

MULTI-FAMILY RESIDENTIAL & COMMERCIAL ONSITE WATER REUSE



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1 INTRODUCTION TO ONSITE WATER REUSE SYSTEMS

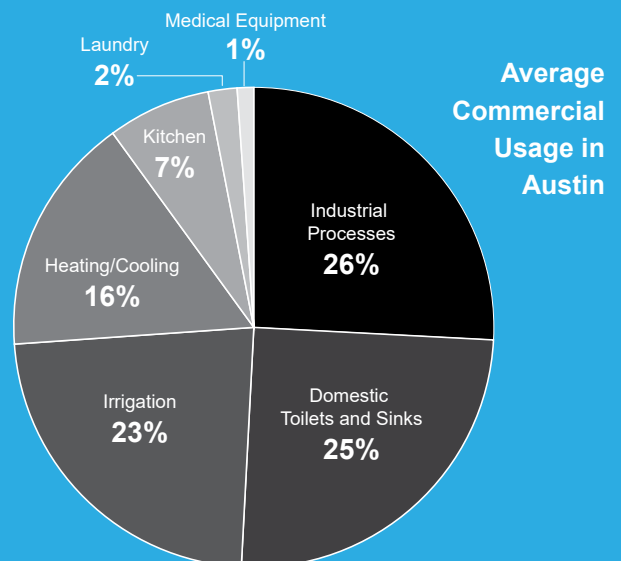
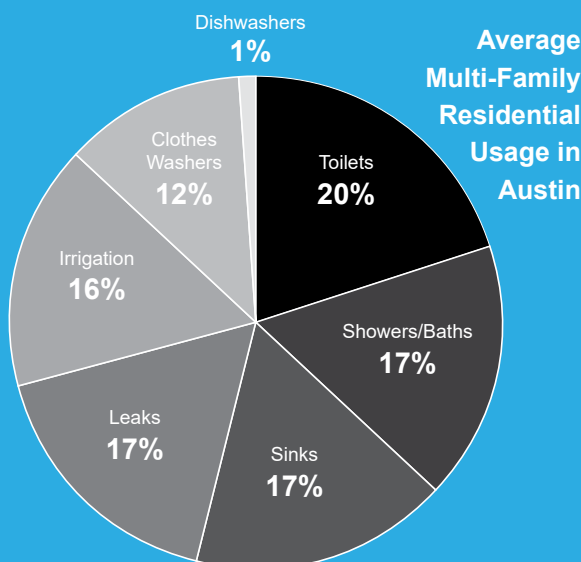
Purpose

This guide helps Austin Water customers associated with multi-family residential or commercial developments navigate the City of Austin's regulations for the design, construction, permitting and operation of onsite water reuse systems. It also describes incentives for installation. Onsite water reuse systems, sometimes referred to as water recycling systems, when properly designed and operated, make efficient and safe use of water that would otherwise be diverted to a treatment plant or water body. The guide only addresses onsite water reuse systems for non-potable applications.

Background

For more than 100 years, Austin Water has been committed to providing, safe, reliable, high quality and sustainable water to our customers. Austin Water currently treats drinking water from the Colorado River at three treatment plants located along Lakes Austin and Travis. In an effort to maintain a sustainable water supply for future generations, Austin Water is committed to reducing its water demands through conservation programs, and to promote efficient and resilient water systems that will help mitigate the effects of future droughts.

Recognizing that a significant portion of water use at multi-family residential and commercial developments (irrigation/outdoor, heating/cooling, clothes washing, toilet flushing and certain industrial processes) could be met by a non-potable supply, Austin Water provides rebate incentives for property owners who install certain types of onsite collection and water reuse systems at their property.



