CITY OF HOUSTON

# WATER CONSERVATION PLAN

2024

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HOUSTON PUBLIC WORKS

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# HOUSTON 2024 WATER CONSERVATION PLAN

## 1.0 INTRODUCTION

Houston provides water and wastewater service to its customers through the water service line of Houston Public Works (HPW). Houston strives to protect public health and the environment and provide superior customer service. Houston's goal is to provide all customers with drinking water that meets the State of Texas "superior" rating at pressures required to meet their daily needs.

Houston is a large regional water supplier that provides both retail and wholesale service. As of 2024, Houston supplies treated water to 2.6 million residents and an additional 2.9 million people through 69 wholesale water contracts. By 2060, the combined total is expected to reach 7.6 million people.

The State Water Plan, which details how Texas will address our state's growing water needs, calls for serious statewide conservation efforts to meet a quarter of Texas' future water needs. Region H, the fast growing, mainly urbanized region in which Houston is located, has specific conservation goals articulated in the region's plan. Houston has implemented, and will continue to develop, a wide range of water conservation programs to educate and engage customers about the importance of water and what they can do to protect and preserve this essential resource.

### 1.1 OBJECTIVES

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation plans. The TCEQ guidelines and requirements are included in **Appendix B**. HPW has developed this Water Conservation Plan (Plan) in accordance with TCEQ guidelines and requirements. This Plan will continually reassess opportunities to improve water efficiency and conservation based on new or updated information as available.

Water supply has always been a key issue in the development of Texas. In recent years, increasing population and economic development in southeast Texas have led to growing demands for water supplies. Local and less expensive sources of water supply are already developed and additional supplies to meet future demands will be expensive and difficult to secure. Severe drought conditions in the recent past highlight the importance of the efficient use of existing supplies to make them last as long as possible.

The purpose of the Plan is to ensure water use efficiency within an organization. The Plan is a strategy or combination of strategies for:

- Reducing the loss or waste of water;
- Reducing the consumption of water;
- Improving, or maintaining the efficiency in the use of water; or
- Increasing recycling and reuse of water.

These goals address both water conservation (using less water) and water efficiency (improving processes to use the least amount of water needed for a process). Applying strategies to achieve these goals in Houston's Plan may reduce the pressure on the existing system by

reducing water demand through water conservation measures, lower the operating costs of the existing system, extend the life of existing infrastructure which saves money, and delay the need for developing expensive alternative water sources.

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 HPW's commitment to water conservation and efficiency strategies—including best management practices established by the Water Conservation Implementation Task Force and Water Conservation Advisory Council (WCAC), which were incorporated, where practicable, in the development of water conservation measures.

The WCAC regularly reviews, updates, and creates additional best management practices through a collaborative process. The Texas Water Development Board (TWDB) published *The Complete Guide: BMPs for Municipal Water Providers* and *The Complete Guide: BMPs for Wholesale Water Providers* in 2017, both of which were consulted for this plan. Water efficiency and conservation approaches may be adjusted based on new or updated information, and as best management information becomes available on the TWDB website at https://www.twdb.texas.gov/conservation/BMPs/index.asp.

The Houston 2024 Water Conservation Plan replaces the previous plan dated July 1, 2019.

During the period of the 2019 Plan, programs implemented by HPW were impacted by the COVID-19 pandemic. Specifically, programs and projects that were public facing were heavily curtailed through 2020 and the first half of 2021. The objectives of this 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 document the level of recycling and reuse in the water supply; and
- To extend the life of current water supplies by reducing the rate of growth in demand.

The 2024 Plan seeks to address the three Pillars of Water Equity as identified in the US Water Alliance briefing paper, "An Equitable Water Future." The three pillars of water equity are:

- Ensure all people have access to clean, safe, affordable water service;
- Maximize the community and economic benefits of water infrastructure investments; and
- Foster community resilience in the face of a changing climate.

The challenges to water equity as identified by the US Water Alliance in the briefing paper are:

- Aging and inadequate infrastructure;
- Affordability;
- Fragmentation; and
- Climate impacts.

HPW employed the three pillars of water equity as a framework to update the 2024 Plan and may achieve significant conservation savings to help extend the life of existing water supplies while ensuring affordability of water.

## 1.2 DEFINITIONS

**Bucket:** A container which holds no more than five gallons to be used singly by one person.

**Commercial water use:** Water use which is integral to the operations of commercial, non-profit, and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

**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 supply is conserved and made available for future or alternative uses.

**Contamination:** The presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality to constitute a health hazard or impair the usefulness of the water such that the water system cannot be used.

**Customer:** Any person, company, organization, or municipality using water supplied by the City of Houston.

**Director:** The City of Houston Public Works Director or designee.

**Drought:** A prolonged period of abnormally low precipitation that adversely affects growing or living conditions.

**Impervious surface:** Any structure, street, driveway, sidewalk, patio, or other surface area covered with brick, asphalt paving, tile or other impervious or nonporous material.

**Industrial water use:** The use of water in processes designed to convert materials of lower value into forms having greater usability and value.

**Institutional water customer:** Public, educational, or other organizations devoted to a particular cause or program including all levels of government agencies, schools, colleges, and healthcare facilities such as nursing homes and hospitals.

**Landscape irrigation use:** Water use for irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way, and medians.

**Landscape irrigation (system):** A system of fixed pipes, emitters, and/or heads that apply water to landscape plants or turfgrass, including, but not limited to, inground and permanent irrigation systems, and/or hose-end sprinklers.

**Landscaping plant(s):** Any member of the horticultural kingdom Plantae, including any tree, shrub, vine, herb, flower, succulent, ground cover, or grass species that grows or has been planted outdoors for such purpose.

**Landscape watering:** The application of water to landscape trees, shrubs, plants, or grass to promote the health and/or growth of existing landscape plants.

**Non-essential water use:** Water use that is neither essential nor required for the protection of public health, safety, and welfare.

**Person or User:** The provisions of the plan shall apply to all persons, users, and property utilizing water provided by the City of Houston. The terms "person" and "user" as used in the plan includes individuals, corporations, partnerships, associations, and all other legal entities.

**Production capability:** The volume/amount a public water supplier can produce utilizing the current water resources and infrastructure.

**Resilience:** Resilience refers to the ability of an individual, community, or system to respond and adapt to crises, and to treat them as opportunities for transformation and improvement. It encompasses the capacity of all people, including vulnerable communities, to respond to shock and trauma of all kinds. In the context of water, resilience is discussed in terms of vulnerability to climate impacts and natural disasters.

**Reservoir:** The City of Houston raw water holding facilities, including Lake Livingston, Lake Conroe, Lake Houston, and Allen's Creek Reservoir.

**Restriction device:** A pipe or valve which has an orifice designed to restrict the flow of water from a water supply line through a water meter serving a customer.

**Swimming pool:** Any structure, basin, chamber, tank, or large tub, including hot tubs, containing water for swimming purposes, diving, or recreational bathing, and having a depth of two feet or more at any point.

**Vulnerable communities:** Vulnerable communities face historic or contemporary barriers to economic and social opportunities and a healthy environment. The principal factors in community vulnerability are income, race or ethnicity, age, language ability, and geographic location. This may include low-income people, certain communities of color, immigrants, seniors, children, people with disabilities, people with limited English-speaking ability, rural communities, tribal communities, people living in unincorporated areas, people living in public housing, and currently or formerly incarcerated people.

**Water emergency:** A water system failure due to weather, electrical or mechanical failure, contamination of source, extremely low river water allotment, or act of God or force majeure.

**Water equity:** Equity refers to just and fair inclusion—a condition in which everyone has an opportunity to participate and prosper. Water equity occurs when all communities have access to safe, clean, affordable drinking water and wastewater services; are resilient in the face of floods, drought, and other climate risks; have a role in decision-making processes related to water management in their communities; and share in the economic, social, and environmental benefits of water systems.

**Water stress:** Water stress occurs when individuals and communities face difficulty in accessing water services. It can include inadequate access to drinking water, wastewater, and stormwater services for everyday needs, whether due to lack of infrastructure, difficulty paying for services, or poor water quality. Water stress encompasses water-related climate impacts such as floods, droughts, and rising sea levels. Facilities like wastewater treatment plants can

cause stress to residential communities in the surrounding areas. Water stress also affects people that rely on water for their livelihood, such as farming communities.

**Watering schedule:** Permissible days for outdoor water use based upon odd and even numbered addresses or other determining guidance.

**Water supply:** Amount of water available to meet the immediate unrestricted customer demands based on the available water resources and infrastructure.

**Wholesale water user:** Potable water provided to a person, political subdivision, or municipality who is not the ultimate user of the water.

## 1.3 ABBREVIATIONS

**Table 1-1: Abbreviations**

| Abbreviation | Full Nomenclature |
|---|---|
| AMI | Advanced Metering Infrastructure |
| AWWA | American Water Works Association |
| AWE | Alliance for Water Efficiency |
| BMP | Best Management Practices |
| CEC | Citizens' Environmental Coalition |
| EPA | Environmental Protection Agency |
| EPAct | Environmental Protection Act |
| FOG | Fats, Oils, Grease |
| GPCD | Gallons per Capita per Day |
| GPF | Gallons of Water per Flush |
| GPM | Gallons per Minute |
| HPARD | Houston Parks and Recreation Department |
| HETs | High Efficiency Toilets |
| HPW or Houston | Houston Public Works |
| ICI | Industrial, Commercial, and Institutional |
| ICIM | Industrial, Commercial, Institutional, and Multifamily |
| ILI | Infrastructure Leakage Index |
| LEED | Leadership in Energy and Environmental Design |
| MGD | Million Gallons per Day |
| MUD | Municipal Utility District |
| PACE | Property Assessed Clean Energy Program |
| RWH/CR | Rainwater Harvesting and Condensate Reuse |
| RWPG | Regional Water Planning Group |
| TAC | Texas Administrative Code |
| TEK | Texas Essential Knowledge and Skills |
| TCEQ | Texas Commission on Environmental Quality |
| TWDB | Texas Water Development Board |
| UARL | Unavoidable Annual Real Losses |
| W.A.T.E.R. | Water Aid to Elderly Residents |
| WCAC | Water Conservation Advisory Council |
| WCTT | Water Conservation Tracking Tool |

# 2.0 REGULATORY BASIS FOR WATER CONSERVATION PLAN

## 2.1 TCEQ RULES GOVERNING CONSERVATION PLANS

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 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 elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

There are three instances when a water conservation plan should be submitted to the TWDB:

- entities applying for or currently receiving financial assistance of greater than $500,000 from the TWDB;
- entities with 3,300 connections or more; or
- entities that have surface water rights through TCEQ.

Additionally, TCEQ rules governing development of the conservation plans for public water suppliers are contained in *Title 30 Part 1, Chapter 288, Subchapter B, Rule §288.20 of the Texas Administrative Code*, which is included in **Appendix B**. For these rules, a drought contingency plan is defined as "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)." Houston's Drought Contingency and Emergency Water Management Plan is in **Appendix D**.

### 2.1.1 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 Profiles – Section 4.0 and Appendix C
- 288.2(a)(1)(B) – Record Management System – Section 6.1.3
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 5.0
- 288.2(a)(1)(D) – Accurate Metering – Section 6.2.3
- 288.2(a)(1)(E) – Universal Metering – Section 6.2.3
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Section 6.2.3
- 288.2(a)(1)(G) – Public Education and Information Program – Section 6.1.5
- 288.2(a)(1)(H) –Water Rate Structure – Section 6.1.2
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 4.1
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 5.2
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Groups – Section 5.3 and Appendix F
- 288.2(c) – Review and Update of Plan – Section 9.0

### 2.1.2 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 6.2
- 288.2(a)(2)(B) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.1.8

### 2.1.3 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 Houston include the following:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 6.1.2
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes and Rules on Water-Conserving Fixtures – Section 6.1.8
- 288.2(a)(3)(C) – Replacement of Retrofit of Water-Conserving Fixtures – Section 6.2.5
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 6.2.4
- 288.2(a)(3)(E) – Pressure Control and Reduction – Section 6.1.3
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 6.1.4
- 288.2(a)(3)(G) – Method to Monitor Plan Effectiveness/Efficiency – Section 5.2
- 288.2 (a)(3)(H) – Other Water Conservation Practices – Section 6.1

In addition to being a public water supplier under TCEQ rules, the City of Houston also acts as a wholesale provider so TCEQ water conservation rules for wholesale providers are also addressed.

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

### 2.1.4 Minimum Conservation Plan Requirements for Wholesale Water Suppliers

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

- 288.5(1)(A) – Description of Service Area – Section 4.0 and Appendix C
- 288.5(1)(B) – Specific, Quantified Goals – Section 5.0
- 288.5(1)(C) – Measure and Account for Water Diverted – Section 6.2.3
- 288.5(1)(D) – Monitoring and Record Management System – Section 6.1.3
- 288.5(1)(E) – Program of Metering and Leak Detection and Repair – Section 6.2.3
- 288.5(1)(F) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.1.8
- 288.5(1)(G) – Reservoir System Operation Plan – Section 4.1
- 288.5(1)(H) – Means of Implementation and Enforcement – Section 5.2

- 288.5(1)(I) – Documentation of Coordination with Regional Water Planning Groups – Section 5.3 and Appendix F
- 288.5(3) – Review and Update of Plan – Section 7.0

### 2.1.5 Additional Conservation Strategies for Wholesale Water Suppliers

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

- 288.5(2)(D) – Other Water Conservation Practices – Section 3.2 and Section 6.1

# 3.0 BEST MANAGEMENT PRACTICES

## 3.1 GUIDANCE AND METHODOLOGY FOR REPORTING ON WATER CONSERVATION AND WATER USE

In addition to TCEQ rules regarding water conservation, this Plan incorporates elements of the *Guidance and Methodology for Reporting on Water Conservation and Water Use* (the Guidance) developed by TWDB and TCEQ, in consultation with the WCAC. 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. HPW has considered elements of the Guidance in preparation of this Plan.

## 3.2 TWDB WATER CONSERVATION PLANNING TOOL

The TWDB has developed a Municipal Water Conservation Planning Tool for utilization by utilities to evaluate various best management practices. The tool is pre-loaded with data submitted by utilities as part of the water use surveys and has a library of best management practices with water savings and associated cost. HPW utilized the tool in development of the per capita goals in this Plan and for comparing cost and savings. HPW encourages each of its Wholesale Customers to utilize the tool, to the extent practical, for water conservation planning.

## 3.3 ANALYSIS OF BEST MANAGEMENT PRACTICES

Historically, HPW has tracked the implementation and effectiveness of water conservation plans through the Water Conservation Annual Report, Utility Profile, and Water Loss Audit Report, which are submitted to the TWDB every year.

In 2019, HPW began using the American Water Works Association (AWWA) Utility Benchmarking Tool as an additional tracking method. The Utility Benchmarking Tool tracks utility performance data and calculates performance indicators in areas such as organizational development, business operations, customer service, and water and wastewater operations. Per the AWWA, these indicators are designed to help utilities improve operational and managerial effectiveness. Benchmarking utility performance indicators will allow Houston to track performance and compare results with peers to identify areas for improvement.

Houston water conservation efforts are ongoing with innovative programs developed and evaluated annually. Programs are designed and budgets developed based on planned

participation. Where applicable, programs are evaluated in terms of annual water savings, project life, and cost per unit of water saved. These programs serve as tools for achieving both short-term and long-term reductions in per capita consumption and are selected based on their potential for reducing water use at the lowest cost per unit of water saved. These tools and programs are discussed in more depth in Section 6.

Annually, HPW calculates consumption and tracks changes for customer use in gallons per customer per day. This information is used to gauge the effectiveness of programs to achieve the consumption reductions desired and, if performance is below target, to alter, change or introduce new conservation programs. Programs are based on TCEQ and TWDB best management practices (BMPs) as outlined below:

- Programs that have been implemented in the past (benefits continue);
- Programs currently in implementation;
- Programs scheduled for implementation; and
- Programs currently under consideration for implementation.

To update the Plan, HPW evaluated the best management practices outlined in the *Water Conservation Best Management Practices Guides for Municipalities and Wholesale Providers*. **Table 3-1** lists water conservation strategies required or recommended as BMPs for municipal water utilities by the TCEQ and TWDB. **Table 3-1** indicates whether they are currently employed or whether they will be considered to meet future per capita reduction goals. It is important to remember that previously implemented programs, such as toilet and washing machine replacement programs, will continue to have a significant impact on per capita water use well after the program phases out.

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| Table 3-1: Water Conservation Best Management Practices Implementation Schedule (continued) | | | | | | |
|---|---|---|---|---|---|---|
| **BMP** | **Best Management Practices (BMP) Description** | **Implementation Schedule** | | | | **Notes** |
| | | **Code** | **Before 2024** | **Before 2029** | **Before 2034** | |
| **Municipal BMPs** | | | | | | |
| **Conservation Analysis and Planning** | | | | | | |
| 2.1 | Conservation Coordinator | | ✓ | | | A conservation position was added as part of the creation of a Water Conservation Division within Houston Water. |
| 2.2 | Cost-Effectiveness Analysis for Municipal Water Users | | ✓ | | | Use multiple analysis tools across Houston Water |
| 2.3 | Water Survey for Single-Family and Multi-Family Customers | | | ✓ | | Future Consideration for Single-Family Surveys |
| 2.4 | Customer Characterization | | | ✓ | | Future Consideration |
| **Financial** | | | | | | |
| 3.1 | Water Conservation Pricing | ✓ | ✓ | | | Future Consideration for additional customer classes |
| 3.2 | Wholesale Agency Assistance Programs | | ✓ | | | |
| **Systems Operations** | | | | | | |
| 4.1 | Metering of All New Connections and Retrofit of Existing Connections | | ✓ | ✓ | | About 80,000 Sensus point devices have been installed as of 2023. Plan to replace all meters over time. |
| 4.2 | System Water Audit and Water Loss | | ✓ | | | $4.2B toward water and wastewater projects using CAP 5-year funding |
| **Landscaping** | | | | | | |
| 5.1 | Athletic Field Conservation | | | ✓ | | Future Consideration |
| 5.2 | Golf Course Conservation | | | ✓ | | Future Consideration for two municipal golf courses managed by Houston and three municipal courses managed by private companies. |
| 5.3 | Landscape Irrigation Conservation and Incentives | | ✓ | | | Promotes WaterMyYard.org App for weekly watering needs and Houston Chapter of the Native Plant Society website for planting needs. Outdoor conservation tips on HPW website. |

| Table 3-1: Water Conservation Best Management Practices Implementation Schedule (continued) | | | | | | |
|---|---|---|---|---|---|---|
| BMP | Best Management Practices (BMP) Description | Implementation Schedule | | | | Notes |
| | | Code | Before 2024 | Before 2029 | Before 2034 | |
| **Municipal BMPs** | | | | | | |
| 5.4 | Park Conservation | | ✓ | | | Future Consideration |
| 5.5 | Residential Landscape Irrigation Evaluations | | | ✓ | | Future Consideration, as part of water survey or as stand alone |
| 5.6 | Outdoor Watering Schedule | | | ✓ | | Future Consideration for Drought Contingency Only |
| **Education and Public Awareness** | | | | | | |
| 6.1 | Public Information | | ✓ | | | Continue current programs |
| 6.2 | School Education | | ✓ | | | Continue current programs |
| 6.3 | Public Education and Outreach | | ✓ | | | Continue current programs |
| 6.4 | Partnerships with Nonprofit Organizations | | ✓ | | | See examples of active partnerships in multiple public education and awareness events and programs. |
| **Rebate, Retrofit, Incentive Programs** | | | | | | |
| 7.1 | Conservation Programs for Industrial, Commercial, and Institutional Accounts | | ✓ | | | Offered to 50 customers – will evaluate for future |
| 7.2 | Residential Clothes Washer Incentive Program | | ✓ | | | Pilot Program faucets, showerheads, toilets, and clothes washers will inform future programs |
| 7.3a | Plumbing Code Residential Toilet Replacement Programs | ✓ | | | | Adopted Per City Plumbing Code; |
| 7.3b | Additional Residential and Commercial Toilet Replacement Programs | | ✓ | | | Pilot Program faucets, showerheads, toilets, and clothes washers.; and giveaway programs for showerheads, aerators, and dye leak detection tabs; Consider for Multifamily properties |
| 7.4a | Plumbing Code Showerhead, Aerator and Toilet Flapper Retrofit | ✓ | | | | Adopted Per City Plumbing Code |
| 7.4b | Additional Showerhead, Aerator and Toilet Flapper Retrofit Program | | ✓ | | | Pilot Program faucets, showerheads, toilets, and clothes washers.; and giveaway programs for faucet aerators and dye leak detection tabs |

| Table 3-1: Water Conservation Best Management Practices Implementation Schedule (continued) | | | | | | |
|---|---|---|---|---|---|---|
| **BMP** | **Best Management Practices (BMP) Description** | **Implementation Schedule** | | | | **Notes** |
| | | **Code** | **Before 2024** | **Before 2029** | **Before 2034** | |
| **Municipal BMPs** | | | | | | |
| 7.5 | Water Wise Landscape Design and Conversion Programs | | ✓ | | | Not recommended |
| 7.6 | Industrial, Commercial, Institutional, and Multifamily (ICIM) Custom Conservation Rebates | | ✓ | | | PACE loan program began in 2015 |
| 7.7 | Plumbing Assistance Programs for Economically Disadvantaged Customers | | | ✓ | | Future Consideration based on pilot program |
| **Conservation Technology** | | | | | | |
| 8.1 | New Construction Graywater | | | | | Not recommended |
| 8.2 | Rainwater Harvesting and Condensate Reuse | | ✓ | | | Rain Barrel sales began in 2012; Evaporation Credit Program for Cooling Towers |
| 8.3 | Water Reuse | | ✓ | | | Onsite Irrigation and Plant Washdown |
| **Regulatory and Enforcement** | | | | | | |
| 9.1 | Prohibition on Wasting Water | ✓ | | | | Drought Continency Plan will require by Ordinance |
| 9.2 | Conservation Ordinance Planning/Development | | | ✓ | | Future Consideration for irrigation ordinances |
| 9.3 | Enforcement of Irrigation Standards | | | ✓ | | Future Consideration for watering restriction schedules, especially during drought |
| **Wholesale BMPs** | | | | | | |
| 2.1 | Customer Contract Requirement to Develop and Implement Water Conservation / Drought Contingency Plans | | ✓ | | | Required after official adoption of the plan and according to Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code. |
| 2.2 | Technical Assistance and Outreach | | ✓ | | | |
| 3.1 | Cost-Share Program | | | | | |
| 3.2 | Collective Purchase and Direct Distribution of Water Conservation Equipment | | | | | |

# 4.0 DESCRIPTION OF SERVICE AREA AND UTILITY PROFILE

## 4.1 DESCRIPTION OF SERVICE AREA

Houston is the largest city in Texas, home to 2.6 million residents as of 2023. HPW, the largest water/wastewater utility in the state, supplies an additional 2.9 million people through contract and wholesale customers outside the city limits.

