South Florida Water Management District

Water Audit Guidance for Florida Green Lodging Program Applicants

Last Updated: July, 2013

Florida Green Lodging Applicants:

You are advised to also see the following presentation:

Lowering Operating Costs for Commercial and Institutional Buildings through Water Use Efficiency Improvements

Available within the same document library as this presentation.

Florida Green Lodging Program

The Florida Green Lodging Program requires applicant properties:

1. *"Have a water assessment conducted by a local utility company, local water management district or other appropriate organization"*

   OR

2. *"Conduct a self-audit using the South Florida Water Management District's Water Efficiency Self-Audit Guide… Submit completed worksheets"* (as proof)

Florida Green Lodging Program

Consulting firms exist whom can perform water audits

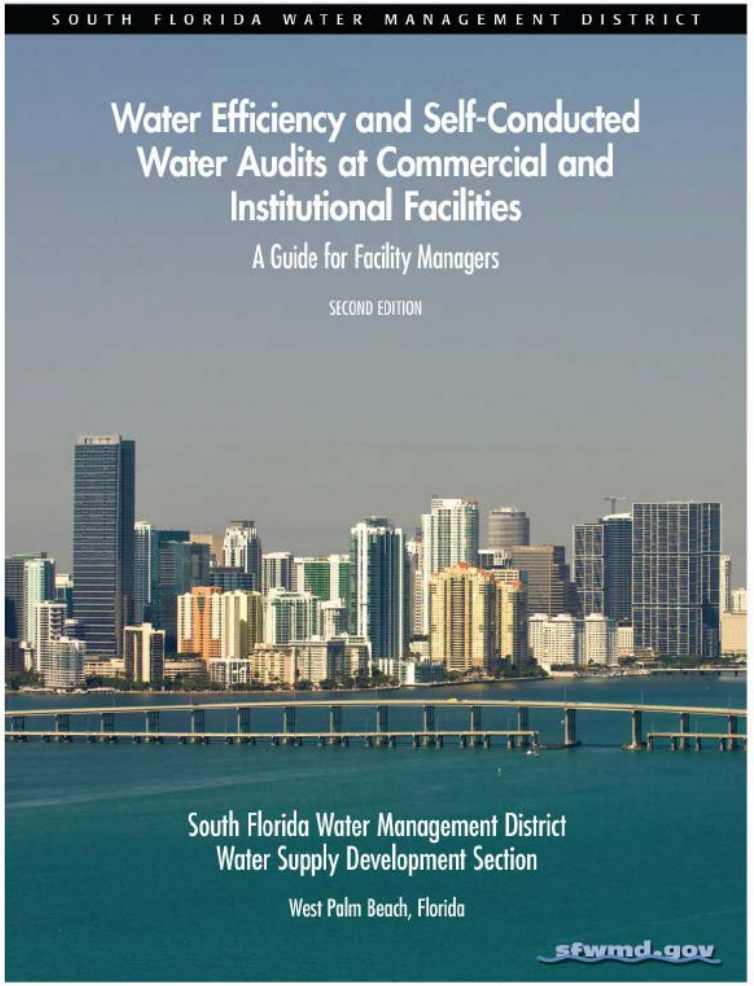
But with some guidance, you (or your staff) can conduct a audit of your facility

And fulfill this element of the Florida Green Lodging Program

SFWMD's Water Efficiency Improvement and Self-Conducted Water Audit Guide for Facility Managers

- Written for Facility Managers *anywhere*
- Fully Comprehensive

  (Indoors and outdoor water use)
- Detailed Water Audit Steps
- Savings Calculators
  - to create estimates of costs, savings and investment recovery periods
- **Best of all…**
  this is a FREE publication



Required Water Audits for Florida Green Lodging Program Applicants

Florida Green Lodging Program Applicants

As part of your application, you are only required to conduct the only **BASIC** water audit procedures for applicable areas of your facility

Exceptions (NOT required):

- *Irrigation System Distribution Uniformity, Application Rate and Calibration*
- *Facility Leak Detection*

The worksheets associated with each procedure are what you will be submitting to the Florida Green Lodging Program

Florida Green Lodging Program

By the time you've completed the required audit procedures:

- You will have a much greater understanding of where, how, and how much water your facility uses
- You will know where and how you can reduce your water use and expenses
- You will be informed on how to make cost-effective efficiency improvement decisions

The following pages highlight the required procedures and documentation

Please refer to page iv of the guidebook for a complete listing of required water audit procedures