Regulatory Authority

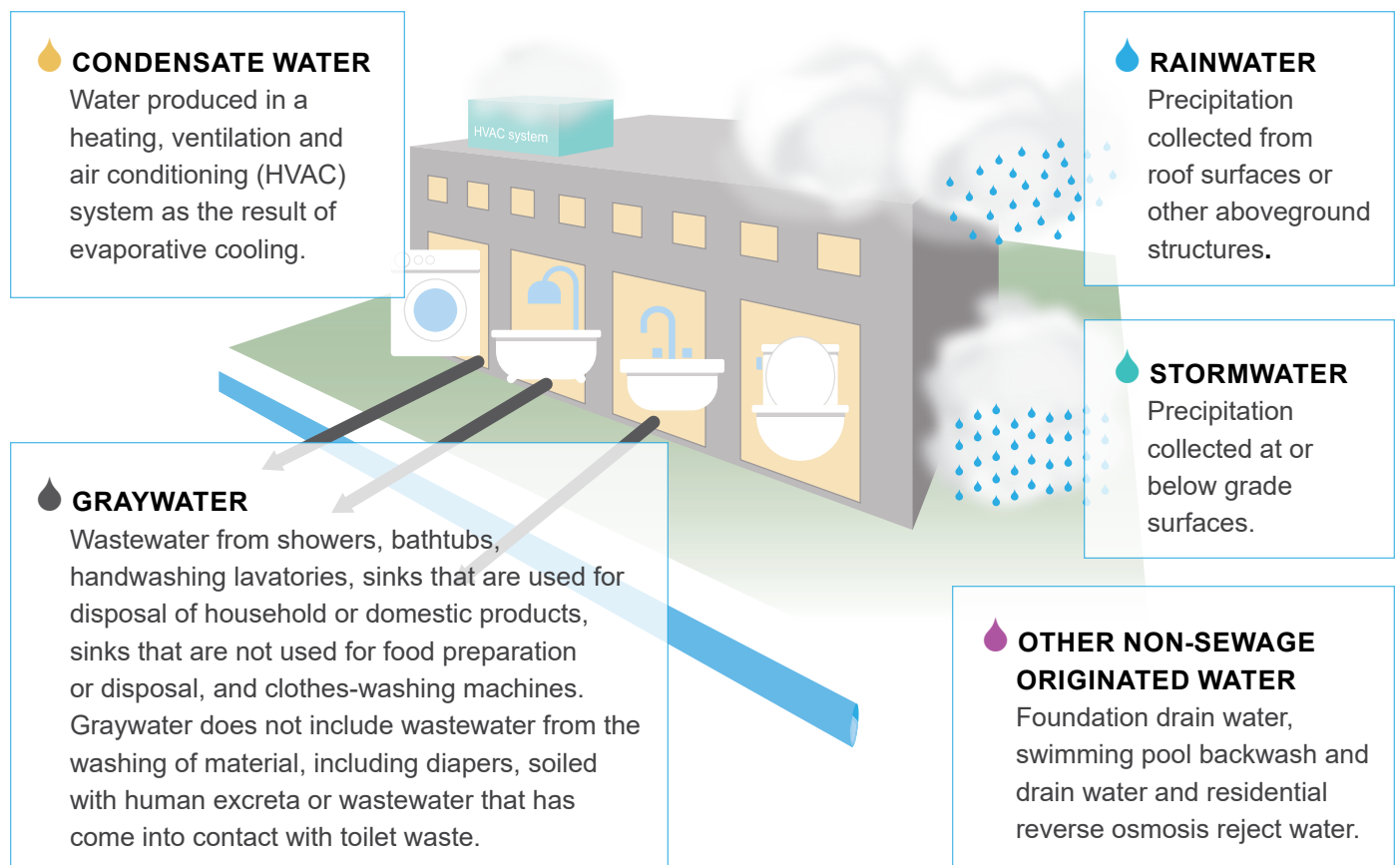
Both state and local regulations apply to onsite water reuse systems in the City of Austin. State allowances and criteria for onsite water reuse systems can be found in [30 TAC Chapter 210 Subchapter F](#). If used in accordance with this subchapter, no authorization to reuse these waters is required from the [Texas Commission on Environmental Quality](#) (TCEQ) unless directed by the Executive Director of TCEQ.

Local system design, construction, installation and permitting requirements for onsite water reuse systems are found in the [City's Plumbing Code](#) (Chapters 15 & 16 of the [Uniform Plumbing Code](#)). The City's Plumbing Code is applicable to any structure served by the City's water utility, Austin Water. If your water or wastewater bill is issued by Austin Water, these regulations apply to your property.

Definition of Terms: Alternative Onsite Waters and Graywater

In the City of Austin, the permitting requirements for onsite water reuse systems vary by the water source being collected (rainwater, graywater, etc.), and by the intended use of the water (irrigation, toilet flushing, etc.). In addition, treatment is required for certain onsite water reuse systems. See the schematic below for descriptions of alternative onsite water sources and graywater.