Houston is an active participant in the Region H Regional Water Planning Group (RWPG). Region H includes all or part of 15 counties: Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Leon, Liberty, Madison, Montgomery, Polk (partial), San Jacinto, Trinity (partial), Waller, and Walker.

Houston is a regional water supplier. It operates three water supply reservoirs, three water purification plants, 146 groundwater wells, 55 groundwater plants, 8 re-pressurization plants, and more than 7,660 linear miles of distribution pipeline across a four-county area consisting of more than 650 square miles, making HPW's water system one of the most complex water systems in the nation.

Eighty-five percent of Houston's municipal water supply is derived from their three water purification plants, which have a combined production capacity of up to 640 million gallons per day (MGD). These plants are the Northeast Water Purification Plant (rated at 80 MGD), located at Lake Houston and serves the northern region of Houston's service area; the East Water Purification Plant (rated at 360 MGD), located east of I-610 and west of Greens Bayou and serves the central region of HPW's service area; and the Southeast Water Purification Plant (rated at 200 MGD), located north of Clear Lake and serves the southeastern region of Houston's service area. These plants meter all water produced and pressurize water at between 80 and 90 psi.

The remaining 15% of HPW's municipal water supply is provided by 146 groundwater wells, which have a combined production capacity of up to 200 MGD. Three of the wells are permitted by the Lone Star Groundwater Conservation District, three by the Fort Bend Subsidence District, and the remaining 140 wells by the Harris-Galveston Subsidence District.

In 2023, retail and wholesale usage were 167.7 billion gallons of treated water, averaging 456.6 MGD.

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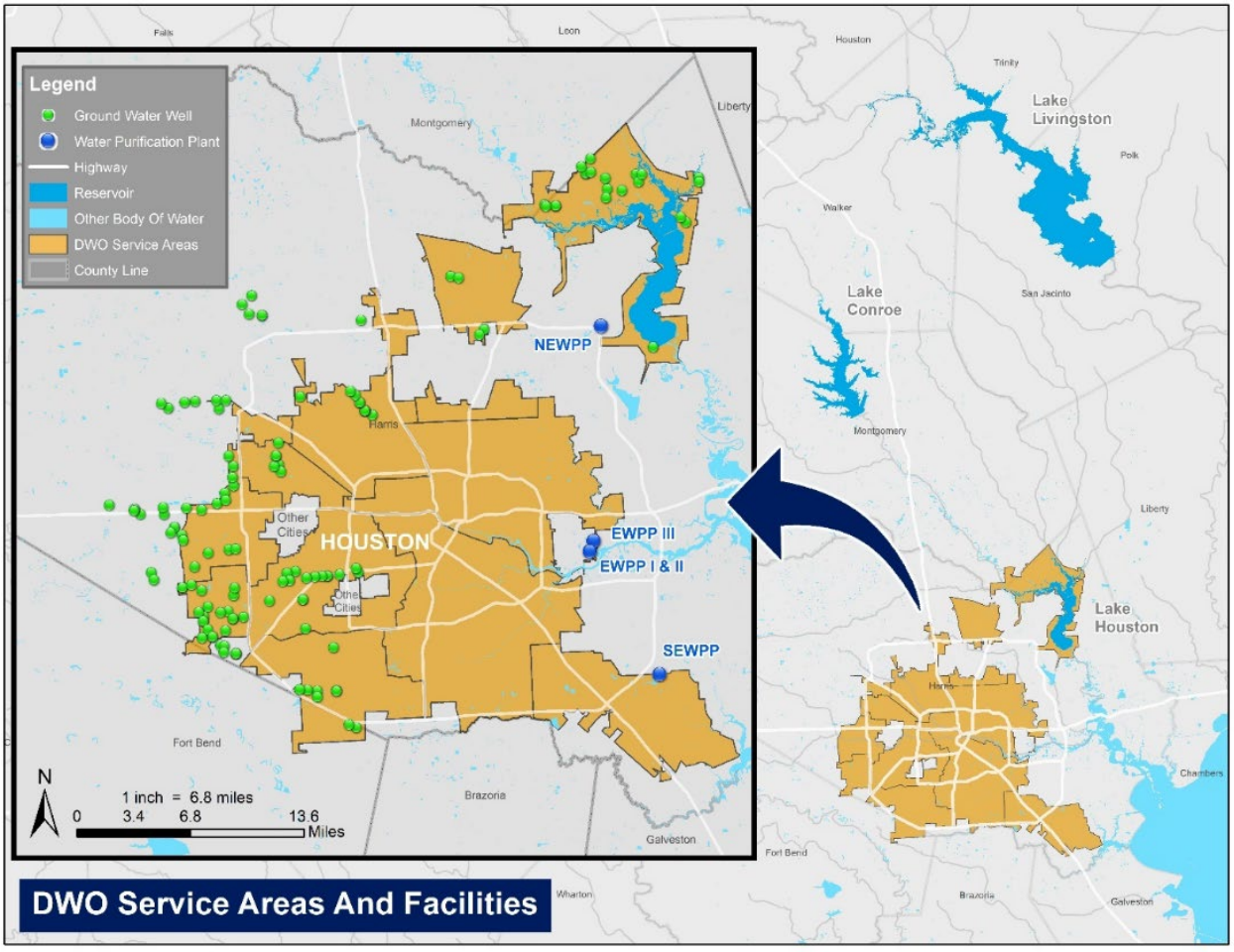
**Figure 4-1** shows Houston's retail water service area, water sources, and water treatment plants.

**Figure 4-1: City of Houston Water Service Area and Facilities**




**Source: Houston Public Works*

HPW provides untreated, treated, and reclaimed water to wholesale customers by contract. As of 2023, Houston has 161 wholesale contracts, 68 with cities, municipal utility districts (MUD), and regional water authorities for treated water service. In 2023, these treated water contract customers used 83.3 billion gallons, averaging 228.2 MGD.

HPW has raw water reservoirs, including Lake Livingston, Lake Conroe, and Lake Houston. **Table 4-1** outlines HPW's permitted raw water diversions.

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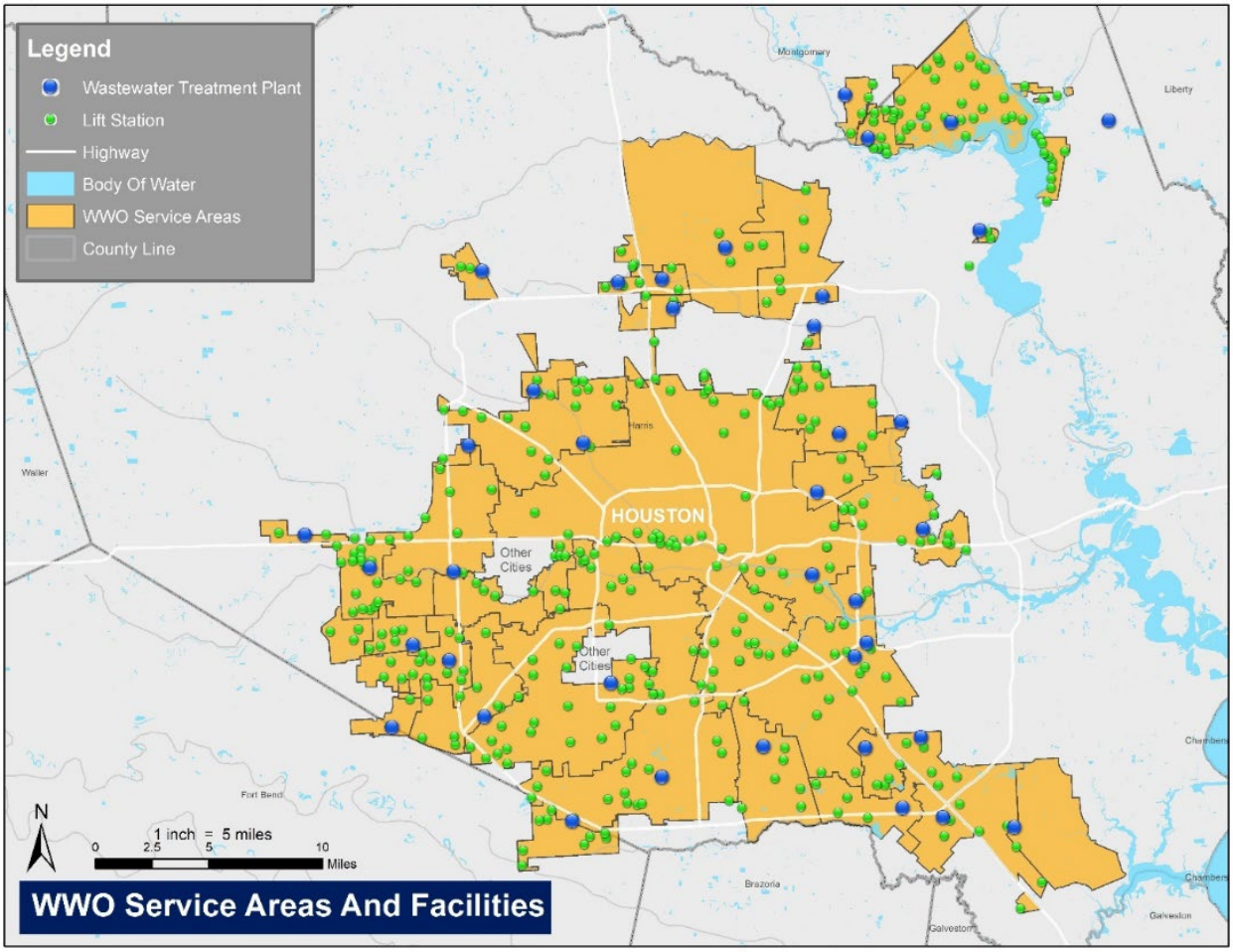
| Table 4-1: Adjudicated Water Rights | | | | | |
|---|---|---|---|---|---|
| Water Right # | Permitted Use | Source | Quantity | | Priority Date |
| | | | Acre Ft/Yr. | MGD | |
| 10-4965 | Multiple Use | Lake Houston (1) | 112,000 | 100 | May 7, 1940 |
| | | Lake Houston (1) | 56,000 | 50 | February 26, 1944 |
| | **Subtotal** | | **168,000** | **150** | |
| 10-4963 | Multiple Use | Lake Conroe (2) | 66,667 | 59.5 | January 12, 1959 |
| 10-5807 | Multiple Use | Lake Houston | 14,100 | 12.6 | December 3, 2008 |
| 10-5808 | Multiple Use | San Jacinto River | 40,000 | 35.7 | September 22, 2009 |
| 10-5826 | Multiple Use | Multiple Bayous | 130,000 | 116 | March 26, 2004 |
| 10-5827 | Reuse | Multiple Bayous | 290,462 | 259.1 | May 14, 2004 |
| 08-4261 | Multiple Use | Lake Livingston | 444,000 | 396.4 | September 23, 1959 |
| | Multiple Use | Lake Livingston | 458,800 | 409.6 | September 23, 1959 |
| | **Subtotal** | | **902,800** | **806** | |
| | Municipal | Wallisville | 10,000 | 8.9 | September 23, 1959 |
| | Industrial | Wallisville | 28,000 | 25 | September 23, 1959 |
| | **Subtotal** | | **38,000** | **33.9** | |
| | Multiple Use | Southern Canal (3) | 31,600 | 28.2 | December 30, 1913 |
| | Multiple Use | Southern Canal (3) | 13,400 | 12 | December 30, 1913 |
| | **Subtotal** | | **45,000** | **40.2** | |
| 08-4277 | Irrigation | Dayton Canal | 33,000 | 29.5 | July 2, 1913 |
| | Irrigation | Dayton Canal | 5,000 | 4.5 | August 25, 1969 |
| | **Subtotal** | | **38,000** | **34** | |
| 12-5851 | Multiple Use | BRA SYSOP | 33,333 | | October 15, 2004 |
| **TOTALS** | | | **1,766,362** | **1,546.90** | |
| *1* | *Municipal, Industrial and Irrigation (Multiple Use)* | | | | |
| *2* | *Houston's 2/3 undivided share by use* | | | | |
| *3* | *Run-of-river right included in Certificate of Adjudication No. 08-4261 with Lake Livingston and Wallisville. Purchased 1969.* | | | | |

## 4.2 TREATMENT CAPACITY

The City's service area is currently served by 3 surface water treatment plants and 55 groundwater plants. The approved surface water treatment capacity for the three surface water plants is 535 MGD, while the approved groundwater treatment capacity is 370 MGD. These plants are shown in **Figure 4-1**.

The City has a wastewater treatment capacity of 563.7 MGD with a total of 38 treatment facilities and 3 sludge plants. **Figure 4-2** shows the location of the City's wastewater treatment facilities.

**Figure 4-2: City of Houston Wastewater Service Area and Facilities**




**Source: Houston Public Works*

**Appendix C** contains Houston's most recent Water Utility Profile based on the formats recommended by TCEQ for both retail suppliers and wholesale suppliers.

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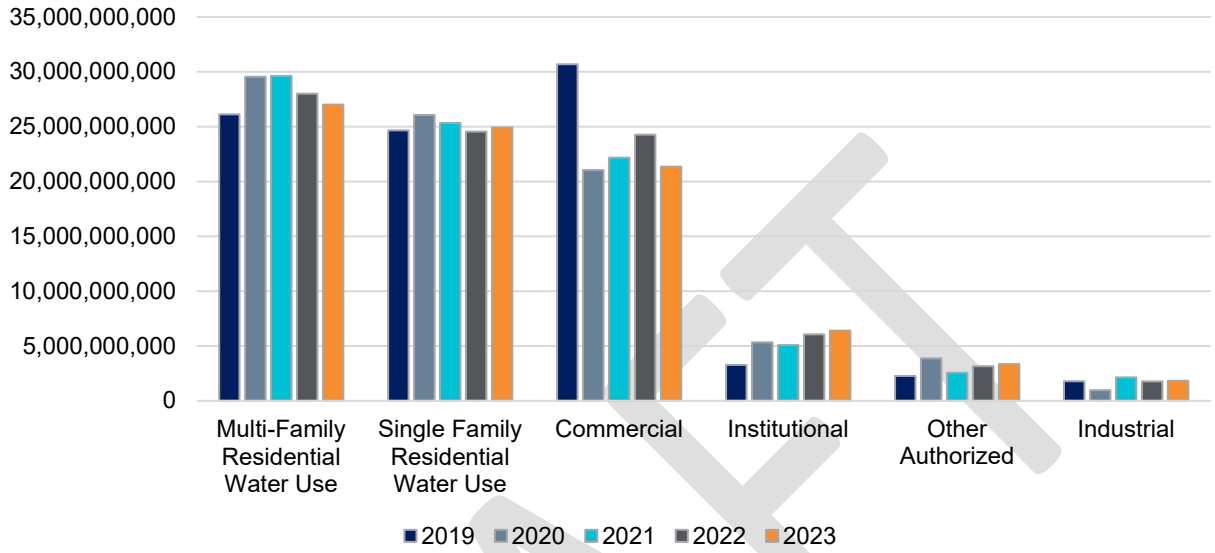
**Figure 4-3** shows the categories of water use for HPW. The Other category includes water authorized for other uses, including back flushing, line flushing, storage tank cleaning, fire department use, municipal government offices, or municipal golf courses/parks.

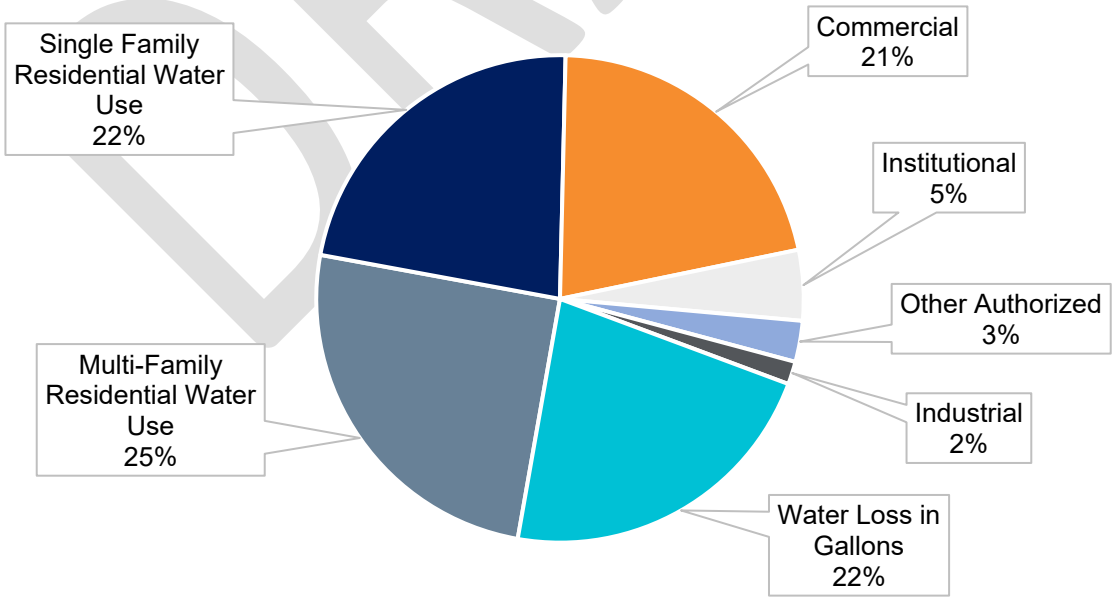
Figure 4-3: Houston Water Consumption by Use Category




*Source: TWDB Water Conservation Annual Reports*

**Figure 4-4** illustrates the percentage of water used per category, averaged for the period from 2019-2023.

Figure 4-4: Percentage of Water Consumption by Category
(Based on 2019-2023 Average Yearly Consumption in Gallons)




*Source: TWDB Water Conservation Annual Reports*

# 5.0 SPECIFICATION OF WATER CONSERVATION GOALS

## 5.1 TCEQ WATER CONSERVATION GOALS

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

- Maintain the 5-year moving average total per capita and residential per capita water use below specified amount in **Table 5-1**.
- Maintain the level of water loss in the system below the specified amount in **Table 6-2**.
- Maintain a program of universal metering and meter replacement and repair as discussed in Section 5.2.
- Maintain the Infrastructure Leakage Index (ILI), as described in Section 6.1.3, below the specified amount in **Table 6.2**.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program as discussed in Section 6.1.
- Increase efficient water usage and decrease waste in lawn irrigation by enforcement of reasonable irrigation and landscape water management regulations described in Section 7.3, 7.4, and 7.5.

## 5.2 GPCD GOALS

The 2022 TWDB State Water Plan required the 16 regional water planning groups to set per capita water use goals for municipal water users. Texas has 16 RWPGs, one for each designated regional water planning area (A–P). The RWPGs have many responsibilities; however, they have a limited scope and authority, and are non-regulatory The bottom-up approach to the state long-range water planning process was designed to focus RWPGs on the identification of water needs (potential shortages) and feasible water management strategies to ensure there are adequate water supplies in times of drought. RWPGs are tasked to develop 50-year Regional Water Plans that serve the entire region and take into consideration the water needs of all water use categories within the region. Regional Water Plans must reflect and respond to changes in population, water supplies, technological improvements, economic shifts, project viability, and state policy.

