

# REGIONAL LANDSCAPE INITIATIVES

BEST MANAGEMENT PRACTICES FOR  
NORTH TEXAS WATER CONSERVATION PROGRAMS



## COLLABORATIVE EFFORT BY:

Dallas Water Utilities  
North Texas Municipal Water District  
Tarrant Regional Water District  
Upper Trinity Regional Water District

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This document was made in collaboration with the North Texas Regional Water Providers to be a guide of best management practices to reduce water waste and encourage long-term water conservation.

The North Texas Regional Water Providers are comprised of:  
Dallas Water Utilities  
North Texas Municipal Water District  
Tarrant Regional Water District  
Upper Trinity Regional Water District





## THE NORTH TEXAS REGIONAL WATER PROVIDERS BELIEVE:

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- Waters of the state are of limited supply and are subject to ever-increasing demands.
- The continuation of Texas's economic prosperity depends on the availability of adequate water supplies for future uses.
- The North Texas Regional Water Providers strategy is to promote the conservation and efficient use of water and to prevent the waste of this valuable resource.
- Landscapes are essential to the quality of life in North Texas by providing areas for active and passive recreation.
- Landscapes enhancing to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development.
- Landscape design, installation, maintenance, and management can and should be water efficient.
- The right to use water is limited to the amount reasonably required for the beneficial use to be served, and the right does not and shall not extend to waste or unreasonable methods of use.

## NORTH TEXAS REGIONAL WATER PROVIDERS AGREE TO LANDSCAPE BEST MANAGEMENT PRACTICES THAT:

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- Promote the values and benefits of landscaping practices that integrate and go beyond conservation and efficient water use.
- Establish provisions for water management practices and water waste prevention for existing landscapes.
- Promote the benefits of consistent landscape ordinances and BMPs with neighboring local and regional agencies in North Texas.

# PROMOTION OF ET-BASED WEEKLY WATERING ADVICE AND RECOMMENDATIONS

## BACKGROUND, IMPORTANCE AND BENEFITS

This BMP can be useful for cities with a significant percentage of customers using automated landscape irrigation systems. It applies to single and multi-family residences, commercial, industrial, and institutional customers.

A common practice among these user groups is to set the irrigation controller once, forgetting to make adjustments, and allowing water to be applied whether the landscape needs it or not based on recent rainfall and actual water needs. This leads to substantial overwatering and possible diseases that can be detrimental to plant health.

Water providers in the Dallas-Fort Worth area sponsor weather stations to collect daily weather data and provide the most accurate watering recommendations. Many cities in the Dallas-Fort Worth area can already take advantage of these ET-based recommendations and incorporate them into their water conservation programs, at no cost to the city.

Providing evapotranspiration (ET)-based weekly watering recommendations can reduce the amount of water applied for outdoor watering if customers follow the guidance.

A drawback with this BMP is the adoption rate. Since these recommendations may change every week, it requires customers to adjust their controllers more often.

Some customers may prefer to set their sprinkler controller once and follow a regular schedule. In this scenario, it may be better to encourage them to follow the twice-weekly watering recommendation instead.

### ***Evapotranspiration (ET):***

*The combined amount of water transpired by plants and the water evaporated from the soil.*

It is dependent on several factors, including:

- Temperature
- Humidity
- Wind
- Solar radiation
- Type of plant

The purpose of providing ET-based recommendations is to apply the amount of supplemental irrigation necessary to replace the water lost to ET, which was not met by rainfall.

Example: A weekly potential ET value of 1.5 inches with a warm-season turf coefficient of 0.6 and a normal stress quality factor of 0.6 with no rainfall results in a weekly watering recommendation of 0.5" for the lawn.



# CASE STUDIES

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## *Water My Yard*

The Texas A&M AgriLife Extension Service (AgriLife) and North Texas Municipal Water District (NTMWD) partnered together to create the 'Water My Yard' online tool and app that provides weekly ET-based lawn watering recommendations.

'Water My Yard' is an online platform where homeowners can sign up to receive weekly recommendations based on their location and a few specifications about their sprinkler system. Users can then choose to accept the recommendations by email, text, or both. Local weather data is derived from multiple weather stations that NTMWD sponsors.

Additional sponsors have joined the program to provide 'Water My Yard' to their respective service areas, including the Upper Trinity Regional Water District, Lower Colorado River Authority, and the Cities of Irving, Bryan, and College Station.

## *Weekly Watering Advice*

Tarrant Regional Water District (TRWD) and Dallas Water Utilities (DWU) also provide weekly watering recommendations for most of North Texas, based on data from weather stations scattered throughout the Dallas-Fort Worth area.

These recommendations are distributed by email and text every week from the 'Water Is Awesome' website. These recommendations are provided in inches of water needed and the number of minutes necessary to apply that amount of water for spray, rotor, and multi-stream sprinklers.

## *WaterWise Newsletter*

The City of Frisco provides weekly lawn watering advice on the city's website and through the WaterWise Newsletter distributed to subscribers every Monday. Frisco has a weather station they use to determine how much water is needed for each particular week.

## TALKING POINTS

- Providing ET-based recommendations reduces wasteful watering habits such as overwatering and runoff, and promotes healthy lawn care that reduces diseases from affecting the lawn and plants.
- Weekly watering recommendations are based on the past week's weather conditions and the ET rate of warm-season grass and suggest only applying the amount of water needed to replace what was lost.
- Many local cities already have access to these recommendations through the participation of the major water providers sponsoring local weather stations and programs.
- Weekly recommendations can be distributed through email, text, or Facebook posts.

## ADDITIONAL LINKS AND RESOURCES

[Texas ET Network](#)

[Water My Yard](#)

[Water Is Awesome](#)

[City of Frisco Water Resources](#)

# RECOMMENDED PLANT LIST

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## BACKGROUND, IMPORTANCE AND BENEFITS

The North Central Texas region has a history of promoting native and adapted plants in the area through the North Central Texas Council Of Government's (NCTCOG) Texas SmartScape program. Many water conservation educators also handle stormwater pollution prevention, and this BMP straddles messaging related to both water conservation and water quality. Many local master gardener associations and extension agents also have recommended plant lists. These lists can be tailored to various audiences—residents, local nurseries, landscapers, parks and recreation staff, etc. However, merely having a plant list is not enough; it needs to be promoted through public outreach and demonstration gardens or used in public landscapes and right-of-ways.

One key strategy is to partner with other organizations that promote native and drought-tolerant plants. The NCTCOG Public Education Task Force oversees the Texas SmartScape program. Texas SmartScape provides customizable promotional materials, and the website promotes regional events, Texas SmartScape Month materials, and educational information. Local cities can partner with nurseries to use the Texas SmartScape stickers on native and drought-tolerant plants. It is best to do this during specific sales events since it can be a challenge to ensure proper use of the Texas SmartScape stickers during regular business year-round.

Another strategy is to collaborate with city facilities and the departments responsible for their landscapes to promote native and drought-tolerant plants. Highlighting these facility landscapes provides residents with the opportunity to view the plants in action. Signage at these locations is another way to raise awareness amongst the foot traffic at city facilities.

Partnering with local master gardeners, garden clubs, and organizations to host native and adapted plant classes is another great way to raise awareness. March is Texas SmartScape Month in North Texas, which gives many opportunities to partner and promote on a local and regional level. Cities across the region conduct awareness campaigns, plant sales, and classes.



### TALKING POINTS

- Native and adapted landscapes are more than rocks, cactus, and desert. These plants offer rich diversity and variety for landscapes beyond turf grass.
- Native and adapted plants are suited to the climate and soil conditions of North Texas, making them more drought-tolerant and pest/disease resistant.
- Native and adapted plants attract beneficial animals and insects to landscapes such as birds, bees, and butterflies.
- Native and adapted plants require less water, fertilizer, and pesticides which promotes water conservation and reduces polluted runoff to local waterways.



