City of Pearland

2019 Water Conservation Plan



PREPARED FOR:

City of Pearland

PREPARED BY:

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FOREWORD

This Water Conservation Plan was prepared for the City of Pearland by Freese and Nichols, Inc., pursuant to Texas Commission on Environmental Quality rules, one of which is a requirement that all retail water suppliers that serve 3,300 or more connections submit a water conservation plan every five years.[1] For the purposes of regional coordination, the 2019 Water Conservation Plan for the City of Houston (Houston) was consulted.[3] Similarly, the *2019 Water Conservation Plan*[4] for the Gulf Coast Water Authority was consulted.

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This Water Conservation Plan is based on the Texas Administrative Code in effect on January 31, 2019 and considers water conservation best management practices from Texas Water Development Board (TWDB) Report 362, *Water Conservation Best Management Practices Guide*.[5] In 2007, the state legislature created the Water Conservation Advisory Council (WCAC) as a council with expertise in water conservation with one of their charges to regularly review existing Best Management Practices (BMPs) and add additional new BMPs as appropriate. The WCAC BMPs available as of January 31, 2019 have also been considered in the preparation of this plan.

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1. INTRODUCTION AND OBJECTIVES

Water supply has always been a key issue in the development of Texas and the Houston region. In recent years, the increasing population and economic development of the Houston area have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely already developed. Historic reliance on groundwater supplies in the area has caused subsidence in the Gulf Coast aquifer. The Harris-Galveston Subsidence District and the Fort Bend Subsidence District were created to reduce subsidence by reducing reliance on groundwater. Utilities in those districts are being encouraged to transition from groundwater to surface water. The City of Pearland is diversifying its supplies beyond groundwater, to include surface water and reuse. Additional surface water supplies to meet higher demands will come at higher cost than current groundwater resources. 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 and drought contingency plans, , one of which is a requirement that all retail water suppliers that serve 3,300 or more connections submit a water conservation plan every five years[2]. The TCEQ guidelines and requirements are included in Appendix B. The City of Pearland (Pearland) has developed this Water Conservation Plan in accordance with TCEQ guidelines and requirements. Since Pearland is a wholesale water customer of the City of Houston (Houston), the *2019 Water Conservation Plan*[3] for Houston was consulted during the development of this Plan to ensure consistency. Similarly, the *2019 Water Conservation Plan*[4] for the Gulf Coast Water Authority was consulted. This Water Conservation Plan replaces Ordinance 1508 dated October 27, 2014.

The City of Pearland 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 Pearland's commitment to enhanced water conservation and efficiency strategies – particularly those best management practices (BMPs) established by the Water Conservation Implementation Task Force[5] and the Water Conservation Advisory Council (WCAC), which were incorporated, where appropriate, 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. The WCAC has furthered the efforts of the Task Force by updating existing BMPs and creating new BMPs as new technologies and programs arise.

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.
- To encourage efficient outdoor water use.
- To extend the life of current water supplies by reducing the rate of growth in demand.

2. DEFINITIONS

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. CUSTOMER means any person, corporation, or organization using water supplied by the City of Pearland.

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. EXTRA-TERRITORIAL JURISDICTION (ETJ) means an area outside of the city limits where cities can regulate some activities.

6. 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.

7. 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.

8. MUNICIPAL USE means the use of potable water provided by a public water supplier as well as the use of treated sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.

9. REUSE/RECYCLED WATER means reclaimed municipal wastewater that has been treated to a quality that meets or exceeds the minimum standards of the 30 Texas Administrative Code, Chapter 210 and is used for lawn irrigation, industry, or other non-potable purposes.

10. RESIDENTIAL GALLONS PER CAPITA PER DAY (Residential GPCD) is 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.

11. TOTAL GALLONS PER CAPITA PER DAY (Total GPCD) is the total amount of water purchased, diverted and/or pumped for potable use divided by the total permanent population and then divided by the number of days in the year. Diversion volumes of reuse as defined in TAC Chapter 288.1 shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.

12. WATER CONSERVATION PLAN means this water conservation plan approved and adopted by the City Council of Pearland on January 27, 2020.

Abbreviations

Abbreviation	Full Nomenclature
AMI	Advanced Metering Infrastructure
BMP	Best Management Practice
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
MGD	Million Gallons per Day
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 public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as "A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the reuse and recycling of water, and for preventing the pollution of water." The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

Minimum Conservation Plan Requirements

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

- 288.2(a)(1)(A) – Utility Profile – Section 4 and Appendix C
- 288.2(a)(1)(B) – Record Management System – Section 6.1.2
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 5
- 288.2(a)(1)(D) – Accurate Metering – Section 6.1
- 288.2(a)(1)(E) – Universal Metering – Section 6.1
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Section 6.1
- 288.2(a)(1)(G) – Public Education and Information Program – Section 6.2
- 288.2(a)(1)(H) – Non-Promotional Water Rate Structure – Section 6.3
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 6.5
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 6.6
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Group – Section 6.7 and Appendix D
- 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 – Section 6.1.3
- 288.2(a)(2)(B) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.4

Additional Conservation Strategies

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

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 6.3
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 7.2
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 7.1
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.3

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 Water Conservation Advisory Council (the "Guidance").[6] The Guidance was developed in response to a charge by the 82nd 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. The City of Pearland has considered elements of the Guidance in preparation of this Plan.

4. WATER UTILITY PROFILE AND DESCRIPTION OF THE CITY OF PEARLAND SERVICE AREA

Appendix C to this Water Conservation Plan contains the Utility Profile for the City of Pearland presented in the format recommended by the TCEQ.