HPW works with the Region H Water Planning Group to help develop the water conservation plan documents. This Plan is consistent with RWPG methodology and structure. A letter documenting that a copy of the Water Conservation Plan was sent to the Chair of the Region H Water Planning is attached in **Appendix F**.

The Gallons per Capita per Day (GPCD) measure provides a numeric goal for water utilities to evaluate success of water conservation strategies. **Total GPCD** includes water use by residential, industrial, commercial, and institutional (ICI) customers. **Residential GPCD** includes the water use of only the residential population housed in single family and multi-family housing. It includes both indoor and outdoor water use.

The State and Regional Water Plans include each water entity setting goals for reducing water consumption over a five- and ten-year period.

Houston's goals are shown in **Table 5-1** and **Figure 5-1**. The determination of specific water conservation targets relies on several factors, including planned BMPs, past water consumption trends, data from relevant literature, and insights gained from the practices of other utilities. These targets encompass the collective contributions of all programs and components toward achieving water savings.

HPW completes a TCEQ-required **Water Conservation Annual Report** that 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, including the amount of water saved. If the goals are not being met, Houston must document why not in the report.

The GPCD goals in **Figure 5-1** and **Table 5-1** are based on a reduction calculation of **0.4 GPCD** for each year for the five- and ten-year periods.

**Table 5-1: Projected GPCD Goals (5-Year Rolling Average)**

| Description | Units | 2023 | 2029 | 2034 |
|---|---|---|---|---|
| Total GPCD[a.] | GPCD | 126 | 124 | 122 |
| Residential GPCD[b] | GPCD | 59 | 58 | 57 |

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

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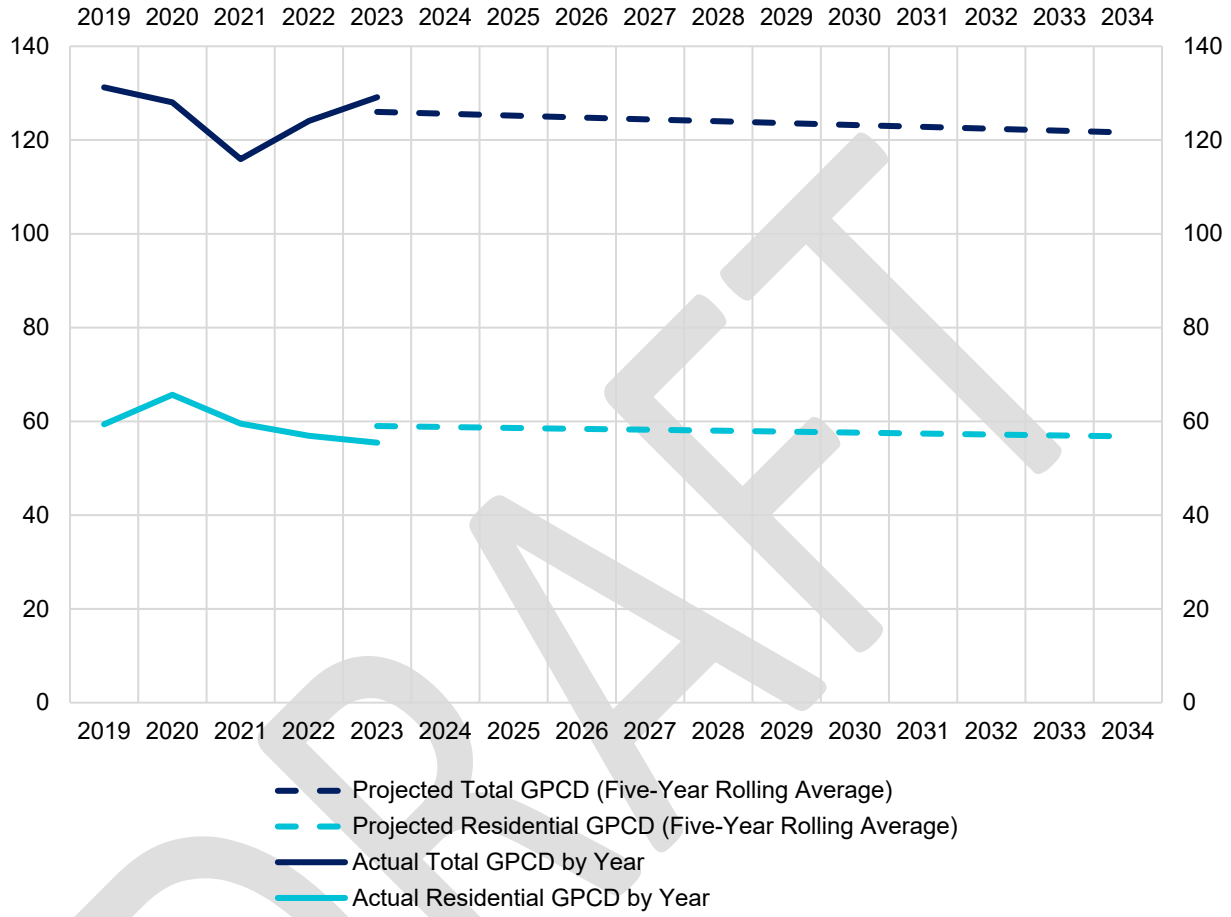
**Figure 5-1** shows historic total and residential GPCD since 2019 and projected total and residential GPCD for a ten-year period.

Figure 5-1: Houston Water Historic and Projected GPCD
(Total and Residential)




**Source: TCEQ Water Conservation Annual Reports*

About half the regional planning groups selected 140 GPCD as part of the 2022 State Water Plan. HPW has already achieved the State Water Plan goal of 140 GPCD. Houston has the advantage of living in one of the Texas regions typically receiving abundant rainfall. In Texas, landscape irrigation makes up a substantial portion of water use, especially for residential customers. With sufficient rainfall resulting in less use of water for irrigation, Houston can achieve a lower GPCD easier than most Texas Cities.

As shown in **Figure 5-1**, the Total GPCD and Residential GPCD for 2019-2023 do not follow the same track. In 2020, COVID-19 resulted in an increase in residential water use and a decrease in ICI water use. The Total GPCD increase in 2023 was affected by a combination of weather conditions, including extreme drought, lower than average precipitation, and higher than average temperatures.

Weather is a major factor in water use and can cause significant variations in water use from one year to the next. To smooth out the impacts of short-term, yearly weather changes due to prolonged periods of excessive heat and/or drought, HPW uses a five-year rolling average to determine GPCD goals and track progress.

# 6.0 PRACTICES TO MEET CONSERVATION GOALS

## 6.1 CURRENT CONSERVATION PROGRAMS

### 6.1.1 Conservation Analysis and Planning BMPs

*Water Conservation Division and Conservation Coordinator (BMP 2.1)*

As stated in BMP 2.1, the designation of a conservation coordinator is required by House Bill 1648, effective September 1, 2017, for all retail public water utilities with 3,300 service connections or more.

In 2019, Houston established a Water Conservation group within the Houston Water Planning branch. This group is directed by a Senior Division Manager who is responsible for implementing this Plan and developing programming that produces measurable outputs to help HPW reach its GPCD and water loss five-year and ten-year targets. This position is designated as the Water Conservation Coordinator.

*Cost Effective Analysis (BMP 2.2)*

As stated in BMP 2.2, cost effective analysis may allow HPW to determine the economic benefit of a decision to decide whether it is worth pursuing, continuing, or ending conservation programs and efforts. This allows prioritization of conservation programs balancing community impact with operational costs of running the program and benefits are limited to those that are measurable, which has potential to bias decision-making.

To address how much water-use conservation can be cost-effectively achieved, a team of researchers led by Dr. Timothy T. Loftus, Professor of Practice in Geography and Water Resource Strategist for the Meadows Center for Water and the Environment, developed a suite of water conservation program scenarios, tailored for Houston, that individually and collectively indicate a positive benefit-cost ratio. This project was funded by the City of Houston and the Houston-Galveston Subsidence District, as part of the District's 2019 Water Conservation Grant Program.

The Water Conservation Tracking Tool (WCTT), an MS-Excel-based model developed for the AWE, has been applied in developing conservation program scenarios. The model-based tool is designed to help a water service provider plan for and track water conservation program activity and results. The tool provides an analytical framework for estimating the effects that plumbing/appliance standards and planned conservation programs will have on future water use, utility costs, sales revenue, and average customer rates and bills. The tracking tool evaluates these effects in terms of costs and benefits from the perspectives of the utility (and its ratepayers) and program participants. Costs and benefits are calculated separately for each conservation measure evaluated and can be used to help screen measures and construct program portfolios. Scenarios are developed for residential meter-class accounts and commercial/institutional meter-class accounts. Separate scenarios are evaluated for residential indoor and outdoor water use.

To track conservation activities, Houston uses conservation software developed by a third-party vendor, the Goldwater Wholesaler Platform. This software platform allows HPW and its wholesale customers to visualize and quantify the impacts of specific conservation and efficiency programming on retail and wholesale customer consumption behavior. With this information, HPW and its wholesale contract customers make informed decisions regarding what programming to invest in, and more easily communicate the value of these programs to their ratepayers and elected officials.

Houston Water Planning is developing a digital twin platform to manage all aspects of water together, including water conservation and water loss.

This comprehensive approach to conservation is critical to a large regional water supplier like HPW, with benefits including:

- Creation of a single data and communication hub for information on conservation activities throughout the retail and wholesale system;
- Regional reduction of peak-day, peak-season, and long-term demand on Houston's water system using highly advanced conservation analytics;
- Avoidance of transmission, treatment, distribution, and wastewater costs due to coordinated conservation programming across the retail and wholesale system; and
- Deferment of plant expansion costs due to coordinated conservation programing across the retail and wholesale system.

### 6.1.2 Financial BMPs

#### *Water Conservation Rates (BMP 3.1)*

Per BMP 3.1, TCEQ requires municipal utilities to have a non-promotional water rate structure. HPW is reviewing additional financial relief programs and policies, water conservation programs, and recently underwent a rate restructuring. To cover increasing costs, water and sewer rates are adjusted each year in April. Houston has had an inclining rate structure where the unit price increases as water consumption increases. The utility uses pricing as both a demand management tool and a way to generate additional revenue.

Houston structures its retail and wholesale rates such that the utility achieves adequate cost recovery and satisfies legal requirements to reflect the cost of service for each type of customer while ensuring everyone pays their fair share.

The annual automatic adjustment is required by bond holders and partially addresses the rising cost of running HPW. The rate updates address the rising cost of service, including maintaining, replacing, and upgrading aging infrastructure, paying debts, and maintaining reserves. HPW last increased water and wastewater rates beyond the automatic annual rate adjustments in 2010. Every five years, HPW completes an in-depth Water and Wastewater Cost of Service Rate Study to ensure that water and Wastewater rates recover all the costs of services. In 2021, HPW completed a new Rate Study, which determined that water and wastewater rates must be increased to meet these rising costs.

City of Houston Ordinance 2021-515 passed by City Council on June 23, 2021, approved a revenue increase of 9% for water and 20% for wastewater, effective September 1, 2021. Rates

for all classes can be found at https://www.houstontx.gov/citysec/HPW/ratestable.pdf or in Appendix C.

*Wholesale Agency Assistance Program (BMP 3.2)*

Wholesale agency assistance program measures are designed to deliver assistance to its wholesale utility customers who purchase water and provide retail water service to customers. Under BMP 3.2, the wholesale agency will provide financial and/or technical support to wholesale purchasers to advance water conservation efforts both for the wholesale customer and its retail water customers. Financial support should consist of incentives or equivalent resources as appropriate and beneficial. All BMP programs that target retail water customers should be supported when they can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective.

Houston Water's Wholesale Water Conservation Program can be found at https://www.houstonpublicworks.org/wholesale-customers. HPW is committed to ensuring a reliable future water supply for Houston and its customer water utilities. The Wholesale Water Conservation Program is offered free to wholesale treated water customers and provides consulting services utilizing the Goldwater Dashboard planning tool. Using Goldwater's Wholesaler Platform, utilities can easily accomplish the following, free of charge:

- Track and quantify conservation savings;
- Assess progress for meeting conservation goals;
- Evaluate out different water savings and cost scenarios;
- Assist with compiling data for required annual reports and plans; and
- Receive a Findings Report to present to stakeholders.

These tools will make it easier to reduce overall and peak water demands and serve as an effective communication tool for stakeholders and decision-makers.

### 6.1.3 System Operations BMPs

*Metering of All New Connections and Retrofit of Existing Connections (BMP 4.1)*

One of the key elements in water conservation is careful tracking of water use and control of losses. Reducing nonrevenue water is one of the few conservation programs that directly impacts rates. Programs for universal metering, meter testing, meter repair, and periodic meter replacement have been developed using AWWA standards and are essential elements in the HPW program to control losses.
As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2(a)(2)(B), the record management system for water pumped, water delivered, and water sold; estimates for water losses; and allows for the separation of water sales and uses into residential (single family, multifamily), commercial, institutional, and industrial categories. This information is included in the TCEQ-required Water Conservation Annual Report, as described in Section 6.1.8.

HPW meters all the connections in the distribution system. The connection distribution by water use category is included in **Table 6-1** below. Meters range in size from ¾ inches to 16 inches. All meters met AWWA accuracy standards when installed.

| Table 6-1: Connection Distribution by Water Use Category | |
|---|---|
| **Meter Type by Water Use Category** | **Total Number** |
| Residential – Single Family | 430,799 |
| Residential – Multifamily | 695,891 |
| Industrial | 276 |
| Commercial | 59,518 |
| Institutional | 4,443 |
| **Total** | **1,190,927** |

**Source: TWDB Water Use Survey 2023*

### *System Water Audit and Loss Control (BMP 4.2)*

Per BMP 4.2, water loss audits and water loss programs are effective methods of accounting for all water usage by a utility. Performing a reliable water loss audit is the foundation of production-side water resource management and loss control in public drinking water systems. The structured approach of a water loss audit allows a utility to reliably track water uses and provides the information needed to address unnecessary water and revenue losses. The information from a water loss audit is valuable in setting performance indicators, goals, and priorities to cost-effectively reduce water losses.

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

The TWDB requests that cities include water loss in GPCD, water loss per connection, and Infrastructure Leakage Index (ILI) in Water Audit Reports. These are performance indicators that can be used to determine the effectiveness of the water loss reduction program. See **Table 6-2** for Water Loss Goals.
HPW's water main replacement program is divided into two categories for purposes of capital improvement project programming: the water transmission system and the water distribution system.

#### 1. Water Transmission System

The water transmission system includes large diameter pipelines (24 inches and larger) and valves that move high volumes of treated water throughout Houston's service area, and large diameter pipelines that move untreated surface water to the three water purification plants. HPW's water transmission system has approximately 4.55 million linear feet of large diameter pipelines ranging from 24 inches and larger.

The water transmission system also includes seven major repump stations that repressurize the transmission system, and 156 storage tanks that provide water volume to meet average and peak day demands. Projects undertaken by HPW in the transmission system portion of the water main replacement program include the rehabilitation and replacement of large diameter water lines, valves, pumps, and storage tanks.

### 2. Water Distribution System

The water distribution system includes the small diameter pipelines (less than 24 inches) that deliver treated water to homes and businesses. The water distribution system also includes customer meters and fire hydrants. HPW's water distribution system has approximately 32.6 million linear feet (6,170 miles) of small diameter pipeline, approximately 460,000 water meters, and more than 61,000 fire hydrants. Projects undertaken by HPW in the distribution system portion of the water main replacement program include repair and replacement of small diameter lines to help improve water quality and fire protection in neighborhoods.

In 2023, Houston performed emergency waterline repairs to battle the city's ongoing water leaks caused by the extreme drought and the city's aging infrastructure. More than 4,000 water leaks were repaired. Areas of the water distribution system in which numerous leaks and line breaks occur are targeted for replacement.

The Infrastructure Leakage Index (ILI) is a calculation of the theoretical lowest leakage possible divided by existing calculated leakage. This is developed as a unique value for every city and includes variables such as the distance from the curb stop to the meter boxes, the pressure in the system, and the number of service lines or connections per mile of water main.

Unavoidable Annual Real Losses (UARL) in 2023 were approximately 4.68 billion gallons. This is the theoretical lowest leakage currently possible with the existing infrastructure and service connection density. In 2023, Houston had an ILI of approximately 6.79. ILI is a reliable performance indicator for benchmarking the performance of a utility in operational management of real losses. An ILI of 5-8 can be found in areas where the cost to purchase and obtain/treat water is low, as are rates charged to customers; the reliability, capacity, and integrity of the water supply infrastructure make it relatively immune to supply shortages; and water resources are plentiful, reliable, and easily extracted. The goals for this Plan are set out in **Table 6-2.**

**Table 6-2: Water Loss Goals**

| Description | Units | 2023 | 2029 | 2034 |
|---|---|---|---|---|
| Water Loss GPCD | GPCD[a] | 37 | 35 | 33 |
| Real Water Loss per Connection | Gals/Connection per Day[b] | 78.8 | 74.9 | 70.9 |
| Real Losses | ILI[c] | 6.79 | 6.45 | 6.13 |

*Source: HPW 2023 Water Audit Report*

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

*b. Total Water Loss per Connection per Day = Water Losses ÷ Number of service connections ÷ 365*

*c. ILI = Current Annual Real Losses ÷ Unavoidable Annual Real Losses (Number of service connections + length of watermains ÷ average pressure)*

HPW tests approximately 78.36 miles of water main with two dedicated leak detection crews each year. Once leaks are detected, repair teams are deployed to address the leaks on normal business days. To further reduce real water losses, HPW will plan and develop a proactive water loss program. As part of this program, the city will implement the following actions:

- Conduct regular inspections of all water main fittings and connections;
- Use a water modeling program;
- Monitor individual pressure zones;
- Conduct continuous monitoring of water demand of all pressure planes;
- Install temporary leak noise detectors and loggers;
- Operate pressure zones based on topography; and
- Limit surges in pressure.

HPW has enhanced its mainline leak detection program using the (Advanced Metering Infrastructure (AMI) network. In 2023, HPW completed the installation of above ground AMI infrastructure. Multiple base stations are in place to ensure system redundancy. Approximately 80,000 Sensus SmartPoint devices have been installed on the inground metering infrastructure. Future applications are under development with manufacturers.

Another measure to control water loss as part of the routine operations of HPW is to encourage residents to call 311 City Helpline or to report leaks and other problems on MyCity Houston GIS Online. (https://houston311.powerappsportals.us/en-US/#). It allows residents and businesses to request, track, and explore information and report issues through several city departments, including HPW.

### 6.1.4 Landscaping BMPs

*Winter Sprinkler Shut Off (BMP 5.3)*

Per BMP 5.3, landscape irrigation conservation practices are an effective method of accounting for and reducing outdoor water usage while maintaining healthy landscapes and avoiding run-off. Using this BMP, the utility provides non-residential and residential customers with customer support, education, incentives, and assistance in improving their landscape water-use efficiency. Incentives include rebates for purchase and installation of water-efficient equipment.
HPW encourages the public to turn off automated water sprinkler systems from November 1-February 28 to save water and money. With shorter days and colder nights, turfgrass goes dormant during the winter. Dormant grass requires almost no supplemental irrigation since typical winter rainfall patterns are usually more than sufficient for lawn needs. Turning off irrigation systems helps conserve water and can help protect the system from damaging winter conditions.

### 6.1.5 Education and Public Awareness BMPs

Per BMP 6.1, public information programs, even though they may not be directly related to any equipment or operational change, can result in both short and long-term water savings. Behavioral changes by customers will only occur if a reasonable yet compelling case can be presented with sufficient frequency to be recognized and absorbed by customers. There are many resources that can be consulted to provide insight into implementing effective public information programs. Like any marketing or public information program, to be effective, water

conservation public information should be planned out and implemented in a consistent and continual manner.

Per BMP 6.2, effective school education programs should provide curriculum material appropriate to the grade level of the student, increasing in complexity from elementary school through high school. If such a curriculum does not already exist, local curriculum experts may be willing to help develop the desired materials.

Per BMP 6.3, effective water conservation education and outreach should be planned and implemented in a consistent and continual manner. Many low-cost or free resources are available which can be used to effectively conduct public outreach and education efforts.

Per BMP 6.4, organizations such as the Master Gardeners, Master Naturalists, Botanical Gardens, and environmental entities with water conservation sympathies are enlisted to use their volunteers to deliver water conservation education to their typical and expanded audiences. The volunteers are provided special training, and the organization may be subsidized based on audiences reached. The delivery vehicles are speaker bureaus, neighborhood events, school projects, and demonstration gardens but the volunteers may also respond to audit requests, rebate inspections, and conduct research.

The goal is education of customers about the overall picture of water resources in the community and how conservation is important for meeting the goals of managing and sustaining existing water supplies and avoiding or delaying building of new facilities. An equally important part of the program is to provide data and information on specific actions and measures the customers should take to implement these community goals. Showing customers that the results of those actions have made a difference encourages greater participation in conservation efforts.

There are a variety of tools that can be effectively used to communicate water conservation and public education and awareness. These include use of print, radio, and television media; billboards; direct distribution of materials; special events such as exhibits and facilities tours; and maintenance of an informative website.