# CASE STUDIES

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## *Newcomer's Guide to Gardening in North Texas*

The Dallas-Fort Worth area is one of the fastest-growing regions in the country. Many people moving to the area are not familiar with the plants, soil, wildlife, and water challenges of the region. In 2017, the City of Allen worked with Texas A&M AgriLife Extension in Collin County to create the Newcomer's Guide to Gardening in North Texas. When the City of McKinney took over the program for the region, its popularity grew significantly. [Newcomer's Guide to Gardening in North Texas](#) program is targeted to new homeowners moving to North Texas. The popularity of the event has grown every year, with hundreds of people attending each event.

## *Texas SmartScape*

The Texas SmartScape program was created in response to new stormwater regulations in 1999 by a task force within the North Central Texas Council of Governments. The program was one tool cities could use to be in compliance with public education and outreach criteria of the MS4 stormwater permit. The program includes an extensive plant database, a calendar of local plant sales and education events, design tips, and resources staff can use to promote native and drought-tolerant plants to customers. The program is a regional effort, which also helps to amplify reach and foster brand recognition.



## ADDITIONAL LINKS AND RESOURCES

[Texas SmartScape](#)

[North Central Texas Council of Governments' Texas SmartScape Program](#)

[Lady Bird Johnson Wildflower Center-North Texas](#)

[Native Plant Society of Texas](#)

[Texas Superstar](#)

[National Wildlife Foundation Native Plant Finder](#)

[City of Richardson Drought Tolerant Plant List](#)

[City of Irving Guide to Using Native Plants](#)

# ADDITIONAL WATER SAVING MEASURES FOR NEW IRRIGATION SYSTEM REQUIREMENTS

## BACKGROUND, IMPORTANCE AND BENEFITS

*In 2007, The 80<sup>th</sup> Texas Legislature passed House Bill 1656, Senate Bill 3, and House Bill 4 related to regulating irrigation systems and irrigators by adopting minimum standards and specifications for designing, installing, and operating irrigation systems.*

The Texas legislation required cities with a population over 20,000 to develop a landscape irrigation program that includes permitting, inspection, and enforcement of water conservation for new irrigation systems. The landscape irrigation rules must have been adopted to comply with the January 1, 2009, effective date.

In 2008, staff from many area cities participated in a regional committee that provided comments to the Texas Commission on Environmental Quality (TCEQ) rule-making process, reviewed the adopted rules, and drafted a recommended ordinance for North Central Texas municipalities.

The regional committee ordinance recommended additional requirements above the minimum standards to increase water conservation in new irrigation systems.

Participating cities included:

- Arlington
- Bedford
- Burleson
- Carrollton
- Dallas
- Denton
- Fort Worth
- Frisco
- Grand Prairie
- Mansfield
- North Richland Hills
- Southlake



### Planning for Growth

The benefit of the irrigation rules is directly related to water conservation and the Region C Water Planning Group Plan.

In the North Central Texas region, the estimated population of 7,504,000 in 2020 will increase to 14,348,000 by 2070.

Region C's long-term water supply strategy states that 27% of the new water supplies will come from conservation and reuse to meet the water demands of 2070.

An estimated 30-60% of treated water is applied to landscapes during the summer months, and up to 50% is wasted due to runoff, overwatering, and evaporation.

# CASE STUDIES

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## *Above and Beyond Standards*

Many cities within the area have adopted irrigation system standards above the minimum state requirements, including:

- Allen
- Arlington
- Dallas
- Fort Worth
- Frisco
- Mansfield

There are many standards above the minimum state requirements that any city can adopt. Here are a few common standards North Texas cities have adopted:

- Requiring all non-turf landscape areas included in the irrigation plan to be designed with:
  - Subsurface irrigation
  - Drip irrigation
  - Pressure compensating tubing
- Requiring a flow control master valve to be installed on the backflow prevention device's discharge side on all new installations.
- Requiring check valves where elevation differences may result in low head drainage.
- Requiring pop-up heads to be installed at grade level and operated to extend above all landscape turfgrass.
- Requiring an "operational" rain and freeze sensor.

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***Find these commonly adopted and additional standards in Appendix B.***



## TALKING POINTS

- State statutes already require minimum irrigation system standards.
- Irrigation efficiency is crucial to meeting long-term water supply goals.
- Irrigation technology has advanced significantly over the last ten years and local ordinances should be reviewed and updated if needed.



## ADDITIONAL LINKS AND RESOURCES

[TCEQ Landscape Irrigation Standards and Requirements](#)

[2017 State Water Plan](#)



# YEAR-ROUND TWICE PER WEEK WATERING SCHEDULES

## BACKGROUND, IMPORTANCE AND BENEFITS

A mandatory maximum twice-weekly watering schedule as a BMP has been gradually gaining acceptance in the North Texas region and the state. Generally, "day of the week" irrigation schedules are based either on even/odd address numbers, trash/recycling pick-up days, or geographic areas related to distribution pressure zones. The assigned watering schedules apply to all customer types: residential (single-family and multi-family) and industrial, commercial, institutional (ICI). The schedules apply to automatic irrigation systems and hose-end landscape sprinklers but usually do not apply to soaker hoses, drip irrigation, or hand watering.

Some cities have considered the implementation of twice-weekly watering without a mandatory schedule. In this scenario, the provider would leave the schedule up to the customer so a twice-weekly schedule could be on whatever days the customer chooses. However, voluntary twice-weekly watering cannot be affordably verified or enforced. Communities with remote read meters are better equipped to consider a voluntary schedule, provided they can run useful reports and effectively communicate with customers.

The benefit of a mandatory maximum watering schedule is to reduce landscape overwatering, which is common with the use of automatic irrigation systems. Overwatering landscapes can also occur using hose-end sprinklers but is less likely due to the additional effort required.

Cities with mandatory twice-weekly watering schedules find that customer resistance usually ends after one growing season. After that experience, customers see that the two-day schedule is ample for healthy landscapes.

**NOTE:** This BMP could be improved with the inclusion of BMP 1 (ET-Based Weekly Watering Advice/Recommendations) since landscapes frequently need less than twice-weekly watering.

### TALKING POINTS

- Automatic irrigation systems have made watering landscapes much more effortless. The American Water Works Association (AWWA) estimates automated systems use 35% more water than those irrigating with a hose-end sprinkler. If those automatic systems routinely use the automatic timer function, they use an additional 47% more water than those who manually operate their in-ground systems. The amount of water wasted with a "set it and forget it" mindset is not sustainable for future population growth and our finite water resources.
- Twice weekly watering can result in 8-10% savings and may be an effective way to manage peaks in watering throughout the summer months.
- Deep and infrequent watering is best for the development of a healthy turfgrass root system. Deep roots make lawns more resistant to heat and winter freezes and prevent erosion.
- Many North Texas horticulturists have endorsed twice-weekly watering as more than sufficient for landscapes in the region, even in the heat of summer.





# CASE STUDIES

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## *Dallas Water Utilities*

Dallas Water Utilities (DWU) was the first city in North Texas to adopt a mandatory maximum twice-weekly watering schedule as a conservation measure in 2012. DWU has experienced an average reduction of 13% of their total pumpage (combined retail and wholesale customers) since 2012, with an average 16% reduction on their non-watering days.

## *North Texas Municipal Water District*

Freese and Nichols, Inc. (FNI) performed an analysis on twice per week watering for the North Texas Municipal Water District (NTMWD) from 2015 to 2017. NTMWD serves 1.7 million customers across multiple north Dallas suburbs. The district invests in conservation education and reuse and currently has a mandatory, twice per week watering restriction in April-October and one time per week November-March. FNI built a model to predict water use during periods without drought restrictions. This model was then used during drought conditions to estimate what water use would have been without restrictions. The savings were calculated by finding the difference between modeled water use and observed water use. The model took the average daily pumping with weather-corrected trends, days since last rainfall, maximum temperature, and precipitation. Ultimately, FNI determined that NTMWD's twice-per-week watering schedule attributed to a 2.5-3% water savings.

## *Texas Water Development Board*

In 2015, the Texas Legislature appropriated funds to the Texas Water Development Board (TWDB) to fund a research project principally charged with determining the savings of municipal water conservation activities being implemented in relation to the recommended municipal conservation water management strategy supply volumes in the 2017 State Water

Plan. The project was also tasked with identifying activities that participating water utilities could pursue to meet future goals.

