

Sustainable Facility

Forget Taxes...It's Water We Need To Audit

by Klaus Reichardt

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If there is one thing we can say about the potential water challenges facing the United States — indeed, the world — it is that we have had plenty of warnings. Respected source after source, from the United Nations to the U.S. Bureau of Reclamation, reports that the demand for clean, potable water will surpass supply in countries around the world in the next 20 to 30 years.

Some of this will be the result of global warming, which will cause flooding in certain parts of the world and droughts in others. In many areas, such as in the United States, water challenges will be caused by old and outdated water infrastructure that simply can no longer meet demand. In China and parts of Asia, the growing industrial demand for water may cause governments to reduce water deliveries to residential customers.

Not only will water become an increasingly precious commodity, no longer taken for granted here and in other developed countries, but it will become more expensive. It comes down to basic economics: As the supply dwindles, the cost will go up.

More and more facility managers around North America are now taking steps to decrease energy demand and the amount of pollution they generate as well as to reduce their overall environmental footprint. In addition, they should reduce the amount of water they use. And this should be viewed as an opportunity: Consuming less water and using it more wisely will lower operating costs as well.

Where to Start



A water audit should present a number of ways to reduce water waste. But as a starting point, an effective water-reduction program in a commercial facility begins with the occupants. Managers need to make building users aware that the facility is seeking ways to reduce water consumption. This usually entails the following:

- Send a letter or memo from top managers of the facility that a water-conservation program is being implemented and encourage the full support of building users.
- Emphasize that the program will work only if each individual in the facility does his or her part; water conservation is the ultimate team effort.

- Establish a water-saving-idea box to collect water-conservation suggestions; often these suggestions turn out to be some of the most valuable.
- Post water-conservation stickers in restrooms, kitchens and other heavy-water-usage areas.
- Provide tips on reducing water consumption in daily building operations. These may be posted or may appear in a memo or newsletter.
- Establish a realistic goal. If the facility is now using 200,000 gallons of water per year, set a goal to reduce this by 10 percent in one year and provide regular updates of how the program is working.

There are several other steps that can be taken. Some companies have gone as far as bringing in speakers and having seminars on water conservation. In any case, the goal is simple: Get building users aware of and involved in a water-conservation program. This is key to success.

Elements of a Water Audit

Now we can get to the heart of a water-conservation program: the water audit. Those of us deeply involved with sustainability and protecting the environment have heard the expression, “You can’t manage what you can’t measure.” This is especially true when it comes to water conservation. Unless you know how much water is being used and where in a facility, there really is little way for it to be managed and eventually reduced.

That’s where a water audit comes into play. A water audit is a process by which all the uses of water on a site are recorded and analyzed as to amounts, flow rate, flow direction, temperature (in those areas where it is heated) and quality requirements.

For cost purposes, a water balance sheet is also necessary. Similar to an accounting balance sheet, the total inflow of water should equal the total outflow, taking into account amounts used for irrigation or subject to evaporation. For instance, if 5,000 gallons of water are flowing into the building each day but only 4,000 gallons are returning to sewers or treatment facilities, there are 1,000 gallons missing. This could be an indication of a major leak that is wasting both water and money.



The earth’s water supply is fixed, therefore it’s important to take care of this resource. The key to preserving what water we have is through less consumption, finding ways to be less wasteful and not polluting our potable supplies. An added benefit to reducing overall water consumption is reduced costs. Image courtesy of Waterless Co.

Conducting a Water Audit



The green building movement has raised public awareness of vulnerable water resources and encouraged the implementation of water conservation techniques. Yet regulatory, financial and cultural obstacles still hinder widespread adoption of alternatives to conventional water systems.

water leak.

- Secure a plumbing diagram of the facility, if possible.
- Determine the number of employees or building users over the past one to three years; look to see how many work shifts were in place.
- List where water is being used (e.g., kitchens, restrooms, landscape irrigation, industrial areas, heating, air-conditioning).

The next step involves a building walk-through. With water diagrams and use information at hand, confirm where water is being used and determine flow rates. See if and where water-saving measures have been implemented, note work shifts for each area of the facility and look for water loss due to evaporation or leaks. Judge overall water efficiency; this usually entails testing water fixtures to see if they are working properly.

Learning from the Audit

A water audit can be a real eye-opener for building managers. One of the first things often discovered is how many water leaks a building has. Leaks are far more serious water wasters than most of us realize. A slow-dripping, leaky faucet may waste more than 5,000 gallons of water per year. A water audit conducted by the California Department of Water Resources found that about 10 percent of the water delivered to a typical facility is lost to leaks.



Another revealing area of water waste is in restrooms. Aside from landscaping, more water is

In a large facility, it may be necessary to hire an engineer or water-management firm with expertise in conducting a water audit. However, much can be accomplished in-house whether a professional is brought in or not. The first steps involve selecting building personnel familiar with the facility and its operations. Choose one person to be the water-efficiency coordinator in charge of the water audit.

This is some of the information the coordinator will need to collect:

- Gather water bills going back one to three years; note water rates. Check to see if there are spikes when water bills are higher than usual and try to determine the cause of spikes such as added employees, expanded landscape irrigation needs, etc. A spike can also be caused by a

used in restrooms than in any other area of a facility. Water can be easily saved by installing water-flow restrictors on faucets. Sensor-controlled faucets have also been found to use less water than manually controlled systems.

However, toilets and urinals are the biggest water wasters. If these fixtures are more than ten years old, replacing them is recommended. Newer systems are available that use less water than is currently mandated by the federal government. Further, when it comes to urinals, many facilities are now opting for no-water urinals, which can save as much as 40,000 gallons of water each year on average. Facilities seeking LEED certification often select these systems to help earn water credits.

Finally, it is not uncommon to discover areas where water is simply being used unnecessarily. How often have you seen sprinklers irrigating landscaping while it is raining? This is so common that rain and moisture sensors, which can override a manual or automatic landscape irrigation system, are now considered “must-haves” with all new landscaping projects.

Promoting Success

We have been able to only touch on the key areas of a water audit: how to conduct it and how it can result in water savings. Many municipal water departments can provide more information on water audits specific to your area. However, a properly conducted water audit invariably reveals a number of opportunities for a facility to reduce water usage.

Once possibilities for reductions have been discovered and calculated, this is information to share with building users and even the general public. Many water utilities are eager to help publicize good results that might encourage other facilities to develop similar programs and conduct their own audits. Further, a successful water-conservation program is news because it means more water is available for the community. Even more, it puts a facility on display as an entity that is socially and environmentally responsible, two goals of any sustainable organization.

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