

Assessing the Water Savings Impact of Irrigation and Landscape Management Strategies.

Jenna Smith, King County Housing Authority Resource Conservation Manager

Representing Seattle Public Utilities and the Saving Water Partnership

Case Study: Landmark Office Park, City of Renton, WA

2/26/15

Abstract

The case study studied the results of an irrigation project undertaken by Seattle Public Utilities and its wholesale customer, the City of Renton, on the site of a Renton commercial customer, the Landmark Office Park, during the 2014 irrigation season. The following describes the steps and time required to complete the steps.

There were four different strategies evaluated during the study, which ran from June 1 to October 15, 2014.

1. Assessment – historical management reviewed
2. Implementation – changes made and savings estimated
3. Monitoring & Adjustments – Utility bill analysis and fine-tuning
4. Final results and next steps – Evaluated savings and developed irrigation schedules for following year.

Task	Description	Time Est.
STEP 1 - ASSESSMENT		
Gather historical water consumption data	Contacted City of Renton utility and ask for billing data by bill date and units charged. Determined cost of water per billing unit.	30 minutes
Review consumption information and look for patterns or anomalies.	Formatted data by year and month in an Excel pivot table to visually see historic use patterns (Table 1)	1 hour
Document the programmed irrigation runtimes and type of conservation features being used or available on the controllers. 1 hour	Visited site and used Schedule Forms (on savingwater.org in the irrigation scheduling section: http://savingwater.org/groups/public/@spu/@swp/documents/webcontent/01_030110.pdf) to document irrigation schedules. Compared schedules to the standard schedules calculated on www.iwms.org	30 minutes per controller
Determine who is in charge of the irrigation system and landscape and interview them to	Walk the site with Dean Penner from Signature LLC. He pointed out areas that had issues, like too wet or too dry, broken valves, etc.	2 hours

Task	Description	Time Est.
learn more about issues at the site.		
Operate each zone and document conditions and issues.	With Penner operated each zone for 5 minutes and checked for leaks, breaks, or any other hardware or coverage issue. Document type of plant material, sprayhead and microclimate on forms.	5 minutes per zone
Identify problem areas or zones and perform an audited to calculate runtimes for each.	<p>Performed an Irrigation Association audit on 3 zones and calculate runtimes. https://www.irrigation.org/uploadedFiles/Certification/CLIA/CLIA_AuditWorksheets(1).pdf</p> <p>Compared audit calculated schedules to typical schedules for the site. Estimate savings, if any.</p> <p>Audit Dates: West, Zone 1: June 16, by myself East, Zone 14: August 8, with Dean Penner West, Zone 8: August 12, by myself</p>	3 hour each zone
Review billing data again to check that sensors are working	<p>After reviewing landscape and irrigation management practices, reviewed billing data. Consumption clearly showed rain sensors working but not weather sensors (Hunter Solar Sync, which are onsite sensors). Controllers were checked to make sure sensor ports were connected and to see if error messages were occurring.</p> <p>.....</p> <p>East sensor appeared to be functioning properly, but West sensor’s module digital interface not working.</p> <p>Contacted Hunter Rep and he walked through steps for checking sensor connections and settings on controller. Controller settings were not set for Solar Sync so setting was corrected for both controllers and all Programs. Also, vendor sent new module, which was replaced on August 20 by contractor.</p> <p>Note: Controller settings for Solar Sync appeared to be set correctly, it was only on closer review of billing data was this issue resolved.</p>	<p>30 min.</p> <p>.....</p> <p>1 hour staff time</p> <p>1 hour contractor time</p>
Step 2 – New Irrigation Schedules:	Case Study Actions:	Estimated Time

Task	Description	Time Est.
		Required
Program the clocks with new irrigation schedules, if needed.	<p>August 8, 2014</p> <p>The East irrigation system was reprogrammed with the standard irrigation schedules for turf and shrub, while the West was left to run as originally scheduled.</p> <p>The 3 audited turf zones, 2 on the West and 1 on the East were programmed with the audit calculated runtimes on Aug. 8 and Aug. 12.</p>	1 hour
Adjust clock features	A closer review of the AMR data revealed controller settings were not actively utilizing weather sensors. Contacted Hunter rep and he walked through steps for checking sensor connections and settings on controller. Controller settings were not set for Solar Sync so setting was corrected for both controllers and all Programs. Hunter rep sent new module, which was replaced on August 20 by contractor.	
Step 3 – Monitoring:	Case Study Actions:	Estimated Time Required
Visit the site weekly and review billing data or read the meter to monitor consumption and visual quality of plant material.	<p>Visited the site about every 2 weeks from Aug. 12 on. Took pictures and looked for issues. Sept 6, East trees and shrub beds showed slight drought stress (Rhododendron leaves slightly closed). Sept 18, East trees losing leaves but West trees didn't.</p> <p>Note: <i>On closer inspection, noticed that the fine mulch used on all beds appears to be impeding water penetration.</i></p>	1 hour per week (should be performed during the peak season: July, Aug, Sept)
Adjust irrigation schedules.	Because beds were dry, new irrigation schedules were developed and programmed into the controllers. The new schedules utilized the IA's irrigation calculations using more customized variables for site conditions.	2 hours
Step 4 – Results:	Case Study Actions:	Estimated Time Required
Identify major issues related to scheduling and program controllers for the following irrigation season with best schedules	Standard irrigation schedules from www.iwms.org shrubs were not sufficient to deal with the full sun for the site's hot blacktop parking lot and building's glass windows. Also the type of mulch product (fine) used over the years has likely created a sponge-like barrier that impedes moisture penetration. The sites original schedule for shrubs	3 hours

Task	Description	Time Est.
	of 10-15 (50-75 min. per week) minutes 5 days in a row compared the standard schedules of 14 minutes (28 minutes), twice per week, was likely keeping the mulch layer wet so that subsequent watering would penetrate slightly the mulch barrier. The final irrigation runtimes were set at 3 days per week, for 20 min. per day for a total of 60 minutes.	
Calculate Savings	The overall long-term water savings will depend on the weather, however, based purely on pre and post irrigation schedules, savings is estimated to be about 30%.	