Houston is building a robust water conservation public education program with implementation and enhancement of public education and awareness activities since 2019. **Table 6-3** illustrates the growth of the program since its inception in 2019. Following the table are descriptions of these efforts.

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| Table 6-3: Public Education and Information Summary | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
| | No. | Reach | No. | Reach | No. | Reach | No. | Reach | No. | Reach |
| Brochures Distributed | | 8,832 | 1 | 3,069 | 87 | 21,311 | 73 | 34,000 | 1 | 20,000 |
| Utility Bill Inserts | | | 1 | 41,323 | 5 | 200,000 | 2 | 900,000 | 2 | 650,000 |
| Press Releases | 2 | 50,000 | | | 3 | 67,59 | 5 | 11,250 | 2 | 4,500 |
| TV PSAs | | | | | 3 | 5,028,569 | | | 8 | 23,967,400 |
| Radio PSAs | | | | | 1 | 1792,00 | 4 | 3,026,700 | 5 | 3,079,247 |
| Hispanic Media Outreach | | | | | | | 60 | 759,663 | 17 | 1.060.763 |
| Educational School Programs | 17 | 1,465 | 5 | 472 | 10 | 363 | 26 | 5,934 | 111 | 108,620 |
| Displays, Exhibits, and Presentations | 21 | 1,060 | 4 | 105 | 25 | 1,473 | 33 | 1,822 | 34 | 1,755 |
| Community Events | 14 | 8,882 | 2 | 373 | 12 | 527 | 66 | 18,092 | 65 | 55,373 |
| Email Blasts | | | | | | | 10 | 2,600,000 | 11 | 2,356,000 |
| Social Media - Facebook | 6 | 5,419 | 14 | 10,452 | 2 | 33,372,032 | 52 | 697,868 | 78 | 73,105 |
| Social Media - Twitter | 3 | 24,752 | 12 | 84,505 | 25 | 67,428 | 55 | 154,444 | 105 | 165,863 |
| Social Media - Instagram | | | | | 1 | | 5 | 541 | 45 | 43,472 |
| Social Media - Nextdoor | | | | | | | 2 | 16,408 | 4 | 180,667 |
| Social Media - YouTube | | | | | 12 | 1724 | 5 | 1,602 | 11 | 1,759,018 |
| Paid Online Advertising | | | | | 1 | 36,638,261 | 3 | 675,760 | 3 | 473,506 |
| Facility Tours | 98 | 3,751 | | | | 193,378 | 2 | 30 | 2 | 25 |
| Other | | | | | 9 | | 87 | 4,071,314 | 26 | 202,907 |
| **TOTALS** | **161** | **104,161** | **39** | **140,299** | **196** | **75,711,025** | **492** | **12,994,911** | **530** | **33,141,458** |

**Data provided by HPW and TCEQ Water Conservation Annual Reports*

## *Public Information (BMP 6.1)*

*Give Water a Break*

https://www.houstonpublicworks.org/give-water-break

The **Give Water a Break** campaign is Houston's newest campaign to educate the public about water conservation during drought and provide information about year-round water conservation efforts. Through depictions of obvious wastefulness that diminishes Houston's water supply, it shows the audience the how, when, and why behind water conservation. The goal is to shift the public's mindset from "wasting water because I can" to "saving water because I should." In the summer of 2022, HPW ran this campaign in

both English and Spanish in anticipation of stage-one drought conditions. The campaign includes YouTube bumper ads, social media content, radio spots, and Hulu commercials, in addition to assets for general water conservation and winter advisories. HPW also provides links to YouTube featuring some of the Give Water a Break Campaign messaging videos. An example of the messages for this campaign are below.


*Water Works Festival*

https://www.houstonpublicworks.org/water-works-festival#4257225834-860024711

Each year, HPW hosts the **Water Works Festival** to engage and educate the public about the value of water. Emphasis is on topics such as water conservation, the water cycle, local water systems, species habitats, weather, water quality and ecology. Additionally, attendees can learn about the city's water supply, water purification plants, wastewater treatment systems, conservation efforts, drought plans, stormwater projects and more.

*Gulf Coast Water Conservation Symposium*

https://www.allianceforwaterefficiency.org/events/2024-gulf-coast-water-conservation-symposium

HPW is an active participant in the annual **Gulf Coast Water Conservation Symposium**, a one-day regional event presenting information to water utilities and customers about water conservation legislation, planning, education, smart conservation investment, implementation strategies, and industry best practices. HPW employees have served on the symposium's steering committee to plan the symposium, raised awareness of the event, and presented at the symposium.

*Houston Runs on Water*

https://www.houstonpublicworks.org/houston-runs-water

In 2021, HPW partnered with Texas Water Foundation on a statewide campaign—Texas Runs on Water. Houston was one of three regions to pilot the campaign. Recognizing the importance of local messaging, and the nuance of water concerns statewide, the campaign is intentionally constructed to allow local pride of place to exist within the umbrella campaign concept. In Houston, the campaign was adopted as **Houston Runs on Water**. The goal of the campaign is to inspire Houstonians to value their water. HPW also provides links to YouTube featuring some of the Houston Runs on Water campaign videos.

*Fix-a-Leak Week*

https://www.houstonpublicworks.org/fix-leak-week

From 2021-2023, HPW partnered with Dallas, Fort Worth, Round Rock, and Tarrant Regional Water District to offer two virtual Environmental Protection Agency (EPA) WaterSense Program **Fix-a-Leak Week** workshops (indoor and outdoor focused). Residents from all over the state could join the online seminars to learn how to fix simple plumbing problems, detect and patch leaks in their own home, and receive information about how to conserve water using water-efficient fixtures. HPW also provides links to YouTube featuring video recordings of Fix-a-Leak week Workshops.

*Imagine a Day without Water*

https://www.houstonpublicworks.org/imagine-day-without-water

Since 2019, HPW has been a proud partner of the U.S. Water Alliance. Each year since joining, HPW participates in the national education campaign—**Imagine a Day without Water**. The campaign is intended to raise awareness about the value of water and recognize what life would be like without it. HPW uses the event to educate and engage the community with interactive and educational contests, programs, special events, resolutions, and social media engagement all centered around how water is essential, invaluable, and in need of investment. As part of the national education campaign—Imagine a Day Without Water—HPW invites the community to participate in an Instagram Photo and Video Contest highlighting the importance of water. The 2023 year's theme was Beauty of Water. Participants are asked to submit photos and videos highlighting water's beauty, significance, and importance in daily lives. Examples include images of a coffee brewing in the morning, a family pet lapping up water, ripples on the surface of a lake, the ice in lemonade, and a dew drop on a blade of grass.

*Walk for Water*

https://events.watermission.org/site/TR?fr_id=2511&pg=entry

More than 2 billion people around the world lack access to safe drinking water. In many countries, women and children must walk over three miles to collect water for their families and communities. Often, water is not safe to drink. HPW and its partner, Grundfos, encourage the public to join in the fight against water insecurity all over the globe. **Walk for Water** spreads awareness about those around the world without access to clean drinking water and 100% of funds raised go directly to the nonprofit Water Mission to build safe water solutions in developing nations and disaster areas.

*Water My Yard*

https://www.watermyyard.org/

From March-October, HPW and Texas A&M AgriLife encourage the use of their **Water My Yard** app to know when to water. Residents can visit the website or download the free app (search Water My Yard). Residents can select to receive free texts, emails, or app notifications. This tool tells residents exactly how much water their lawn needs on a weekly basis (if any). This ensures they are not using too much water while maintaining a healthy yard. Water My Yard uses both local rainfall data and information about a resident's sprinkler system to provide the most accurate information.

The goal of the campaign is to effectively communicate when to water lawns for the health of the lawn, for customer financial savings, and to promote water conservation. HPW also provides links to YouTube featuring some of the Give Water a Break Campaign messaging videos and instructions on how to install and use the Water My Yard app.

*Presentations*

https://www.houstonpublicworks.org/presentations

The HPW team is available to provide presentations not only for schools, but also for other community members including clubs, homeowner associations, businesses, council districts, and other organizations. In-person and virtual presentations on topics listed below are offered.

- **Water Conservation**: Participants learn how to use and conserve water at home, school, and work. Activities will highlight how conservation affects our drinking water resources, water treatment demand, and future water needs and supplies.
- **Drought:** Presenters explain how the Drought Contingency and Emergency Water Plan fits into Houston's overall Water Conservation Plan, the stages of the Drought Contingency Plan, and how to help reduce demand and conserve water during a drought.
- **Protect Our Pipes**: Information on Fats, Oils and Grease (FOG) and how these materials clog our sewer lines when poured down drains and toilets is offered. Participants learn simple ways to prevent FOG from clogging sewer lines.
- **Water Quality**: An overview is provided regarding each phase of the drinking water treatment process and how water is delivered to homes, schools, and places of employment. Participants learn the difference between stormwater and wastewater.
- **Water Cycle**: Presenters explore the movement of water above and on the surface of the Earth, the sun's energy, and gain a basic understanding of the water cycle and its importance.
- **Watersheds and Wetlands**: Presenters identify and define the benefits of a watershed and wetlands and why they are important to our source water.

### *School Education (BMP 6.2)*

HPW's education and outreach team gives presentations to Houston area students throughout the school year. The team is available to present to all grade levels, in individual classrooms or assemblies, and craft messages to include age-appropriate activities and content. Educators request a topic and activity from a wide variety of content from the Project WET curriculum. Students participate in hands-on activities that support the Texas Essential Knowledge and Skills (TEKS) standards. On average, the education and outreach team give presentations at more than 25 schools and school-related events each year.

### *Public Education and Outreach (BMP 6.3)*

- Promote Houston's water conservation measures.
- Follow the three Pillars of Water Equity from the US Water Alliance.
- Include inserts on water conservation with water bills or mail outs at least twice per year, including material developed by staff and material obtained from the TWDB, TCEQ, and other sources.
- Encourage local media coverage of water conservation issues, including social media, and the importance of water conservation.
- Notify local organizations, schools, and civic groups that staff are available to make presentations on the importance of water conservation and ways to save water.
- Encourage residents and commercial customers to use the free WaterMyYard.org app to find out how much water the lawn needs. The app provides watering recommendations based on the weather, location, and irrigation system.

- Encourage residents and commercial customers to visit the Houston Chapter of the Native Plant Society's webpage (https://npsot.org/wp/houston/go-native/) for information about selecting native plants for landscaping.
- Provide water conservation tips about indoor and outdoor water usage on the HPW website (https://www.houstonpublicworks.org/residential-ustomers#230548828-1234108202).
- Encourage installation of WaterSense-labeled toilets. WaterSense-labeled products use less water and can save money. The City of Houston Plumbing Codes requires toilets to use no more than 1.28 gallons per flush. HPW provides a video for how to fix a leaky toilet.
- Encourage replacement of showerheads with a WaterSense-labeled showerhead. HPW offers free water-efficient (1.25 gpm) showerheads to residents. The City of Houston Plumbing Codes requires showerheads to use no more than 2.0 gallons per minute (gpm).
- Encourage replacement of old, inefficient faucets and aerators with WaterSense-labeled models to help residents save water and money.

### *Partnerships with Nonprofits (BMP 6.4)*

#### *Citizens' Environmental Coalition*

In 2023, Citizens' Environmental Coalition (CEC) partnered with Green Mountain Energy Earth Day at Discovery Green and HPW Water Works Festival. CEC connects Houston's environmental community with a diverse range of programs, resources, and events. CEC provides opportunities for access to careers and advocacy opportunities that may not otherwise be available, to foster a sense of wonder and appreciation for local natural resources, and to ensure that work is collaborative and strategic. With 100 member organizations and individuals, CEC represents a diverse group of nonprofit organizations, governmental bodies, concerned community members, and activists.

#### *Alliance for Water Efficiency*

The Alliance for Water Efficiency (AWE) is a nonprofit dedicated to the efficient and sustainable use of water across North America. Based in Chicago, AWE advocates for water efficient products and programs, and provides information and assistance on water conservation efforts. AWE works with more than 500 member organizations, providing benefit to water utilities, business and industry, government agencies, environmental and energy advocates, universities, and consumers.

#### *Adopt an Esplanade Program*

Beautiful, well-maintained public spaces reflect community pride, enhance the urban environment, provide incentives to revitalize core neighborhoods and promote economic redevelopment. The City of Houston Adopt-An-Esplanade program plays a key role in this effort as a program designed to bring Houston neighborhoods together in committed, collaborative partnerships to improve and maintain city esplanades. The Houston Parks and Recreation Department administers the program and Keep Houston Beautiful provides volunteer coordination, community education, training, planning assistance, and loans tools and equipment for beautification and cleanup projects. Participants include civic groups, garden clubs, business owners, city and state agencies and corporate sponsors. The Houston Adopt-an-Esplanade Program provides a step-by-step guide designed to assist neighborhood organizations through the process of esplanade adoption and maintenance. Funding for the publication of this guide was provided by a grant from the Texas Forest Service. Texas Forest Service provides financial and technical assistance for urban forestry projects in Houston as well as the State of Texas.

*Awards and Recognition*

**EPA WaterSense 2023 Partner of the Year Award:** Houston has become a proactive partner in the EPA's WaterSense program and has been recognized for their partnership, including during the period since publication of the 2019 Plan. WaterSense partners contribute to the program's success by enhancing the market for water–efficient products, practices, and services. Each year WaterSense recognizes those partners who have gone beyond in supporting WaterSense. HPW promoted water efficiency across its service area and in other parts of Texas in 2022 to earn this award (https://www.epa.gov/watersense/watersense-awards#Houston23).

**2022 and 2023 Wyland National Mayor's Challenge for Water Conservation:** The City of Houston, along with four other major cities, was named the winner of its category in the 2022 and 2023 Wyland National Mayor's Challenge for Water Conservation. Houston took home the top prize for populations above 600,000, being designated as a Water-Wise City by the Wyland Foundation.

**AVA Platinum Winner for Excellence in Concept, Design, and Digital Communication - Give Water a Break:** Issued by the international AVA Digital Awards competition that recognizes excellence by creative professionals responsible for the planning, concept, direction, design and production of digital communication.

**NACWA National Environmental Achievement Award- Give Water a Break:** The Give Water a Break campaign was selected as a winner of the 2024 National Environmental Achievement Award in the Public Information & Education: Educational Program category.

**Hermes Creative Awards- Give Water a Break:** The Give Water a Break campaign received an honorable mention in the 2023 Hermes Creative Awards, an international competition that recognizes creative professionals for excellence in planning, designing and executing creative content and campaigns.

### 6.1.6 Rebate, Retrofit, and Incentive Programs BMPs

*Industrial, Commercial, and Institutional (ICI) Building Assessments (BMP 7.1)*

Under BMP 7.1, the utility identifies ICI customers and sorts them according to water usage. The utility should focus its ICI Conservation Program on the higher use customers and those sectors with the highest conservation potential. In addition to domestic water use by employees and customers, many industry-specific processes are captured in this BMP. Differences in this industry-specific category of water use result in unique opportunities for significant water savings within each utility service area. Similarities in overall water use by ICI customers create opportunities for an ICI Water Conservation Program which is the subject of this BMP.

HPW offers commercial customers the ability to save money on overhead costs through free utility assessments for commercial buildings. This program provided free professional water, electricity, and gas utility assessments to up to 50 commercial buildings throughout the 2023 calendar year. Each assessment included data analysis on utility use and a monthly breakdown of cost and consumption patterns. Recommended practices, guidance on potential cost savings, and rebate assistance are included as a part of this program. This program can find inefficiencies in a building's water consumption, energy, and natural gas use. Identifying these areas can reduce customers' overhead costs. Past participants have saved millions of gallons of water and tens of thousands of dollars in lower water and sewer costs.

Wastewater credits are also given to manufacturing customers whose water use is absorbed through a manufacturing process, such as production of beverages. Customers install at least one product line make-up meter which registers the water that is used solely in the manufacturing process. These customers then submit monthly readings of these sub-meters which are used to calculate their credits. The credits are calculated by multiplying the total consumption registered on their sub-meter(s) by the current sewer rate.

Customers with evaporative cooling towers can receive wastewater credits by installing a make-up meter that registers the water that goes into the cooling tower and a blowdown meter that registers water that is discharged into the sewer after it has been used in the cooling tower. Credits are calculated by deducting the monthly discharge through the blowdown meter from the consumption through the make-up meter. The result is then multiplied by the current sewer rate to determine the amount of the credit.

### *Property Assessed Clean Energy (PACE) Program (BMP 7.1)*

Houston's commercial Property Assessed Clean Energy (PACE) program provides an additional tool for Houston property owners to finance energy efficiency, renewable energy, and water conservation projects. The State of Texas authorized municipal and county PACE Programs in 2013. Houston City Council adopted an ordinance establishing a Houston PACE program on November 4, 2015. As of February 1, 2017, PACE programs are available in ten Texas counties (Brazos, Cameron, El Paso, Fort Bend, Hays, Hidalgo, Nueces, Travis, Williamson, and Willacy) and two cities (Houston and Dallas).

PACE is a nationally renowned, voluntary financing program that allows owners of commercial, industrial, and multi-family residential properties (with five or more dwelling units) to obtain low-cost, long-term loans for water conservation, energy-efficiency improvements, and distributed generation.

In exchange for funds provided by a private lender to pay for the improvements, the property owner voluntarily requests that the local government place an assessment secured with a senior lien on the property until the assessment is paid in full. As PACE assessment payments are offset by the project's utility cost savings and the term of PACE assessments may extend up to the projected life of the improvement, improvements financed through a PACE program may generate positive cash flow upon completion without up-front, out-of-pocket costs to the property owner.

### *Fixture Replacement/Retrofit Programs (BMP 7.4)*

Per BMP 7.4, plumbing retrofits usually include showerheads and kitchen and bathroom faucet aerators. Recent studies have shown that replacing toilet flappers is also an effective method of conserving water in the residential sector. Four types of high quality, low flow plumbing devices are to be installed under this program: showerheads rated at 2.0 Dd or less; kitchen faucet aerators of 2.2 gpm or less, bathroom faucet aerators of 1.5 gpm or less, and toilet flappers that flush the toilet at the design flush volume for that toilet model. The utility may meet the requirements of this BMP through enforceable ordinances and inspection programs requiring replacement of inefficient plumbing when ownership of the property transfers or by date certain no later than five years. The utility may meet the requirements of this BMP through enforceable ordinances and inspection programs requiring replacement of inefficient plumbing when ownership of the property transfers or by date certain no later than five years.

Currently, HPW provides faucet aerators and toilet dye leak tabs as promotional items but may consider expanding the program. This may require updating the Houston Plumbing Code to reduce the showerhead retrofits to 1.25 gpm and aerator replacements to 1.0 gpm.

*Showerheads*

The shower is the second-biggest water user in a household. The City of Houston Plumbing Codes requires showerheads to use no more than 2.0 gpm. HPW encourages residents to save money by switching to a low-flow showerhead, specifically to install WaterSense labeled water-efficient (1.25 gpm) showerheads. HPW also offers larger showerhead giveaway events.

*Faucet Aerators*

HPW offers free water saving faucet aerators to residents to replace current aerators with free 1.5 gallon per minute aerator to help reduce indoor water consumption. The new aerator features dual-threading to fit both male- and female-threaded faucets (aerator's thread sizes: male 15/16"-27, female 55/64"-27) and uses only 1.5 or 2.0 gpm, saving valuable hot water.

*Toilet Tank Leak Detecting Tablets*

Leaks inside your toilet can waste up to 200 gallons of water per day. Toilet leaks can be hard to find and are normally caused by a bad flapper valve, flapper valve seal, a bad ballcock valve, an improperly positioned float arm or a defective overflow tube. HPW offers residents free leak detection dye tablets to help identify silent toilet leaks

### *Water-wise Building Standards (BMP 7.5)*

Per BMP 7.5, the utility offers financial incentives for landscape conversion to a water-wise landscape or requires by ordinance that all new landscapes incorporate water wise principles. Water-wise landscaping involves not only plant selection but also follows optimum landscaping principles listed below. Financial incentive programs that promote water-wise landscaping contain an educational component involving the seven principles of water-wise landscaping. Water-wise landscaping material often consumes whatever quantity of water the customer supplies, so careful follow-up is necessary to ensure that excess irrigation does not take place. Incentives should be designed to be rescinded if water use returns to previous levels or exceeds the projected water budget for the new landscape.

In 2011, Houston revised its plumbing and building codes. A section on low-impact development was added to Houston's Infrastructure Design Manual. Low-impact development can reduce the amount of treated water used for irrigation by utilizing stored rainwater and slowing runoff through use of green stormwater infrastructure improvements. Houston will continue to rigorously enforce its plumbing and building codes and encourage the use of low-impact development practices. A copy of Houston's plumbing and building codes is available at: https://www.houstonpermittingcenter.org/building-code-enforcement.html.