Pearland provides retail service to residential and commercial customers; the city does not have any wholesale customers. Pearland city limits encompass approximately 55 square miles. The 2017 population is estimated at 119,700, which includes a small portion of the ETJ that City of Pearland serves. The city is projected to continue to grow in the coming decades.

The City owns and operates ten water wells that have a combined pumping capacity of 12,825 gallons per minute (gpm), or 18.47 million gallons per day (MGD). The current surface water contract for the Shadow Creek Water Plant is take-or-pay with a maximum day capacity of 6 MGD. The current surface water contract with the City of Houston routed through the Alice Water Plant is pay-as-you-go for 10 MGD. The combined groundwater and surface water system capacity is 34.5 MGD. The City has initiated design of a new 10 MGD surface water treatment plant west of State Highway 288.

Available city-wide ground and elevated storage capacities total 14.0 and 4.5 million gallons, respectively.

There are currently five wastewater treatment plants in the City of Pearland: JHEC, Longwood, Barry Rose, Far Northwest, and Southdown. The current, total combined capacity of the plants is 12.55 MGD.[7]

Figure 4-1 shows the historic per capita use by the City of Pearland. These numbers represent the total gallons per capita per day (GPCD) of Pearland customers between 2014 and 2018, to include all uses (residential, commercial, irrigation, etc.). Pearland's five-year average during that period was 111 GPCD, which is well below TWDB's recommended goal of 140 GPCD for utilities within Regional Water Planning Groups. **Figure 4-2** shows the historic percentage of water loss by the City of Pearland. The percentage reported in 2016 appears to be anomalous, and further investigation into the methodology used to calculate that percentage should be performed. **Figure 4-3** is a map showing the service area for the City of Pearland.

