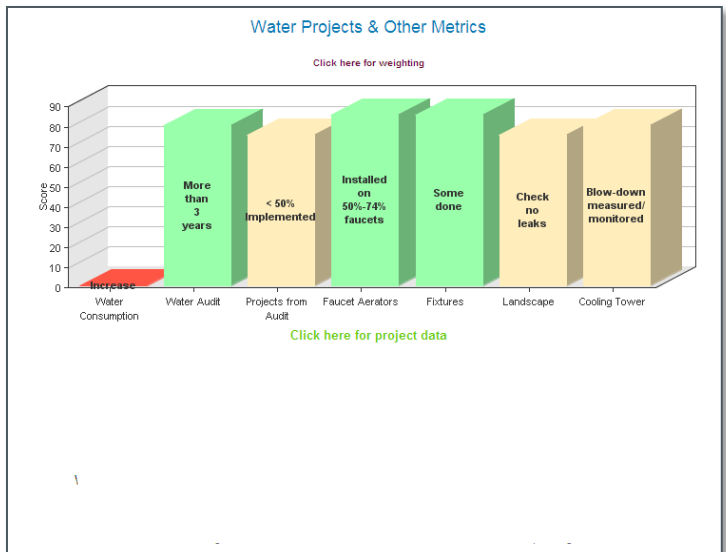
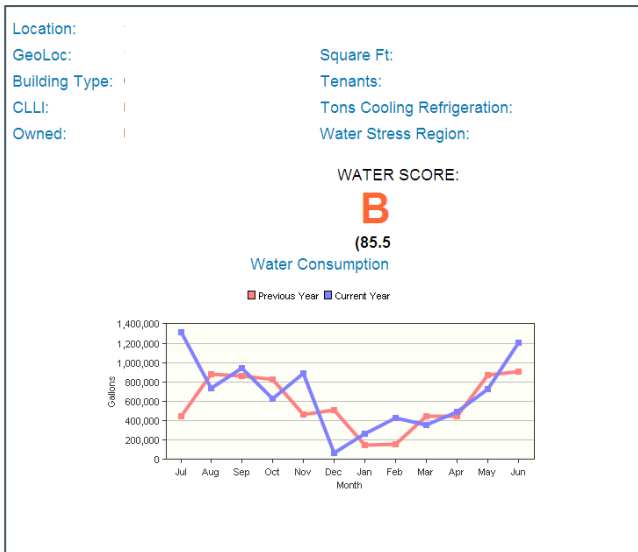


# Water Score Card Guide



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## Overview

A Water Score Card provides a single and clear metric for quantifying the overall effectiveness of the water management program at your facilities. It can be used to:

- Provide an overall picture of your water use by applying the Score Card at individual facilities across your portfolio.
- Recognize the facilities where water efficiency efforts have been made.
- Identify facilities where water efficiency opportunities are greatest.
- Gather data about water use in cooling towers.
- Create a shared understanding among staff about responsible water practices.

This guide walks you through the components of the Score Card and provides tips and lessons from AT&T's experience in creating one. The Score Card can be adapted to use at your company or organization — whether it's a Fortune 500 company with thousands of offices across the U.S., or a small company with just one facility.

This guide is divided into 2 sections:

1. **Implementation tips** – includes advice grounded in real world experience on how to implement the score card.
2. **Building your Score Card** – provides details on each aspect of the Score Card and how to apply it.

### 1. Implementation tips

The primary purpose of the Score Card is to increase the visibility and accountability of water efficiency within a company or an organization. When implementing the Score Card, here are some tips to consider:

#### **Host it on a web portal**

- The most effective way to build a Water Score Card tool is by hosting it on a web portal so that existing data can be entered and is easily accessible.

#### **Send the Score Card to all sites**

- If you manage a small portfolio, consider sending the Score Card to all your sites. If you manage a large portfolio, use the Score Card at facilities that use the most water. This can be determined by looking at the water utility bills at facilities over the last few years. Focus this effort on those facilities where the opportunity for improvement is greatest.

#### **Assign a water champion**

- Assign one person at each facility to be the Water Champion. They will be responsible for taking the lead in completing the Score Card. This will likely be a facility manager or engineer, who is most familiar with the operations and equipment at the facility. Establishing this single point of contact at each facility creates a sense of ownership and responsibility for performance.