### *Native Plants Programs (BMP 7.5)*

The Houston Parks and Recreation Department's (HPARD) Natural Resources Management Program began its native plant propagation program in May 2016 to produce locally collected native grasses and wildflowers for installation into Houston's prairie restoration sites. Seeds are hand-collected from remnant and restored prairies around the Houston area and propagated by staff and volunteers in Houston's greenhouse. After one to two years of growing, the plants are

installed in one of HPARD's five prairie restoration sites throughout the city during community volunteer events. The program currently produces over 10,000 one-gallon pots per year of more than 90 distinct species that are available for use in habitat restoration projects.

Since 2019, HPARD has partnered with the Houston Arboretum and Houston Audubon to offer an annual Spring Native Plant Sale (https://houstonarboretum.org/events/). Most plants available at nurseries are not native to the Houston area. The annual plant sale gives citizens the opportunity to purchase native plants that are adapted to the region's climate, which means they can tolerate Houston's weather extremes that can range from prolonged periods of heavy rainfall to dry spells. In addition, many of these plants attract birds, butterflies, bees, and other pollinators. The sale includes native grasses, shrubs, trees, and flowers (including milkweed).

### *Water Aid To Elderly Residents (W.A.T.E.R) Fund (BMP 7.7)*

The premise of BMP 7.7 is by making plumbing improvements and repairs to potable water leaks in a home that might otherwise go without, customers are assisted in reducing their overall consumption, thereby lowering bills and simultaneously conserving water for the utility.
In addition to making repairs to potable water leaks, the BMP may also include automatic replacement of high-flow fixtures found in a qualifying home. When high-flow toilets and showerheads are automatically replaced in addition to leak repair, the savings from the BMP will increase.

HPW is motivated to better understand and address water and sewer service affordability through a customer assistance program called the Water Aid to Elderly Residents (W.A.T.E.R) Fund. The fund is designed to provide financial assistance to senior citizens and others needing help paying water and wastewater bills. It is funded entirely through voluntary donations from customers, charities, and businesses, and 100% of the contributions go toward assistance. The City pays all administrative costs.

The Fund assists low-income senior citizens (60+) who are residential utility customers of Houston and live in single-family dwellings. Limited assistance is also available to disabled or low-income customers. Preference shall be given to those who have met the US Health and Human Services Poverty Guidelines for three (3) months or longer. Applicants can receive up to $100 every six (6) months towards their water bills. If the water bill is less than this amount, qualified seniors may use any remaining portion in the following months to pay those bills. At the end of six (6) months, customers may reapply for further assistance.

### *Utility Relief Program (BMP 7.7)*

In March of 2021, the Houston City Council unanimously passed a one-time ordinance implementing a utility relief program that adjusted affected water bills, suspended fees for past due payments, and suspended utility disconnections for households with unexpectedly high water and wastewater consumption related to the intense Winter Storm Uri in February 2021. An estimated 25% of customers experienced a leak because of freezing temperatures, power outages, freezing pipes, and varying pressure issues. Typically, customers need to demonstrate proof of repairs for the regular leak adjustment program, but in this situation, they granted automatic adjustment for single-family residential customers and allowed multi-family and commercial customers to apply for the adjustment.

*Plumbing Assistance for Economically Disadvantaged Customers (BMP 7.7)*

The Plumbing Assistance Programs for Economically Disadvantaged Customers BMP is focused on making plumbing repairs in single-family homes owned by economically disadvantaged customers. Utilities and socio-economists have both observed that economically disadvantaged homeowners are less likely to make water-saving repairs due to the cost, and that some repairs may be altogether cost prohibitive for economically disadvantaged customers. Additionally, it is often the case that customers incurring high water bills because of major leaks have difficulty not only in paying for the higher water bills, but also in paying for the cost of the repair. By making the necessary repairs, customers may experience lower, more manageable bills and become more reliable customers with respect to paying their bills.

Part of the AWE affordability assessment for HPW was a Direct Installation Pilot where a subset of homes would receive installation of high efficiency toilets, showerheads, faucets, and clothes washing machines at no cost to the household.

In 2023, HPW partnered with the City of Houston Housing and Community Development Department—Single Family Division, to install high efficiency faucets, showerheads, toilets, and clothes washers. This partnership will help rehabilitate low-income residences and provide additional data to inform the next steps for HPW.

### 6.1.7 Conservation Technology BMPs

*Rain Barrel Program (BMP 8.2)*

Per BMP 8.2, rainwater harvesting and condensate reuse (RWH/CR) conservation programs are an effective method of reducing potable water usage while maintaining healthy landscapes and avoiding problems due to excessive run-off. Using this BMP, the utility provides customers with support, education, incentives, and assistance in proper installation and use of RWH/CR systems. RWH/CR systems will be most effective if implemented in conjunction with other water efficiency measures including water-saving equipment and practices.

Rainwater harvesting is based on ancient practices of collecting–usually from rooftops–and storing rainwater close to its source, in cisterns or surface impoundments, and using it for nearby needs. ICI users have found it to be cost effective to collect the condensate from large cooling systems by returning it into their cisterns as well. Facilities with large cooling demands will be in the best position to take advantage of condensate reuse, which due to its quality can potentially be used in landscape irrigation, as cooling tower makeup water, or in some industrial processes.

The variability in rate and occurrence of precipitation events requires that rainwater or condensate be used with maximum efficiency. Incentives may include rebates for purchase and installation of water-efficient equipment.

Rain barrels capture water from a roof and hold it for later use such as on lawns, gardens, or indoor plants. Collecting roof runoff in rain barrels reduces the amount of water that flows from properties. Rain barrels conserve water and provide free water for use in landscapes. Twice a year, Houston Water and the Green Building Resource Center cohost a Rain Barrel Sale (https://www.houstonpublicworks.org/rain-barrel-program). At these events, residents can purchase 50-gallon rain barrels at a municipal discounted price. The sales began in 2012, initially hosted by the Mayor's Sustainability Office. In 2014, the Green Building Resource

Center took over hosting the event activities, and in 2020, HPW began cohosting the event to leverage efforts and further incentivize the program. In 2021, HPW expanded the program to include subsidies (additional discounts) to rain barrels for Houston water customers (when funding is available). HPW aims to make residential water harvesting more accessible and affordable.

### 6.1.8 Regulatory Enforcement BMPs

#### *Conservation Ordinance Planning and Development (BMP 9.2)*

BMP 9.2 is designed to provide guidance in developing and implementing a successful conservation ordinance that addresses permanent year-round water savings. Short-term cutbacks based on temporary drought conditions is not the focus of the practice but should be considered to address short term conditions. The most successful conservation ordinances have support from a community with a knowledgeable and engaged customer base, whether through education and awareness or a voluntary conservation program. A community that is considering this BMP should first determine what goals they wish addressed, such as long-term resources, peak or seasonal demand, capacity issues, or reduced wastewater flows and then analyze end uses to help identify what may have the greatest potential for water savings. Stakeholders associated with those end uses should be brought into the process as early as possible. A reliable source for additional information and approaches to identifying opportunities for water conservation is the TWDB's *Guidance and Methodology for Reporting on Water Conservation and Water Use*.

Infrastructure Design Manual (BMP 9.2)

A copy of Houston's Infrastructure Design Manual is available on Houston's website at https://edocs.publicworks.houstontx.gov/documents/design_manuals/idm.pdf.

#### *Leadership in Energy and Environmental Design (BMP 9.2)*

In 2004, the Houston City Council adopted Resolution No. 2004-15 establishing the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System™ as a standard for new or replacement city-owned facilities and for major renovation of city-owned buildings and facilities with over 10,000 square feet of occupied space. LEED™ provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED™ emphasizes state of the art strategies for various energy and environmental aspects of a building, including water savings. Examples of past, present and future LEED™ projects for city owned facilities can be found at https://www.houstontx.gov/generalservices/leed.html. More information about the standard is available at https://www.houstontx.gov/generalservices/leed.html.

#### *State and Federal Standards Adopted (BMP 9.2)*

The 1992 federal Energy Policy Act (EPAct) required water-conserving fixtures in new construction and renovations. The standards call for flows of no more than 2.2 gallons per minute (gpm) for faucets, 2.5 gpm for showerheads, and 1.6 gallons per flush for toilets.

In 2009, Texas House Bill 2667 mandated that toilet and urinal manufacturers phase in High Efficiency Toilets (HETs), starting with 50% of in-state sales by January 1, 2010, and 100% by January 1, 2014. An HET is defined as a toilet that uses no more than 1.28 gallons of water per flush (GPF), or 20 percent less than the 1.6-GPF models mandated by the EPAct. These state

and federal standards ensure that all new construction and renovations in the City are equipped with water-conserving fixtures. Houston implements and enforces the regulatory aspects of this Plan through existing codes and ordinances. These include Building and Plumbing Codes (www.houstonpermittingcenter.org/code-enforcement), Chapter 47–Water and Sewers, of the City of Houston Code of Ordinances (http://www.houstontx.gov/codes/index.html), and LEED™ Certification of City-owned facilities (Resolution No. 2004-15) (http://www.usgbc.org/Docs/Archive/General/Docs1981.pdf).

## 6.2 REQUIREMENT FOR WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

As of 2023, HPW has 161 wholesale contracts, 68 of which are with cities, municipal utility districts, and regional water authorities for treated water service. In 2023, these treated water contract customers used 83.3 billion gallons, averaging 228.2 MDG. Wholesale customers is contractually obliged to develop, implement, and update Water Conservation Plans or conservation measures using the applicable requirements of TCEQ Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Texas Administrative Code 30 TAC Chapter 288(a)(2)(C). The City's Water Conservation and Drought Contingency Plans are available to wholesale customers to aid with the development of their plans.

The City requires that each wholesale customer provide a copy of their Water Conservation Plan and required water system audit (as required by the TWDB water audit reporting requirement as specified by House Bill 3338) to the City of Houston. This is required in any new contracts developed with wholesale customers as specified in 30 TAC Chapter 288.

## 6.3 POTENTIAL CONSERVATION PROGRAMS

### 6.3.1 Conservation Analysis and Planning BMPs

*Water Survey For Single-Family and Multi-Family Customers (BMP 2.3)*

A Water Survey Program can be an effective method of reducing both indoor and outdoor water usage. Under this BMP, the utility conducts a survey of single-family and multi-family customers to provide information to them about methods to reduce indoor water use through replacement of inefficient showerheads, toilets, aerators, clothes washers, and dishwashers. If the customer has an automatic irrigation system, the survey includes an evaluation of the schedule currently used and recommends any equipment repairs or changes to increase the efficiency of the irrigation system.

*Future Consideration: HPW currently offers a limited water survey program for ICI customers and may consider expanding the program to include residential and multi-family customers. Once the scope of services is determined, there are three options for conducting the survey: train utility staff to conduct an onsite survey; hire an outside contractor to conduct the onsite surveys; or provide a printed or online survey for customers to complete on their own. When conducting an onsite survey for a customer with an automatic irrigation system that is managed by an irrigation or maintenance contractor, it is beneficial to have the contractor present for the irrigation system survey.*

*Customer Characterization (BMP 2.4)*

One of the newer BMPs is Customer Characterization, the practice of analyzing a utility's customer data trends towards the purpose of realizing targeted water savings. Undertaking a Customer Characterization allows the utility to better understand how water is used within its service area, to recognize the differences between various subsects within its customer base, and to facilitate positive experiences between the utility and the customer that inform both parties of their respective values and familiarize high water users with ways to reduce their usage.

Just as the motivations for deploying an AMI program will be different across utilities, each utility's purpose for embarking on Customer Characterization will be different, and the analysis should be crafted with their specific goal(s) in mind. Customer Characterization is one of the most effective tools for tailoring a utility-wide conservation program, because it yields actionable insight and stimulates community conversation.

In May 2023, AWE partnered with HPW to assess water and sewer service affordability for single-family households. The assessment included:

- A review of HPW's affordability efforts;
- An assessment of water affordability at the census tract level using single-family customer consumption data;
- An assessment of the tiered rate structure and water usage;
- An estimate of how water conservation strategies can impact water affordability; and recommendations throughout for HPW to consider as potential ways to improve water and sewer service affordability for low-income residents

*Future Consideration: HPW has begun analyzing its customer data trends towards the purpose of realizing targeted water savings. Undertaking a Customer Characterization allows the utility to better understand how water is used within its service area, to recognize the differences between various subsects within its customer base, and to facilitate positive experiences between the utility and the customer that inform both parties of their respective values and familiarize high water users with ways to reduce their usage.*

### 6.3.2 Financial BMPs

*Water Conservation Pricing (BMP 3.1)*

Per BMP 3.1, Water Conservation Pricing is the use of rate structures that discourage the inefficient use or waste of water. Conservation pricing structures include increasing unit prices with increased consumption such as inverted block rates, base rates, and excess use rates such as water budget rates, and seasonal rates. Seasonal rate structures may include additional charges for upper block (outdoor) usage or excess-use surcharges for commercial customers to reduce demand during summer months. The goal of conservation pricing is to develop long run consumption patterns consistent with cost. Under this BMP, utilities should consider establishing rates based upon long-run marginal costs, or the cost of adding the next unit of capacity to the system. An established cost of service methodology should be followed whenever rates are developed or proposed for change.

*Future Consideration: HPW may use data analysis tools described in previous sections to determine if changes to conservation pricing structure for other customer classes are warranted in the future.*

### 6.3.3 Systems Operations BMPs

#### *Metering of All New Connections and Retrofit of Existing Connections (BMP 4.1)*

Proper installation of meters by size and type is essential for good utility management. Using and maintaining the most accurate meter for each type of connection will generate adequate revenues to cover the expenses of the utility, equity among customers, reduce water waste and reduce flows to wastewater facilities. AWWA provides several resources listed in the reference section of this BMP. The purpose of this BMP is to ensure that all aspects of meter installation, replacement testing and repair are managed optimally for water use efficiency.

*Future Consideration: HPW has enhanced its mainline leak detection program using the AMI network. Future applications are under development with manufacturers. Functionalities will include pressure sensing, hydrant flow monitoring, and water quality sensing, among others.*

*A more intense audit will consist of one or any combination of the following actions:*

- *Evaluation of the automated meter read system;*
- *Investigation of problematic meters;*
- *Investigation of how the amount of water is estimated in the flushing program;*
- *Investigate how water loss is estimated due to main breaks;*
- *Coordination with Fire Department to determine water usage by Fire Departments;*
- *Fire service monitoring for all businesses; and*
- *Testing of suspect metering devices.*

#### *System Water Audit and Water Loss Control (BMP 4.2)*

This BMP is intended for all utilities. This practice should be considered by a utility that would like to analyze the benefits of reducing its water loss, unbilled authorized consumption, and other nonrevenue water; does not conduct a water loss audit on an annual basis; wants to determine if under-registering meters are impacting its revenues or wants to reduce main breaks and leaks. To maximize the benefits of this BMP, a utility should use the information from its water loss audit to revise meter testing and repair practices, reduce unauthorized water use, improve accounting for unbilled water, and implement effective water loss management strategies.

*Future Consideration: Over the next five years, HPW plans to use capital improvement project funding and operations maintenance funding for replacement and repairs in the water transmission system.*

### 6.3.4 Landscaping BMPs

#### *Athletic Field, Golf Course, and Park Conservation (BMP 5.1, 5.2, 5.4)*

This BMP is intended for all Municipal Water User Groups (“utility”) which manage irrigated athletic field(s) and/or serve a customer with irrigated athletic field(s). Athletic fields, irrigated

parks, recreation centers, fountains, or pools, and golf courses often involve a visible use of water during the day, which comes under scrutiny by the public and water resource managers both because of large water demand to maintain them, and because of the perception that the water use may be excessive. The specific measures listed as part of these BMPs can be implemented individually or as a group. Utilities may already be implementing one or more of these elements and they may want to adopt additional elements outlined in this document.

*Future Consideration: Golf courses are often good candidates for reuse water or other alternative sources of water. Two municipal golf courses managed by Houston and three municipal courses managed by private companies could be targeted for this BMP.*

### *Residential Landscape Irrigation Evaluations (BMP 5.5)*

The Residential Landscape Irrigation BMP is intended for use by a municipal water user or water utility with a large majority of customers utilizing automatic in-ground irrigation systems. Outdoor irrigation constitutes about 60 percent or more of water used by households during the summer months, and much of that water is wasted due to overwatering and broken or maladjusted components. Helping customers identify these issues can amount to large water savings and a positive customer service image for the utility.

*Future Consideration: Residential landscape irrigation evaluations may be offered as a stand-alone program or as part of the residential water survey program if implemented. Evaluations can be done by training existing staff or by contracting the service.*

### *Outdoor Watering Schedule (BMP 5.6)*

This BMP is intended for all utilities and is considered an essential component of a comprehensive outdoor water conservation program. Utilities across Texas are already familiar with the concept of water restrictions. However, utilities typically only impose water restrictions as a drought management strategy and maintain these limitations on outdoor water use for a temporary period. To promote continued water savings year-round regardless of drought conditions, this BMP provides a guiding framework for the adoption of mandatory, permanent outdoor watering schedules. Although all utilities can benefit from the implementation of outdoor watering schedules, utilities with high seasonal usage will see the greatest impact on outdoor water demands.

Utilities should consider combining the planning for and adoption of maximum outdoor watering schedules with other outdoor landscape education and incentive programs. Some of the programs that pair well with permanent outdoor watering schedules include robust education on regionally appropriate landscape practices, irrigation efficiency, and budgeting landscape water seasonally. These additional efforts are essential to achieving the maximum water savings from this BMP.

*Future Consideration: HPW will investigate the feasibility of implementing seasonal or year-round time-of-day and day-of-week watering restrictions, potentially for drought contingency. Ordinances would be required for implementation of this BMP.*

### 6.3.5 Rebate, Retrofit, and Incentive Program BMPs

*Fixture Replacement/Retrofit Programs (BMP 7.4)*

Per BMP 7.4, plumbing retrofits usually include showerheads and kitchen and bathroom faucet aerators. Recent studies have shown that replacing toilet flappers is also an effective method of conserving water in the residential sector. Four types of high quality, low flow plumbing devices are to be installed under this program: showerheads rated at 2.0 gpm or less; kitchen faucet aerators of 2.2 gpm or less, bathroom faucet aerators of 1.5 gpm or less, and toilet flappers that flush the toilet at the design flush volume for that toilet model. The utility may meet the requirements of this BMP through enforceable ordinances and inspection programs requiring replacement of inefficient plumbing when ownership of the property transfers or by date certain no later than five years. The utility may meet the requirements of this BMP through enforceable ordinances and inspection programs requiring replacement of inefficient plumbing when ownership of the property transfers or by date certain no later than five years.

*Future Consideration: Currently, HPW provides faucet aerators and toilet dye leak tabs as promotional items but may consider expanding the program as part of residential water survey programs and/or plumbing assistance programs. This may require updating the City of Houston Plumbing Code to reduce the showerhead retrofits to 1.25 gpm and aerator replacements to 1.0 gpm.*

## 7.0 ADOPTION OF WATER CONSERVATION PLAN, PERIODIC REVIEW, AND UPDATE OF PLAN

Opportunity for public comment on the plan was provided at the Houston City Council Committee meeting on May __, 2024. **Appendix K** contains a copy of the resolution from the May __, 2024, City Council meeting at which this Plan was adopted.

TCEQ requires that water conservation plans be reviewed and, if necessary, updated every five years to coincide with the regional water planning process. This 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

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# APPENDIX B

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION PLANS

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION 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 to produce 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 period.
(4) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.
(5) Commercial use--The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial, or institutional users.
(6) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).
(7) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric but does not include agricultural use.
(8) Institutional use--The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison, or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.

(9) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water from a public water supplier.
(10) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.
(11) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field re-pressuring.
(12) Municipal use--The use of potable water provided by a public water supplier as well as the use of sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.
(13) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.
(14) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.
(15) Public water supplier--An individual or entity that supplies water to the public for human consumption.
(16) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.
(17) Residential gallons per capita per day--The total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.
(18) Residential use--The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor uses.
(19) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.
(20) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.
(21) Total use--The volume of raw or potable water provided by a public water supplier to billed customer sectors or nonrevenue uses and the volume lost during conveyance, treatment, or transmission of that water.
(22) Total gallons per capita per day (GPCD)--The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in this chapter shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.
(23) Water conservation coordinator--The person designated by a retail public water supplier that is responsible for implementing a water conservation plan.

(24) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).
(25) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.
(26) Wholesale use--Water sold from one entity or public water supplier to other retail water purveyors for resale to individual customers.

