continuing Public Education and Information Campaign**

The continuing public education and information campaign on water conservation includes the following elements:

- Utilize the “Water IQ: Know Your Water” and other public education materials produced by NTMWD.
- Utilize the “Water4Otter” campaign for students.
- Insert water conservation information with water bills. Inserts will include material developed by Member Cities’ and Customers’ staff and material obtained from the TWDB, TCEQ, and other sources.
- Encourage local media coverage of water conservation issues and the importance of water conservation.
- Notify local organizations, schools, and civic groups that Member City or Customer staff and staff of NTMWD are available to make presentations on the importance of water conservation and ways to save water.
- Promote the *Texas Smartscape* web site ([www.txsmartscape.com](http://www.txsmartscape.com)) and provide water conservation brochures and other water conservation materials available to the public at City Hall and other public places.
- Make information on water conservation available on the Member City’s or Customer’s website (if applicable) and include links to the “Water IQ: Know Your Water” website, *Texas Smartscape* website and to information on water conservation on the TWDB and TCEQ web sites and other resources.
- NTMWD is an EPA Water Sense Partner and participates in the EPA Water Sense sponsored “Fix a Leak Week.” NTMWD encourages all member cities and customers to become EPA Water Sense Partners.
- Utilize the Water My Yard website and encourage customers to sign-up to receive weekly watering advice.



### **6.3 NTMWD Reservoir System Operation Plan**

Member Cities and Customers of NTMWD purchase treated water from NTMWD and do not have surface water supplies for which to implement a reservoir system operations plan. NTMWD operates multiple sources of water supply as a system. The operation of the reservoir system is intended to optimize the use of the District's sources (within the constraints of existing water rights) while minimizing energy use cost for pumping, maintaining water quality, minimizing potential impacts on recreational users of the reservoirs and fish and wildlife.

### **6.4 Coordination with Regional Water Planning Group and NTMWD**

The adopted ordinance(s) or regulation(s) and the adopted water utility profile will be sent to the Chair of the appropriate Water Planning Group and to NTMWD.

### **6.5 Requirement for Water Conservation Plans by Wholesale Customers**

Every contract for the wholesale sale of water by a Member City and/or Customer that is entered into, renewed, or extended after the adoption of this water conservation plan will include a requirement that the wholesale customer and any wholesale customers of that wholesale customer develop and implement a water conservation plan meeting the requirements of Title 30, Chapter 288, of the Texas Administrative Code. This requirement extends to each successive wholesale customer in the resale of the water.

### **6.6 Increasing Block Water Rate Structure**

Each Member City and Customer must adopt, if it has not already done so, an increasing block rate water structure that is intended to encourage water conservation and to discourage excessive use and waste of water upon completion its next rate study or within five years. An example water rate structure is as follows:

#### Residential Rates

1. Monthly minimum charge. This can (but does not have to) include up to 2,000 gallons water use with no additional charge.
2. Base charge per 1,000 gallons up to the approximate average residential use.
3. 2<sup>nd</sup> tier (from the average to 2 times the approximate average) at 1.25 to 2.0 times the base charge.



4. 3<sup>rd</sup> tier (above 2 times the approximate average) at 1.25 to 2.0 times the 2<sup>nd</sup> tier.
5. Additional tiers with further increases if desired.
6. The residential rate can also include a lower tier for basic household use up to 4,000 gallons per month or a determined basic use.

#### Commercial/Industrial Rates

Commercial/Industrial rates should include at least 2 tiers, with rates for the 2<sup>nd</sup> tier set at 1.25 to 2.0 times that of the first tier. Higher water rates for commercial irrigation use are encouraged, but not required.