Onsite Water Sources



Treatment Overview

 RAINWATER	<p>Rainwater is relatively clean when it falls from the sky as precipitation. However, rainwater can become contaminated when it comes into contact with roof surfaces and while it is being stored. In general, rainwater requires only filtration components for reuse applications.</p> <p>Disinfection of rainwater is required for toilet/urinal flushing, clothes washing and trap priming.</p>
 GRAYWATER	<p>Graywater quality is dependent on its source. Graywater can contain many of the same contaminants as sewage, but in much lower quantities because it has not come into contact with food or human waste. In general, graywater requires filtration or treatment components for reuse applications.</p> <p>Disinfection of graywater is required for toilet/urinal flushing, clothes washing, trap priming and if it is used for above grade irrigation/outdoor applications.</p>
 STORMWATER	<p>Stormwater, similar to rainwater, is relatively clean when it falls from the sky as precipitation. However, stormwater can become contaminated when it comes into contact with ground surfaces and while it is being stored. In general, stormwater requires filtration or treatment components for reuse applications.</p> <p>Disinfection of stormwater is required for toilet/urinal flushing, clothes washing, trap priming and if it is used for above grade irrigation/outdoor applications.</p>
 CONDENSATE WATER	<p>Condensate water is similar in quality to distilled water, but can become contaminated when it comes into contact with metal pipes, or while it is being stored. In general, condensate water requires filtration or treatment components for reuse applications.</p> <p>Disinfection of condensate water is required for toilet/urinal flushing, clothes washing, trap priming and if it is used for above grade irrigation/outdoor applications.</p>
 OTHER NON-SEWAGE ORIGINATED WATER	<p>Other non-sewage originated water includes water from foundation drains, swimming pool backwash and drains, and residential reverse osmosis systems. This water can contain organic and inorganic contaminants, but is suitable for reuse. In general, this water requires filtration or treatment components for reuse applications.</p> <p>Disinfection of other non-sewage originated water is required for toilet/urinal flushing, clothes washing, trap priming and if it is used for above grade irrigation/outdoor applications.</p>

2 WATER REUSE DESIGN AND CONSTRUCTION CONSIDERATIONS

Design Components

Onsite water reuse systems generally include four design components:

collection, treatment, storage and distribution. The specific design requirements are contained within [30 TAC Chapter 210 Subchapter F](#) and the [City's Plumbing Code](#).

Alternative Water Source Collection System

Waters are collected onsite via gutters or plumbing systems that convey the water to a treatment and/or storage tank.

Onsite Treatment and Disinfection System

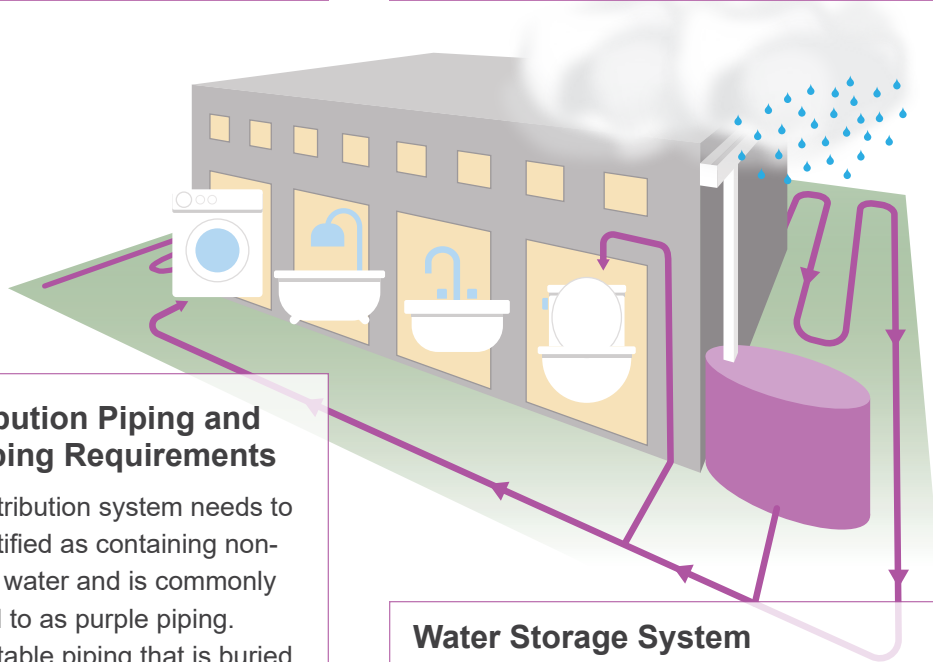
Treatment is dependent on both the source water and its intended end use. Rainwater is relatively clean and requires little more than filtration for most uses. Disinfection is required when human contact with graywater or alternative onsite waters is likely to occur.