#### **Take time to educate and share**

- Take the time to educate the people involved on why the Score Card and water efficiency efforts are important. As with everything, having leadership support in the effort will communicate the importance of the program to the organization. This perspective will help everyone understand that water efficiency is an important effort, even with the competing obligations in their schedule.
- Introduce the Water Score Card at a session with the whole team. For example, if there are quarterly meetings of facility managers, this could be a good opportunity for a Senior Leader to

introduce the Water Score Card. Stress the importance of the effort and communicate that regular updates and performance reviews will be shared with the group.

**Be patient and persistent**

- The first time the Score Card is completed sets the baseline, and the results may not be great. That's okay. The purpose of the exercise is to identify opportunities and show progress, so it's logical that the first effort won't be perfect.

**Communicate results**

- Share the results of each Score Card session publically. Highlight the results of the facilities that have good grades. Celebrate the successes of that location and share the techniques that were used.

**Focus your efforts**

- Separately, work with the responsible parties at the facilities that did not score well. There is a good chance that the visibility of their poor performance will inspire them to work harder to improve their score —That is the power of a common and public Score Card. Consider pairing a high-performer with a low performer in order to establish a mentoring relationship.

**Establish a clear process**

- Repeat the Score Card process at an interval that makes sense for your organization.

## **2. Score Card components**

### **Design and Grade**

The Water Score balances the strength of the water management program at a facility with the consecutive year water consumption trend. Water Scores are rated as "A" through "D" – with an "A" being the most favorable.

By design, a facility can only obtain the highest water performance score by having an EXCELLENT water management program in combination with a DECREASING water consumption trend. Conversely, a positive water trend without a GOOD water management program will not score as well. Scores are calculated by multiplying the weight of each category (e.g. Aerators = 10%) by the data for that category (e.g. Aerators < 50% = 70) to define points allotted for that section (e.g. 7 points for Aerators).

There are 12 components to the Score Card, which are listed below along with the percent weight we assign for each. These components and percentages can be adjusted to reflect the type of activity you're trying to stimulate based on how your particular company uses water. For instance, if your facility has relatively few people but requires substantial mechanical cooling (e.g. a data center), you may want reduce the percentage weight of faucets and fixtures and increase the cooling tower and rebates value.

Score Card Component	% of Grade
Water Consumption Change	10%
Water Audit	15%
Projects from Audits	10%
Faucet Aerators	10%
Fixtures	10%
Landscape	10%
Water Champion in Annual Performance Review	4%
Cooling Tower Sewer Credit	4%
Water Re-Use/Non-Potable Water	4%
Rebates	4%
Innovation	4%
Cooling Tower Operations	15%
	<b>100%</b>

## The data collected should be as follows:

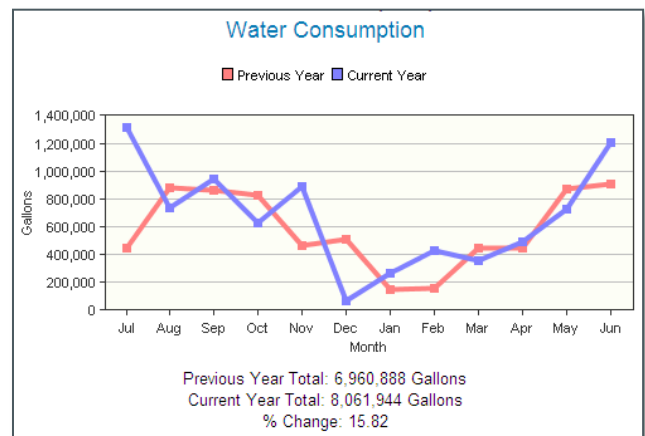
### Water Consumption Change – 10%

This data comes from the Water/Sewer utility bills. If your company hasn't been tracking its water use, you can contact your Water/Sewer Utility to gather past data on water and sewer use. Many utilities can provide historic records that show the monthly trend of water consumption and compare year-over-year.

The Score Card should compare year-over-year consumption to assign a score.

As shown in the table below, if water consumption increases, then no points are awarded. Otherwise, points vary between 85% and 100%.

Increase	0%
Down 0-2%	85%
Down more than 2%	100%



## Water Audit – 15%

As with energy, it is critically important to understand what water efficiency opportunities may exist at your facility. A Water Audit is a tool that reviews all the ways that water is used at the facility, and identifies opportunities to reduce consumption.