Required Water Audits for Florida Green Lodging Program Applicants (Guidebook's Table of Contents)

Contents

Appendices

Review red circled areas

X–ed areas are not required for FL Green Lodging

Focus on areas in blue circle

Required Water Audits for Florida Green Lodging Program Applicants
(close-up blue circled areas on prev. slide)

Basic Header Sheet

Basic Facility Header Sheet

Site Name			
Address			
Facility Ops. Manager Name & Contact Info.			
Auditor Name(s) & Contact Info.			
Date of Audit			
Buildings and Years Built			
Population Breakdown			
Full-time Employees Population #1	Males_____	Females_____	
Full-time Employees Population #2	Males_____	Females_____	
Visitor Group #1	Males_____	Females_____	
Visitor Group #2	Males_____	Females_____	
Visitor frequency and duration			
Months Per Year of Operation			
Water Provider & Billing Rate			
Gas Provider & Billing Rate			
Electricity Provider & Billing Rate			
Cooling Towers			
Cooling Capacity			
Typical Operating Tonnage			
Hours Per Day of Operation			
Days Per Month of Operation			
Months Per Year of Operation			
Are Sewer Credits Received?			
Irrigation System? Submetered?			
Other large or significant points of on-site water use? (commercial kitchen, vehicle washes, etc.)			

Basic Information on the property (Site name, address, contact, etc.)

Water Meter Information

Worksheet 1. Meters and Submeters

Meter/Submeter Number and Location	Type (see Appendix A)	Pipe Size (inches)	Date of Last Accuracy Check & Calibration	Records Used for Which Areas of Building or Campus

Estimating Daily Water Use and Cost

$$\text{Daily water use} = \frac{\text{Total water use (gals)}}{\text{Number days in billing cycle}}$$

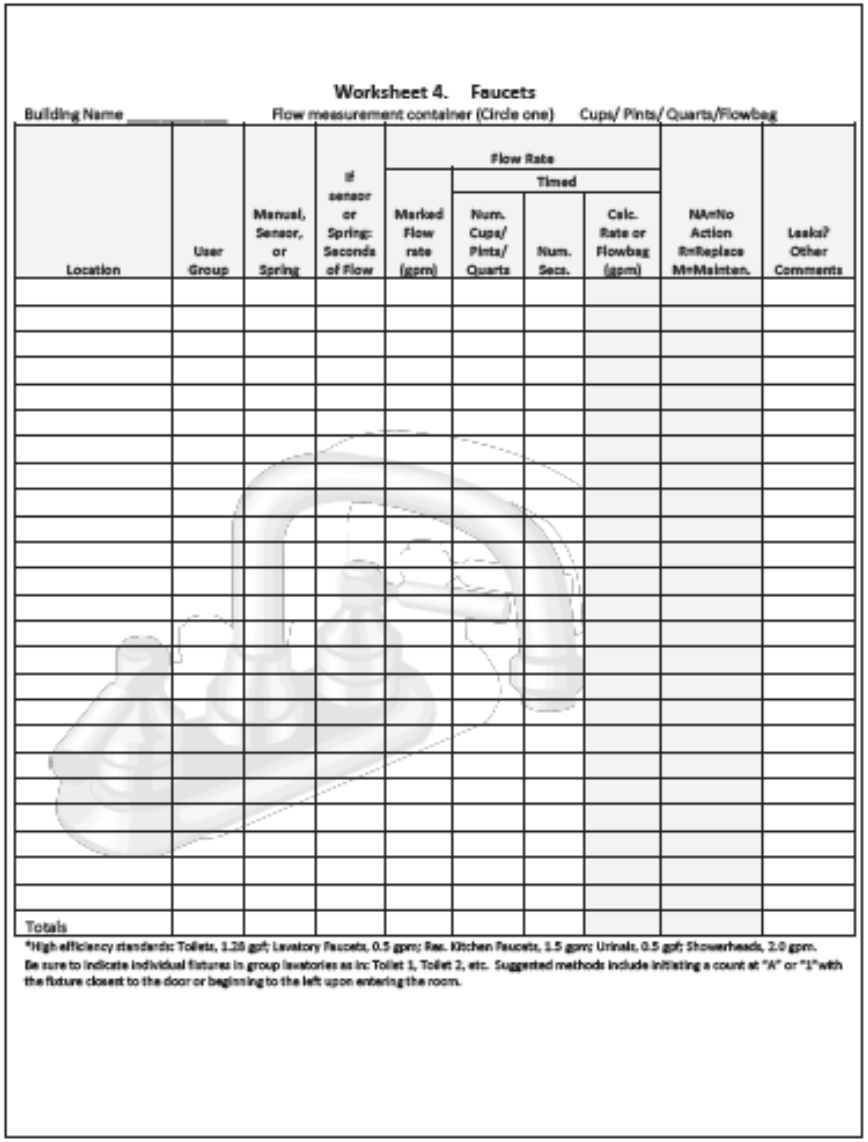
$$\text{Daily water cost} = \frac{\text{Total cost for billing cycle}}{\text{Number days in billing cycle}}$$