Distribution Piping and Plumbing Requirements

The distribution system needs to be identified as containing non-potable water and is commonly referred to as purple piping. Non-potable piping that is buried or in a building is required to be colored or marked purple to distinguish it from a potable water system.






Water Storage System

Water can be stored in tanks for future use. For example, rainwater is collected during precipitation events, but used for irrigation during periods of little to no precipitation.



Allowed Usages and Treatment Requirements

The table below specifies treatment requirements for onsite water reuse systems in multi-family residential and commercial developments.

	 RAINWATER	 GRAYWATER*	 STORMWATER	 CONDENSATE	 OTHER NON-SEWAGE ORIGINATED WATER
Below Grade Irrigation/ Outdoor Landscape	Filtration	Filtration	Filtration	Filtration	Filtration
Above Grade Irrigation/ Outdoor Landscape	Filtration	<ul style="list-style-type: none"> Not Allowed for Multi-Family Treatment & Disinfection for Commercial 	Treatment & Disinfection	Treatment & Disinfection	Treatment & Disinfection
Toilet/Urinal Flushing, Clothes Washing & Trap Primers	Treatment & Disinfection	<ul style="list-style-type: none"> Not Allowed for Multi-Family Treatment & Disinfection for Commercial 	Treatment & Disinfection	Treatment & Disinfection	Treatment & Disinfection
Process Water & Cooling Tower Makeup Water	Treatment when combined with Graywater	Treatment	Treatment when combined with Graywater	Treatment when combined with Graywater	Treatment when combined with Graywater

*Graywater is not allowed to be used for irrigation in the Edwards Aquifer Recharge Zone or in any other geologically sensitive area.

Minimum Water Quality Requirements

The minimum water quality requirements for onsite water reuse systems at multi-family residential and commercial developments are found in [30 TAC Chapter 210 Subchapter F](#). These treatment standards are in general alignment with the [NSF/ANSI 350 and 350-1](#) standards for onsite residential and commercial water reuse treatment systems. Water from a commercial onsite water reuse system that is required to meet E. coli limits must be monitored for E. coli at least monthly. Monitoring records must be maintained at the site and be readily available for inspection by the TCEQ for a minimum of five years.

System Overflow

Graywater reuse systems must be designed and constructed so that the graywater storage system overflows to the sanitary sewer system for the building. The graywater must enter the sanitary sewer system through either one air gap or two backflow valves or backflow preventers (double-check valve).

Onsite water reuse systems that do not contain graywater cannot have a physical connection to a sanitary sewer system. When the system reaches capacity, it is allowed to overflow onto the ground only if the overflow is caused by inflow of rainwater or stormwater. Overflow under these conditions may flow into an organized storm drain system.

System Bypass

Special design considerations are necessary when an onsite reuse system combines the storage of graywater with any other type of alternative onsite water in the same tank (combined reuse systems). This is to prevent rainwater and stormwater from overflowing into the sanitary sewer system, and to prevent graywater from overflowing into the organized storm drain system.

Combined reuse systems must be designed and constructed so that 100% of graywater can be diverted to the sanitary sewer system prior to entering the storage tank. Graywater must be diverted to the sanitary sewer system during periods of non-use of the system or if the storage tank reaches 80% capacity. The graywater must enter the sanitary sewer system through either one air gap or two backflow valves or backflow preventers. In addition, combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the storage tank reaches 80% capacity..

Makeup Water

The City's potable water or reclaimed water may be used as a backup supply (makeup water) to an onsite water reuse system provided the City's water supply is protected by an air gap or reduced-pressure principle backflow preventer in accordance with Section 603.5.21 of the City of Austin's Plumbing Code. Direct connections of the City's potable water or reclaimed water to the treatment components of an onsite water reuse system are NOT allowed (i.e. for filter backwashing).