TWDB interviewed and collected data from 170 utilities that ultimately participated, measuring and quantifying more than 547 individual conservation activities. Percent reduction for twice per week watering measures was between 2.74 percent and 13.47 percent of total demand based on the percentage of outdoor water use by single-family customers.

## **Terms to know:**

### **System Impacts:**

Some cities are concerned that their distribution systems can't handle the differing demands of twice-weekly watering schedules. But many systems have successfully resolved that concern by assigning irrigation schedules based on trash pick-up schedules, neighborhoods, or other geographic areas.

### **Variations:**

Large properties, site-specific soil conditions, etc., may not be feasible for a twice-weekly schedule, so many communities offer variations that can be requested and granted as appropriate.

### **Cool Season Grasses:**

Allowing variations to grow cool season grasses in winter should be discouraged as an inefficient use of a limited resource. Some cities may allow variations, and some have decided not to. In drought conditions, variations should not be considered for cool-season grasses.

## ADDITIONAL LINKS AND RESOURCES

[TWDB Statewide Water Conservation Quantification Project](#)

[2020 North Texas Outdoor Watering Summit Resources](#)

# TIME OF DAY WATERING SCHEDULES

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## BACKGROUND, IMPORTANCE AND BENEFITS

Although the primary purpose of this best management practice (BMP) is to reduce wind drift and evaporation losses during the active growing season, defined under this BMP as the period from April 1 to October 31, this time of day restriction may apply throughout the year.

Many Texas cities have adopted either year-round time of day watering schedules or period-specific time of day watering schedules tied to growing seasons or drought management stages. Whether year-round or period-specific, these adopted time of day schedules intend to increase efficiencies by eliminating outdoor irrigation use when climatic factors negatively impact irrigation system efficiencies.

In terms of landscape irrigation, midday is not an optimal time to irrigate because evapotranspiration rates are higher, and plants are more susceptible to stress associated with factors such as higher temperatures and lower relative humidity.

**Under normal circumstances, landscape watering with an irrigation system or sprinkler is permitted on authorized watering days, before 10 a.m. or after 6 p.m.**

### TALKING POINTS

- Many cities within the DFW Metroplex adopted a time of date watering schedule over ten years ago, and it has become a community standard for many residents.
- The main reason to consider adopting this BMP is to reduce water waste related to irrigation systems.
- By reducing losses associated with evaporation and wind drift, it is possible to increase irrigation efficiency by 15 percent.
- Evapotranspiration is typically the highest during the hottest hours of the day, generally between 10:00 a.m. and 6:00 p.m.
- The probability of drift from an operating irrigation system is also greater due to typically higher wind speeds during the day.



# CASE STUDIES

The following is a sampling of local Texas cities with either adopted year-round or period-specific time of day watering schedules.

<b>Year-Round Time of Day Watering Schedules</b>
Arlington, TX
Fort Worth, TX
Frisco, TX
Garland, TX
Grapevine, TX
Mansfield, TX
Southlake, TX

<b>Period-Specific Time of Day Watering Schedules</b>	
<b>Apr 1 - Oct 31</b>	<b>Apr 1 - Sept 30</b>
Allen, TX	Irving, TX
Dallas, TX	
Flower Mound, TX	<b>May 1 - Sept 30</b>
McKinney, TX	Lewisville, TX
Mesquite, TX	Highland Village, TX
Plano, TX	
Sachse, TX	<b>June 1 - Sept 30</b>
University Park, TX	Denton, TX

## **Terms to know:**

### **Evapotranspiration**

Evapotranspiration is the combination of water loss by transpiration of plants and evaporation from soil and plant surfaces.

### **Preventing Stress**

Prevent plant stress by ensuring an adequate supply of water within the root zone to allow the plant to better deal with the day's heat.

### **Relative Humidity**

Relative humidity and evapotranspiration have an inverse relationship. When relative humidity increases, evapotranspiration decreases, and when relative humidity decreases evapotranspiration increases.

### **Drift**

The probability of drift from an operating irrigation system is greater due to typically higher wind speeds during the day.

### **Drift and Evaporation Losses – Day vs. Night**

The best time to begin irrigation is after nightfall and, more specifically, early morning. Night-time temperatures and wind speeds are much lower, which means lower evaporative losses during irrigation. Night-time humidity is higher, which also reduces evaporation. Estimates of water losses attributed to drift and evaporation can range from 20 to 30 percent during the day and five to 15 percent at night, depending on the specific region.

## ADDITIONAL LINKS AND RESOURCES

[Clemson Cooperative Extension: Irrigation Time of Day](#)

[North Texas Outdoor Watering Survey, 2020 North Texas Outdoor Watering Summit Resources](#)

# WATER WASTE PROVISIONS

## BACKGROUND, IMPORTANCE AND BENEFITS

Outdoor irrigation makes up approximately 35-40% of total water use in most North Texas communities. Poorly maintained sprinkler systems result in significant water waste due to runoff, overspray onto impervious surfaces, and evaporation. Many communities have adopted ordinances to address water waste with enforcement measures. But not all communities or water providers have taken this approach.

Included in the 2004 Texas Water Development Board Report 362 "Water Conservation Best Management Practices Guide", the adoption of a water waste ordinance has been supported for some time. Communities with a water waste ordinance can emphasize the principle of reducing water waste and have the ability to administer long-term efficient use of water supplies.

The main purpose of a water waste ordinance is to mandate that water waste is prevented during lawn and landscape irrigation, that water resources are conserved for their most beneficial and vital uses, and that public health is protected. It provides a defined enforcement mechanism for exceptional neglect related to the proper



maintenance and efficient use of water fixtures, pipes, and irrigation systems.

Many utilities and cities are installing meters with electronic communication capabilities. AMI (automated metering infrastructure) and AMR (automatic meter reading) technology allow multiple readings per day and on-demand access to water use data. These new meters can be accompanied by online portals that enable regular communication with residents and customer engagement. Customers and cities can be notified of continuous usage, can easily access and review water bills, set budgets for water use, and proactively manage indoor/outdoor water use.

### Existing water waste ordinance offenses often include:

- Sprinkler runoff from a property greater than 50 feet.
- Operating an irrigation system or other lawn watering device during any form of precipitation or when temperatures are below 32 degrees Fahrenheit.
- Irrigation to pond in a street or parking lot to a depth greater than 1/4 inch.
- Failure to repair a controllable leak, including a broken sprinkler head, a leaking valve, leaking or broken pipes, or a leaking faucet.
- Operating a permanently installed irrigation system with a broken head or a head that is out of adjustment where the arc of the spray head is over a street or parking lot.
- Operating an irrigation system during the hours of 10 am-6 pm either seasonally or year-round when prohibited. Exceptions are provided for testing, auditing, and repair of the system.
- Washing of driveways, sidewalks, parking lots or other impervious surface areas with an open hose or spray nozzle attached to an open hose, except when required to eliminate conditions that threaten public health, safety or welfare.
- Washing vehicles with a hose that lacks an automatic shut-off valve.



# CASE STUDIES

## *City of Dallas*

The City of Dallas implemented its outdoor water conservation ordinance in 2002. The ordinance prohibited wasteful water use, required the first time of day restrictions in North Texas, and mandated working rain and freeze sensors on all automatic irrigation systems. In 2012, Dallas adopted twice-weekly watering requirements as part of the ordinance.

In 2013, Dallas modified enforcement of the water conservation ordinance to allow civil penalties for violations. Civil enforcement reduces the burden on code enforcement and municipal court dockets during peak season or periods of drought because it does not require a court appearance.

## *City of Allen*

The City of Allen has a stringent water waste provision included in the water resource management ordinance. Violations include fines that can be up to \$2000 per day per occurrence. Code enforcement issues tickets, and the judge sets the fine amounts.