Simplest scenario is just water bill divided by number of days in billing period…

but there can be complicating circumstances.

The guidebook walks you through the different possible scenarios.

Indoor Plumbing Fixtures & Appliances



Worksheet 4. Faucets

Building Name _____ Flow measurement container (Circle one) Cups/ Pints/ Quarts/Flowbag

Location	User Group	Manual, Sensor, or Spring	If sensor or Spring: Seconds of Flow	Flow Rate				NAmNo Action RnReplace MnMainten.	Leaks? Other Comments
				Marked Flow rate (gpm)	Timed: Num. Cups/ Pints/ Quarts	Timed: Num. Secs.	Timed: Calc. Rate or Flowbag (gpm)		
Totals									

*High efficiency standards: Toilets, 1.28 gpf; Lavatory Faucets, 0.5 gpm; Rec. Kitchen Faucets, 1.5 gpm; Urinals, 0.5 gpf; Showerheads, 2.0 gpm.

Be sure to indicate individual fixtures in group lavatories as in: Toilet 1, Toilet 2, etc. Suggested methods include initiating a count at "A" or "1" with the fixture closest to the door or beginning to the left upon entering the room.

Basic water use rate for each fixture is measured & documented (Faucets, showerheads, toilets)

Basic information on appliances is documented

Again, water use rates of fixtures & appliances can and do change over time.

Commercial Kitchen Fixtures and Appliances

Worksheet 9. Commercial-Grade Kitchen Appliances

Dishwasher	Location		Make/ Model	Quantity	Racks washed per day	Building hot water fuel type	Booster water heater fuel type	Operating days per year	ENERGY STAR Qualified?
		Under Counter							
		Door Type							
Low Temp.		Single Tank Conveyor							
Or High Temp.		Multi Tank Conveyor							
Leaks or Other Comments									

Ice Machine	Location		Make/ Model	Quantity	Harvest rate (pounds ice per day)	Potable water use (gallon per 100 pounds ice)	Operating days per year	ENERGY STAR Qualified?
		Ice Making Head						
		Remote Condensing Unit /Split System						
		Self-Contained Unit						
Leaks or Other Comments								

Steam Cooker	Location		Make/ Model	Quantity	Pounds of food cooked per day per unit	Number of pans per unit	Operating hours per day	Operating days per year	ENERGY STAR Qualified?
		Electric							
		Natural Gas							
Leaks or Other Comments									

Clothes Washer	Location	How is water for each unit heated?	Make/ Model	Quantity	Average number of loads per week	Type of water heating	Type of clothes dryer	Electric or Gas Drier	ENERGY STAR Qualified?
		Electric Heat							
		Gas Heat							
Leaks or Other Comments									

Combi Oven	Location		Make/ Model	Quantity	Operating hours per day	Operating days per year	Pounds of food cooked per day per oven
		Electric Heat					
		Gas Heat					
Leaks or Other Comments							

See Worksheet 10 for Commercial-Grade Kitchen Fixtures.

Basic information on appliances is documented

Basic water use rate for some fixtures are measured & documented
(Hand-washing faucets, pre-rinse spray valves)

Cooling Tower Water Use

Basic information on unit and use documented (tons of cooling capacity; is the unit submetered; etc.)

Basic visual inspection (are there visible leaks; etc.)