Cross Connection Control

In order to protect the City's potable water system from contamination by a non-potable water system, certain backflow prevention assemblies may be required at sites with onsite water reuse systems. Specific backflow prevention requirements are found in Table 603.5 of the City of Austin's Plumbing Code. Cross connection testing and backflow prevention assembly testing must be performed by licensed individuals registered with Austin Water.

Piping and Other Identification Requirements



Piping

All exposed piping and piping carrying alternative onsite reuse water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."



Tank, Hose Bibb, Restroom and Equipment Room Signs

Signage for tanks, hose bibbs, restrooms and equipment rooms must be clearly labeled and visible to indicate that a facility uses "NON-POTABLE WATER." Detailed signage requirements are found in Chapters 15 & 16 of the [City's Plumbing Code](#).

3 PERMITTING ONSITE WATER REUSE SYSTEMS

Permitting Requirements



Austin Water requires customers to register certain onsite water reuse systems installed at multi-family residential and commercial developments. The **Auxiliary Water System Registration** form can be found on the following Austin Water webpage:

[Water Protection Forms, Applications and Reports](#)

In addition to registration, installation permits are required for certain onsite reuse systems as outlined in the table on the following page.

	Registration Required For	Permit Required For
 RAINWATER	<ul style="list-style-type: none"> • Systems >500 gallons 	<ul style="list-style-type: none"> • Pumped irrigation/outdoor systems >500 gallons • Systems with components interior to a building • Systems with a backup connection from any water source
 GRAYWATER	<ul style="list-style-type: none"> • All systems 	<ul style="list-style-type: none"> • All systems
 STORMWATER	<ul style="list-style-type: none"> • All systems 	<ul style="list-style-type: none"> • All systems
 CONDENSATE	<ul style="list-style-type: none"> • Systems >500 gallons 	<ul style="list-style-type: none"> • Pumped irrigation/outdoor systems >500 gallons • Systems with components interior to a building • Systems with a backup connection from any water source
 OTHER NON-SEWAGE ORIGINATED WATER	<ul style="list-style-type: none"> • All systems 	<ul style="list-style-type: none"> • All systems

Design and Installation Requirements

Onsite water reuse systems at multi-family residential and commercial developments must be designed by a person registered or licensed to perform plumbing design work (either a Master Plumber or a Professional Engineer licensed by the State of Texas). These systems must be installed by a Responsible Master Plumber licensed by the State of Texas and registered with the City of Austin.

Important Contact Information

Austin Water – Water Conservation Division

Provides guidance and resources related to onsite water reuse systems as well as rebates to incentivize the installation of certain systems.

Webpage: <http://www.austintexas.gov/departments/water-conservation>

Phone: 512-974-2199

Austin Water – Special Services Division

Administers the Cross Connection/Water Protection Program to protect the health and safety of the public water supply from auxiliary water sources including onsite water reuse systems.

Webpage: <http://draft.austintexas.gov:8080/departments/auxiliary-water-sources>

Phone: 512-972-1060

Development Services Department – Building Permits Service Center

Issues permits to construct and performs installation inspections related to onsite water reuse systems.

Webpage: <http://austintexas.gov/departments/building-permits>

Phone: 512-978-4000

Permitting Steps

Design Approval & Permitting

1. Preliminary Review

Contact the Austin Water Conservation Division for a complimentary preliminary review of your onsite water reuse system permit application. This step is optional but highly recommended to ensure the permitting process goes smoothly, and to ensure you are made aware of any qualifying incentives for onsite water reuse systems provided by the utility.

2. Submit Applications

Submit building permit and auxiliary water permit applications to the Development Services Department. If you are applying for an Austin Water rebate that requires pre-approval, submit your application to the Austin Water Conservation Division.

3. Obtain Approval

Once your permit applications are approved, you will be issued a permit to construct the onsite water reuse system.

Construction and Approval for Use

4. Construct the System

A system must pass all Development Services Department Inspections. If your system requires a backflow prevention assembly, this will have to be inspected, tested and approved by a third party prior to your final construction inspection.

5. Operate and Maintain System

After you pass final inspection, you are approved to use your system to save water. No operating permit will be issued, but you are responsible for maintaining your system according to the operation and maintenance manual. You are also responsible for ensuring reoccurring cross connection testing is performed if your system requires it.

