Welcome

- The webinar will be 60 minutes in length with time for questions and answers.
- The phone line will be muted during the presentation.
- Questions can be typed in throughout the webinar and will be answered, either through the chat or by speaker.
- To access forms, FAQ or other information related to the Cooling Tower Efficiency Program please visit
- www.austintexas.gov/page/cooling-tower-efficiency-program

COOLING TOWER EFFICIENCY PROGRAM OVERVIEW

November 2023

Presenters

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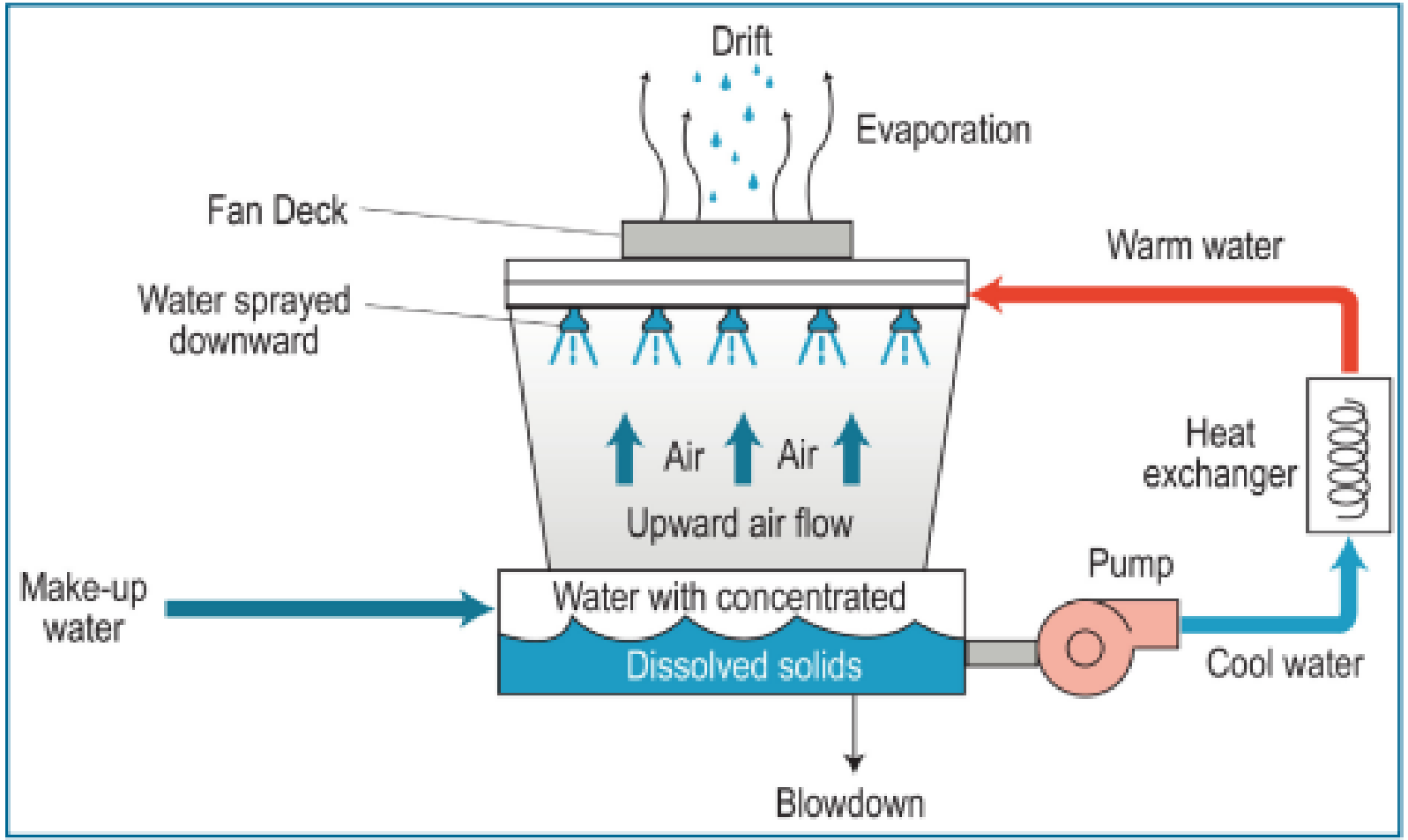
Webinar Road Map

- What is a cooling tower?
- Program History
- Requirements
- Challenges
- Rebate and Incentive Information
- Questions and Answers
- Contact Information

What is a Cooling Tower?