No specialized training is required by the auditor, but it may be helpful to consult with the maintenance vendor

Worksheet 11. Cooling Tower Water Use – Basic Audit

Cooling Tower General Observations

a) Cooling tower location _____

b) Tons of cooling capacity (if known) _____

c) Are flow meters or submeters present on feedlines (circle one)? YES / NO

d) Are flow meters or submeters present on drainlines (circle one)? YES / NO

e) Is the tower a closed loop (not once through) (circle one)? YES / NO

f) At how many cycles is the tower currently be run at? (you may have to consult with your maintenance vendor). _____

g) Looking at Table 14, what percentage of total water use would be saved if the cycles of concentration were increased from the current level to five or six? _____

h) Indicate the visible condition of the cooling tower:

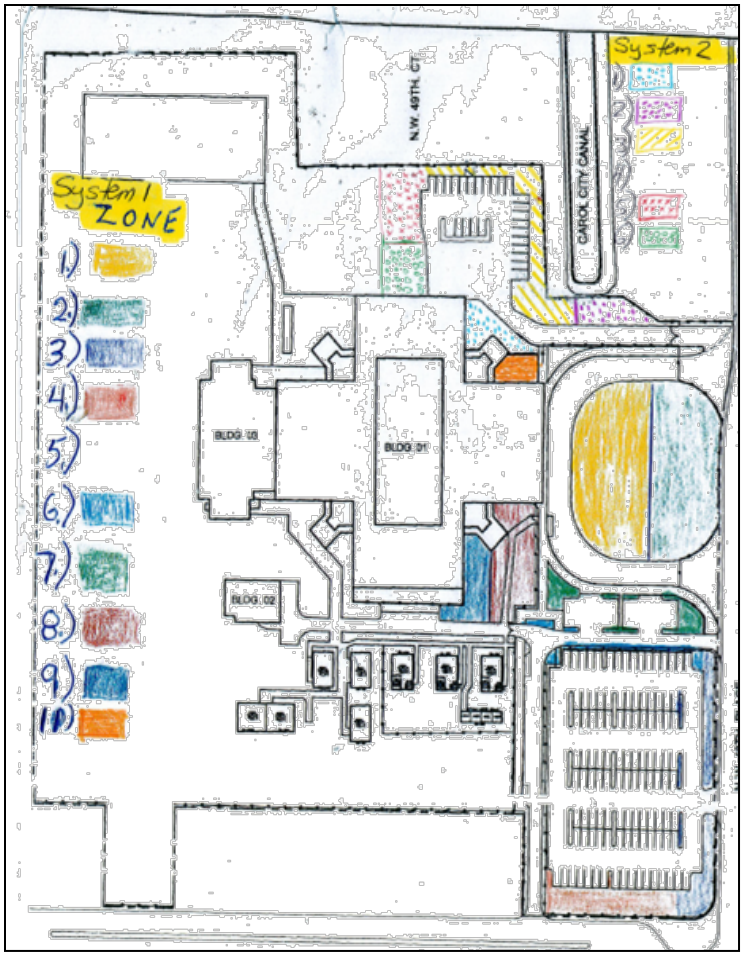
	None	*Very little	Some	A lot	Where?
Noticeable leaks					
Noticeable corrosion					
Mineral precipitate scaling on the heat exchangers, condenser tubes, or elsewhere					
Algae or slime (biofouling)					
Drift (misting)					

*This would account for a small amount at the interface where the air hits the corrugated heat exchangers, condenser tubes, etc.

Irrigation Schedule & Controller

Basic sketch of irrigation system zone boundaries or system blueprints.

Review days and runtimes of irrigation system



Outdoor Landscape & Irrigation System Survey

Basic landscape and irrigation system design compatibility reviewed and documented.

Basic operating condition of landscape system reviewed and documented.

		General Plant Type		Sprinkler Types				Sprinkler Functinality and Need			If Annuals or Perennials:		
		See Note 1		See Notes 2 - 5				See Note 6			See Notes 7 - 9		
	Zone Runtime (in minutes)	Turf, Annual/ Perennial, or Trees/ Shrubs	More than one gen. plant type in zone?	Rotor; Sprayhead; or Micro	All same type?	All same Brand?	Sprinkler type matches plants?	Clogged; Tilted; Obstructed; Broken	Wetting Pattern ok?	Does this zone need irrigation at all?	Adequate Mulch?	Trees/ Shrubs recently installed?	Is mico-irrigation used?
Zone 1													
Zone 2													
Zone 3													
Zone 4													
Zone 5													
Zone 6													
Zone 7													
Zone 8													
Zone 9													
Zone 10													
Zone 11													
Zone 12													
Zone 13													
Zone 14													
Zone 15													
Zone 16													
Zone 17													
Zone 18													
Zone 19													
Zone 20													
Zone 21													
Zone 22													
Zone 23													
Zone 24													

All "No" responses should be reviewed for corrective action. Refer to the Post procedure.