For commercial properties in violation, the city can access an administrative fee in \$200 increments up to \$2000 directly into the water bill. Customers can appeal through hearings at the water department. In many cases, violators produce enough evidence to have the initial violation waived; however, the administrative fee will be higher if a subsequent violation occurs. During a period of drought, these violations are considered a criminal penalty. If a person accrues multiple offenses, fines can exceed \$2000 and if the customer doesn't show up in court, a warrant could be issued for their arrest.

**Cities should determine the best means of enforcement, be it tickets or administrative fees that work best for their community.**

## TALKING POINTS

- The overall purpose is to promote water efficiency, gain compliance in order to reduce water waste, and not to write citations on first notifications of violations.
- The ordinance can provide additional assistance or enforcement actions if no corrective action has been taken after a certain number of correspondences.
- Advancement of AMI systems may allow water providers to notify customers of potential leaks.



## ADDITIONAL RESOURCES AND LINKS

[City of Allen's Irrigation Checklist](#)

[City of Richardson Water Conservation](#)

[Texas Water Development Board: Prohibition on Wasting Water](#)

# RAIN AND FREEZE SENSORS FOR COMMERCIAL SPRINKLER SYSTEMS

## BACKGROUND, IMPORTANCE AND BENEFITS

All new irrigation systems in Texas must have a rain or moisture shut-off device—commonly referred to as a rain and freeze sensor in North Texas—or other technology designed to inhibit or interrupt the irrigation system’s operation during periods of moisture rainfall. Any repairs to existing irrigation systems require the installation of a rain or moisture shut-off device. (30 TAC Part 1 Ch 344)

These sensors interrupt an automatic irrigation system controller’s cycle when a specific amount of rainfall has occurred. They are small devices connected to the irrigation system controller and mounted in an open area exposed to rain.

The amount of water that can be saved using rain shut-off devices varies, but savings are usually substantial in a year with average rainfall. Several factors are involved in determining how much a sensor can reduce water usage: how often it rains, whether or not the controller is left on for automatic operation, and the amount of water applied by the system per cycle. If the amount of water applied per watering cycle by the whole system is known, it is easy to calculate how much water is being saved each time the sensor interrupts the watering cycle because of rainfall.

### TALKING POINTS

Advantages of a rain and freeze sensor:

- Conserves water -- prevents irrigation after recent rain events.
- Saves money -- reduces utility bills by interrupting the irrigation system after adequate rainfall.
- The system only runs when necessary, which reduces wear on the irrigation system.
- Reduces disease damage by eliminating unnecessary irrigation events.
- Reduces liability caused by irrigation systems running during a freeze event, which can cause road hazards.

Source: Alliance for Water Efficiency



*Photo courtesy of the City of Lubbock, TX.*

# CASE STUDIES

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## *City of Fort Worth*

The City of Fort Worth requires a rain and freeze sensor on all commercial irrigation systems. An annual inspection is required and can be done in conjunction with the annual backflow inspection.

## *City of Frisco*

The City of Frisco irrigation ordinance requires a rain and freeze sensor that has the capability to set thresholds for both rain and freeze at 40 degrees or above. Proof of compliance requires a letter from the manufacturer stating this capability.

## *City of Allen*

The City of Allen requires all commercial irrigation accounts to be inspected with an audit once every three years. This audit includes testing if the rain and freeze sensor is functioning.

## *City of Dallas*

The City of Dallas mandates working rain and freeze sensors on all automatic irrigation systems in Dallas, both residential and commercial.



## ADDITIONAL LINKS AND RESOURCES

[City of Allen Water Resource Management Ordinance](#)

[City of Frisco Irrigation Ordinance](#)

[City of Fort Worth Irrigation Requirements](#)

# ADOPT A WATER EFFICIENCY OUTREACH PROGRAM

## BACKGROUND, IMPORTANCE AND BENEFITS

Perhaps one of the most important actions a utility can take in increasing water use efficiency among its customers is through public education and outreach programs (E&O).

The goal of E&O programs is to influence behavioral change for short and long-term water savings. Regular and consistent messaging in customer education will provide an overall picture of water resources in the community. Communicating the need for conservation helps manage existing water supplies and avoids or delays the need for expanded or new infrastructure to meet increased water demands.

Customer education also provides valuable information on specific actions they can take in their home or business to meet these community goals while also benefiting from them personally (i.e., managing their water bill).

Each utility should develop an education and outreach plan suited to their community that is adaptable over time. Understanding which messages need to be conveyed regularly and identifying the target audience(s) is key to a successful program. An effective public education program will help develop trust between the community and the utility as relevant, timely, and fact-based information is provided, and customer service is enhanced.

Many cities have dedicated water conservation web pages located within the main city or utility website to find tips and other resources. The Texas Water Development Board is one source that provides publications and other materials that can be placed online or made available in city/utility buildings.

The various education and outreach tools also allow cities to promote other programs offered, such as rebates or events, and to communicate

other important messages, such as drought conditions or water service outages.

Some customers prefer to learn information during a class-type setting or to tour facilities or demonstration areas to understand certain conservation techniques better. Offering in-person or virtual classes or workshops provides an opportunity to connect with these customers and provide hands-on experience and answer questions on a range of conservation issues.

### TALKING POINTS

- An effective Public Education and Outreach program can be an effective and cost-efficient method to produce short and long-term water savings.
- An effective Public Education and Outreach program can build trust in the utility and enhance the its customer service capabilities.
- Integrating educational resources that have been developed by other cities, state and federal agencies, and non-profit groups can significantly expand the cities' efforts at little or no cost.
- When developing a Public Education and Outreach program, cities should identify their target audiences and convey consistent messages.
- The size and scope of the Public Education and Outreach program will be dependent on the capability of the utility to manage the program.



# CASE STUDIES

## *Water Is Awesome Regional Campaign*

In 2016, the City of Dallas, North Texas Municipal Water District, and Tarrant Regional Water District launched a regional outreach campaign called “Water is awesome. Use it. Enjoy it. Just don’t waste it.” It aims to increase the general public’s knowledge of the value of water in their everyday lives and encourages ways not to waste it. The campaign provides simple tips, mixed with a bit of humor, through television, radio, digital, print, outdoor, and social media advertising.

In 2019, an additional tagline, “Keep Texas Water on Tap,” was incorporated to promote the Water is Awesome brand and direct traffic to [waterisawesome.com](http://waterisawesome.com). In 2020, a “customer city toolkit” provided customizable resources allowing cities to incorporate their logos with the campaign brand for their website, social media, and print. Cities are encouraged to use campaign resources to advance conservation efforts.

## *Demonstration Gardens*

Growing popularity in native and adaptive plants for landscaping has led to the establishment of demonstration gardens throughout the Dallas-Fort Worth area. The Upper Trinity Regional Water District and Tarrant Regional Water District, for example, maintain demonstration gardens to provide examples to residents of the different plants that can be utilized and other gardens’ styles.

These demonstration gardens are popular for tours and workshops to convey that water-efficient landscaping is beautiful and uses less water and chemicals. The cities of Dallas and Plano conduct WaterWise Landscape Tours annually, whereby residents can visit homes of

other residents to see how these plants are incorporated into a home’s landscape.

## *Water Efficiency Network of North Texas (WENNT)*

WENNT is a conglomerate of cities and water providers in the Dallas-Fort Worth area that meets monthly to discuss water conservation efforts and highlight specific programs. Attending these monthly meetings allows participants to gain new ideas and learn about new resources that may benefit their program. To learn more contact your water provider conservation coordinator.

## *City of Plano*

To help citizens identify and repair irrigation problems, the City of Plano developed an interactive website, “Water Water Everywhere: A Guide to Sprinkler Repair,” that provides an overview of sprinkler system parts, how to identify sprinkler head problems, and an explanation of the “Cycle and Soak” watering method. This website is one example of resources that other cities can use by linking to their website and promoting on social media channels.