Cycles of Concentration (CoC)

Savings Potential From Increased Cycles

Increasing cycles of concentration from 3 to 6 reduces cooling tower water usage by **20 percent**

Initial Concentration Ratio (Cri)	New Concentration Ratio (CRf)										
	2	2.5	3	3.5	4	5	6	7	8	9	10
1.5	33%	44%	50%	53%	56%	58%	60%	61%	62%	63%	64%
2.0	–	17%	25%	30%	33%	38%	40%	42%	43%	44%	45%
2.5	–	–	10%	16%	20%	25%	28%	30%	31%	33%	34%
3.0				7%	11%	17%	20%	22%	24%	25%	26%
3.5	–	–	–	–	5%	11%	14%	17%	18%	20%	21%
4.0	–	–	–	–	–	6%	10%	13%	14%	16%	17%
5.0	–	–	–	–	–	–	4%	7%	9%	10%	11%
6.0	–	–	–	–	–	–	–	3%	5%	6%	7%

EPA

Cycles of Concentration (CoC)

Recirculating Water Parameters	Maximum Values	Austin Water	Cycles of Concentration
Conductivity (micro-ohms)	3300	372	8.8
Total Dissolved Solids (ppm)	2050	222	9.2
Total Alkalinity as CaCO3 (ppm)1	600	65	9.2
Total Alkalinity as CaCO3 (ppm)2	500	65	7.6
Calcium Hardness as CaCO3 (ppm)	600	99	6.6
Chlorides as Cl (ppm)	300	52	5.7
Sulfates (ppm)	250	33	7.6
Silica (ppm)	150	7	21.4
Langelier Saturation Index (LSI)	+2.8		

Recirculating water parameters are from ASHRAE 189.1- 2020 *Standard for the Design of High-Performance Green Building*.

[1] Excluding galvanized steel
[2] Galvanized steel (passivated)
[3] Last reported during the 2nd quarter of 2023
[4] Last reported during the 2nd quarter of 2023

Program History and Requirements

COOLING TOWER EFFICIENCY PROGRAM OVERVIEW

Program History

January 1,2008 Cooling Tower standards

Cooling Tower standards are adopted and become effective on January 1st.

September 6, 2017 approval of registration and inspection.

Austin City Council approves the mandatory registration and annual inspection requirements as part of the local amendments to the 2015 Uniform Mechanical Code and Uniform Plumbing Code.

December 10, 2020 approval of fines

Austin City Council approves administrative fines to ensure compliance to the Cooling Tower Efficiency Program requirements.

Cooling Tower Standards

As stated in *Section 1126 Cooling Tower Standards* of the City of Austin's Local Amendments to the Uniform Mechanical Code. Adopted in 2008.

- Achieve a **minimum of five cycles of concentration** if the cooling tower utilizes potable water as its primary source of make-up water;
- Be fitted with overflow sensors and alarms, make-up and blowdown water meters to manage water consumption, and conductivity controllers;
  - If the cooling tower is 100 tons or more, the make-up and blowdown meters and overflow alarm shall be connected to the building's central energy management system or utility monitoring dashboard; and
- Be equipped with drift eliminators with a drift rate of not more than 0.005% of the circulated water flow rate for crossflow towers and 0.002% for counterflow towers when operated consistent with the equipment manufacturer's instructions and with the cooling tower, evaporative condensers, and fluid coolers.

Cooling Tower Standards

- A biocide shall be used to treat the cooling system recirculation to minimize the growth of Legionella and other microorganisms and to increase water use efficiency.
- Commercial and multifamily facilities permitted after September 5, 2017, with an evaporative cooling tower system with a combined cooling capacity equal to or greater than 100 tons, shall have a minimum of 10% of the cooling tower make-up water offset with reclaimed or onsite water reuse.