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

**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. The water supplier shall select any combination of the following strategies, 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*

**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 §288.5 Water Conservation Plans for Wholesale Water Suppliers**

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

(1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:

(A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;

(B) specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;

(C) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;

(D) a monitoring and record management program for determining water deliveries, sales, and losses;

(E) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;

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

(G) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;

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

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

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

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

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

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

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

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

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

# APPENDIX C

# WATER RATE ORDINANCE

HOUSTON PUBLIC WORKS

**TABLE OF WATER AND WASTEWATER RATES**
**September 1, 2021**

**In accordance with Section 4 of Ordinance No. 2021-515, the following are the final rates and charges for water and wastewater services for Fiscal Years Ending (FYE) 2022 – 2026 as adopted by Houston Public Works, and as recommended by the Amended Rate Study dated August 2021. These final rates and charges do not in any case deviate from the scheduled dates or exceed the maximum rates and charges for any customer type authorized by Ordinance No. 2021-515. Upon publication of this document on the City Secretary's website as of September 1, 2021, the rates and charges set forth below are final and shall be implemented in accordance with their respective effective dates without further action of City Council.**

**As noted in Ordinance No. 2021-515, Section 5.2 of the Master Ordinance and Ordinance No. 2010-305, collectively, require certain automatic annual adjustments to the water and wastewater rates based on inflationary indices described therein. Those automatic adjustments were not altered by Ordinance 2021-515 and will continue to occur annually as required by the Master Ordinance.**

DocuSigned by:
**Signed** Carol Haddock
A93C410B72B3453...
**Carol Ellinger Haddock, P.E.**
**Director, HPW**

| Table 1 - Water Monthly Service Charges and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Meter Size** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Charges* | *Future Adjustments* | | | | |
| 5/8-inch | $6.25 | +$0.32 | +$0.19 | +$0.17 | +$0.14 | +$0.03 |
| 3/4-inch | 6.25 | +0.32 | +0.19 | +0.17 | +0.14 | +0.03 |
| 1-inch | 8.80 | +0.40 | +0.32 | +0.28 | +0.25 | +0.05 |
| 1 1/2-inch | 12.43 | +0.52 | +0.50 | +0.45 | +0.42 | +0.06 |
| 2-inch | 14.61 | +0.59 | +0.60 | +0.56 | +0.52 | +0.07 |
| 3-inch | 32.76 | +1.20 | +1.49 | +1.40 | +1.34 | +0.17 |
| 4-inch | 63.27 | +2.21 | +2.99 | +2.81 | +2.72 | +0.32 |
| 6-inch | 147.88 | +5.02 | +7.14 | +6.72 | +6.56 | +0.75 |
| 8-inch | 184.20 | +6.21 | +8.93 | +8.41 | +8.19 | +0.95 |
| 10-inch | 244.84 | +8.23 | +11.90 | +11.22 | +10.94 | +1.26 |
| 12-inch | 341.44 | +11.43 | +16.64 | +15.69 | +15.31 | +1.76 |
| TCEQ Fee per connection | 0.21 | +0.00 | +0.00 | +0.00 | +0.00 | +0.00 |

| Table 2 - Water Monthly Service Charges and Future Adjustments: Special Customer Types | | | | | | |
|---|---|---|---|---|---|---|
| **Meter Size** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Charges* | *Future Adjustments* | | | | |
| **Transient:** | | | | | | |
| 1-inch | $95.00 | +$11.96 | +$7.75 | +$12.88 | +$7.71 | +$12.84 |
| 2-inch | 185.00 | +20.00 | +15.00 | +25.00 | +15.00 | +25.00 |
| 3-inch | 460.00 | +51.36 | +37.69 | +62.86 | +37.78 | +62.99 |
| **Resale:** | | | | | | |
| 5/8- and 3/4-inch | $24.05 | +$0.20 | +$0.09 | +$0.06 | +$0.03 | +$0.00 |
| 1-inch | 39.00 | +0.27 | +0.12 | +0.10 | +0.07 | +0.04 |
| 1 1/2-inch | 60.40 | +0.31 | +0.19 | +0.16 | +0.13 | +0.11 |
| 2-inch | 73.25 | +0.33 | +0.22 | +0.20 | +0.17 | +0.15 |
| 3-inch | 180.00 | +0.83 | +0.51 | +0.50 | +0.48 | +0.46 |
| 4-inch | 360.00 | +1.00 | +1.00 | +1.00 | +1.00 | +1.00 |
| 6-inch | 859.00 | +1.76 | +2.34 | +2.40 | +2.45 | +2.49 |
| 8-inch | 1075.00 | +0.25 | +2.91 | +3.00 | +3.08 | +3.13 |
| **Metered Fire:** | | | | | | |
| 5/8-inch | $4.70 | +$0.23 | +$0.08 | +$0.05 | +$0.09 | +$0.01 |
| 3/4-inch | 4.70 | +0.23 | +0.08 | +0.05 | +0.09 | +0.01 |
| 1-inch | 6.15 | +0.27 | +0.11 | +0.09 | +0.18 | +0.07 |
| 1 1/2-inch | 8.20 | +0.35 | +0.16 | +0.14 | +0.31 | +0.14 |
| 2-inch | 9.45 | +0.38 | +0.19 | +0.17 | +0.38 | +0.19 |
| 3-inch | 20.00 | +0.48 | +0.44 | +0.41 | +1.01 | +0.58 |
| 4-inch | 37.00 | +1.37 | +0.85 | +0.84 | +2.07 | +1.21 |
| 6-inch | 85.00 | +3.00 | +2.00 | +2.00 | +5.00 | +3.00 |
| 8-inch | 105.00 | +4.30 | +2.49 | +2.50 | +6.26 | +3.77 |
| 10-inch | 140.00 | +4.87 | +3.32 | +3.33 | +8.36 | +5.05 |
| **Unmetered Fire:** | | | | | | |
| 5/8- and 3/4-inch | $6.70 | +$0.21 | +$0.05 | +$0.05 | +$0.04 | +$0.00 |
| 1-inch | 9.55 | +0.23 | +0.07 | +0.09 | +0.09 | +0.02 |
| 1 1/2-inch | 13.60 | +0.29 | +0.09 | +0.14 | +0.17 | +0.07 |
| 2-inch | 16.05 | +0.30 | +0.11 | +0.16 | +0.22 | +0.10 |
| 3-inch | 36.00 | +0.87 | +0.23 | +0.42 | +0.59 | +0.37 |
| 4-inch | 70.00 | +1.35 | +0.44 | +0.84 | +1.24 | +0.79 |
| 6-inch | 165.00 | +2.00 | +1.00 | +2.00 | +3.00 | +2.00 |
| 8-inch | 205.00 | +3.05 | +1.24 | +2.50 | +3.76 | +2.52 |
| 10-inch | 275.00 | +1.60 | +1.65 | +3.33 | +5.03 | +3.38 |
| 12-inch | 380.00 | +5.79 | +2.30 | +4.66 | +7.05 | +4.75 |

| Table 3 - Single Family Residential Water Volume Rates and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Rates* | *Future Adjustments* | | | | |
| **Customers with usage up to 3,000 gallons per month:** | | | | | | |
| First 1 kgal | $1.00 | +$0.20 | +$0.10 | +$0.20 | +$0.15 | +$0.10 |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| ** Single family residential customers who use 3,000 gallons or less per month receive a conservation credit.* | | | | | | |
| **Customers with Usage over 3,000 gallons per month:** | | | | | | |
| First 1 kgal | $5.50 | +$0.60 | +$0.40 | +$0.50 | +$0.50 | +$0.50 |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| Next 6 kgal | 8.00 | +0.65 | +0.45 | +0.65 | +0.55 | +0.70 |
| Next 8 kgal | 11.00 | +0.65 | +0.35 | +0.80 | +0.50 | +0.70 |
| Over 20 kgal | 15.00 | +0.65 | +0.35 | +0.65 | +0.35 | +0.50 |

| Table 4 - Sample Single Family Residential Water Bills and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Billed Usage** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Bill Amount* | *Increase to Bill Amount* | | | | |
| Meter Charge + TCEQ Fee | $6.46 | +$0.32 | +$0.19 | +$0.17 | +$0.14 | +$0.03 |
| 1,000 gallons | 7.46 | +0.52 | +0.29 | +0.37 | +0.29 | +0.13 |
| 2,000 gallons | 8.46 | +0.72 | +0.39 | +0.57 | +0.44 | +0.23 |
| 3,000 gallons | 9.46 | +0.92 | +0.49 | +0.77 | +0.59 | +0.33 |
| 4,000 gallons | 28.46 | +2.72 | +1.79 | +2.17 | +2.14 | +2.03 |
| 5,000 gallons | 33.96 | +3.32 | +2.19 | +2.67 | +2.64 | +2.53 |
| 6,000 gallons | 39.46 | +3.92 | +2.59 | +3.17 | +3.14 | +3.03 |

| Table 5 - Retail Water Volume Rates and Future Adjustments | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Customer Type** | **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| | | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | | *Rates* | *Future Adjustments* | | | | |
| Multifamily Residential | All Usage | $5.45 | +$0.49 | +$0.36 | +$0.45 | +$0.47 | +$0.42 |
| Commercial/ Industrial | All Usage | 5.55 | +0.60 | +0.40 | +0.60 | +0.57 | +0.52 |
| Irrigation | Block 1 | --- | --- | --- | --- | --- | --- |
| | Block 2 | --- | --- | --- | --- | --- | --- |
| | All Usage | 10.00 | +0.45 | +0.27 | +0.45 | +0.44 | +0.39 |
| Transient | All Usage | 10.00 | +0.45 | +0.27 | +0.45 | +0.44 | +0.39 |
| Resale | All Usage | 10.00 | +0.45 | +0.27 | +0.45 | +0.44 | +0.39 |
| Emergency Backup | All Usage | 10.00 | +0.45 | +0.27 | +0.45 | +0.44 | +0.39 |
| Metered Fire | All Usage | 10.00 | +0.45 | +0.27 | +0.45 | +0.44 | +0.39 |

| Table 6 - Wholesale Water Volume Rates and Future Adjustments | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Customer Type** | **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| | | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | | *Rates* | *Future Adjustments* | | | | |
| Contract w/Airgap | Minimum | $3.35 | +$0.35 | +$0.02 | +$0.11 | +$0.17 | +$0.10 |
| | Excess | 0.85 | +0.05 | +0.02 | +0.08 | +0.05 | +0.05 |
| Contract w/o Airgap | Minimum | 4.05 | +0.15 | +0.02 | +0.05 | +0.15 | +0.15 |
| | Excess | 0.85 | +0.05 | +0.02 | +0.08 | +0.05 | +0.05 |
| GRP Areas 1 & 2 | All Usage | 2.68 | +0.28 | +0.02 | +0.08 | +0.14 | +0.08 |
| GRP Area 3 | All Usage | 1.01 | +0.11 | +1.12 | +0.07 | +0.10 | +0.06 |
| Contract Untreated | All Usage | 0.8500 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| Table 7 - Wastewater Monthly Service Charges and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Meter Size** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Charges* | *Future Adjustments* | | | | |
| 5/8-inch | $10.00 | +$1.50 | +$1.00 | +$1.10 | +$0.60 | +$0.60 |
| 3/4-inch | 10.00 | +1.50 | +1.00 | +1.10 | +0.60 | +0.60 |
| 1-inch | 12.45 | +1.79 | +2.15 | +1.61 | +0.96 | +1.08 |
| 1 1/2-inch | 15.93 | +2.23 | +3.78 | +2.25 | +1.57 | +1.49 |
| 2-inch | 18.03 | +2.47 | +4.76 | +2.62 | +1.96 | +1.70 |
| 3-inch | 35.46 | +4.60 | +12.60 | +5.92 | +4.63 | +4.03 |
| 4-inch | 64.76 | +8.16 | +25.37 | +11.87 | +9.09 | +7.97 |
| 6-inch | 146.02 | +18.05 | +60.80 | +28.36 | +21.47 | +18.89 |
| 8-inch | 180.90 | +22.29 | +76.01 | +35.43 | +26.79 | +23.58 |
| 10-inch | 239.14 | +29.38 | +101.40 | +47.26 | +35.66 | +31.40 |
| 12-inch | 331.92 | +40.65 | +141.85 | +66.09 | +49.79 | +43.87 |
| 16-inch | 805.89 | +98.31 | +348.49 | +162.30 | +122.00 | +107.56 |

| Table 8 - Wastewater Monthly Service Charges and Future Adjustments: Special Customer Types | | | | | | |
|---|---|---|---|---|---|---|
| **Meter Size** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Charges* | *Future Adjustments* | | | | |
| **Industrial with Surcharge:** | | | | | | |
| Industrial Program | $100.00 | +$200.00 | +$200.00 | +$200.00 | +$200.00 | +$250.00 |
| **Sewer Only:** | | | | | | |
| Single Family Res. | $36.00 | +$5.00 | +$4.00 | +$5.00 | +$5.00 | +$5.00 |
| Duplex | 72.00 | +10.00 | +8.00 | +10.00 | +10.00 | +10.00 |
| Multifamily Res. | 36.00 | +5.00 | +4.00 | +5.00 | +5.00 | +5.00 |
| Commercial | 72.00 | +10.00 | +8.00 | +10.00 | +10.00 | +10.00 |
| Industrial | 72.00 | +10.00 | +8.00 | +10.00 | +10.00 | +10.00 |

| Table 9 - Single Family Residential Wastewater Volume Rates and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Rates* | *Future Adjustments* | | | | |
| First 1 kgal | $4.00 | +$0.50 | +$0.30 | +$1.00 | +$0.75 | +$0.40 |
| Next 1 kgal | | | | | | |
| Next 1 kgal | | | | | | |
| Next 1 kgal | 10.50 | +0.75 | +0.25 | +0.75 | +0.30 | +0.70 |
| Next 1 kgal | | | | | | |
| Over 5 kgal | | | | | | |

| Table 10 - Sample Single Family Residential Wastewater Bills and Future Adjustments | | | | | | |
|---|---|---|---|---|---|---|
| **Billed Usage** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| *Month of Increase* | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | *Bill Amount* | *Increase to Bill Amount* | | | | |
| Meter Charge only | $10.00 | +$1.50 | +$1.00 | +$1.10 | +$0.60 | +$0.60 |
| 1,000 gallons | 14.00 | +2.00 | +1.30 | +2.10 | +1.35 | +1.00 |
| 2,000 gallons | 18.00 | +2.50 | +1.60 | +3.10 | +2.10 | +1.40 |
| 3,000 gallons | 22.00 | +3.00 | +1.90 | +4.10 | +2.85 | +1.80 |
| 4,000 gallons | 32.50 | +3.75 | +2.15 | +4.85 | +3.15 | +2.50 |
| 5,000 gallons | 43.00 | +4.50 | +2.40 | +5.60 | +3.45 | +3.20 |
| 6,000 gallons | 53.50 | +5.25 | +2.65 | +6.35 | +3.75 | +3.90 |

| Table 11 - Retail Wastewater Volume Rates and Future Adjustments | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Customer Type** | **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| | | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | | *Rates* | *Future Adjustments* | | | | |
| Multifamily Residential | All Flow | $7.40 | +$0.66 | +$0.29 | +$0.90 | +$0.53 | +$0.60 |
| Commercial | All Flow | 7.40 | +0.66 | +0.29 | +0.90 | +0.53 | +0.60 |
| Industrial (no surcharge) | First 2 kgal | --- | --- | --- | --- | --- | --- |
| | Over 2 kgal | --- | --- | --- | --- | --- | --- |
| | All Usage | 7.40 | +0.66 | +0.29 | +0.90 | +0.53 | +0.60 |
| Industrial with Surcharge | All Flow | 8.00 | +0.60 | +0.10 | +0.65 | +0.25 | +0.25 |
| | BOD (per lb) | 0.4437 | +0.0512 | +0.0376 | +0.0638 | +0.0402 | +0.0386 |
| | TSS (per lb) | 0.3384 | +0.0347 | +0.0122 | +0.0349 | +0.0184 | +0.0180 |
| | Ammonia (per lb) | 0.6253 | +0.0549 | -0.0126 | +0.0351 | +0.0079 | -0.0080 |

| Table 12 - Wholesale Wastewater Volume Rates and Future Adjustments | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Customer Type** | **Rate Block** | **FYE 2022** | | **FYE 2023** | **FYE 2024** | **FYE 2025** | **FYE 2026** |
| | | *Sept. 2021* | *April 2022* | *April 2023* | *April 2024* | *April 2025* | *April 2026* |
| | | *Rates* | *Future Adjustments* | | | | |
| Capital without Collection System | All Flow | $1.65 | +$0.00 | +$0.00 | +$0.00 | +$0.00 | +$0.00 |
| Capital with Collection System | All Flow | 3.00 | +0.12 | +0.00 | +0.05 | +0.01 | +0.00 |
| No Capital with Collection System | All Flow | 6.25 | +0.00 | +0.15 | +0.67 | +0.40 | +0.44 |
| Connection-based | All Connections | 25.00 | +0.30 | +1.42 | +2.87 | +1.71 | +1.93 |

# APPENDIX D

# CITY OF HOUSTON UTILITY PROFILE BASED ON TEXAS COMMISSION ON ENVIRONMENTAL QUALITY FORMAT

Texas Water Development Board

# UTILITY PROFILE FOR RETAIL WATER SUPPLIER

Fill out this form as completely as possible.
**If a field does not apply to your entity, leave it blank.**

## CONTACT INFORMATION

Name of Utility: City of Houston

Public Water Supply Identification Number (PWS ID): TX1010013

Certificate of Convenience and Necessity (CCN) Number: 99144

Surface Water Right ID Number: 2925-B, 4261-B, 4277-A, 4963-A, 4965-A, 5807, 5808, 5826

Wastewater ID Number: See Attachment

Completed By: Amanda Siebels Title: Senior Division Manager

Address: 611 Walker City: Houston Zip Code: 77006

Email: Amanda.Siebels@houstontx.gov Telephone Number: 832-395-2721

Date: 5/1/2024



Regional Water Planning Group: H Map

Groundwater Conservation District: Harris, F Map

Check all that apply:

- [x] Received financial assistance of $500,000 or more from TWDB
- [x] Have 3,300 or more retail connections
- [x] Have a surface water right with TCEQ

Texas Water Development Board

# Section I: Utility Data

## A. Population and Service Area Data

1. Current service area size in square miles: 650
(Attach or email a copy of the service area map.)

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

| Year | Historical Population Served By Retail Water Service | Historical Population Served By Wholesale Water Service | Historical Population Served By Wastewater Service |
|---|---|---|---|
| 2019 | 2,343,365 | 2,529,487 | 2,260,590 |
| 2020 | 2,320,268 | 2,529,487 | 2,273,397 |
| 2021 | 2,529,611 | 2,735,764 | 2,286,203 |
| 2022 | 2,529,611 | 2,912,072 | 2,299,010 |
| 2023 | 2,565,968 | 2,858,778 | 2,311,817 |

3. Provide the projected service area population for the following decades.



| Year | Projected Population Served By Retail Water Service | Projected Population Served By Wholesale Water Service | Projected Population Served By Wastewater Service |
|---|---|---|---|
| 2020 | 2,320,268 | 2,526,487 | 2,273,397 |
| 2030 | 2,798,278 | 3,031,784 | 2,728,076 |
| 2040 | 3,073,268 | 3,334,962 | 3,000,884 |
| 2050 | 3,349,540 | 3,635,109 | 3,270,963 |
| 2060 | 3,626,591 | 3,924,918 | 3,532,641 |

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

Retail Water Service- TWDB
WW Retail and subscriber customer - HGSD projected population
Wholesale customer demands were projected using HGSD data and a per capita demand of 150 gpcd using the same peaking factors developed for retail customers in each of the treated water service areas.

Texas Water Development Board

## B. System Input

Provide system input data for the previous five years.

Total System Input = Self-supplied + Imported – Exported

| Year | Self-supplied Water in Gallons | Purchased/Imported Water in Gallons | Exported Water in Gallons | Total System Input | Total GPCD |
|---|---|---|---|---|---|
| 2019 | 165,091,410,891 | 0 | 52,843,883,168 | 112,247,527,723 | 131 |
| 2020 | 163,943,857,000 | 0 | 55,506,469,000 | 108,437,388,000 | 128 |
| 2021 | 161,131,328,713 | 0 | 54,091,003,000 | 107,040,325,713 | 116 |
| 2022 | 173,564,665,347 | 0 | 58,991,835,000 | 114,572,830,347 | 124 |
| 2023 | 182,267,080,000 | 0 | 61,314,334,000 | 120,952,746,000 | 129 |
| **Historic 5-year Average** | 169,199,668,390 | 0 | 56,549,504,834 | 112,650,163,557 | 126 |

## C. Water Supply System (Attach description of water system)

1. Designed daily capacity of system 907,000,000 **gallons** per day.
2. Storage Capacity:
   Elevated 11,650,000 **gallons**
   Ground 175,330,000 **gallons**



3. List all current water supply sources in gallons.

| Water Supply Source | Source Type* | Total Gallons |
|---|---|---|
| Gulf Coast Aquifer | Ground | 27,696,913,000 |
| San Jacinto (Run of River) | Surface | 26,068,114,551 |
| Lake Houston | Surface | 23,889,382,229 |
| Lake Livingston | Surface | 244,204,793,712 |
| Reuse | Surface | 480,383,365 |
| | Choose One | |

*Select one of the following source types: *Surface water, Groundwater, or Contract*

4. If surface water is a source type, do you recycle backwash to the head of the plant?
   - (●) Yes 723,000 estimated **gallons** per day
   - ( ) No

Texas Water Development Board

## D. Projected Demands

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

| Year | Population | Water Demands (gallons) |
|---|---|---|
| 2025 | 2,632,342 | 120,292,764,716 |
| 2026 | 2,665,529 | 121,420,177,008 |
| 2027 | 2,698,716 | 122,537,898,696 |
| 2028 | 2,731,903 | 123,645,929,780 |
| 2029 | 2,765,090 | 124,744,270,260 |
| 2030 | 2,798,278 | 125,832,965,104 |
| 2031 | 2,825,777 | 126,656,976,694 |
| 2032 | 2,853,276 | 127,472,958,576 |
| 2033 | 2,880,775 | 128,280,910,750 |
| 2034 | 2,908,274 | 129,080,833,216 |

2. Describe sources of data and how projected water demands were determined. Attach additional sheets if necessary.

Projected retail population and demand determined by TWDB, HGAC and City of Houston Water Infrastructure Planning.