6. Rebate Payment

If you have applied for an Austin Water rebate, there will be an additional post-installation inspection prior to receiving funds.

4 ONGOING OPERATION OF ONSITE WATER REUSE SYSTEMS

Minimum Testing, Inspection, and Maintenance Frequency

Local testing, inspection, and maintenance requirements for onsite water reuse systems are found in Tables 1501.5 and 1601.5 of the [City's Plumbing Code](#). These activities must be tracked by the property owner or system operator in a maintenance log, which should include the date of each system inspection. An example log can be found at the end of this document. An operation and maintenance manual is also required for any permitted onsite water reuse system.



Additional State Requirements

Additional State requirements related to the on-going operation of onsite water reuse systems are summarized below. More information can be found in [30 TAC Chapter 210 Subchapter F](#).

Water from an onsite water reuse system must be applied at a rate that will not result in ponding or pooling, or cause runoff across the property lines or onto any paved surface.

Water from an onsite water reuse system shall not be applied using a spray distribution system except in accordance with the following conditions.

- 💧 Water from the spray distribution system must be applied at times when people and pets are not actively using the distribution area.
- 💧 Water from the spray distribution system must not be applied during rainfall events, when the ground is frozen, or within 24 hours after one-half inch or more of rain.
- 💧 Water from the spray distribution system must be applied at a rate to prevent ponding, puddling, or runoff.
- 💧 Water from the spray distribution system must not be sprayed or allowed to drift off the property.
- 💧 The spray distribution system must not be connected to a potable or raw water irrigation system unless suitable backflow prevention is provided to protect the potable or raw water system.
- 💧 The spray distribution system must be inspected and repaired as needed to prevent discharges to water in the state or off the property.

The storage and use of water from an onsite water reuse system must not create a nuisance, threaten human health, or damage the quality of surface water or groundwater.

Swimming pool backwash and drain water cannot be used within five days of adding chemicals for shock or acid treatment.

5 REBATES AND INCENTIVES FOR ONSITE WATER REUSE SYSTEMS

Through its Water Conservation Program, Austin Water currently offers a number of rebates to incentivize customers to install onsite water reuse systems on their property. Customers who reuse water effectively should see savings in their monthly water bills.

Eligibility

To qualify for an Austin Water rebate you must be a customer of Austin Water or a qualifying water provider, and you must either be the property owner or the utility account holder (with written permission from the property owner). Additional criteria apply for each rebate program, and specific information can be found on Austin Water's Water Conservation webpage at the following address: <http://www.austintexas.gov/department/water-conservation-rebates>.



Qualifying Rebate Programs

At the time of publication the following rebate programs are available to multi-family residential and commercial customers for onsite water reuse system installations through Austin Water.

- 💧 Rainwater Harvesting
- 💧 Bucks for Business

These rebates are subject to change, and pre-approval is typically required before purchasing or installing any of the materials that are covered by the rebates. For the most up-to-date program information, customers are encouraged to check Austin Water's Water Conservation webpage prior to submitting a rebate application: <http://www.austintexas.gov/department/water-conservation-rebates>.



6 ADDITIONAL CONSIDERATIONS FOR CONDENSATE REUSE

Mandatory Condensate Recovery Systems for New Development

In June of 2017 the Austin City Council approved the adoption of the City's [Mechanical Code](#) which includes the following provisions related to condensate reuse systems:

- ◆ Section 310.10 requires new commercial and multi-family facilities with a cooling capacity of 200 tons or greater to install condensate recovery systems for beneficial reuse. Beneficial reuse includes the allowed usages outlined in this guide.
- ◆ Section 1126.0(6) requires new commercial and multi-family facilities with a cooling capacity of 100 tons or greater to either utilize blowdown water for beneficial reuse, or to offset a minimum of 10 percent of the cooling system's make-up water with reclaimed water or water from an onsite water reuse system.

Special Requirements for Industrial Condensate Reuse Systems

The [Texas Commission on Environmental Quality](#) (TCEQ) has adopted special requirements for industrial condensate reuse systems that are not covered in this guide. These industrial condensate reuse guidelines can be found in [30 TAC Chapter 210 Subchapter E](#). Authorization to reuse industrial wastewater under this subchapter may be obtained from the TCEQ, but is not needed for: internal recycling systems, closed loop systems, or makeup water within a facility.