Efficiency Standards

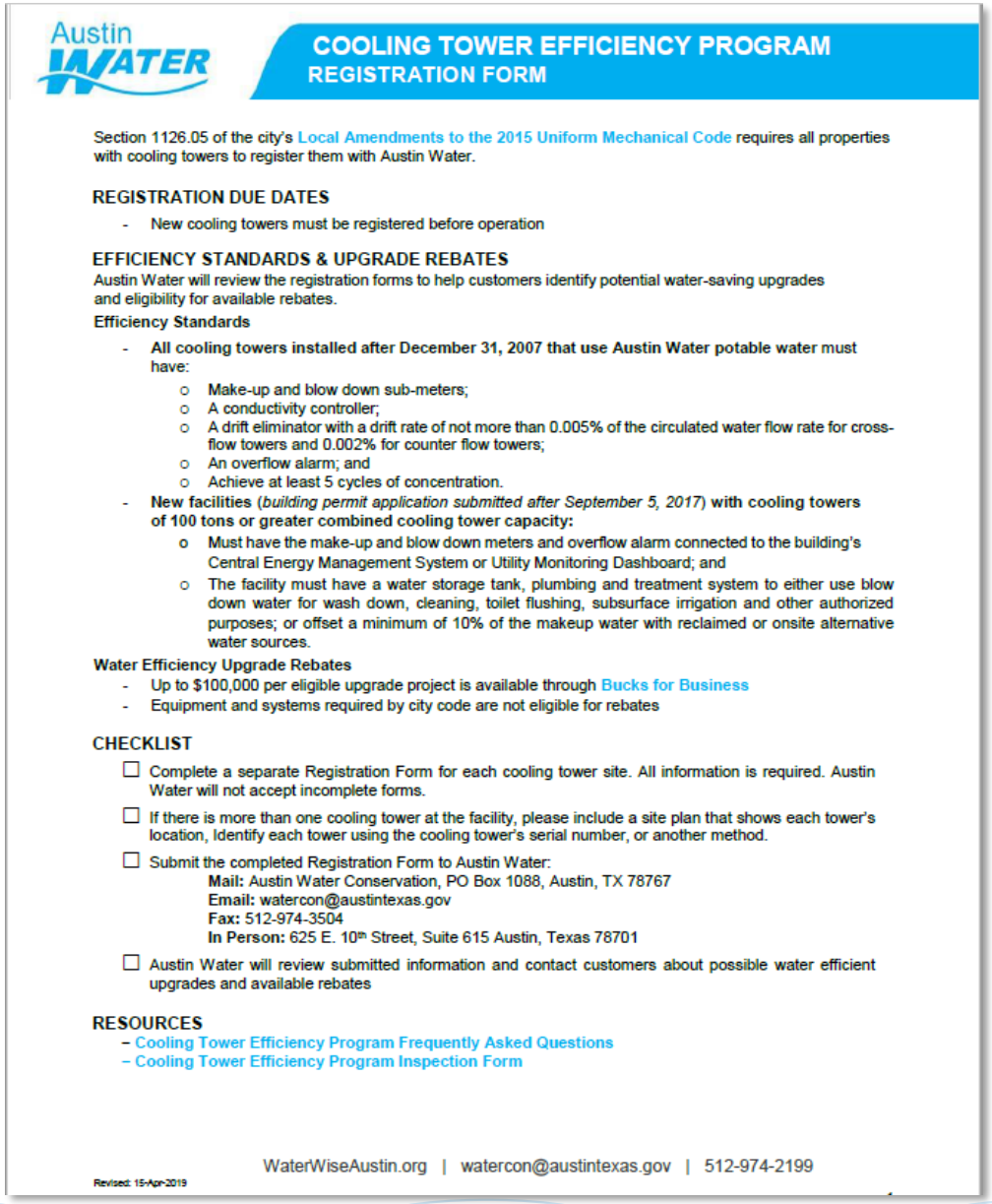
- Applies to all **cooling towers installed or replaced** after December 31, 2007
- **New facilities** after Sept 5, 2017
  - makeup water 10% offset
  - Connection to management dashboard
  - Maintain monthly logs

Exceptions/variances

- Efficiency standards and equipment requirements do not apply to:
  - Cooling towers not using potable water as a source of make-up water;
    - E.g., reclaimed water (AW treated wastewater) , on-site auxiliary water, air cooled or refrigerant systems
  - State owned/funded property subject to Texas Gov't Code §447.004, Title 34 TAC §19.32

Registration

- All cooling towers must register with the program.
- New or replacement towers must register prior to operation.
- If ownership of the CT has changed, a new registration is required.