There are a few ways you can obtain a Water Audit:

- **Utility-sponsored audits:** Local water/sewer utilities will occasionally provide resources to provide water audits. Contact your water utility to see if they can help.
- **Vendors Audits:** Tap into your current vendors. Your current mechanical/engineering vendor can provide an analysis of your water efficiency opportunities. If you are considering other mechanical projects, see if you can engage them to provide a simple audit as part of the service included in the project.
- **Self-audits:** You can also use simple templates to help guide your own assessment of your facility. There are many available online. A few samples can be found in the [Water Toolkit](#) that can be customized to meet your needs.

Scoring for this section should be:

**Water Audit:**

Never (0)

Yes, more than 3 years ago (80)

Yes, within 3 years (100)

## Projects from Audits – 10%

After compiling a complete list of water efficiency opportunities from your water audit, you will be able to identify where the best opportunities lie. Some projects require little to no additional investment, while other will require a funding request. Examples of projects include the following:

Miminal Investment	Funding Request
Install aerators on all faucets	Install high-efficiency cooling tower
Ensure all faucets/fixtures don't leak	Install high-efficiency drip irrigation
Increase Cycles of Concentration to 6	Install high efficiency faucets and fixtures
Install xeriscape/drought-tolerant plants	

All potential water projects should be entered in the Water Score Card. Create a section of the Score Card in which you list the projects and show progress toward completion.

In this example, Options 2 and 3 show progress on non-Capital projects. Option 3 indicates a full evaluation/business case work for all Capital projects,

**Projects from Audit:**

Click [here](#) to enter water project details

No action taken (0)

Projects identified and < 50% non-Capital projects implimented (75)

Projects identified and 50 - 100% non-Capital projects implimented (85)

Capital projects identified and business case done (100)

[Click here for project data](#)

Project Desc	Category	Net Cost	Payback	Annual Savings (\$)	Annual Savings (gals)	Target Comp	Actual Comp	Status
Example - installed low flow on sinks	fixtures	\$500.00	9 months	\$45,000.00	2000	12/15/10		Awaiting Quote

even if they haven't been funded or completed.

## Faucet Aerators – 10%

A typical faucet delivers around 2.2 gallons per minute (gpm) of water. By buying a low-flow faucet or by installing an aerator (which incorporates air into the water stream to make it feel more voluminous), a facility can reduce water consumption for a very low-cost investment, usually around .5 gpm. Aerators offer an inexpensive way to greatly increase the water efficiency of faucets.

**Faucet Aerators:**

- None (0)
- Low-flow aerators installed on < 50% faucets (70)
- Low-flow aerators installed on between 50 - 74% faucets (85)
- Low-flow aerators installed on between 75 - 100% faucets (100)

If your facility has faucets that receive frequent use, it is recommended that you install aerators because they are low-cost equipment with high savings and quick payback. To complete the Score Card, simply indicate what percentage of heavy-use faucets have aerators or low-flow (0.5 gpm or less) faucets installed.

**IMPORTANT NOTE: Aerators should only be used on faucets that receive daily use and are in high-occupancy buildings. The addition of aerators is not recommended for faucets that are in low-occupancy buildings, faucets that are not used for several days in a row, or faucets that are in areas of a building with low occupancy even though one or more floors might be heavily occupied. Extended periods of standing water in plumbing (whether from a "dead leg" plumbing run or from a lightly-used faucet with an aerator) can lead to complications impacting the potability of the water.**

## Fixtures – 10%

This section of the Water Score Card reports the efficiency of inside water fixtures such as toilets, faucets and urinals. For each fixture, indicate if you have these high-efficiency fixtures installed in "None", "Some" or "All" of the locations where these fixtures might be used.

**Fixtures:**

<b>Low Flow Toilets</b>	<b>Automatic Controls</b>	<b>Ultra Low Flush Urinals</b>
<input type="radio"/> None (60)	<input type="radio"/> None (60)	<input type="radio"/> None (60)
<input type="radio"/> Some (80)	<input checked="" type="radio"/> Some (80)	<input checked="" type="radio"/> Some (80)
<input checked="" type="radio"/> All (100)	<input type="radio"/> All (100)	<input type="radio"/> All (100)