Figure 4-1: City of Pearland Per Capita Water Use

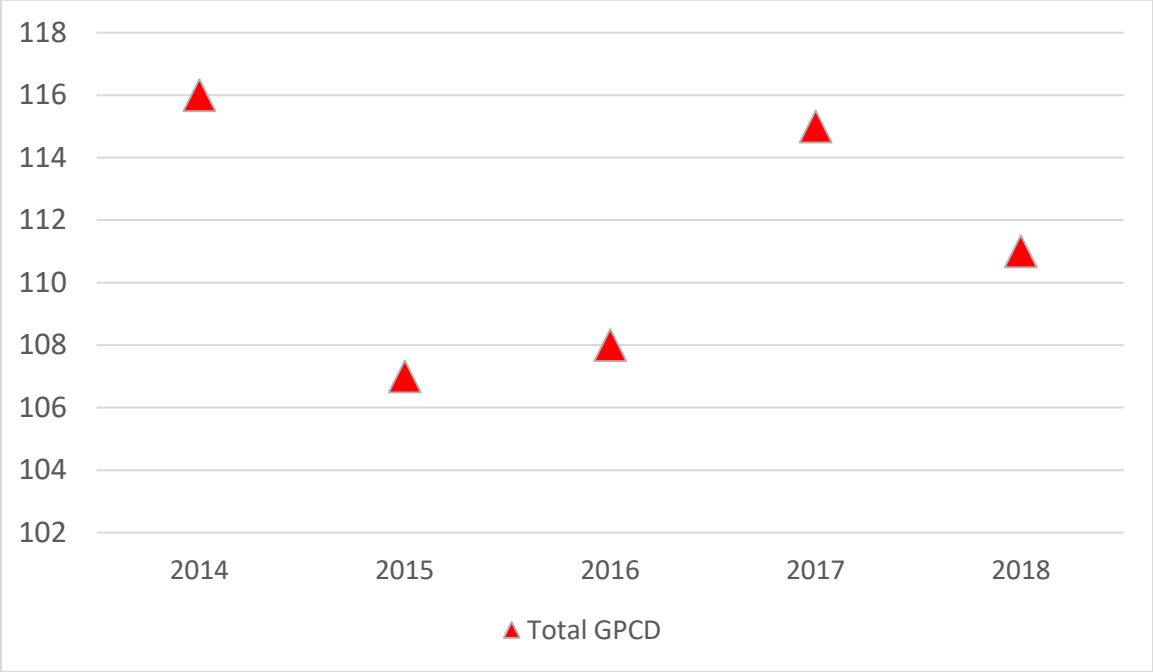


Figure 4-2: City of Pearland Percent Water Loss

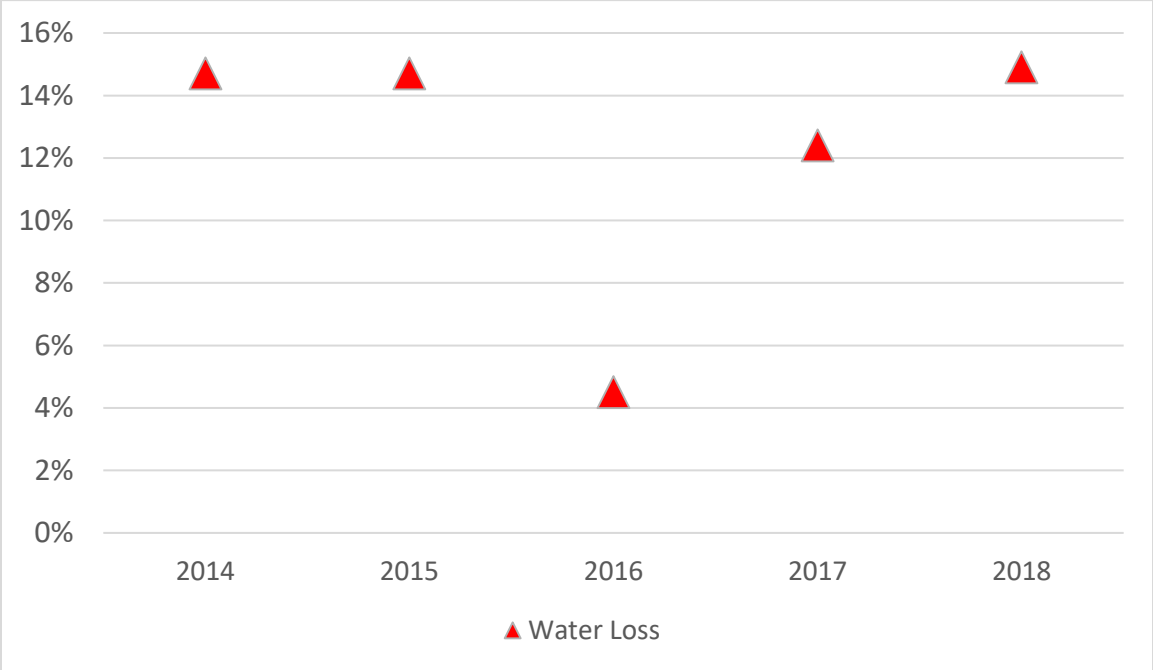
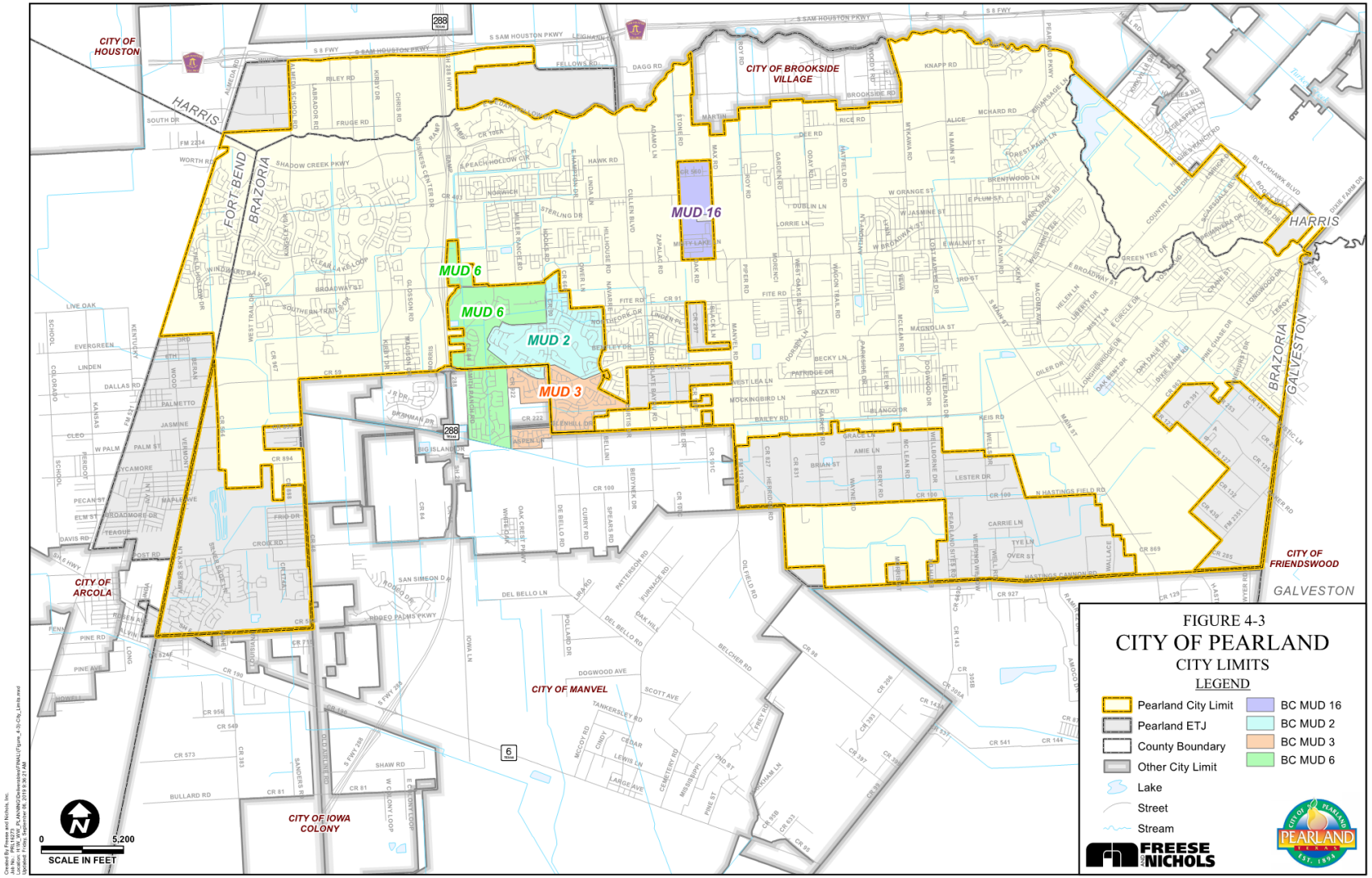


Figure 4-3: City of Pearland Retail Water Service Area



5. SPECIFICATION OF WATER CONSERVATION GOALS

TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. Pearland has developed 5-year and 10-year goals for municipal per capita use. The goals for this water conservation plan include the following:

- Maintain the 5-year average total and residential per capita water use below the specified amount in gallons per capita per day, as shown in the completed **Table 5-1**.
- Maintain the level of water loss percentage in the system below 12 percent annually in 2019 and as discussed in Section 6.1.2 for subsequent years.
- Implement and maintain a program of Advanced Metering Infrastructure (AMI), universal metering, and meter replacement and repair, as discussed in Section 6.1.2.
- 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.
- Delay and decrease capital expenditures required to serve Pearland's future growth.