Rain Sensor & Soil Moisture Survey

Basic inspection of rain shut-off device (rain sensor or soil moisture sensor).

Rain Sensor Survey – Basic Audit		
See Notes 11 - 13.		
Rain Sensor Location _____		
Is the sensor located away from all building eves, gutter downspouts, trees, or other structures that would impede rainfall?	Yes	No
Is the sensor located close to an air conditioning condensate line or another source of water than may saturate the sensor?	Yes	No
Visually inspect the sensor		
Does the cork look fresh and soft, not brittle and dry?	Yes	No
Do the wires look intact?	Yes	No

Rain Sensor Survey –Advanced Audit		
Did the sensor successfully interrupt the irrigation event?	Yes	No

Outdoor Landscape & Irrigation Water Use Cheat Sheet

Irrigation and Landscape Cheat Sheet

The notes below correspond to a line on the Irrigation and Landscape Audit Worksheet indicated by the number preceding each notation.

This cheat sheet is not meant to take the place of the Post-Audit sections of the Irrigation and Landscape audit procedures. It is meant to serve as a quick reference. The Post-Audit sections of each relevant procedure should be reviewed after conducting the survey.

In general, you will be investigating the most basic settings of the controller as well as the landscape plantings and irrigation hardware in each zone. **Although presented separately for descriptive purposes, you will be performing more than one audit procedure concurrently (by default) as you survey each zone.** For this reason, the irrigation and landscape worksheets have been combined for your convenience.

1- There should be only type one per zone. The three 'General' plant types are: turfgrass; annuals/perennials; trees/shrubs.
2- See reverse of this page for photos of each.
3- There should be only one.
4- Matched brands are more likely to have matched application rates.*
5- Rotors and sprayheads should be used for lawns or turfgrass (sprayheads are not recommended for irrigation of plants and shrubs); only microirrigation should be used for plants and shrubs.
6- Zones or parts of zones that may not necessitate irrigation include areas with mature trees and shrubs, areas not used, viewed or visited by facility staff or the general public, such as a narrow, non-traffic alleyway or an area behind a dumpster etc. Be sure to investigate the watering needs of small shrubs before removing them from the irrigation system.
7- Zones with annual or perennial plants should have approximately 3 inches of mulch; zones dominated by trees/shrubs may also benefit from a mulch layer.
8- If they are mature or were installed more than one year ago, they may not require irrigation. This zone should be further evaluated for removal from the irrigation system.
9- Microirrigation is the only class of sprinkler which should be used for annuals, perennials, trees and shrubs.
10- Turfgrass has high irrigation requirements. It should be used to fulfill needs such as recreational areas or in swales, etc. and should not be used as a space filler.
11- Rain sensors should not be located under anything which could impede rainfall or allow water from source other than rain to fall upon it.
12- The cork should be fresh and spongy. They typically last between two and three years.
The wires should be connected, unafraid, and protected from the elements.
13- Soil moisture sensors should not be located in an area where rainfall could be impeded or where water from a source other than rain could cause soil moisture in the immediate area to increase.
14- Soil moisture sensors should be located near the mid-point of any on-site slope in an open area among vegetation with the highest watering requirements.
15- Soil moisture sensors should be located equidistant from sprinkler heads.

* Irrigation sprinklers do not always clearly indicate their flow rate in gallons per minute. Determining the precipitation rate of installed sprinklers requires a high level of familiarity with irrigation equipment or requires substantial time and effort for research. This is not part of this simplified audit. Instead, check all sprinkler heads in the zone to ensure they are the same type (rotor, spray, or micro) and the same brand. While being the same type and brand does not necessarily indicate uniformity of precipitation rate, more than one type or brand in a zone most likely means water is delivered unevenly.

(Continued on next page)

Photos of Common Irrigation Sprinklers

Rotor used to irrigate open areas of turf.

Sprayhead emitters.

Micro-irrigation emitter.

Another example of a micro-irrigation emitter.

Florida Focus

Runtime ranges for irrigation sprinkler types based on vegetation and seasonal needs.