Texas Water Development Board

## E. High Volume Customers

1. List the annual water use, in gallons, for the five highest volume **RETAIL customers**. Select one of the following water use categories to describe the customer; choose Residential, Industrial, Commercial, Institutional, or Agricultural.

| Retail Customer | Water Use Category* | Annual Water Use | Treated or Raw |
|---|---|---|---|
| CITY OF HOUSTON | Institutional | 3,063,723,000 | Treated |
| HISD | Institutional | 682,296,000 | Treated |
| HARRIS COUNTY | Institutional | 497,110,000 | Treated |
| UNIVERSITY OF HOUSTON | Institutional | 412,449,000 | Treated |
| MEMORIAL HERMANN | Commercial | 309,569,000 | Treated |

*For definitions on recommended customer categories for classifying customer water use, refer to the online Guidance and Methodology for Reporting on Water Conservation and Water Use.

2. If applicable, list the annual water use for the five highest volume **WHOLESALE customers**. Select one of the following water use categories to describe the customer; choose Municipal, Industrial, Commercial, Institutional, or Agricultural.

| Wholesale Customer | Water Use Category* | Annual Water Use | Treated or Raw |
|---|---|---|---|
| Equistar Chemicals LP (37812) | Industrial | 11,093,499,000 | Raw |
| North Harris Co. Regional Wate | Municipal | 9,497,501,000 | Raw |
| West Harris Co. Regional Water | Municipal | 8,845,452,000 | Treated |
| Deer Park Refining Partnership | Industrial | 7,348,982,000 | Raw |
| City of Pasadena | Municipal | 6,800,007,000 | Treated |

*For definitions on recommended customer categories for classifying customer water use, refer to the online Guidance and Methodology for Reporting on Water Conservation and Water Use.



## F. Utility Data Comment Section

Provide additional comments about utility data below.

none

Texas Water Development Board

# Section II: System Data

## A. Retail Connections

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

| Water Use Category* | Active Retail Connections | | | |
|---|---|---|---|---|
| | Metered | Unmetered | Total Connections | Percent of Total Connections |
| Residential – Single Family | 430,799 | 0 | 430,799 | 36% |
| Residential – Multi-family (units) | 695,891 | 0 | 695,891 | 58% |
| Industrial | 276 | 0 | 276 | 0% |
| Commercial | 59,518 | 0 | 59,518 | 5% |
| Institutional | 4,443 | 0 | 4,443 | 0% |
| Agricultural | 0 | 0 | 0 | 0% |
| **TOTAL** | 1,190,927 | 0 | 1,190,927 | |

*For definitions on recommended customer categories for classifying customer water use, refer to the online Guidance and Methodology for Reporting on Water Conservation and Water Use.

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



| Water Use Category* | Net Number of New Retail Connections | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| Residential – Single Family | 2,137 | 3,009 | 2,857 | 823 | 6,745 |
| Residential – Multi-family (units) | 485 | -375 | 655,115 | -654,938 | 679,845 |
| Industrial | 199 | -232 | 186 | -182 | 118 |
| Commercial | -2,028 | -1,701 | 12,951 | -5,710 | 8,305 |
| Institutional | 12,842 | 8,618 | 129 | -184 | 257 |
| Agricultural | 0 | 8,083 | -8,083 | 0 | 0 |
| **TOTAL** | 13,635 | 17,402 | 663,155 | -660,191 | 695,270 |

*For definitions on recommended customer categories for classifying customer water use, refer to the online Guidance and Methodology for Reporting on Water Conservation and Water Use.

Texas Water Development Board

## B. Accounting Data

For the previous five years, enter the number of gallons of RETAIL water provided in each major water use category.

| Water Use Category* | Total Gallons of Retail Water | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| Residential - Single Family | 24,661,840,000 | 26,060,404,000 | 25,329,441,000 | 24,543,987,000 | 24,927,473,000 |
| Residential – Multi-family | 26,125,381,000 | 29,550,316,000 | 29,621,006,000 | 27,995,586,000 | 27,005,071,000 |
| Industrial | 1,778,745,000 | 966,351,000 | 2,131,771,000 | 1,770,954,000 | 1,821,450,000 |
| Commercial | 30,691,172,000 | 23,854,234,000 | 22,161,525,000 | 24,262,804,000 | 21,343,436,000 |
| Institutional | 3,277,037,000 | 5,325,849,000 | 5,077,866,000 | 6,062,976,000 | 6,391,710,000 |
| Agricultural | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | 86,534,175,000 | 85,757,154,000 | 84,321,609,000 | 84,636,307,000 | 81,489,140,000 |

*For definitions on recommended customer categories for classifying customer water use, refer to the online Guidance and Methodology for Reporting on Water Conservation and Water Use.

## C. Residential Water Use

For the previous five years, enter the residential GPCD for single family and multi-family units.

| Water Use Category* | Residential GPCD | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| Residential - Single Family | 39 | 31 | 27 | 27 | 27 |
| Residential – Multi-family | 31 | 35 | 32 | 31 | 29 |
| | | | | | |



## D. Annual and Seasonal Water Use

1. For the previous five years, enter the gallons of treated water provided to RETAIL customers.

| Month | Total Gallons of Treated Retail Water | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| January | 6,454,688,000 | 6,610,213,000 | 5,970,806,000 | 6,475,616,000 | 6,884,323,000 |
| February | 5,462,518,000 | 5,903,606,000 | 5,728,054,000 | 6,450,942,000 | 5,866,171,000 |
| March | 5,828,995,000 | 6,726,692,000 | 6,528,552,000 | 5,625,396,000 | 5,813,174,000 |
| April | 6,393,375,000 | 5,589,786,000 | 6,542,402,000 | 6,219,038,000 | 6,338,070,000 |
| May | 6,112,948,000 | 6,752,349,000 | 6,818,811,000 | 6,849,384,000 | 6,418,321,000 |
| June | 7,558,709,000 | 6,603,317,000 | 6,827,775,000 | 7,694,085,000 | 7,119,427,000 |
| July | 7,423,778,000 | 7,744,867,000 | 6,632,287,000 | 7,865,490,000 | 7,608,429,000 |
| August | 8,079,511,000 | 7,336,518,000 | 7,111,544,000 | 7,840,217,000 | 7,757,184,000 |
| September | 8,004,061,000 | 7,266,112,000 | 7,389,339,000 | 7,126,497,000 | 8,431,357,000 |
| October | 7,148,386,000 | 7,236,581,000 | 6,762,099,000 | 7,815,176,000 | 7,812,363,000 |
| November | 6,476,445,000 | 6,369,760,000 | 6,474,734,000 | 7,249,281,000 | 6,899,445,000 |
| December | 6,382,729,000 | 6,671,670,000 | 6,522,341,000 | 6,438,668,000 | 6,362,935,000 |
| **TOTAL** | 81,326,143,000 | 80,811,471,000 | 79,308,744,000 | 83,649,790,000 | 83,311,199,000 |

2. For the previous five years, enter the gallons of raw water provided to RETAIL customers.

| Month | Total Gallons of Raw Retail Water | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| January | 6,195,027,000 | 5,795,471,000 | 6,942,986,000 | 7,507,085,000 | 6,648,180,000 |
| February | 5,904,593,000 | 5,914,254,000 | 7,063,398,000 | 7,002,612,000 | 5,846,112,000 |
| March | 5,655,717,000 | 6,120,944,000 | 5,587,908,000 | 6,319,999,000 | 5,231,318,000 |
| April | 6,442,367,000 | 6,752,291,000 | 6,546,774,000 | 7,344,818,000 | 6,843,825,000 |
| May | 6,273,123,000 | 6,150,034,000 | 7,347,859,000 | 7,369,963,000 | 6,666,126,000 |
| June | 6,702,007,000 | 6,636,487,000 | 8,082,318,000 | 7,248,982,000 | 7,318,156,000 |
| July | 6,564,580,000 | 7,245,081,000 | 8,490,328,000 | 7,976,269,000 | 7,256,200,000 |
| August | 7,123,061,000 | 7,399,164,000 | 7,931,602,000 | 7,997,026,000 | 7,511,647,000 |
| September | 6,707,427,000 | 7,573,666,000 | 7,870,630,000 | 7,528,047,000 | 7,986,798,000 |
| October | 6,304,847,000 | 6,696,877,000 | 7,533,866,000 | 7,110,761,000 | 7,598,371,000 |
| November | 6,004,424,000 | 7,050,392,000 | 7,484,607,000 | 6,949,552,000 | 7,083,390,000 |
| December | 6,049,248,000 | 7,021,033,000 | 7,126,316,000 | 6,817,847,000 | 6,684,929,000 |
| **TOTAL** | 75,926,421,000 | 80,355,694,000 | 88,008,592,000 | 87,172,961,000 | 82,675,052,000 |

3. Summary of seasonal and annual water use.

| Water Use | Seasonal and Annual Water Use | | | | | Average in Gallons |
|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 | |
| Summer Retail (Treated + Raw) | 43,451,646,00 | 42,965,434,( | 45,075,854,0( | 46,622,069,0( | 44,571,043,0( | 44,537,209,200 / 5yr Average |
| TOTAL Retail (Treated + Raw) | 157,252,564,0 | 161,167,165 | 167,317,336,( | 170,822,751,( | 165,986,251,( | 164,509,213,400 / 5yr Average |



## E. Water Loss

Provide Water Loss data for the previous five years.

Water Loss GPCD = [Total Water Loss in Gallons ÷ Permanent Population Served] ÷ 365
Water Loss Percentage = [Total Water Loss ÷ Total System Input] x 100

| Year | Total Water Loss in Gallons | Water Loss in GPCD | Water Loss as a Percentage |
|---|---|---|---|
| 2019 | 23,441,484,560 | 27 | 21% |
| 2020 | 18,804,872,104 | 22 | 17% |
| 2021 | 20,158,476,311 | 22 | 19% |
| 2022 | 26,784,545,186 | 29 | 23% |
| 2023 | 34,246,986,578 | 37 | 28% |
| **5-year average** | 24,687,272,948 | 27 | 22% |

Texas Water Development Board

## F. Peak Water Use

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

| Year | Average Daily Use (gal) | Peak Day Use (gal) | Ratio (peak/avg) |
|---|---|---|---|
| 2019 | 457,000,000 | 567,000,000 | 1.24 |
| 2020 | 448,000,000 | 543,000,000 | 1.21 |
| 2021 | 446,000,000 | 531,000,000 | 1.19 |
| 2022 | 480,000,000 | 587,000,000 | 1.22 |
| 2023 | 499,000,000 | 659,000,000 | 1.32 |

## G. Summary of Historic Water Use

| Water Use Category | Historic 5-year Average | Percent of Connections | Percent of Water Use |
|---|---|---|---|
| Residential SF | 25,104,629,000 | 36% | % |
| Residential MF | 28,059,472,000 | 58% | % |
| Industrial | 1,693,854,200 | 0% | % |
| Commercial | 24,462,634,200 | 5% | % |
| Institutional | 5,227,087,600 | 0% | % |
| Agricultural | 0 | 0% | % |



## H. System Data Comment Section

Provide additional comments about system data below.

N/A

Texas Water Development Board

# Section III: Wastewater System Data

If you do not provide wastewater system services then you have completed the Utility Profile. Save and Print this form to submit with your Plan. Continue with the Water Conservation Plan Checklist to complete your Water Conservation Plan.

## A. Wastewater System Data (Attach a description of your wastewater system.)

1. Design capacity of wastewater treatment plant(s): 563,713,000 **gallons** per day.

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

| Water Use Category* | Active Wastewater Connections | | | |
|---|---|---|---|---|
| | Metered | Unmetered | Total Connections | Percent of Total Connections |
| Municipal | | | 0 | 0% |
| Industrial | | | 0 | 0% |
| Commercial | | | 0 | 0% |
| Institutional | | | 0 | 0% |
| Agricultural | | | 0 | 0% |
| **TOTAL** | 0 | 0 | 0 | |



2. What percent of water is serviced by the wastewater system? ____%

3. For the previous five years, enter the number of gallons of wastewater that was treated by the utility.

| Month | Total Gallons of Treated Wastewater | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| January | 7,982,299,000 | 7,746,894,000 | 8,343,684,000 | 8,180,984,000 | 9,400,874,000 |
| February | 6,299,465,000 | 6,728,960,000 | 6,671,031,000 | 6,935,802,000 | 7,693,308,000 |
| March | 6,521,389,000 | 7,361,880,000 | 7,237,052,000 | 6,957,346,000 | 7,217,141,000 |
| April | 7,428,474,000 | 7,017,600,000 | 6,729,930,000 | 6,695,145,000 | 7,104,330,000 |
| May | 9,156,172,000 | 7,488,360,000 | 10,561,390,000 | 7,633,902,000 | 9,420,001,000 |
| June | 7,177,623,000 | 6,708,000,000 | 9,473,055,000 | 7,829,043,000 | 8,459,010,000 |
| July | 6,855,030,000 | 7,125,260,000 | 9,807,309,000 | 7,937,845,000 | 7,070,201,000 |
| August | 6,357,480,000 | 8,092,953,000 | 7,502,580,000 | 7,340,577,000 | 7,240,298,000 |
| September | 6,429,000,000 | 6,852,960,000 | 7,822,398,000 | 9,075,711,000 | 8,949,570,000 |
| October | 7,268,260,000 | 6,349,197,000 | 8,294,940,000 | 6,854,227,000 | 7,569,704,000 |
| November | 7,503,039,000 | 8,036,481,000 | 7,308,600,000 | 7,168,380,000 | 7,503,039,000 |
| December | 6,904,540,000 | 7,261,449,000 | 7,528,660,000 | 8,824,215,000 | 6,904,540,000 |
| **TOTAL** | 85,882,771,000 | 86,769,994,000 | 97,280,629,000 | 91,433,177,000 | 94,532,016,000 |

4. Can treated wastewater be substituted for potable water?

○ Yes ◉ No

## B. Reuse Data

1. Provide data on the types of recycling and reuse activities implemented during the current reporting period.

| Type of Reuse | Total Annual Volume (in gallons) |
|---|---|
| On-site irrigation | 66,011,000 |
| Plant wash down | 13,576,690,000 |
| Chlorination/de-chlorination | 0 |
| Industrial | 0 |
| Landscape irrigation (parks, golf courses) | 3,302,406 |
| Agricultural | 0 |
| Discharge to surface water | 0 |
| Evaporation pond | 0 |
| Other | 0 |
| **TOTAL** | 13,646,003,406 |

## C. Wastewater System Data Comment

Provide additional comments about wastewater system data below.



**You have completed the Utility Profile. Save and Print this form to submit with your Plan. Continue with the Water Conservation Plan Checklist to complete your Water Conservation Plan.**

# APPENDIX E

# CITY OF HOUSTON DROUGHT CONTINGENCY AND EMERGENCY WATER MANAGEMENT PLAN

CITY OF HOUSTON

# DROUGHT CONTINGENCY PLAN

2024

**Prepared by:**
**PLUMMER | 1320 S. University Drive Suite 300 | Fort Worth, TX 76107**

HOUSTON PUBLIC WORKS

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# CITY OF HOUSTON
# DROUGHT CONTINGENCY PLAN
# FOR PUBLIC WATER SUPPLIES

**Texas Commission on Environmental Quality**
**Water Availability Division**
**MC-160, P.O. Box 13087 Austin, Texas 78711-3087**
**Telephone (512) 239-4600, FAX (512) 239-2214**

## Drought Contingency Plan
## for a Retail/Wholesale Public Water Supplier

This form is provided as a model of a drought contingency plan for a wholesale public water supplier. If you need assistance in completing this form or in developing your plan, please contact the Conservation Staff of the Resource Protection Team in the Water Availability Division at (512) 239-4600.

Drought Contingency Plans must be formally adopted by the governing body of the water provider and documentation of adoption must be submitted with the plan. For example, adoption by a City Council as an ordinance or by resolution of the entity's Board of Directors adopting the plan as administrative rules.

| | |
|---|---|
| Name: | City of Houston Public Works |
| Address: | 7000 Ardmore Street, Houston, TX 77054 |
| Telephone Number: | (713) 641-9507 Fax: (713) |
| Water Supplies Covered By This Plan: | City of Houston Main System (PWS #1010013), Willowchase (PWS #1011902), Kingwood (PWS #1010348), District 82 (PWS #1011593), Lake Houston Parks (PWS #1011587), Belleau Woods (PWS #1011594), District 73 (PWS #1011585) |
| Water Rights Numbers: | 2925-B, 4261-B, 4277-A, 4963-A, 4965-A, 5807, 5808, 5826, 5827 |
| Regional Planning Group: | Region H |
| Form Completed By: | Amanda Siebels |
| Title: | Senior Division Manager |
| Person Responsible for Implementation: | Amanda Siebels Phone: 832-395-2721 |
| Signature: | _____ Date: _____ |

# SECTION I: DECLARATION OF POLICY, PURPOSE, AND INTENT

In order to conserve the available water supply and/or to protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the City of Houston ("City") adopts the following Drought Contingency Plan ( "Plan").

# SECTION II: PUBLIC & WHOLESALE INVOLVEMENT

According to 30 TAC 288.20(a)(1)(A): *"Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting."*

The City provided opportunity for public input in the development of this Plan by the following means:

1. Making the draft plan available on City of Houston's website, **www.houstonpublicworks.org/waterconservation**
2. Providing the draft plan to anyone requesting a copy
3. Sending a notification to customers requesting feedback
4. Held a public meeting at the Houston City Hall at ____ p.m. on_____, 2024.

# SECTION III: PUBLIC & WHOLESALE CONTRACT EDUCATION

Houston Public Works will periodically provide the public and wholesale water contract customers with information about the Plan, including information about the conditions under which each Stage of the Plan is to be initiated or terminated and the drought response measures to be implemented in each Stage. This information will be provided by the means identified below:

1. Making the plan available to the public through the City of Houston's web site, **www.houstonpublicworks.org/waterconservation**
2. Notifying wholesale contract water customers through the Everbridge system and the wholesale Customer Contact application _____.

# SECTION IV: COORDINATION WITH REGIONAL WATER PLANNING GROUPS

The City of Houston is located within the Region H Water Planning Area. The City shall notify and coordinate with the chair of the Region H Water Planning Group (RHWPG) of this plan for their information and comment. The Plan will be reviewed by RHWPG to assure conformity and consistency with the regional water plan.

# SECTION V: AUTHORIZATION

At the request of the Director of Public Works or his/her designee, the Mayor may authorize and direct the implementation of the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. At the request of the Director of Public Works or his/her designee and based on his or her assessment of the situation, the Mayor shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

# SECTION VI: APPLICATION

The provisions of this Plan shall apply to all customers of the following City public water supplies:

1. Main System (PWS #1010013) – Surface Water & Groundwater
2. Isolated System - Willowchase (PWS #1011902) - Groundwater
3. Isolated System – Kingwood (PWS #1010348) - Groundwater
4. Isolated System - District 82 (PWS #1011593) – Groundwater
5. Isolated System - Lake Houston Parks (PWS #1011587) – Ground Water
6. Isolated System - Belleau Woods (PWS #1011594) – Purchased Surface & Groundwater
7. Isolated System – District 73 (PWS #1011585) – Groundwater

The terms “person” and “customer” as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities. The City of Houston Belleau Woods public water supply (TX ID# 1011594) is covered by this Plan, but as a purchased water system will follow the requirements of the Plan set forth by its water supplier, the City of Humble (TX ID# 1010014).

# SECTION VII: DEFINITIONS

The words and terms used in this plan shall have the following meaning unless the context clearly indicates otherwise.

1. **Aesthetic water use:** water used for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.
2. **Commercial water use**: Water use which is integral to the operations of commercial, non-profit, and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

3. **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 supply is conserved and made available for future or alternative uses.

4. **Contamination:** The presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality to constitute a health hazard or impair the usefulness of the water such that the water system cannot be used.

5. **Customer:** Any person, company, organization, or municipality using water supplied by the City of Houston.

6. **Director:** The City of Houston Public Works Director or designee.

7. **Drought:** An extended period of abnormally low precipitation that adversely affects growing or living conditions.

8. **Even number address:** Street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

9. **Impervious Surface:** Any structure, street, driveway, sidewalk, patio, or other surface area covered with brick, asphalt paving, tile or other impervious or nonporous material.

10. **Industrial water use:** The use of water in processes designed to convert materials of lower value into forms having greater usability and value.

11. **Landscape Watering:** The application of water to landscape trees, shrubs, plants, or grass to promote the health and/or growth of existing landscape plants.