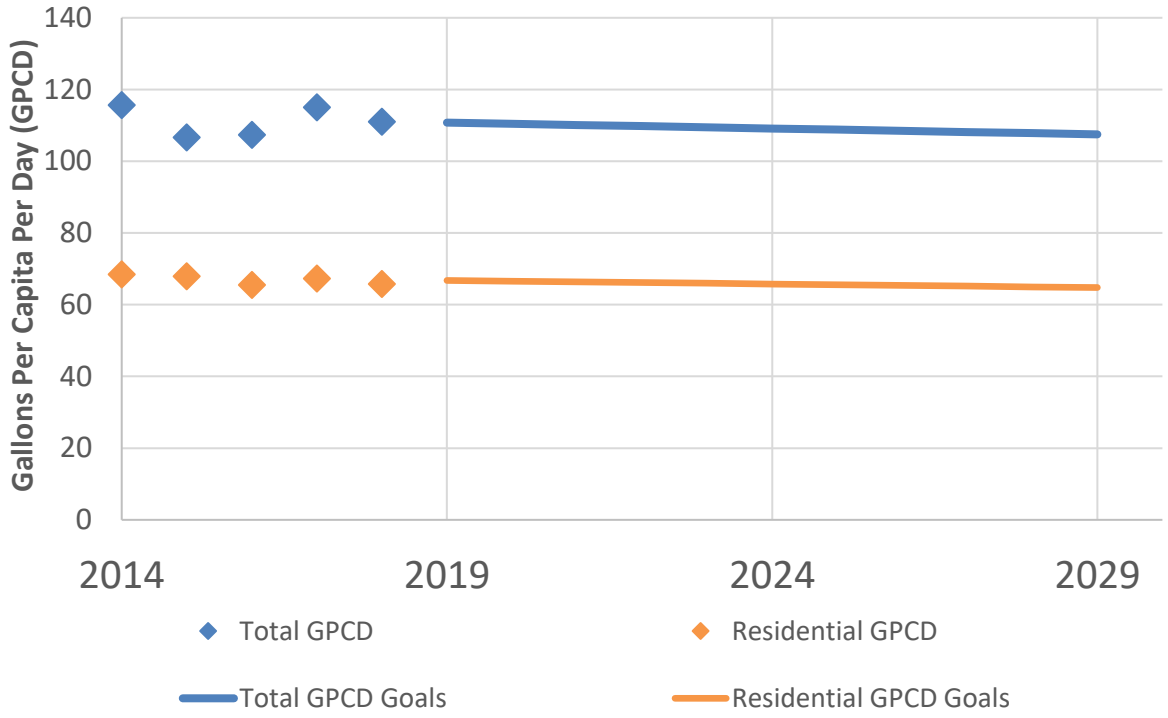
Table 5-1 Five-Year and Ten-Year Total GPCD Goals

Description	Current Average	5-Year Goal	10-Year Goal
Total Per Capita Use (GPCD)[a]	111	109	107
Residential Per Capita Use (GPCD)[b]	65	64	63
Water Loss (GPCD)[c]	13.6	12.1	10.7
Water Loss (Percentage)[d]	12.2%	11.1%	10.0%

a. Total GPCD = (Total Gallons Purchased from Houston & Self-Supplied Water ÷ Permanent Population) ÷ 365
b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365
c. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365
d. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

These goals are for a 5-year average, and therefore some years (dry years) will see higher per capita usage than these average goals. A series of dry years might lead to an average exceeding the goal.

Figure 5-1: Gallons Per Capita Per Day (GPCD) Goals (Total and Residential)



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 in water conservation is careful tracking of water use and control of losses. Accurate metering of water deliveries, detection and repair of leaks in the raw water delivery and potable water distribution systems and regular monitoring of water loss are important elements of the City of Pearland's program to control losses.

6.1.1 Practices to Measure and Account for the Amount of Water Delivered from Houston

Water pumped from groundwater supplies is metered by the City of Pearland with accuracy of ±5%. Water deliveries from the City of Houston are metered by the City of Houston using meters with accuracy of ±2%. The City of Houston maintains a program to pull, test and replace any meters determined to be functioning outside of these parameters.

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

Except for some public uses, the City of Pearland meters all water users. The City is installing meters on all new public uses and the City is implementing a program to have all existing users metered by 2019. The City converted all meters to automated meters in the early 2000s. Pearland has not had a formal meter testing program in recent years, but meter testing is conducted for any meter which displays unusual results. Accuracy of the meters has been good and has not required a formal meter testing program, but the City plans to implement such a program by 2024.

Nonrevenue water is the difference between produced/purchased water and metered water sales to customers plus authorized but unmetered uses. Nonrevenue water can be caused by the following:

- Inaccuracies in customer meters
- Accounts which are being used but have not yet been added to the billing system
- Losses due to water main breaks and leaks in the water distribution system
- Losses due to illegal connections and theft
- Other

Measures to control nonrevenue water are part of the routine operations of the City. A leak detection and repair program is described in Section 6.1.3 below. Meter readers actively watch for and report signs of illegal connections, so they can be quickly addressed.