Austin WATER

COOLING TOWER EFFICIENCY PROGRAM
REGISTRATION FORM

Section 1126.05 of the city's Local Amendments to the 2015 Uniform Mechanical Code requires all properties with cooling towers to register them with Austin Water.

REGISTRATION DUE DATES

- New cooling towers must be registered before operation

EFFICIENCY STANDARDS & UPGRADE REBATES

Austin Water will review the registration forms to help customers identify potential water-saving upgrades and eligibility for available rebates.

Efficiency Standards

- **All cooling towers installed after December 31, 2007 that use Austin Water potable water** must have:
  - Make-up and blow down sub-meters;
  - A conductivity controller;
  - A drift eliminator with a drift rate of not more than 0.005% of the circulated water flow rate for cross-flow towers and 0.002% for counter flow towers;
  - An overflow alarm; and
  - Achieve at least 5 cycles of concentration.
- **New facilities** (*building permit application submitted after September 5, 2017*) **with cooling towers of 100 tons or greater combined cooling tower capacity:**
  - Must have the make-up and blow down meters and overflow alarm connected to the building's Central Energy Management System or Utility Monitoring Dashboard; and
  - The facility must have a water storage tank, plumbing and treatment system to either use blow down water for wash down, cleaning, toilet flushing, subsurface irrigation and other authorized purposes; or offset a minimum of 10% of the makeup water with reclaimed or onsite alternative water sources.

Water Efficiency Upgrade Rebates

- Up to $100,000 per eligible upgrade project is available through Bucks for Business
- Equipment and systems required by city code are not eligible for rebates

CHECKLIST

- ☐ Complete a separate Registration Form for each cooling tower site. All information is required. Austin Water will not accept incomplete forms.
- ☐ If there is more than one cooling tower at the facility, please include a site plan that shows each tower's location, identify each tower using the cooling tower's serial number, or another method.
- ☐ Submit the completed Registration Form to Austin Water:
  Mail: Austin Water Conservation, PO Box 1088, Austin, TX 78767
  Email: watercon@austintexas.gov
  Fax: 512-974-3504
  In Person: 625 E. 10th Street, Suite 615 Austin, Texas 78701
- ☐ Austin Water will review submitted information and contact customers about possible water efficient upgrades and available rebates

RESOURCES

- Cooling Tower Efficiency Program Frequently Asked Questions
- Cooling Tower Efficiency Program Inspection Form