*Demonstration garden found at TRWD.*

## ADDITIONAL LINKS AND RESOURCES

[WaterIQ Statewide Water Education Program](#)

[Save Tarrant Water](#)

[City of Plano WaterWise Landscape Tours](#)

[City of Plano Sprinkler Repair Online Module](#)

[Upper Trinity Regional Water District Demonstration Garden](#)

# OUTREACH ASSISTANCE AVAILABLE FROM WATER PROVIDERS

## BACKGROUND, IMPORTANCE AND BENEFITS

Many cities in the Dallas-Fort Worth area purchase raw or treated water from larger wholesale water providers. Both share a common goal to educate residents about conservation and increase awareness of water resource management. Without direct contact with residents (except for social media), wholesale providers can assist their wholesale customer cities with their communications and provide regional water conservation programs.

Public Outreach and Education is a common element in wholesale water provider and city/ water utility Water Conservation Plans. Therefore, for wholesale providers to assist their customers' outreach efforts, both entities accomplish requirements in their conservation plans.

An additional benefit of wholesale provider outreach assistance is consistent messaging of conservation information across multiple cities. Taking advantage of resources and programs offered by wholesale providers can save money by reducing the expenditures needed to produce materials or coordinate programs.

### TALKING POINTS

- Wholesale and retail water providers benefit from a consistent water conservation message across multiple cities and can enhance their reputation in the community.
- Utilizing resources and programs from wholesale providers allows retail cities to save money by not producing the resources or operating the programs themselves.
- Outreach assistance from wholesale providers accomplishes Public Outreach and Education elements in both the wholesale and retail water providers respective Water Conservation Plans.



# CASE STUDIES

## Wholesale providers

Wholesale providers in the Dallas-Fort Worth area sponsor educational classes taught by Texas A&M AgriLife Extension, Master Gardeners, or others in the area with expertise in many water conservation-related topics. These topics can include water-efficient plant selection and maintenance, rainwater harvesting, sprinkler system maintenance, and more.

Wholesale providers, such as Tarrant Regional Water District (TRWD) and Upper Trinity Regional Water District (UTRWD), offer residential irrigation evaluations to homeowners, at no-charge to the homeowner or the retail city.

TRWD, UTRWD, and Texas A&M AgriLife have partnered together to develop the Water Efficient Recognized Green Professionals

Program for landscape professionals. The purpose of the Green Pros Program is to provide training and resources for professionals to establish and maintain sustainable landscapes. As part of the program, TRWD and AgriLife sponsor a series of five training workshops for landscape professionals on creating water-efficient landscapes, low impact design, native plants, irrigation design, and turfgrass management. After the program, the landscape professionals are recognized as Green Professionals and listed on the 'Save Tarrant Water' website.

Wholesale providers may also produce resources, such as print media, digital online resources, and other materials that can assist a retail provider in promoting of water conservation information. For example, UTRWD and the North Texas Municipal Water District sponsor the 'Water My Yard' program at no charge for their customer cities. UTRWD also produces materials and other resources for their customers to utilize when promoting 'Water My Yard.'

**CYCLE AND SOAK: WATERING EFFICIENTLY TO REDUCE RUNOFF**  
Based on AgriLife's Recommended Landscape Practices. Visit [utrwd.com](http://utrwd.com) for more info.

UPPER TRINITY REGIONAL WATER DISTRICT WATER IQ

**CYCLE 1**  
WAIT 30-60 MIN.

**CYCLE 2**  
WAIT 30-60 MIN.

**CYCLE 3**

Following the cycle and soak method, landscapes are watered in multiple cycles at each sprinkler station – waiting 30 to 60 minutes between cycles to allow the water to soak into the soil and not runoff.

For example: Instead of running a sprinkler station for 12 minutes at one time, schedule your controller to run the station for 2 cycles for 6 minutes or for 3 cycles for 4 minutes. If the watered area is sloped or runoff occurs, use shorter cycles.

The WATER IQ logo is a licensed service mark of the Texas Water Development Board.

*Example of outreach materials provided by Upper Trinity Regional Water District.*

## ADDITIONAL LINKS AND RESOURCES

[UTRWD Irrigation Check-Up Request](#)

[Water Efficient Recognized Green Professionals](#)



# PARK/ATHLETIC FIELD CONSERVATION

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## BACKGROUND, IMPORTANCE AND BENEFITS

This BMP is intended to address park and athletic field conservation if the water provider manages and/or serves customers with irrigated parks and/or athletic fields. These facilities often face scrutiny by the public for using large amounts of water or being perceived as using excessive amounts. Athletic field and park irrigation conservation practices and the careful use of water in the operation and maintenance of park facilities can effectively reduce water demands. Once a water provider or customer adopts this practice, it should be followed closely in order to achieve maximum water efficiency benefits.

With the dedication of an athletic field manager, athletic field conservation effectively reduces system water demand. A manager will implement a watering regimen that only uses the amount of water necessary to maintain the viability of the turf and health of its users. Water is only applied to areas that are essential for the use of the field.

All park facilities should be metered and water use billed to reinforce the importance of water efficiency.

Before developing an efficient watering program, the water provider should consider meeting with parks irrigation personnel, management, and authorized landscape manager. This discussion should focus on water conservation issues and developing an adequate scope of action for efficiency.

The first key is to understand the performance and capabilities of your irrigation system at these facilities. Requiring automatic irrigation systems and controllers at all facilities is recommended. It's essential to have training in soil management, proper aeration methods, nutrient management, mowing, soil testing, and irrigation management. Determine whether the approach of achieving conservation will be voluntary compliance or regulatory compliance. Determine if there is an opportunity to use reclaimed, reused, or

recycled water for parks to conserve potable water. However, specific uses must meet Texas Commission on Environmental Quality (TCEQ) water quality standards for reclaimed water and human contact. They must be appropriate for the particular use of the park. Reclaimed water should be applied based on the appropriate water budget.

When developing athletic field conservation practices, identify the various stakeholders, including the school district staff, nonprofit athletic associations, private sports complex managers, and city staff. Meeting with them will help achieve long-term results.



*City of Arlington's MLK Sports Complex: the world's first sports facility to achieve the Audubon Signature designation.*



# CASE STUDIES

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## *City of Plano*

Plano's water conservation plan allows the City of Plano Parks and Recreation Department to operate using alternative water conservation methods. City of Plano site irrigation systems are programmed, controlled, and monitored remotely by an advanced computerized control system. Alternative landscape irrigation methods are also used in the community. Pecan Hollow Golf Course uses reclaimed water, and the Legacy Business Park uses private lake water supplied by wells to irrigate their respective sites, rather than treated drinking water.

## *City of Arlington*

Recently, Arlington received the Green Ribbon Grant from the Texas Department of Transportation and was awarded \$550,000 for landscaping using Texas native plants and permanent irrigation system improvements to central medians. Where feasible, native plants reduce potable water consumption at outdoor sports facilities. The Tierra Verde Golf Course (mentioned in BMP 11) and the MLK Sports Complex are the first Audubon sanctioned sports center in the United States dedicated to environmental sensitivity. The 100-acre center features baseball fields maintained with organic pesticides and herbicides, an interpretive nature trail, and a playground made of recycled materials. The park's drainage travels through a filter system before flowing into Sublett Creek.

Arlington uses an IRRINet smart-water monitoring system, which allows staff to make immediate adjustments to irrigation practices by monitoring weather conditions, water usage patterns, and remotely detecting leaks. This technology results in \$53,000 in irrigation savings annually.

## TALKING POINTS

- Park irrigation conservation practices and the careful use of water in the operation and maintenance of park facilities can effectively reduce water demands.
- Athletic field conservation is an effective method of reducing system water demands. It results in the athletic field manager following a watering regimen that uses only the amount of water necessary to maintain the turf's viability and its users' health.
- Implementing conservation practices and communicating them with the public can prevent scrutiny and water demand.
- Improvements in irrigation practices are often very cost-effective to achieve and may yield significant savings in a short period at a low cost.