Water and wastewater utilities increasingly face challenges associated with population growth that cannot be offset by reduced per capita consumption, and aging infrastructure that will require significant investment. Advanced Metering Infrastructure (AMI) is one tool in the toolbox of a smart and effective utility which can serve to reduce per capita consumption and therefore delay the need for major capital expenses and rate adjustments, improve customer service, detect potential leaks, and streamline operational decision making and reduce operational costs. City of Pearland is initiating a pilot of an AMI program.

As required by Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 (a)(1)(B), Pearland's record management system allows for the separation of water sales and uses into residential and non-residential classes. The non-residential water use can be tracked by the use of codes into the required categories of commercial, public/institutional, and industrial use categories. Pearland's record management system allows water sales and uses to be tracked as separate categories and includes water sales to multi-family housing in the residential sales category. This information is included in the TCEQ required Water Conservation Implementation Report, as described in Section 6.6.

To track its progress in reducing water losses, the City's Public Works department will perform a monthly water audit, comparing the amount of water purchased from Houston and self-supplied with that distributed through metered sales. A report is prepared outlining the monthly variance in percentage of water loss. The City also performs an annual audit comparing the same data on a calendar year basis.

Total water loss is the difference between water delivered from City of Houston and self-supplied groundwater, minus authorized consumption by Pearland's customers. Authorized consumption includes billed metered uses, unbilled metered uses, and unbilled unmetered uses such as firefighting and releases for flushing of lines. Water losses include two categories:

- Apparent losses such as inaccuracies in customer meters. (Customer meters tend to run more slowly as they age and under-report actual use). Unauthorized consumption due to illegal connections and theft.

- Real Losses due to water main breaks and leaks in the water distribution system and unreported losses.

Measures to control water losses are part of the routine operations of the City of Pearland. Maintenance crews and personnel are asked to look for and report evidence of leaks in the water distribution system. The leak detection and repair program is described in Section 6.1.3 below. Meter readers are asked to watch for and report signs of illegal connections, so they can be addressed quickly.

Table 6-1 shows Pearland's annual water loss percent from 2014-2018. This Plan considers the average from 2014-2018 to be representative of current water loss conditions in Pearland. The average water loss percent during 2014-2018 is approximately 12.2%.

Table 6-1 Pearland Percent Water Loss

Year	%
2014	14.7%
2015	14.7%
2016	4.5%
2017	12.4%
2018	14.9%

6.1.3 Leak Detection and Repair

As they travel the city performing regular duties, maintenance crews and personnel actively 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 will be targeted for replacement as funds are available.

6.2 PUBLIC EDUCATION PROGRAM

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

- Notify customers through newspapers, e-mail, city website, and bill inserts.
- The City website (https://www.pearlandtx.gov/) includes information on water conservation tips.
- Notify local organizations, schools and civic groups that staff are available to make presentations on Pearland's water conservation programs.

- Consider developing or providing a water conservation curriculum for Pearland Public Schools.
- Consider providing a water conservation booth at public events in which the City participates.

6.3 WATER RATE STRUCTURE

Pearland has an increasing block water rate structure that promotes water conservation for residential, commercial and irrigation customers (https://www.pearlandtx.gov/departments/disposal-services/water-rate). The rates are established following a cost of service study by an outside rate consultant. Rates are set to generate the revenues needed to operate and maintain the system and to meet debt service requirements. Pearland utilizes a rate structure that includes a base rate for water service and four tiers of increasing prices for increased water usage for residential customers. Commercial and irrigation customer classes have a base rate for water service and one tier for water usage.

6.4 REQUIREMENT FOR WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

Every contract for the wholesale sale of water 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, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code. The requirement will also extend to each successive wholesale customer in the resale of the water. Each customer shall submit its water conservation plan or water conservation measures to the City of Pearland for review. Each customer shall also submit any changes or amendments to its water conservation plan or water conservation measures to the City of Pearland for review.

6.5 RESERVOIR SYSTEM OPERATION PLAN

The City of Pearland purchases water from Houston and does not have surface water supplies for which to implement a reservoir operation plan.

6.6 WATER CONSERVATION IMPLEMENTATION AND ENFORCEMENT

The City of Pearland 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, Pearland must document the reasons why. The amount of water saved is also documented in this report.

Appendix E contains a copy of the Ordinance adopted by the City Council regarding this *Water Conservation Plan*. The Ordinance designates responsible officials to implement and enforce the *Water Conservation Plan*.

6.7 COORDINATION WITH REGIONAL WATER PLANNING GROUPS

Appendix D includes a letter sent to the Chair of the Region H Water Planning Group, City of Houston and Gulf Coast Water Authority with this Water Conservation Plan. The adopted ordinances and the adopted water utility profile were also sent to the Chair of the Region H Water Planning Group, City of Houston and Gulf Coast Water Authority.

7. ENHANCED WATER CONSERVATION STRATEGIES

The City of Pearland has implemented a number of enhanced water conservation measures which are outlined below.

7.1 REUSE AND RECYCLING OF WASTEWATER

The City of Pearland treats wastewater at five wastewater treatment plants with a total capacity of 12.55 MGD. Reuse water is used for washdown at the wastewater treatment plants. Plans have been developed with Brazoria County MUD #4 to use effluent for golf course irrigation, but this is not currently being done. There are also plans to use effluent to irrigate a proposed arboretum/nature center.