The San Antonio Water System (SAWS) has published a condensate collection and use manual for commercial buildings. The manual was created as a guide for building managers, architects, engineers, and facility personnel to facilitate the comprehensive evaluation, design, and implementation of condensate collection and use systems for commercial buildings. The manual is available for download at the following address on the SAWS website: <http://www.saws.org/Conservation/Commercial/Condensate/index.cfm>

Glossary of Terms

- ◆ **AUXILIARY/ALTERNATIVE WATER** is any water source other than the City's drinking water that is pressurized for use on a property. Onsite water reuse systems are considered auxiliary or alternative water sources.
- ◆ **COMMERCIAL DEVELOPMENT** includes all non-residential structures and their accessory structures.
- ◆ **CONDENSATE WATER** is water produced in a heating, ventilation and air-conditioning (HVAC) system as the result of evaporative cooling.
- ◆ **CROSS-CONNECTION** is a physical connection between drinkable water and a liquid or gas that could make the water unsafe to drink (wherever there is a cross connection, there is a potential threat to public health from the liquid or gas contaminants).
- ◆ **FILTRATION** is a means to physically separate debris and sediment from an onsite water reuse system. When reuse water is distributed through subsurface irrigation or through indoor plumbing, a filter allowing the passage of particles no larger than 100 microns is required.
- ◆ **GRAYWATER** is wastewater from showers, bathtubs, handwashing lavatories, sinks that are used for disposal of household or domestic products, sinks that are not used for food preparation or disposal, and clothes-washing machines. Graywater does not include wastewater from the washing of material, including diapers, soiled with human excreta or wastewater that has come into contact with toilet waste.
- ◆ **MULTI-FAMILY RESIDENTIAL DEVELOPMENT** includes apartment buildings, or any other residential structure that doesn't meet the definition of a single family development.
- ◆ **NON-POTABLE WATER** is water that is not of drinking water quality, but which may still be used for many other purposes such as irrigation/landscaping and toilet/urinal flushing.
- ◆ **OTHER NON-SEWAGE ORIGINATED WATER** is foundation drain water, swimming pool backwash and drain water and reverse osmosis reject water.
- ◆ **POTABLE WATER** is water that is treated to drinking water quality. For the purpose of this guide, potable water refers specifically to drinking water provided by the City of Austin's water utility, Austin Water.
- ◆ **RAINWATER** is precipitation collected from roof surfaces or other aboveground structures.
- ◆ **RECLAIMED WATER** is water from the City of Austin's wastewater treatment plants that is treated for reuse, but that is not suitable for drinking.
- ◆ **SEWAGE** is waste that is primarily organic and biodegradable or decomposable and that originates as human, animal, or plant waste from certain activities, including the use of toilet facilities, washing, bathing, and preparing food.
- ◆ **SINGLE-FAMILY RESIDENTIAL DEVELOPMENT** includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures.
- ◆ **STORMWATER** is precipitation collected from surfaces at or below grade before it enters the bed and banks of a water body that is designated a surface water in the state.

Example Maintenance Log

Property address: _____

System source water(s): _____

End use(s) of water: _____

Every month maintenance	Dates performed											
E. coli testing												

Every 3 months maintenance	Dates performed			
Inspect and clean filters and screens, and replace (where necessary)				

Every 6 months maintenance	Dates performed	
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.		
Inspect and clear debris from roof or other aboveground rainwater collection surfaces		

Every 12 months maintenance	Dates performed	
Inspect pumps and verify operation		
Inspect valves and verify operation		
Inspect pressure tanks and verify operation		
Clear debris from and inspect storage tanks, locking devices, and verify operation		
Inspect caution labels and marking		
Cross-connection inspection and test		

Manufacturer specified maintenance	Dates performed			
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational and maintaining minimum water quality requirements				

As needed maintenance	Dates performed			
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surfaces				
Inspect and maintain mulch basins for gray water irrigation systems to maintain mulch depth and prevent ponding and runoff				

MULTI-FAMILY RESIDENTIAL & COMMERCIAL ONSITE WATER REUSE



Austin Water – Water Conservation Division

watercon@austintexas.gov

512-974-2199

AustinWater.org