## ADDITIONAL LINKS AND RESOURCES

[Texas Water Development Board Park Conservation](#)

[TWDB Athletic Field Conservation](#)

[Texas A&M AgriLife Extension: School of Irrigation](#)

[Texas A&M Turfgrass Resources](#)

[City of Plano Current Irrigation Practices](#)

# GOLF COURSE CONSERVATION AND REUSE

## BACKGROUND, IMPORTANCE AND BENEFITS

Golf courses can use a considerable amount of water for irrigation, especially during the summer. The Environmental Institute for Golf found that from 2003-2005, an 18-hole course in the Southeast region of the country (including North Central Texas) applied an average of 29 inches of irrigation water per acre every year. Irrigation of course play areas, such as fairways, is necessary to support healthy turfgrass and landscape plants, which are important for course playability and aesthetics. However, golf courses can employ several practices to reduce water use while maintaining the course's playability and aesthetics. Also, over-watering and over-fertilization can negatively impact the water quality in local streams and lakes.

By adopting a Conservation Plan, golf courses can benefit by:

- Being a good neighbor by conserving local water supplies.
- Saving money by reducing water use.
- Protecting local water quality.
- Maintaining playing conditions on the course.
- Increasing irrigation equipment longevity.

Water providers may take different golf course conservation approaches: encouraging voluntary efforts by the golf courses to conserve water, making it required as part of a contract, or, if possible, passing an ordinance requiring golf courses to develop and implement a conservation plan.

It is important for water providers to work closely with golf courses since they know which practices will have the greatest potential for implementation. The courses may have already completed some best management practices and knowledge which may be effective or not. Water providers should work to coordinate and implement conservation practices on courses that are owned and operated by the local government.

### TALKING POINTS

- Golf courses can implement many practices that reduce water use while maintaining the course's playability and aesthetics.
- Local governments can encourage or require golf courses to reduce water use by developing and implementing a Conservation Plan for the course. It is essential to work closely with golf course staff to identify practices that may save water and evaluate the effectiveness of methods already implemented.
- Golf courses benefit from conservation by saving money on water and maintenance while maintaining high-quality, aesthetically appealing courses.
- Golf courses that are owned and operated by local governments need to implement conservation practices as a way to conserve their water supply.
- Designing a course that reduces irrigated areas and maximizes water use efficiency in the irrigation system also protects water quality in local streams and lakes by reducing runoff and pollutants coming from the courses.
- Golf courses can promote that they are a good neighbor by educating the public on the practices they've implemented and how much water has been saved annually.

*Water conservation and water quality protection measures for golf courses can be found in Appendix C.*

# CASE STUDIES

## *City of Dallas Cedar Crest Golf Course and Stevens Park Golf Course*

Two City of Dallas public golf courses, Cedar Crest and Stevens Park, irrigate with treated effluent (direct reuse) provided by Dallas' Central Wastewater Treatment Plant. Cedar Crest stopped using potable water for irrigation in 2004, and Stevens Park began direct reuse in 2011.



*Hole 6 at Tierra Verde Golf Course.  
More information can be found at  
<https://www.arlingtongolf.com/facts-fees>.*

## *City of Arlington Tierra Verde Golf Course*

Tierra Verde golf course is owned and operated by the City of Arlington. Several measures have saved the golf course an estimated 25-35% on water use compared to ten years ago. Some of the water-saving measures implemented include:

- Replacing the nozzles on almost all of the fairway, rough, and greens sprinkler heads to more efficient brass nozzles.
- Improving irrigation uniformity through careful evaluation of sprinkler head design, nozzle selection, head spacing, pipe size, and pressure selection.
- Replacing smaller rotors (1") in tee areas to part circle and adjustable rotors to eliminate any water hitting non-mowed spots.
- Upgrades to the on-site weather station to give better evapotranspiration data.
- Installing in-ground soil moisture sensors in various course areas to monitor moisture content.
- Utilizing handheld moisture sensors to determine water needs on greens daily.
- Removal of cedar trees and other high water use plants adjacent to turf areas that create dry spots.
- Improving the aerification program to allow more water to infiltrate in high traffic and turf areas.
- Installing an EZFlo fertigation tank to apply wetting agents more easily to the turf.

## ADDITIONAL LINKS AND RESOURCES

[Golf Course Superintendents Association of America](#)

[Environmental Institute for Golf](#)

[Audubon International Cooperative Sanctuary Program for Golf](#)

[Texas Water Development Board – Golf Course Conservation](#)

[United States Golf Association Water Resource Center](#)

[Alliance for Water Efficiency – Golf Course Water Efficiency](#)

# USE OF LICENSED IRRIGATORS TO INSPECT & REVIEW ALL IRRIGATION PERMITS & PLANS

## BACKGROUND, IMPORTANCE AND BENEFITS

This BMP promotes using licensed irrigation inspectors to review and inspect all irrigation system plans and installed components before a permit is released. Many cities use licensed plumbing inspectors, as allowed by TCEQ rules, to perform these duties. However, having dedicated licensed irrigation inspectors to implement all aspects of an irrigation system permitting program provides a certain level of focus for complying with water efficiency standards.

Reviewing irrigation permits and plans before installing allows for changes to be made to the plans and not after the pipe is already in the ground. This ensures the irrigation system's overall quality, promotes irrigation efficiency and guarantees that the system will comply with state and local requirements.

Developing a review and inspection program at the municipal level reduces the chance for unlicensed irrigators to install irrigation systems improperly. Improper installation can waste water, money, cause future maintenance issues, but most importantly, it may contaminate the public water supply. It is crucial to prevent non-potable water in lawn irrigation pipes from flowing into public water supply pipes.

Inspecting the system provides benefits for water conservation. With open-trench inspections, you can check:

- Depth of piping-which protects from freezing temperatures.
- Potential invasion of plant/shrubbery roots.
- Joints are glued appropriately, and no leaks occur.
- Pipe size-to eliminate water hammer.
- Pressure management requirements.
- The overall layout of system.

Keep in mind that staff can hold an irrigators license and inspectors license, but to prevent them from installing and inspecting their work, staff can't have both running concurrently.

In 2011, the 82<sup>nd</sup> Texas Legislature passed House Bill 2507, making it a Class C misdemeanor for an individual to operate as an irrigator in the state of Texas without a valid irrigation license. Therefore, effective September 1, 2011, individuals operating without a license are in direct violation of the Texas Occupational Code, Sec. 1903.256.

Tarrant Regional Water District and Upper Trinity Regional Water District partners with Texas A&M AgriLife Extension to sponsor the Green Pros Program. A training workshop for licensed irrigators that desire to create and maintain environmentally sustainable landscapes. Should you have staff become licensed, this is a great program to meet local contractors and become a water-efficient recognized green professional.

According to the Texas Administrative Code, upon completion of the irrigation system, four items must be completed to inform and educate the owner of the system. These items include a final walk-through, a maintenance checklist, licensed irrigator contact information, and an as-built plan. All irrigation system plans, installation, and review requirements must be followed for long-term water efficiency. Minimum state requirements for Landscape Irrigation can be found in [Chapter 344](#) of the Texas Administrative Code.





# CASE STUDIES

## *City of Frisco*

The City of Frisco uses licensed staff to review irrigation system permits and plans and conduct initial inspections of the irrigation system before backfilling any part of the system. For more information about the irrigation program, visit the [City of Frisco Irrigation](#) website.



## *City of Mansfield*

Since 2012, every new house or building must have an irrigation system in the city of Mansfield. The city has licensed irrigation inspectors on staff to review irrigation system permits and plans before installation. On average, the City of Mansfield inspects and reviews 300-400 plans a year. For more information about the irrigation program, visit the [City of Mansfield Conservation](#) website.



## TALKING POINTS

- Inspections and reviews of permits and plans will optimize the irrigation system's water efficiency and performance, which conserves water, money, and time for the system's owner.
- Inspections and reviews of permits and plans will confirm the proper installation of components, such as a backflow prevention device, isolation valves, and Y-strainers, ensuring public drinking water safety.
- Having an inspection and review process helps water providers know the location and number of systems and who installed them.
- Irrigation systems use a large amount of water. Permit and plan reviews by licensed irrigation inspectors help with the conservation and protection of available water resources.