## **7. ENHANCED WATER CONSERVATION STRATEGIES**

### **7.1 Ordinances, Plumbing Codes, or Rules on Water-Conserving Fixtures**

The state has required water-conserving fixtures in new construction and renovations since 1992. The state standards call for flows of no more than 2.5 gallons per minute (gpm) for faucets, 2.5 gpm for showerheads. As of January 1, 2014, the state requires maximum average flow rates of 1.28 gallons per flush (gpf) for toilets and 0.5 gpf for urinals. Similar standards are now required under federal law. These state and federal standards assure that all new construction and renovations will use water-conserving fixtures. Rebate programs to encourage replacement of older fixtures with water conservation programs are discussed in Section 7.5.

### **7.2 Reuse and Recycling of Wastewater**

Most Member Cities and Customers do not own and operate their own wastewater treatment plants. Their wastewater is treated by NTMWD. NTMWD currently has the largest wastewater reuse program in the state. NTMWD has water rights allowing reuse of up to 71,882 acre-feet per year of treated wastewater discharges from the Wilson Creek Wastewater Treatment Plant for municipal purposes. In addition, NTMWD has also developed the East Fork Reuse Project which can divert up to 157,393 acre-feet per year based on treated wastewater discharges by NTMWD. With the addition of the Main Stem Pump station the District will be able to increase flows through the East Fork Reuse Project up to an additional 56,100 acre-feet per year. When fully developed, these three reuse projects will provide up to 42 percent of the NTMWD's currently permitted water supplies. NTMWD also provides treated effluent from its wastewater treatment plants available for direct reuse for landscape irrigation and industrial use.

Those Member Cities and Customers who own and operate their own wastewater treatment plants should move toward reusing treated effluent for irrigation purposes at their plant site over the next three years. These entities should also seek other alternatives for reuse of recycled wastewater effluent.

### **7.3 Interactive Weather Stations / "Water My Yard" Program**

NTMWD has developed the Water My Yard program to install weather stations throughout its service area in order to provide consumers with a weekly e-mail and information through the "Water My Yard" website to assist consumers in determining an adequate amount of

supplemental water to maintain healthy grass in a specific location. This service represents the largest network of weather stations providing ET-based irrigation recommendations in the State of Texas, and provides 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 is provided that will determine 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. This innovative program has been available to those within the NTMWD service area since May 2013. The city/utility will encourage customers to subscribe to weekly watering updates through Water My Yard or other similar program in an effort to reduce outdoor water consumption.

#### **7.4 Compulsory Landscape and Water Management Measures**

The following landscape water management measures are required by NTMWD for this plan. These measures represent minimum measures to be implemented and enforced in order to irrigate the landscape appropriately and are to remain in effect on a permanent basis unless water resource management stages are declared.

#### **7.5 Additional Water Conservation Measures (Not Required)**

NTMWD also urges its Member Cities and Customers to consider including the following additional water conservation measures in their plans:

- Rebates for rain/freeze sensors and/or ET or Smart controllers

#### **7.6 Monitoring of Effectiveness and Efficiency - NTMWD Annual Water Conservation Report**

The form should be completed by March 31 of the following year and used to monitor the effectiveness and efficiency of the water conservation program and to plan conservation-related activities for the next year. The form records the water use by category, per capita municipal use, and total water loss for the current year and compares them to historical values. Member Cities and Customers will complete the tracking tool by March 31 of the following year and submit them to NTMWD. The annual water conservation report should be sent to NTMWD, which will monitor NTMWD Member Cities' and Customers' water conservation trends.



## **7.7 Water Conservation Implementation Report**

The report is due to the TCEQ by May 1 of every year. This report lists the various water conservation strategies that have been implemented, including the date the strategy was implemented. The report also calls for the five-year and ten-year per capita water use goals from the previous water conservation plan. The reporting entity must answer whether or not these goals have been met and if not, why not. The amount of water saved is also requested.

## **8. IMPLEMENTATION AND ENFORCEMENT OF THE WATER CONSERVATION PLAN**

Updated and maintained in the Code of Ordinances:

Chapter 110- Article VIII

Chapter 110- Article III



## **9. REVIEW AND UPDATE OF WATER CONSERVATION PLAN**

TCEQ requires that the water conservation plans be updated every five years. The plan will be updated as required and as appropriate based on new or updated information.