7.2 ORDINANCES, PUMBING CODES, OR RULES ON WATER-CONSERVING FIXTURES

The City operates under the International Plumbing Code. This code has been formally adopted by the City Council and is included in the Code of Ordinances (https://library.municode.com/tx/pearland/codes/code_of_ordinances?nodeId=COOR_CH23PLGA_ARTIPLCO_S23-1PLCOAD). The City routinely inspects new construction, remodeling, add-ons, etc., through building permits to ensure installation of fixtures adheres to current codes.

The state standards call for flows of no more than 2.5 gallons per minute (gpm) for faucets, 2.5 gpm for showerheads, and 1.28 gallons per flush for toilets and 0.5 gallons per flush for urinals. Similar standards are now required nationally under federal law. These state and federal standards assure that all new construction and renovations will use water-conserving fixtures.

7.3 LANDSCAPE WATER CONSERVATION MEASURES

The City is currently considering adoption of a landscape management ordinance. Among the measures that such an ordinance might include are:

- Prohibition of watering of impervious surfaces (wind driven water drift will be taken into consideration).
- Prohibition of outdoor watering during precipitation or freeze events.
- Rain and freeze sensors required on all new irrigation systems. Rain and freeze sensors must be maintained to function properly.

- Requirement that all new irrigation systems be in compliance with state design and installation regulations (TAC Title 30, Part 1, Chapter 344).

7.4 VOLUNTARY WATER CONSERVATION MEASURES

The City recommends voluntary water use restrictions beginning July 1 and ending October 1 of each year:

- Measures to be implemented directly by the City of Pearland to manage limited water supplies and/or reduce water demand:
    - Reduced or discontinued flushing of water mains
- Water customers are encouraged to voluntarily limit landscape irrigation use to even numbered days of the month for customers with street address ending in an even number (0,2,4,6,8), and odd numbered days of the month for water customers with a street address ending in an odd number (1,3,5,7,9), and to irrigate landscapes between the hours of 6:00 a.m. and 10:00 a.m. and between 8:00 p.m. and 10:00 p.m. on designated watering days, except:
    - Landscape irrigation use is permitted at any time if it is by means of a faucet filled bucket or watering can of five (5) gallons or less, hand-held hose, or drip irrigation.
- Water customers are requested to practice water conservation and to minimize or discontinue non-essential water use.
- Discourage overseeding, sodding, sprigging, broadcasting or plugging with cool season grasses or watering cool season grasses, except for golf courses and competition athletic fields.
- Encourage that all new irrigation systems be in compliance with state design and installation regulations (TAC Title 30, Part 1, Chapter 344).
- Native, drought tolerant or adaptive plants should be encouraged.
- Drip irrigation systems should be promoted.

8. POTENTIAL FUTURE CONSERVATION PROGRAMS

8.1 LANDSCAPE WATER CONSERVATION MEASURES

Other utilities in the region are exploring mandatory no more than twice per week watering schedules, either year-round or seasonal. Implementing such an ordinance could save a utility in the Houston area between 2 percent and 7 percent from their total municipal demand.[8] In order to estimate the potential savings that the City of Pearland might realize, a study specific to Pearland would need to be conducted. The City of Pearland would engage its community in the future, for the purpose of getting feedback that would improve the appropriateness of a potential ordinance related to mandatory no more than twice per week watering. During the development of this potential watering schedule, the City will use the following public involvement tools to gain feedback:

- Public meeting facilitated by public relations professionals
- Social media outreach
- Informational handouts

8.2 LANDSCAPE ORDINANCES

The City of Pearland is projected to have substantial population growth in the next fifty years. The additional population will require additional housing. Review of existing landscape ordinances may be conducted through an inter-departmental process with regular meetings between departments. The process may include:

- Review of the existing ordinances for alignment with the goals of this Plan.
- Benchmarking of the current landscape ordinance with ordinances from other cities promoting water conservation.
- Identification of drought tolerant turf, groundcover, shrubs and trees that are allowed to be planted at new homes.
- Integrating landscape ordinances and other outdoor conservation strategies into land use planning.
- Providing opportunity for feedback from interested parties and citizens.

8.3 ADVANCED LEAK DETECTION AND REPAIR

Areas of the water distribution system in which numerous leaks and line breaks occur are targeted for replacement as funds are available. To track its progress in reducing water losses, the City will perform a monthly water audit, comparing the amount of water purchased from Houston and self-supplied with that distributed through metered sales. A report is prepared outlining the monthly variance in percentage of water loss. The City also performs an annual audit comparing the same data on a calendar year basis. All of these programs over the next few years are in an effort to achieve the water loss goals identified in Section 5 of this Plan.

9. ADOPTION OF WATER CONSERVATION PLAN; PERIODIC REVIEW AND UPDATE OF PLAN

Opportunity for public comment on the plan was provided at a Pearland City Council workshop on January 27, 2020. Appendix E contains a copy of the minutes of the January 27, 2020 City Council meeting at which this Water Conservation Plan was adopted. The ordinance designates responsible officials to implement and enforce the Water Conservation Plan.

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. Texas Commission on Environmental Quality Annual Report. https://www.tceq.texas.gov/assets/public/permitting/forms/20645.pdf

2. 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://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=288, January 2019.

3. City of Houston, "Water Conservation Plan", prepared by City of Houston, July 2019.

4. Gulf Coast Water Authority, "Water Conservation Plan for Gulf Coast Water Authority", prepared by Gulf Coast Water Authority, June 2019.

5. 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.

6. Texas Water Development Board, Texas Commission on Environmental Quality, Water Conservation Advisory Council. "Guidance and Methodology for Water Conservation Reporting."