## ADDITIONAL LINKS AND RESOURCES

[Texas Irrigation Association Best Management Practices](#)

[Irrigation Association Landscape Irrigation Best Management Practices](#)

[Texas Water Development Board: BMPs for Municipal Water Providers](#)

# OFFER FREE OR DISCOUNTED IRRIGATION SYSTEM CHECK-UPS FOR RESIDENTIAL CUSTOMERS

## BACKGROUND, IMPORTANCE AND BENEFITS

The Environmental Protection Agency estimates that up to 70% of the total water used during the summer months is applied as outdoor irrigation. As much as 50% of the water used outdoors is wasted due to overwatering and inefficient or malfunctioning irrigation system components.

Irrigation System Check-Ups (also known as Evaluations or Audits) for residential customers, is a tool that cities can employ to reduce outdoor watering demand. Check-ups are typically offered at no charge to homeowners.

A licensed irrigator will evaluate the irrigation system components and controller settings during a typical check-up to see if the irrigation system can operate more efficiently and identifies needed repairs or adjustments. The licensed irrigator will run the irrigation system to see if the sprinkler heads function correctly and apply water only to the intended areas. They will check the irrigation system's pressure and discuss the controller settings with the homeowner to advise them on the most efficient watering methods.

One valuable aspect of check-ups is the one-on-one assistance and education that a residential customer receives on properly managing the irrigation system. This education can result in long-term water savings because the customer has a better understanding about the system. Water savings may last for multiple years after the evaluation is completed, mainly due to more efficient watering habits. As part of the check-up, the licensed irrigator will identify inefficiencies in the resident's irrigation system and educate them on programming the irrigation controller for more efficient watering practices, such as seasonal adjustment settings and 'Cycle and Soak'. The sponsoring water provider or city can also offer handouts, brochures, and other educational information to residents.

The licensed irrigator can provide a report to the residential customer detailing equipment problems and offer recommendations to change watering habits. Reports can include an estimated water savings amount based on recommended adjustments to the controller run times. The licensed irrigator should also provide a copy of the report to the sponsoring water provider or city.

A drawback of check-ups is that, unlike indoor fixture or appliance replacements, water savings from irrigation system repairs will last a limited number of years. Benefits of check-ups include one-on-one contact with residential customers, providing educational information that may result in greater water savings than irrigation system fixes alone. Check-ups are an excellent customer service tool when managing residents' complaints. When using check-ups, cities can be selective by targeting high water users or those with large lots to maximize budget and water savings.

Water providers or cities should consider conducting a customer satisfaction survey after the check-up is completed to determine how many residents have implemented recommended modifications and gauge satisfaction with the check-up program.



# CASE STUDIES

## *City of Frisco*

The cities of Dallas and Frisco have licensed irrigators on staff who conduct free Irrigation System Check-Ups for their customers upon request by filling out a form online.

The City of Frisco performs check-ups as a conservation program to manage outdoor watering demands. In the first year offered (2006), city staff of completed 660 check-ups. Today, the program has evolved to completing about 3,000 check-ups a year and recently began offering the service to commercial properties. The check-ups, which include programming the watering schedule, searching for leaks or damage, and a detailed report for the customer, boast an average of 40-45% in water savings for the irrigation system.

## *City of Mansfield*

The City of Mansfield participates in TRWD's check-up program and employs licensed irrigators who conduct evaluations for residents. This service is offered to help alleviate the frustrations residents have when they complain about their water bills.

## *North Texas cities and water districts*

Other cities and water districts (i.e., Allen, Propser, Southlake, TRWD, and UTRWD) contract with a licensed irrigation company that conducts the check-up. It is essential to be specific about expectations and deliverables when developing the city and irrigation company's agreement.



## TALKING POINTS

- Outdoor irrigation accounts for up to 70% of total water use during the summer months, and as much as half is wasted due to overwatering and inefficient or malfunctioning irrigation systems.
- Irrigation System Check-ups are a valuable conservation tool that can reduce outdoor watering demand by helping residential customers identify inefficiencies or needed repairs with their irrigation system and how to program the irrigation controller properly.
- Irrigation System Check-ups are performed by a licensed irrigator who is either a city employee or contracts with the city to perform the service.
- Irrigation System Check-ups is a valuable education tool for residential customers by providing one-on-one assistance and providing additional conservation information on brochures, handouts, etc.
- Water savings from Irrigation System Check-ups can last for multiple years from both recommended repairs to the system and more efficient watering habits by the customer.

## ADDITIONAL LINKS AND RESOURCES

Shimabuku, M., D. Stellar, and P. Mayer. 2016. Impact Evaluation of Residential Irrigation Audits on Water Conservation in Colorado. Journal AWWA.

[Tarrant Regional Water District Residential Sprinkler System Evaluation Program](#)

[City of Frisco Free Sprinkler System Check-Ups](#)

[City of Dallas Free Sprinkler System Check-Ups](#)

[City of Mansfield Sprinkler System Evaluation Form](#)



# REBATES TO ENCOURAGE IMPROVED EFFICIENCY IN EXISTING IRRIGATION SYSTEMS

## BACKGROUND, IMPORTANCE AND BENEFITS

As the population increases in the North Texas region, so makes the demand for more water, especially because many newer cities require irrigation systems in new developments. Based on a 2012 study conducted by the Texas Water Development Board, outdoor water use accounted for approximately 31% of all residential water use across Texas from 2004 to 2008. For more details, visit Texas Water Development Board's 2012 Technical Note 12-01, [The Grass is Always Greener...Outdoor Residential Water Use in Texas](#). In this report, on page 23, [Table 3](#) illustrates outdoor residential water use for many larger cities across Texas.

Creating a program that encourages residents to become educated on their irrigation system can improve operation and efficiency. Texas AgriLife Extension has developed a presentation titled [Irrigation Efficiency](#), which provides this education.

Furthermore, when it comes to the type of irrigation system and standard efficiencies, the Texas AgriLife Research and Extension Urban Solutions Center provide the following average efficiencies by system type:

- Surface/Subsurface drip – 90%
- Surface micro drip irrigation – 85%
- Large Rotors – 70%
- Small Rotors – 65%
- Spray Heads – 50%

This BMP provides, in conjunction with the sprinkler evaluation (check-up) program, an incentive to have an evaluation done and make recommended changes.

With such a substantial opportunity for efficiency gains, some cities may wish to consider offering rebates to both residential and commercial customers for upgrading their current irrigation system.

By changing out less efficient equipment, this BMP intends to increase the irrigation efficiency by 10 percent or more.

With 31% of all residential water use statewide attributed to irrigation, and most of that conducted using spray heads with an average efficiency of 50%, there is a real benefit for developing a rebate program for irrigation systems.

According to the Texas Water Development Board's "[Water Use of Texas Water Utilities](#)" 2020 report to the 87<sup>th</sup> Texas Legislature, residential per capita water consumption across all analyzed utilities was 82 gpcd. The total residential water use is approximately 868 billion gallons per year, based on the current population of around 29 million people, and 82 gpcd residential water use. Landscape irrigation attributes to 31% or 269 billion gallons per year based on a review of available data.





# CASE STUDIES

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## *City of Dallas*

Dallas revamped the rebate portion of its Industrial, Dallas revamped the rebate portion of its Industrial, Commercial, Institutional (ICI) Program in January 2019 to include a more appropriate calculation for determining potential rebates for the cost of new water-saving equipment and processes, including irrigation systems. For more information about the program, visit the [City of Dallas ICI Program website](#).

## *City of Allen*

The City of Allen offers a rebate program, depending on the annual budget. Through the H2Ome Improvement SMART Irrigation Technology Rebate Program, participants can receive 50% of the cost up to a maximum of \$125.00 to install qualifying SMART irrigation technology equipment. For more information about the program, visit the [City of Allen H2Ome Rebate Program website](#).

There are many North Texas cities with rebate programs that are unique to their community's needs. Here is a list of some North Texas cities with outdoor irrigation rebate programs:

- [City of Plano](#)
- [City of Southlake](#)
- [City of Lewisville](#)
- [City of McKinney](#)
- [City of Carrollton](#)

## TALKING POINTS

- Outdoor water use accounts for approximately 31% of all residential water use across Texas from 2004 to 2008.\*
- 89% of single-family households practice irrigation. 95% is spray irrigation. 92% of the 95% do not understand how an irrigation system runs.\*\*
- Rebates incentivize customers to invest in upgrades they would not typically invest in by reducing the overall payback period.
- A 10 percent reduction in statewide annual residential irrigation would yield potential savings of approximately 23.9 billion gallons per year.