Sprinkler Type		Winter	Fall	Spring	Summer	Most-Suited Vegetation
Rotors	Ideal	<10	30	40	45	Turfgrass
	Range	0 – 20	20 – 40	35 – 55	40 – 60	
Sprayheads*	Ideal	0	15	20	25	Turfgrass
	Range	0 – 10	10 – 20	15 – 20	20 – 30	
Micro-irrigation		15 – 35	15 – 35	15 – 35	15 – 35	Annuals and Perennials

Source: Green Industry Best Management Practices (GI BMPs) (DEP 2008)
*Sprayheads are actually designed to irrigate turf or lawns, but are often used to irrigate plants and shrubs if they are equipped with a low-flow nozzle. This practice is not recommended. Only micro-irrigation should be used in plant beds.

How difficult/time consuming will this be for me or (my staff)?

Don’t be intimidated!!

The guide book was written for new-comers to water use efficiency in a cook-book style

Actual time required depends on the property and available staff; approximately 3 - 4 minutes per guestroom

All field work should be done in teams of two

For some procedures (irrigation & landscaping), two-way radios are handy; approximately 2.5 hours for 12 zones

Add a few hours to collect and review utility bills if this has not been done in the past already

How difficult/time consuming will this be for me or (my staff)?(Con't)

Again, don't be intimidated!!

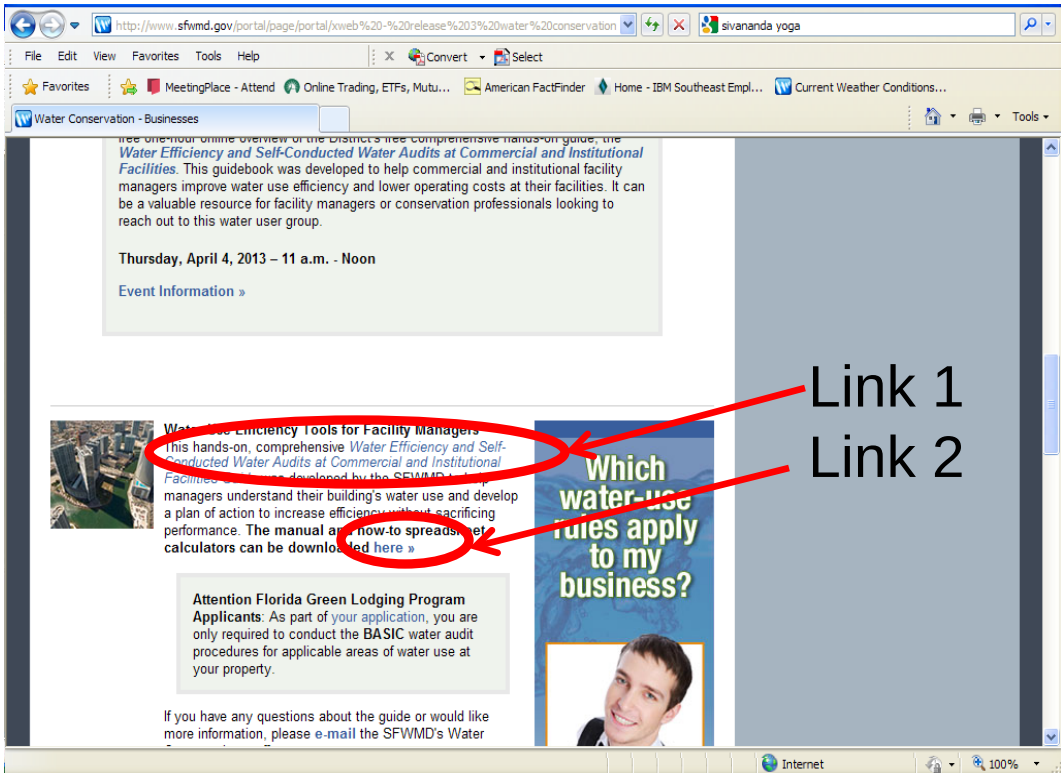
All procedures will prove to be fairly easy once you get started

While supplies last, the Water Management District can send you flow bags free of charge (these are a big time saver).

The District is available to help answer questions as to how to conduct any audit procedure

Ok, so how do I find it?

1. **www.savewaterfl.com**
2. Click on the "**Businesses**" link in the left hand side panel
3. Scroll DOWN to "**Water Use Efficiency Tools for Facility Managers**" (look for the skyline photo)
4. There are two links:
5. The first allows you to look at the guidebook via an **online viewer**. The second bring you to a **library** where you can **download** it and the associated spreadsheet calculators.



Questions?

For questions on how to complete an audit exercise and to request free flow-gauge bags (see page 46 of the guidebook) please contact:

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For all questions related to the Florida Green Lodging Program, please contact:

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