Fixture Type:	Examples:
Low Flow Toilet	25% below local building code, such as: 1.3 gallons per flush (gpf) or less or "dual-flush toilets" - one for a full flush (1.3 gpf to eliminate solid waste) and the second button for a reduced flush (1.0 gpf for liquid waste)
Automatic Controls	Faucets, toilets and urinals use touchless sensors to turn water flow on and off
Ultra Low-Flush Urinals	1 gallon per flush (gpf) or less

## Landscape – 10%

The choices you make with the landscape at your facilities can also have a substantial impact on your water use. The best choice is to use plants and landscape material that are local to the area. This technique (called xeriscaping) is the best way to reduce or eliminate the need for mechanical irrigation. If that is not an option, it is critically important that an efficient irrigation system (smart sensors that detect recent rainfall, drip irrigation, low flow, etc.) is installed and managed efficiently so leaks are eliminated. The [LEED guidelines](#) from the USGBC provide some great resources for this.

**NOTE:** Select “None” if no activities have been done. If you have no landscaping, select the last option (N/A).

**Landscape:**

None (0)

System is checked to ensure no leaks (75)

Irrigation is water efficient. Utilizes low-flow sprinklers, trickle/drip irrigation and has optimized watering schedules and water placement (85)

Utilizes landscaping that minimizes the need for irrigation (drought-tolerant, xeriscape techniques). No/limited irrigation needed. Or N/A (no irrigation at facility) (100)

## Miscellaneous – 4% Each

The last section of the Water Score Card includes a collection of topics:

- **Water Champion in Annual Performance Review** – Do you have anything related to water in your Annual Performance Review? Do you have a goal of learning about water efficient irrigation and xeriscaping? Have you set a goal to get more education about how cooling towers work?
- **Cooling Tower Sewer Credit** – If you have a cooling tower at your facility, have you engaged your water utility to ensure that your bill is correctly reflecting the volume of discharge? Because so much water evaporates from a cooling tower, the amount of water discharged to the sewer should be much less than the inbound amount. Check with the water utility to see if there are possible adjustments to your sewer bill.
- **Water Re-use/Non-Potable Water Use** - Are you taking advantage of any opportunities to re-use water at your facility? Can you reuse condensate for irrigation? Can you reuse water for your cooling needs? Are you making use of Non-Potable water sources such as rain water collection for irrigation and/or cooling towers?
- **Rebates** - Have you investigated if there are any water-related rebates for your area? Local utilities and municipalities are a good place to look for these types incentives that can be used to fund the projects identified in the Water Audit.
- **Innovation** – An “Innovation” section is an opportunity to share any stories of how water efficiency or reuse has been integrated into the operation of your facility.
- **Comments** – This is simply a spot to add any additional information about the water dynamics of your facility and community. This section does not impact the grade of the Water Score Card.
- **Other Topics to Consider:** You may want to add other “Miscellaneous” topics to your Score Card, depending on your situation. Some ideas:

- Add a topic related to specifics sub-metering for irrigation and any special water end-uses (such a fire mains, retail, restaurants, recreational, water features such as fountains, etc.) in addition to the detailed information below about cooling tower meters.
- Include hardscape washing efficiency. How often are sidewalks pressure washed, or is it done with a hose? Higher points would be granted for using only pressure washing.

### Misc:

Water Champion role in A&D Goals (4%)

Cooling Tower Sewer Credit (4%)

Water Re-use (4%)

Rebates Evaluated (4%)

Innovation (4%)

Please describe innovation:

We re-use condensate in the irrigation system and use it to water the xeriscaped landscaping at the facility

Characters left: 500

### Comments:

New cooling tower installation includes zero blow-down maintenance package.



**\*\*If applicable\*\***

## Cooling Tower Operations – 15%

Water cooling towers can be the biggest consumers of water for buildings so this section will provide an overview of the important data to collect to evaluate a cooling tower’s performance. Evaporated water carries away the building’s heat and this water must be added back into the system, or “made up.” The more cooling that is required, the more water that is “consumed” as part of the cooling process.

Additionally, as a result of the evaporation, the solids in the water become more concentrated. The amount of solids in the water will vary depending on the region or how the water utility treats the water. If the build-up of these solids increases too much in a building’s cooling system, it can damage the cooling equipment such as a chiller. To reduce this risk, we use “blow down” water to eliminate those particles.

Chemicals can be used to treat the water so that the water can be used longer in the cooling system— even with the build-up of the solids—without damaging the equipment. Even using chemicals to treat the water, eventually the evaporation will still lead to an increase in the solids in the water to the point that water needs to be “blow down” the sewer to avoid damaging the equipment. Water treatment technologies can help buildings achieve greater water efficiencies.