7. City of Pearland, "2018 Water and Wastewater Impact Fee Update", prepared by Freese and Nichols, Inc., April 2018.

8. Texas Living Waters Project. "Water Conservation By The Yard: A Statewide Analysis of Outdoor Water Savings Potential.", March 2018

Appendix B

Texas Commission on Environmental Quality Rules

Appendix B

Texas Commission on Environmental Quality Rules on Municipal Water Conservation and Drought Contingency Plans

TITLE 30 ENVIRONMENTAL QUALITY

PART 1 TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CHAPTER 288 WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS

SUBCHAPTER A WATER CONSERVATION PLANS

RULE §288.1 **Definitions**

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

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

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(20) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either

disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

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

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

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

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

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

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

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

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 288	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
SUBCHAPTER A	WATER CONSERVATION PLANS
RULE §288.2	**Water Conservation Plans for Municipal Uses by Public Water Suppliers**

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

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

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

(B) a record management system which allows for the classification of water sales and uses into the most detailed level of water use data currently available to it, including, if possible, the sectors listed in

clauses (i) - (vi) of this subparagraph. Any new billing system purchased by a public water supplier must be capable of reporting detailed water use data as described in clauses (i) - (vi) of this subparagraph:

(i) residential;

(I) single family;

(II) multi-family;

(ii) commercial;

(iii) institutional;

(iv) industrial;

(v) agricultural; and,

(vi) wholesale.

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

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

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

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

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

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

(I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and

(J) a means of implementation and enforcement which shall be evidenced by:

(i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and

(ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and

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

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

(A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system;

(B) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

(3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may

require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:

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

(B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;

(C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;

(D) reuse and/or recycling of wastewater and/or graywater;

(E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;

(F) a program and/or ordinance(s) for landscape water management;

(G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and

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

(b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.

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

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

Appendix C

City of Pearland Water Utility Profile Based on TCEQ Format

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 Pearland - Utility Profile Based on TCEQ Format

Name:	City of Pearland
Address:	3501 East Orange Street
	Pearland, TX 77581
Telephone Number:	281-652-1934
Water Right No.(s):	5714
Regional Water Planning Group:	Region H
Form Completed by:	Adam Conner
Title:	Freese and Nichols
Person responsible for implementing conservation program:	Julian Kelly
Signature:	Date: 12/17/2019

NOTE: If the plan does not provide information for each requirement, 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.
   See figure of service area in WCP

2. Service area size (square miles): 55

3. Current population of service area: 124,000

4. Current population served for:
   a. water: 124,000
   b. wastewater: 124,000

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

Year	*Population*
2014	108,000
2015	115,600
2016	119,700
2017	119,700
2018	124,000

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

Year	*Population*
2020	127,750
2030	138,885
2040	152,780
2050	166,675
2060	180,573

7. List source or method for the calculation of current and projected population size.
   Previous and current populations are sourced from Pearland's TWDB Water Audit Reports. Projected population is from the draft 2021 Region H Water Plan.

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? ☐

Note: This is for the year 2018.

Treated Water Users	*Metered*	*Non-Metered*	**Totals**
Residential - Single Family	34,971		34,971
Residential - Multi Family	196		196
Institutional	311		311
Commercial	2,230		2,230
Industrial	61		61
Agriculture	5		5
Total Unmetered	973	973	1,946
TOTAL	**37,774**	**973**	**39,720**

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

Note: Pearland counted apartment units as individual connections in 2015, then counted apartment complexes as individual connections in subsequent years.

Year	*2016*	*2017*	*2018*
Treated Water Users			
Residential - Single Family	1,117	-636	2,026
Residential - Multi Family	-6,400	-18	68
Institutional	-295	20	240
Commercial	1,043	-489	730
Industrial	-10	-42	61
Agriculture	-496	1,126	-1,121
Total Unmetered	0	0	973
TOTAL	**-5,041**	**-39**	**2,977**

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

Note: This represents highest retail customers in 2018

	Customer	*Use (1,000 gal/year)*	*Treated or Raw Water*
1.	SHADOW CREEK RANCH MA	59,616	Treated
2.	PEARLAND ISD	55,322	Treated
3.	SOUTHERN TRAILS R.A. INC	32,095	Treated
4.	TRANQUILITY BAY APTS	23,853	Treated
5.	MAR SHADOW CREEK LP	23,696	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.

Year / *Month*	*2014*	*2015*	*2016*	*2017*	*2018*
January	313,778	321,227	328,878	354,697	364,232
February	281,657	301,518	331,381	324,955	298,440
March	329,999	329,936	385,401	380,590	373,110
April	378,404	318,916	396,963	421,848	407,619
May	438,741	358,599	397,481	499,213	491,064
June	434,077	379,399	369,862	445,750	489,434
July	447,100	534,726	505,254	493,462	550,310
August	491,231	604,091	425,550	470,473	589,369
September	399,763	447,316	394,874	440,976	393,917
October	371,198	255,275	445,367	443,859	395,309
November	342,193	311,957	377,817	407,197	336,796
December	328,568	334,615	344,467	340,838	333,945
Totals	**4,556,709**	**4,497,575**	**4,703,295**	**5,023,858**	**5,023,545**

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).

Surface water purchased from the City of Houston and GCWA. Groundwater is self-supplied.