12. **Non-essential water use**: Water use that is neither essential nor required for the protection of public health, safety, and welfare, including:

    a. Irrigation of landscaped areas, including parks, athletic fields, and golf courses, except as otherwise provided under this plan;
    b. Use of water to wash any motor vehicle, motor bike, boat, trailer, airplane, or other vehicle at any non-commercial establishment not designed for such purposes;
    c. Use of water to wash any sidewalks, walkways, driveways, parking lots, tennis courts, or other impervious surfaces;
    d. Use of water to wash buildings or structures for purposes other than immediate fire protection;
    e. Flushing gutters or permitting water to run or accumulate in any gutter or street;
    f. Use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;
    g. Use of water in fountain or pond for aesthetic or scenic purposes; except where necessary to support non-plant aquatic life; or
    h. Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s).

13. **Odd numbered address**: Street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

14. **Person or User:** The provisions of the plan shall apply to all persons, users, and property utilizing water provided by the City of Houston. The terms "person" and "user" as used in the plan includes individuals, corporations, partnerships, associations, and all other legal entities.

15. **Production capability:** The volume/amount a public water supplier can produce utilizing the current water resources and infrastructure.

16. **Raw Water:** Raw water is defined as water found in the environment that has not been treated and does not have any of its minerals, ions, particles, bacteria, or parasites removed. Raw water includes rainwater, groundwater, water from infiltration wells, and water from bodies like lakes and rivers.

17. **Reservoir:** The City of Houston raw water holding facilities, including Lake Livingston, Lake Conroe, and Lake Houston.

18. **Swimming Pool:** Any structure, basin, chamber, tank, or large tub, including hot tubs, containing water for swimming purposes, diving, or recreational bathing, and having a depth of two feet or more at any point.

19. **Water Emergency:** A water system failure due to weather, electrical or mechanical failure, contamination of source, extremely low river water allotment, or act of God or force majeure.

20. **Water supply:** the amount of water that is available to meet the immediate unrestricted customer demands based on the available water resources and infrastructure.

21. **Wholesale Contract Water user:** Potable water provided to a regional water authority, political subdivision, industrial user, or municipality who is not the ultimate user of the water.

# SECTION VIII: AUTHORIZATION, INITIATION, AND TERMINATION OF DROUGHT AND WATER EMERGENCY ACTION OR STAGES

The Public Works Director or his/her designee shall monitor water supply and/or demand conditions daily and shall determine when conditions suggest that initiation or termination of any Stage of the Plan is warranted, that is, when the specified “triggers” are reached. At the request of the Houston Public Works Director (“Director”) and based on his/her assessment of water utility conditions, the Mayor of the City of Houston (“Mayor”) may declare a drought or water emergency, to include any part of the drought and water emergency Stages listed herein.

During the period covered by the drought or water emergency, the Director will implement and direct such measures, as he or she may deem necessary, to be taken as set forth herein to include, but not by way of limitation, the implementation of the set-out Stages. Such other measures may be implemented as the Director may deem necessary or appropriate to respond to the drought or water emergency to bring the emergency to a close with the minimum loss of property and due consideration for the public health and safety. The City shall be responsible to see that all public notification, outreach education measures, and activities related to the drought or water emergency, and such restrictions and Stages, as have been implemented shall be taken.

In a declared drought or water emergency, any combination of management response options may be used system-wide or in any section of the region as circumstances may require in the judgment of the Director. Any of the measures provided for in this Plan shall be implemented so as not to adversely affect public safety, hospitals, or sanitary uses.

## 1. AUTHORIZATION

At the request of the Houston Public Works Director (“Director”) and based on his or her assessment of the situation, the Mayor of the City of Houston (“Mayor”) may declare a drought or water emergency in the event of any condition that significantly interrupts the ability of the City to supply water to its customers. Initially, actions based on this declaration will include any measure the Director deems as necessary to respond to the drought or water emergency, to include any part of the drought and water emergency Stages listed herein.

If the drought or water emergency is expected to continue for more than five (5) days:

a. The Director shall notify TCEQ within five (5) business days upon implementing any mandatory provisions of this plan, as prescribed in Title 30, Texas Administrative Code, Chapter 288, Subchapter B (288.20(b)), as amended; and

b. The Director shall make a report to the Mayor setting out the nature and expected severity of the drought or water emergency. At such a time, the Mayor will declare continuing use of the Plan.

## 2. INITIATION

In the event of a drought or water emergency, the Director will implement and direct such measures to be taken as set forth herein. Such measures may be implemented as the Director deems necessary or appropriate to respond to the drought or water emergency to bring the emergency to a close with the minimum loss of property and due consideration for public health and safety. The City shall be responsible to see that all public notification, outreach education measures, and activities related to the drought or water emergency, and such restrictions and Stages, as have been implemented shall be taken.

In a declared drought or water emergency, any combination of management response options may be used system-wide or in any section of the region as circumstances may require in the judgment of the Director. Any of the measures provided for in this Plan shall be implemented, conditioned that they will not adversely affect public safety, hospitals, or sanitary uses.

**3. TERMINATION**

The City, through the City staff, will monitor the drought or water emergency and promptly recommend that the Director request the Mayor to declare the drought or water emergency to be concluded. The termination of the declaration of a drought or water emergency shall be declared by the Mayor after receiving and reviewing a report from the Director.

Any Stage may end when the Mayor declares, based on the recommendation from the Director that the conditions leading to the declaration either no longer exist, have been mitigated, or have been escalated, and the Director files a written declaration to that effect with the City Secretary.

Upon termination of a declared drought Stage, and based on the prevailing conditions, the Mayor may declare adoption of a lesser drought Stage or an end to all drought Stages.

# SECTION IX: NOTIFICATION OF DROUGHT RESPONSE STAGES

Upon initiation of a drought Stage, the following public notification actions will be taken:

1. Public notification of the initiation of drought response Stages shall be by means of media alerts, press releases, social media outreach, and on the City's website at www.houstonpublicworks.org.
2. Customer email notifications, billing inserts, or on-bill messaging.
3. The Director, and/or designee, shall make notification to water contract customers upon initiation of the drought response Stages. They will be notified using the Everbridge notification system with a follow-up email. Contact between the Director, and/or designee, and water contract customers shall be maintained throughout drought conditions. Notification shall include a reminder that water will be distributed to all water contract customers pro rata, in accordance with Texas Water Code § 11.039.

# SECTION X: CRITERIA FOR INITIATION AND TERMINATION OF DROUGHT RESPONSE STAGES

The triggering criteria described below are based on:

1. Weather conditions, including rainfall and ambient temperatures, impact irrigation;
2. Combined total storage of surface water supply based on a calculated projection of monthly production of City water that includes historic production and information provided by customers;
3. Combined total storage of surface water supply based on a calculated projection of monthly production of City water based on a calculated projection of current water production (10-day rolling average);
4. Current water production (10-day rolling average) as a percent of the available treatment capacity;

5. Loss of a determined percent of available treatment capacity; and
6. Water pressure readings of a determined pounds per square inch or less throughout all or material portions of the City's treated water distribution system.

For any Stage, the Director's declaration, which may cover all or a portion of the City's water supply system, shall be in writing and filed with the City secretary.

## 1. STAGE I: ABNORMAL CONDITIONS (VOLUNTARY)

**a. Target: Achieve a FIVE percent reduction in OVERALL water use.**

**b. Triggers:**
When the Director finds that the City's water supply system is under stress because of lower-than-average annual rainfall, temperatures that are higher or lower than normal, or other circumstances Stage I will be implemented as follows:

**c. Measures:**
Under Stage I, the City of Houston will focus on, and ask customers for, voluntary reductions in water usage, unless otherwise stated in the declaration. All customers are encouraged to follow the water use restriction measures listed below:

**1. Customer Measures**

a. Voluntary Watering Restrictions

i. Voluntary two-day per week watering, with no watering between 8:00 AM and 7:00 PM, in conformity with the following schedule;
ii. Sundays and Thursdays for single-family residential customers with even-numbered street addresses;
iii. Saturdays and Wednesdays for single-family residential customers with odd-numbered street addresses; and
iv. Tuesdays and Fridays for all other customers.

b. Check for and repair all leaks, dripping faucets, and running toilets.

c. Check for and correct excessive irrigation or uncorrected leaks that result in City water leaving the customer's property by drainage onto adjacent properties, or public or private roadways, or streets or gutters.

d. Power washing for health and safety reasons only is encouraged.

e. Washing of cars only at carwash facilities is encouraged.

**2. Utility Measures**

a. Notify water contract customers of actions being taken in the City of Houston and require implementation of similar procedures.

b. Increase public education efforts on ways to reduce water use;

c. Review the problems that caused the initiation of Stage I;

d. Notify major water users and work with them to achieve voluntary water use reductions;

e. Intensify efforts on leak detection and repair;

f. Reduce non-essential City government water use, including street cleaning, vehicle washing, and operation of ornamental fountains; and

g. Reduce City government water use for landscape irrigation.

**d. Termination:**

A Stage I water shortage ends when the Mayor declares, based on the recommendation from the Director that the severe conditions leading to the declaration either no longer exist, have been mitigated, or have been escalated, and the Director files a written declaration to that effect with the City secretary.

## 2. STAGE II: SEVERE CONDITIONS (MANDATORY)

**a. Target: Achieve a TEN percent reduction in OVERALL water use.**

**b. Triggers:**

Triggers (1) through (5) apply to the main system, and triggers (3) to (5) apply to the isolated systems, as defined under Section VII.

1. Combined total storage of surface water supply is less than 24 months, based on a calculated projection of monthly production of City water that includes historic production and information provided by customers;
2. Combined total storage of surface water supply is less than 16 months, based on a calculated projection of current water production for the most recent 24-hour period;
3. Current water production is 80 percent of the available treatment capacity;
4. Loss of approximately 20 percent of available treatment capacity; or
5. Water pressure readings of 45 pounds per square inch or less throughout all or material portions of the City's treated water distribution system.

**c. Measures:**

All Stage I measures remain in effect. Additionally:

**1. Customer Measures**

a. During a Stage II water shortage, unless otherwise stated in the declaration, all classes of customers are subject to mandatory restrictions of outdoor use.

During a Stage II water shortage, outdoor use shall be unlawful except for the following time periods as specified in the declaration:

i. Between 8:00 a.m. and 7:00 p.m. of the following day on no more than two days per week in conformity with the following schedule: a. Sundays and Thursdays for single-family residential customers with even-numbered street addresses; and b. Saturdays and Wednesdays for single-family residential customers with odd-numbered street addresses; and c. Tuesdays and Fridays for all other customers; or

ii. Between 8:00 a.m. and 7:00 p.m. of the following day on no more than one day per week in conformity with the following schedule: a. Saturdays for single-family residential customers with odd-numbered addresses; b. Sundays for single-family residential customers with even-numbered addresses; and c. Tuesdays for all other customers.

b. Any outdoor water use resulting in water leaving the customer's property by drainage onto adjacent properties, public or private roadways and/or streets, or gutters shall be deemed unlawful.

c. Unrepaired indoor owner leaks shall be deemed unlawful.

d. Excessive irrigation or uncorrected leaks that result in City water leaving the customer's property by drainage onto adjacent properties, or public or private roadways, or streets or gutters shall be deemed unlawful.

e. Power washing is permitted for health and safety reasons only.

f. Washing of cars is permitted only at carwash facilities.

**2. Utility Measures**

a. Review the problems that caused the initiation of Stage II.

b. Notify major water users and work with them to achieve mandatory water use reductions; and

c. Eliminate non-essential City government water use, including street cleaning, vehicle washing, and operation of ornamental fountains; and

d. Reduce City government water use for landscape irrigation; and

e. Notify water contract customers of actions being taken in the City of Houston and require implementation of similar procedures.

**d. Termination:**

A Stage II water shortage ends when the Mayor declares, based on the recommendation from the Director that the severe conditions leading to the declaration either no longer exist, have been mitigated, or have been escalated, and the Director files a written declaration to that effect with the City secretary.

## 3. STAGE III: EXTREME CONDITIONS (MANDATORY)

**a. Target: Achieve a TWENTY percent reduction in OVERALL water use.**

**b. Triggers:**
Triggers (1) through (5) apply to the main system, and triggers (3) to (5) apply to the isolated systems, as defined under Section VII.

1. Combined total storage of surface water supply is less than 18 months, based on a calculated projection of monthly production of City water that includes historic production and information provided by customers;

2. Combined total storage of surface water supply is less than 12 months, based on a calculated projection of current water production for the most recent 24-hour period;

3. Current water production is 85 percent of the available treatment capacity;

4. Loss of approximately 25 percent of available treatment capacity; or

5. Water pressure readings of 40 pounds per square inch or less throughout all or material portions of the City's treated water distribution system.

**c. Measures:**
All Stage I and Stage II drought management response options shall remain in effect. Additionally:

**1. Customer Measures**

a. Residential users will be limited to no more than 5,000 gallons per month;

b. Non-residential users will reduce usage by 10%; and

c. Establishment of new landscape is prohibited.

**2. Utility Measures**

a. Suspend non-essential City government water use, including street cleaning, vehicle washing, and operation of ornamental fountains;

b. Suspend City government water use for landscape irrigation; and

c. Notify water contract customers of actions being taken in the City of Houston and require implementation of similar procedures.

**d. Termination:**
A Stage III water shortage ends when the Mayor declares, based on the recommendation from the Director that the severe conditions leading to the declaration either no longer exist, have been mitigated, or have been escalated,

and the Director files a written declaration to that effect with the City secretary.

## 4. STAGE IV: EXCEPTIONAL CONDITIONS (MANDATORY)

**a. Target: Achieve a THIRTY-FIVE percent reduction in OVERALL water use.**

**b. Triggers:**
Triggers (1) through (5) apply to the main system, and triggers (3) to (5) apply to the isolated systems, as defined under Section VII.

1. Combined total storage of surface water supply is less than 12 months, based on a calculated projection of monthly production of City water that includes historic production and information provided by customers;

2. Combined total storage of surface water supply is less than 6 months, based on a calculated projection of current water production for the most recent 24-hour period;

3. Current water production is 90 percent of the available treatment capacity;

4. Loss of approximately 20 percent of available treatment capacity and or production capacity; or

5. Water pressure readings of 35 pounds per square inch or less throughout all or material portions of the City's treated water distribution system.

**c. Measures:**
All Stage I, II and III drought management response options shall remain in effect. Additionally:

**1. Customer Measures**

a. During a Stage IV water shortage, the following acts or omissions shall be unlawful:

i. All outdoor use;

ii. Use of more than 4,000 gallons of City water per month by single-family residential customers;

iii. Use of more than 4,000 gallons of City water per month (used per unit, as provided in section 47-71 of City of Houston Code of Ordinance) by multi-family residential customers; and

iv. For all customers other than residential customers, failure to reduce use of City water by 15 percent of baseline usage, or any other percentage if recommended by the Director and adopted by city council in the Stage IV water shortage declaration.

2. **Utility Measures**

    a. During a Stage IV water shortage, the Director may authorize a ten percent rate reduction for water usage to customers for reductions of City water use by 20 percent or more than those restrictions set forth in subsection (d), except that the ten percent rate reduction shall not be available to customers whose average monthly usage during the preceding 12-month period was less than 4,000 gallons. The rate reduction for water usage shall be effective for the duration of the existing water shortage period.

    b. Immediately upon the declaration of a Stage IV water shortage, the City may claim force majeure to all its existing water service contracts consistent with the terms of such water service contracts and in accordance with applicable state law.

    c. Notify water contract customers of actions being taken in the City of Houston and require implementation of similar procedures.

d. **Termination:**
A Stage IV water shortage ends when the Mayor declares, based on the recommendation from the Director that the severe conditions leading to the declaration either no longer exist, have been mitigated, or have been escalated, and the Director files a written declaration to that effect with the City secretary.

# SECTION XI: PRO RATA CURTAILMENT

If the triggering criteria specified in Section X of the Plan for Stage IV – Exceptional Conditions have been met, the Director of Public Works is hereby authorized to initiate allocation of water supplies on a pro rata basis in accordance with Texas Water Code, §11.039.

# SECTION XII: CONTRACT PROVISIONS

The City of Houston Public Works Department will include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039.

# SECTION XIII: ENFORCEMENT

Mandatory water use restrictions may be imposed in Stages II, III, and IV. These mandatory water use restrictions will be enforced by warnings and penalties as follows:

1. On the first violation, customers will be given a written warning that they have violated the mandatory water use restriction.
2. On the second and subsequent violations, citations may be issued to customers, with minimum and maximum fines of $100.00 to $2,000.00.
3. After three violations have occurred, the utility may cut off water service to the customer.

# SECTION XIV: VARIANCES

Variances shall be applied for online. Houston Public Works will make a variance process available on their website, with detailed instructions on how to file.

The utility official may grant in writing a temporary variance for an otherwise prohibited water use if the utility official determines that:

1. Failure to grant the variance would cause an emergency condition immediately threatening the life, safety, welfare, or fire protection of the public, the person requesting the variance, or the environment;
2. The applicant cannot comply with the prohibition for technical reasons; or
3. The applicant agrees to implement alternative methods that will achieve the same or a greater level of reduction in water use.

# SECTION XV: COORDINATION WITH WATER CONTRACT CUSTOMERS

In accordance with Texas Water Code Section 11.039, when necessary, as determined by the Director, water deliveries to water contract customers shall be curtailed on a pro-rata basis. Every water contract entered or renewed after adoption of this Plan, including contract extensions, shall include a provision that in the case of a drought or water emergency declaration, water to be distributed shall be done so in accordance with Texas Water Code Section 11.039.

1. The City of Houston will work with our contract customers to ensure their drought Stages meet or exceed our reduction goals.
2. During drought Stages, the City of Houston will work with local subsidence districts and contract customers to increase groundwater production where possible and reduce stress on the main system.
3. During any drought Stage, the City of Houston may exercise the option to suspend the minimum amount of water specified under the “Take or Pay” provision of a customer’s water supply contract.

# SECTION XVI: SYSTEM OUTAGE OR SUPPLY CONTAMINATION

The City of Houston will notify the TCEQ Regional Office as soon as communication can be established.

# SECTION XVII:  APPEALS

The Property Owner or applicant for a new development has the right of appeal pursuant to the Director of any adverse determination.

# SECTION XVIII: SEVERABILITY

If any provision, paragraph, word, or section of this Plan is invalidated by a court of competent jurisdiction, the remaining provisions, paragraphs, words, or sections shall remain in full force and effect and shall be read or interpreted so as to give effect to the purpose of this Plan.

# SECTION XIX: SAVINGS

This Plan is part of the Rules and Regulations adopted by the City of Houston, and save and except as amended hereby, the remaining provisions of the City of Houston shall remain in full force and effect.

# SECTION XX: REVIEW AND UPDATE OF DROUGHT AND WATER EMERGENCY RESPONSE PLAN

As required by TCEQ rules, the City of Houston will review this Drought and Emergency Response Plan no later than May 1, 2024, and every five years after that date to coincide with RHWPG. The Plan will be updated as appropriate based on new or updated information. As the plan is reviewed and subsequently updated, a copy of the revised Plan will be kept on file at the City of Houston Main Public Library and submitted to the RCHWPG for their records.

# SECTION XXI: EFFECTIVE DATE

This Plan shall be and become effective from and after its adoption hereby and shall remain in effect until otherwise amended by the City of Houston or operation of law.

**PASSED, APPROVED and ADOPTED RULES AND REGULATIONS CONCERNING DROUGHT AND WATER EMERGENCY RESPONSE PLAN** at a regularly scheduled meeting of the City of Houston City Council, this *fill in Council adoption date*, at which meeting a quorum was present, said meeting being held in accordance with the provisions of V.T.C.A., Government Code, Sections 551.001 et. seq.

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**This is the final version of the City of Houston's 2024 Drought Contingency Plan, as approved and adopted by the Houston Council on _____, 2024, after incorporation of comments received from _____ of the Texas Commission on Environmental Quality on _____, 2024.**

# APPENDIX F

# LETTER TO REGION H WATER PLANNING GROUP

HOUSTON PUBLIC WORKS

John Whitmire
Mayor

Carol Ellinger Haddock
Director
P.O. Box 1562
Houston, TX 77251-1562

832 395 2500
www.publicworks.houstontx.gov

March 26, 2024

Mr. Mark Evans
Chair, Region H Water Planning Group
3648 Cypress Creek Parkway #110
Houston, TX 77068

**Re: 2024 City of Houston Water Conservation Plan**

Dear Mr. Evans,

Enclosed please find a copy of the 2024 City of Houston Water Conservation Plan, which is submitted to the Regional H Water Planning Group in accordance with 30 T.A.C. Chapter 288. This plan, which includes the 2024 City of Houston Drought Contingency Plan, is the required 5-year update to the 2019 City of Houston Water Conservation Plan. Additional copies have been provided to the Texas Commission on Environmental Quality and the Texas Water Development Board.

Best Regards,

Ekaterina Fitos
Planning Director
Houston Water

Cc. Greg Eyerly, Deputy Director
Mandi Siebels, P.E., Senior Division Manager

# APPENDIX G

# CITY COUNCIL RESOLUTION OF ADOPTION

[City Council Resolution Placeholder Page]