For the Water Score Card, the tiers of excellence for water tower efficiency are:

**Basic:** Make sure that you know how much water is being blown down and made up and that all Preventative Maintenance like corrosion coupons and leak-checks are completed on schedule.

**Better:** Work with your water treatment service provider to evaluate creative ways to manage the cooling tower

chemistry to maximize how many times the water can be circulated through the system before it must blow down the sewer due to the build-up of solids. The number of times the water can be circulated through the system is known as “Cycles of Concentration,” which is a common way to evaluate the efficiency of a cooling tower’s water treatment.

**Best:** Install equipment to support a reduced blow down operation of the cooling tower at your facility that can achieve greater water savings than is possible with a traditional water chemical treatment program.

**NOTE:** Select “None” if no activities have been done. If you do not have a cooling tower at your facility, select the last option (N/A).

**Cooling Tower:**

- None (0)
- Blow-down water is measured/monitored; PMs done (80)
- Maintenance is optimized to reduce blow-down (90)
- System design to minimize blowdown (special tech) or N/A (100)

## Cooling Tower Detail

If your operations rely on cooling towers, additional information can be gathered in an informal section that is merely informational and doesn't factor into the overall grade.

### Tons of Cooling Tower Refrigeration

In order to understand the size of the potential water-saving opportunity, a company needs to understand how many tons of refrigeration cooling towers generate. Facility engineer or cooling tower service providers should be able to provide data to determine how many tons of cooling capacity comes from cooling towers at your facility.

Tons Cooling Tower Ref:

### Average Cycles of Concentration

Cycles of concentration represent the accumulation of dissolved minerals in the re-circulating cooling water in a cooling tower. The circulating water in a cooling tower may not be able to keep the minerals in the water in a dissolved form and the minerals may solidify. These numbers indicate how many times the water circulates through the system before a blow down must occur.

Average Cycles of Concentration:

Work with your facility engineer or cooling tower service provider to determine the average Cycles of Concentration of the cooling towers at your facility.

### Water Flow Measurement

Knowing how much water you use in your cooling towers and how much water you blow down helps you understand how you use water. It also can be critical when working with the local water utility to achieve a sewer credit (for water that is evaporated, rather than blown down). In the Score Card, indicate if you have make up and blow down meters that can measure these water flows, and how much water you use annually.

Can you measure water entering tower? <input checked="" type="radio"/> Yes <input type="radio"/> No	Annual Water used for Tower (gallons): <input type="text" value="1000000"/>
Can you measure water being blown down? <input checked="" type="radio"/> Yes <input type="radio"/> No	Annual Blow Down (gallons): <input type="text" value="250000"/>

### Current Water Treatment Program

How are you currently managing your cooling tower operation? Provide as much detail as you can, such as:

- Do you use chemical treatment?
- Is there any other cooling tower efficiency equipment installed?
- Which vendor, if any?
- How much on-site work by PMs?
- What is annual cost for this management?

Current Water Treatment Description:  
  
Current Water Treatment Cost (Annual): \$

## Chemical Use

Chemical use is a very common method to manage the challenges of cooling tower maintenance, such as corrosion and biological growth. In the Score Card, indicate the types of chemicals that are currently used and their associated volumes, if any. You may need to work with your chemical treatment provider to get these estimated volumes. Exact chemical details and volumes are not necessary; please provide general guidance of the type and volume of chemicals used.

Can you determine the type and quantity of chemicals used?  Yes  No

Please provide any details (chemicals, annual volumes, etc.):

Sulfuric acid for PH (3x30 gal barrels/yr).  
Corrosion inhibitor (55 gallon and 30 gallon drum/yr). Chlorine anti-microbial (5 gallon

## System Performance

Add any details you can provide about the current condition and performance of your cooling tower. When was the last inspection to determine the quality of the water treatment? When was the last Eddy Current test, and what were the results? Have you tested the water corrosiveness with corrosion coupons (these can provide an early warning if there is excessive corrosion to the system before expensive equipment might be damaged such as the chiller)? Is there any visible corrosion or biological activity?

How is system performing (corrosion or film on last chiller annual)?:

Last Eddy Current test during 2009 chiller annual indicated no defects. Small visible corrosion on exterior of tower.