WaterWiseAustin.org | watercon@austintexas.gov | 512-974-2199

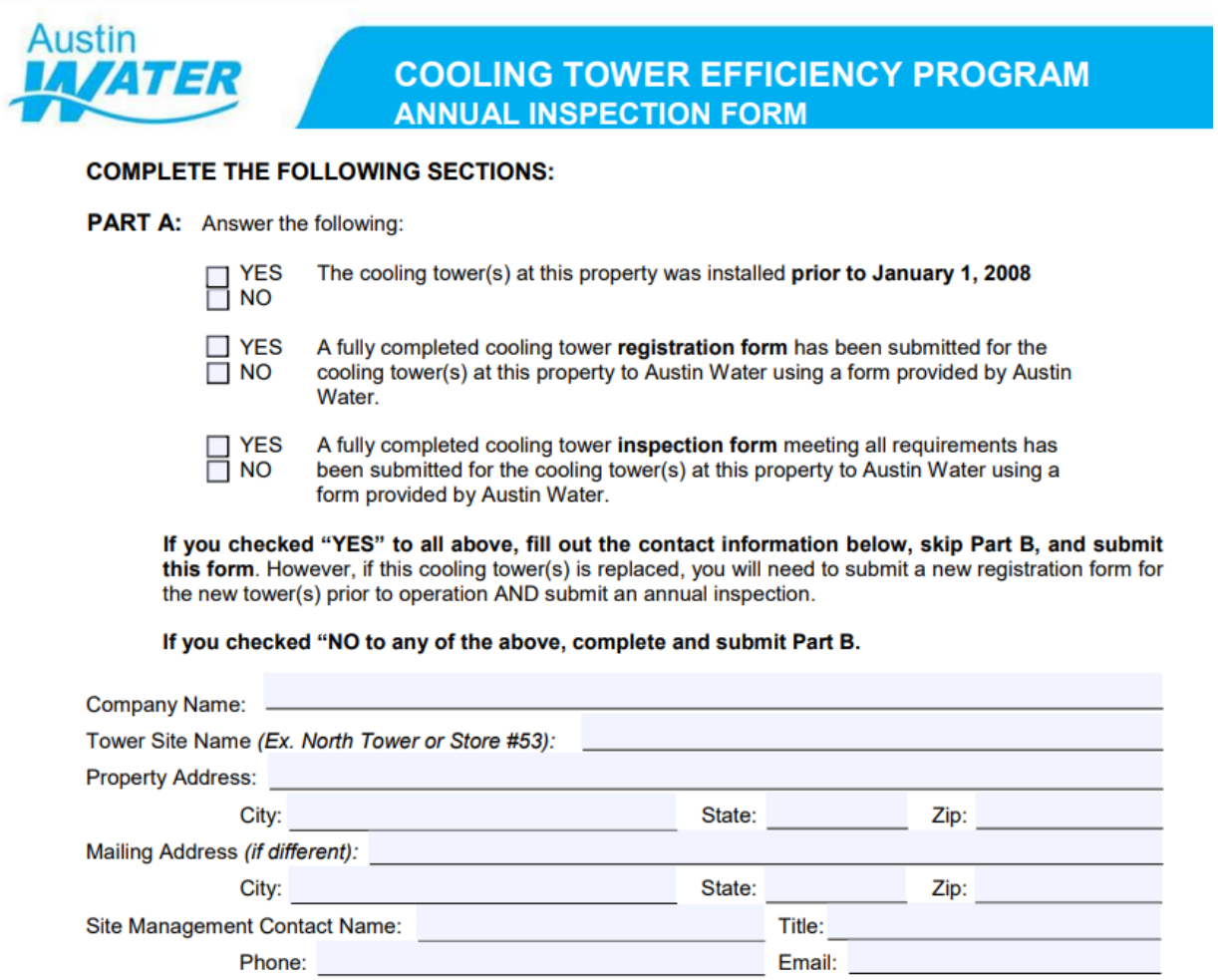
Revised: 15-Apr-2019

Inspections

- Cooling towers must be inspected annually
- Report due by March 1st of each year
- Inspection must be within 90 days before due date (Dec 1st)
- Must be performed by third party Texas registered mechanical/chemical engineer or TDLR licensed air conditioning and refrigeration contractor (Class A - RE combined)
- Report must be on Austin Water form. All fields must be filled out.
- Must be sent to Austin Water Conservation Division

Inspections

- Towers installed prior to Jan 1st 2008 are not required to meet the efficiency requirements.
- They must be registered with the program and provide PART A of the inspection report by the March 1st deadline.
- This allows us to have updated contact information and verify the tower has not been replaced.



Austin WATER

COOLING TOWER EFFICIENCY PROGRAM
ANNUAL INSPECTION FORM

COMPLETE THE FOLLOWING SECTIONS:

PART A: Answer the following:

☐ YES ☐ NO — The cooling tower(s) at this property was installed **prior to January 1, 2008**

☐ YES ☐ NO — A fully completed cooling tower **registration form** has been submitted for the cooling tower(s) at this property to Austin Water using a form provided by Austin Water.

☐ YES ☐ NO — A fully completed cooling tower **inspection form** meeting all requirements has been submitted for the cooling tower(s) at this property to Austin Water using a form provided by Austin Water.

If you checked "YES" to all above, fill out the contact information below, skip Part B, and submit this form. However, if this cooling tower(s) is replaced, you will need to submit a new registration form for the new tower(s) prior to operation AND submit an annual inspection.

If you checked "NO to any of the above, complete and submit Part B.

Company Name: _____

Tower Site Name *(Ex. North Tower or Store #53)*: _____

Property Address: _____

City: _____ State: _____ Zip: _____

Mailing Address *(if different)*: _____

City: _____ State: _____ Zip: _____

Site Management Contact Name: _____ Title: _____

Phone: _____ Email: _____

Program Updates:

- Fees:
  - A fee of $758 will be added to the utility account every month for out of compliance registered properties. This includes efficiency and reporting requirements.
  - To avoid the fee, properties will need to submit an inspection report by the March 1st deadline. Any towers installed after 1/1/2008 will need to meet all the efficiency requirements.

Where do I submit my documents?