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*	*2014*	*2015*	*2016*	*2017*	*2018*
Residential	2,521,072	2,784,463	3,020,920	2,803,195	2,908,338
Single-Family	*2,521,072*	*2,597,265*	*2,651,500*	*2,597,674*	*2,650,636*
Multi-Family	*0*	*187,198*	*369,421*	*205,521*	*257,702*
Commercial	690,787	401,236	1,319,140	531,717	503,386
Institutional	0	35,146	70,819	56,901	190,644
Industrial	0	27,015	112,119	0	26,094
Agriculture	422,738	411,317	0	550,833	401,862
TOTAL	**3,634,597**	**3,659,176**	**4,522,999**	**3,942,646**	**4,030,324**

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

Year	*Amount (gallons)*	*Percent*
2014	670,864,529	14.7%
2015	689,897,900	14.7%
2016	216,290,905	4.5%
2017	567,408,143	12.4%
2018	746,509,226	14.9%

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**
2018	15,417	Historical Demand
2019	16,876	*Interpolated*
2020	18,335	2021 Region H Water Plan
2021	18,465	*Interpolated*
2022	18,596	*Interpolated*
2023	18,726	*Interpolated*
2024	18,857	*Interpolated*
2025	18,987	*Interpolated*
2026	19,117	*Interpolated*
2027	19,248	*Interpolated*
2028	19,378	*Interpolated*

Note: Projections include TWDB estimated reductions for plumbing fixtures. Projections are from the draft 2021 Region H Plan as approved by TWDB for the City of Pearland WUG.

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	Brazoria County Groundwater Conservation District	7,730.53 AF/year
Contracts	Treated Water Contract with City of Houston - Shadow Creek	6,720.86 AF/year
	Treated Water Contract with City of Houston - Alice WTP	11,201.44 AF/year
Other		
Total		25,652.83 AF/year

B. Treatment and Distribution System

1. Design daily capacity of system: 34.46 MGD

Treatment Plant	Reliable Pumping Capacity (MGD)
McLean	0.92
Mary's Creek	1.10
Liberty	1.97
Magnolia	1.53
Garden	1.72
Southeast	2.84
Cullen	1.80
Kirby	3.06
Southdown	1.78
Country Place	1.75
Alice	10.00
Shadow Creek	6.00
Total	34.46

Note: Treatment Plant Reliable Pumping Capacity above represents well capacity of all City wells and treatment capacity of the two City surface water treatment plants (Alice and Shadow Creek).

2. Storage capacity: 18.619 MG
   a. Elevated 4.5 MG
   b. Ground 14.119 MG

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

City of Pearland does not own or operate any water treatment plants.

IV. WASTEWATER SYSTEM DATA

A. Wastewater System Data (if applicable)

1. Design capacity of wastewater treatment plant(s) (MGD): 16.6

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):

   Note: This represents estimated reuse volume in 2018 (golf course irrigation and plant wash down).

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, Average/Max (MGD)	Operator	Owner	Receiving Stream
Reflection Bay	00WQ10134-008	6/24	City of Pearland	City of Pearland	Clear Creek
JHEC WRF	00WQ10134-007	4/16	City of Pearland	City of Pearland	Mary's Creek / JHEC Wetland
Barry Rose WRF	00WQ10134-002	3.1/12	City of Pearland	City of Pearland	Clear Creek
Longwood WRF	00WQ10134-010	2.5/10	City of Pearland	City of Pearland	Mary's Creek
Southdown WRF	00WQ00122-95001	0.95/3.8	City of Pearland	City of Pearland	Hickory Slough

B. Wastewater Data for Service Area (if applicable)

1. Percent of water service area served by wastewater system: 100%

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

Year	*2014*	*2015*	*2016*	*2017*	*2018*
Month					
January	209,862	299,660	280,604	322,868	309,403
February	208,166	215,147	230,999	256,530	291,715
March	244,221	317,219	272,539	341,849	267,785
April	215,216	326,207	306,798	293,734	253,852
May	252,539	359,065	325,807	268,130	259,255
June	222,881	277,577	327,266	290,677	260,164
July	224,467	243,973	253,583	272,740	277,718
August	231,434	277,418	324,400	349,350	230,200
September	254,821	268,022	284,052	297,783	335,832
October	235,693	323,333	243,132	269,894	330,663
November	245,147	306,258	238,349	250,931	312,405
December	266,579	277,715	279,709	301,357	328,582
Totals	**2,811,026**	**3,491,594**	**3,367,238**	**3,515,843**	**3,457,574**

Appendix D

Letters to Region H Water Planning Group, Houston and Gulf Coast Water Authority

January 28, 2020

Mr. Mark Evans, Chair
Region H Water Planning Group
c/o North Harris County Regional Water Authority
3648 Cypress Creek Parkway, Suite 110
Houston, TX 77068

Dear Mr. Evans:

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Pearland. I am submitting a copy of this plan to the Region H Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City Council of Pearland adopted the Plan on January 27, 2020.

Sincerely,

Julian Kelly
Public Works Superintendent - Water
City of Pearland

January 28, 2020

Paula Paciorek, Water Conservation Manager
City of Houston
611 Walker, 21st Floor
Houston, TX 77002

Dear Ms. Paciorek:

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Pearland. I am submitting a copy of this plan to the City of Houston in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City Council of Pearland adopted the Plan on January 27, 2020.

Sincerely,

Julian Kelly
Public Works Superintendent - Water
City of Pearland

January 28, 2020

Brandon Wade, General Manager
Gulf Coast Water Authority
3630 FM 1765
Texas City, TX 77591

Dear Mr. Wade:

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Pearland. I am submitting a copy of this plan to the Gulf Coast Water Authority in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City Council of Pearland adopted the Plan on January 27, 2020.

Sincerely,

Julian Kelly
Public Works Superintendent - Water
City of Pearland

Appendix E

Adoption of the Water Conservation Plan