Sources:

\*2012 study conducted by the Texas Water Development Board,

\*\* Texas AgriLife Research and Extension Urban Solutions Center

## ADDITIONAL LINKS AND RESOURCES

[Rebate and Voucher Program Introduction](#)

[TWDB: Best Management Practices for Water Providers](#)

[WaterSense Rebate Finder](#)

[SAWS Residential Irrigation Design Rebate](#)

[City of Round Rock Conservation Rebates](#)

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# COMMUNICATION TOOLKIT

## GENERAL COMMUNICATION TOOLS AND STRATEGIES

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### GENERAL COMMUNICATION TIPS

Before using the tools and strategies, decide what to measure or how you will track success.

Readability matters. The general public reads at an 8th-grade reading level. Use simple words, refrain from using water-related jargon and acronyms.

Translate legalistic terms when required to use regulatory language.

Determine your target audience for each message and event. Defining a niche audience will help you reach more people on a deeper level.

Develop internal and external brand ambassadors. These are community influencers who amplify your message.

Use the same voice and tone across each messaging platform.

Create a content calendar that includes evergreen material—national campaigns and events—or seasonal occurrences, such as frozen pipes or high water bills.

Consistency is the key to establishing the cadence for your posts, blogs, newsletters, etc.

### WATER CONSERVATION AND COMMUNICATION TIPS



Develop your “water story” for all stakeholders. The “story” includes infrastructure needs, water pricing, water sources, how your city fits in the bigger picture, etc.



All water providers are encouraged to understand their water system and communicate the value of conservation measures on current and future infrastructure needs.



Provide graphics to illustrate water use concepts, such as the urban water cycle, rising water rates, and projects.

# COMMUNICATION TOOLKIT

## GENERAL COMMUNICATION TOOLS AND STRATEGIES

### CUSTOMER TOUCH POINTS

Water providers should use a diverse mix of tools and strategies to communicate their water conservation message, including:



Utility/Water Bills



Virtual/Live Events



Newsletters



Local Ambassadors



Educational Classes



Print Media



Customer Portals



Demonstration Gardens



Radio



Social Media



Billboards



Television



Schools



Websites

### SOCIAL MEDIA ETIQUETTE

#### DO'S

Do remember all content is for your audience, not you or your organization.

Do break up big ideas or concepts into smaller points, which creates more content and easier understanding.

Do link to more information (your website) whenever possible.

Do include humor, puns, national calendar days, and interesting facts when appropriate.

Do use trending topics and hashtags when appropriate.

Do retweet or share related appropriate organizations' posts.

Do appropriately credit the photo/video source.

#### DON'TS

Don't assume your audience knows anything about your subject.

Don't post without a visual to support your point.

Don't post an image until you confirmed the platform's photo specs.

Don't post for quantity. Posts should be engaging and purposeful.

Don't use low-quality photos or logos. The minimum high-resolution image is 72 dpi for web use.

Don't create long videos. Keep videos 30 seconds to 90 seconds and include captions.

Don't create complicated graphics or infographics. Simplicity is key.



# ADDITIONAL WATER SAVING MEASURES FOR NEW IRRIGATION SYSTEM REQUIREMENTS

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Many cities within Region C have adopted irrigation system standards above the minimum state requirements. Some of these standards include:

- Require property owners that install their irrigation system to also comply with the adopted city ordinance.
- Require submission of the irrigation plan in conjunction with the permit application to the applicable city official/department.
- Require all new irrigation systems to include an automatic controller.
- Require all new irrigation systems to not utilize above-ground spray in landscapes that are less than 60 inches in either length or width and which contain impervious pedestrian or vehicular traffic surfaces along two or more perimeters. The use of subsurface or drip irrigation and pressure compensating tubing is permitted if the qualifying area will be irrigated.
- Require all non-turf landscape areas included in the irrigation plan to be designed with subsurface irrigation, drip irrigation, and/or pressure compensating tubing. If the irrigation plan includes a foundation watering system, require a separate station be dedicated for drip irrigation for the purpose of watering a structure's foundation.
- Require a flow control master valve to be installed on the discharge side of the backflow prevention device on all new installations.
- Require check valves where elevation differences may result in low head drainage. Check valves may be located at the sprinkler head(s) or on the lateral line.
- Require that pop-up heads shall be installed at grade level and operated to extend above all landscape turfgrass.
- Require that all new irrigation systems must include an automatic controller capable of providing the following features:
  1. Multiple irrigation programs with at least three start times per program.
  2. Limiting the irrigation frequency to once every 7 days and once every 14 days
  3. Water budgeting feature
- Require additional information and description for the required "walk-through."
- Require an "operational" rain and freeze sensor.
- Require the signed maintenance checklist be submitted to the applicable city official/department. Require the irrigator's name, license number, company name, telephone number, and the dates of the warranty period to be on the maintenance checklist.
- Require the irrigation plan indicating the actual installation of the system and the associated seasonal watering schedule be submitted to the applicable city official/department.
- Require the irrigation plan and maintenance checklist be transferred from the new home builder to the first home buyer with documentation confirming the transaction provided to the applicable city official/department.

# ADDITIONAL GOLF COURSE CONSERVATION REUSE

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## WATER CONSERVATION AND WATER QUALITY PROTECTION MEASURES

Water conservation and water quality protection measures for golf courses may include, but are not limited to, the following:

### Golf Course Landscape Design and Water Sources

- When feasible, use alternative water sources, such as reclaimed or reuse water from wastewater treatment facilities, to supplement or replace potable water sources. Monitor reclaimed water tests regularly for salinity. Rainwater harvesting and on-site pond storage are additional alternative water sources to consider.
- Select drought-tolerant turfgrass varieties to minimize water use while maintaining a high-quality playing surface.
- Reduce the number of irrigated acres on the course by converting non-play and rough areas to native grasses and other drought-tolerant plants. These plants will provide an attractive and low-maintenance landscape.
- Develop a Drought Management Plan that can be implemented when water supplies are low enough to enact local drought mitigation efforts.

### Irrigation System Design and Maintenance

- Irrigation systems should be properly designed and installed to maximize water use efficiency while reducing operational costs and maintaining a healthy and playable course.
- Utilize new technology, such as soil moisture sensors, evapotranspiration data, and computer-controlled systems that maximize water efficiency by irrigating based on the turfgrass's moisture needs.
- Hand watering greens or other smaller areas will save water compared to running the entire zone in that area.
- Design the irrigation system to ensure that the irrigation water is distributed evenly and efficiently, with a Distribution Uniformity of 80% or better.
- Frequently inspect all sprinkler heads and other components of the irrigation system and make any adjustments or repairs as needed to improve water use efficiency. Conducting a system-wide audit by a licensed irrigation professional annually can help identify inefficiencies in the system.
- Fix leaks in the system immediately.
- Rain sensors can shut off the irrigation system when an adequate amount of rainfall is received.
- Irrigating in the early morning hours before temperatures rise and when wind speeds are low will reduce the amount of water lost to evaporation.
- Use mowing, aeration, nutrients, and soil amendments to improve soil condition and increase water infiltration.

### Water Quality Protection

- Apply fertilizers and chemicals according to the directions on the label. Do not overapply.
- Do not overwater fertilizers when applying, resulting in runoff that could carry fertilizers into a nearby stream or pond.
- Maintain vegetated buffers at least 15 feet from the edge of a stream or pond to capture pollutants that may runoff from the course.

The water savings should be simple to quantify for golf courses with meters or computer-controlled irrigation systems if records existed before implementing any practices.

This document was made in collaboration with the North Texas Regional Water Providers to be a guide of best management practices to reduce water waste and encourage long-term water conservation.

The North Texas Regional Water Providers are comprised of:  
Dallas Water Utilities  
North Texas Municipal Water District  
Tarrant Regional Water District  
Upper Trinity Regional Water District