Please submit your registration and/or inspection to:

Mail: Austin Water Conservation, PO Box 1088, Austin, TX 78767
Email: FacEvalSubmit@austintexas.gov
Fax: 512-974-3504
In Person: 625 E. 10th Street, Suite 615 Austin, Texas 78701

Cooling Tower Efficiency Program documents must be submitted to the water conservation division by March 1st.

Frequently asked question

- **The cooling tower at our location is scheduled to be replaced due to damage from a freeze, will I need to offset a minimum of 10% of the make-up water with reclaimed or an onsite alternative water source?**
- **We have recently taken ownership of a building and were not aware of the program, are we still required to get an inspection and submit all paperwork by the March 1st deadline?**

Program challenges

- Cooling tower identification
- Property turnover and sales
- Program Awareness
  - EL and CTEP
- Timely submission

What We Have Learned

- Older towers more efficient than expected
- Minimum five cycles achievable without additional water treatment for properly maintained/operated towers using AW potable water
- Many towers built after the 2008 not meeting all code requirements (e.g., overflow alarms)

Incentives

Evaporative Loss Program

- A voluntary program to receive a billing adjustment for wastewater that is determined by the evaporative water loss for the cooling tower.
- To qualify the property must apply and submit additional material for review.
- Contact the Evaporative Loss group for additional information at AwEvapLoss@austintexas.gov.

Voluntary Reclaimed Connection Rebate

Austin Water's **Voluntary Reclaimed Water Connection Pilot Rebate** offers up to $100,000 to help with costs associated with voluntarily connecting to and using reclaimed water from Austin Water's reclaimed water system.

WATER SAVINGS

- Reclaimed water can be used to offset many non-potable water demands
- Reclaimed water rates for voluntary connections are roughly 40% of drinking water rates

REBATE AMOUNT

- **$100,000 maximum rebate** per eligible property
  - **Cooling tower conversion** – $100 per ton, up to 75% of eligible project costs
  - **Landscape irrigation conversion** – $750 per zone, up to 75% of eligible project costs
  - **Other uses** – $1.00 per 1,000 gallons saved over a 20-year period, up to 75% of eligible project costs
- Eligible project costs include all related labor and materials, excluding permitting costs

BUCKS FOR BUSINESS REBATES ARE AVAILABLE FOR:

- **ALTERNATIVE COOLING SYSTEMS** – Kick the cooling tower and receive up to $100,000 for alternative cooling systems that do not use water or use significantly less water than traditional cooling towers. Includes, but is not limited to, hybrid systems, fluid refrigerant systems, dry or air-cooled systems, and geothermal systems.
- **COOLING TOWERS UTILIZING RECLAIMED WATER** – Receive up to $100,000 for water treatment, filtration, and other systems for reclaimed water (treated municipal wastewater) used in cooling towers. Includes water softeners, sulfuric acid, ozonation, side stream filtration using rapid sand, cartridge, or cyclonic filters that help remove solids
- **INCREASED COOLING TOWER EFFICIENCY**
  - **$1,000 for an overflow alarm** *(for cooling towers installed prior to January 1, 2008)* - In only three months, a 2 gallon per minute overflow can result in 259,200 gallons of water loss and $3,650 in water costs. Replacing a malfunctioning ballcock style (float on a rod) fill valve with a solenoid operated valve using an external level sensor to prevent overflows has a payback period of less than six months.
  - **$1,100 for an automated cooling tower conductivity controller** *(for cooling towers installed prior to January 1, 2008)* - Savings of up to 800,000 gallons and up to 40% in water costs a year, depending on current cycles, cooling size/capacity and load.
  - **Up to $100,000 for water treatment, filtration, or other systems to increase cycles of concentration above five cycles** - Includes water softeners, sulfuric acid, ozonation, side stream filtration using rapid sand, cartridge, or cyclonic filters that help remove solids.
  - **Up to $100,000 for alternative water systems for cooling tower make-up** *(for cooling towers installed prior to September 6, 2017)* - Includes projects to recover and use on-site alternative water sources such as air conditioning condensate and manufacturing process water.

Cooling Tower Rebate Available from Austin Energy

- You can apply for and receive rebates from both Austin Water and Austin Energy
- Separate applications for each. Austin Energy information is here:
  - https://savings.austinenergy.com/rebates/commercial/offerings/cooling-and-heating/cooling-tower
- Must contact Austin Energy to determine rebate amount. Austin Energy offers $300 per kW you save.
- Must apply for Austin Energy rebate before installation of equipment.

Questions?

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