

This presentation premiered at WaterSmart Innovations

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Auditing Large Commercial Properties: Lessons from Scottsdale Water's First Two Years



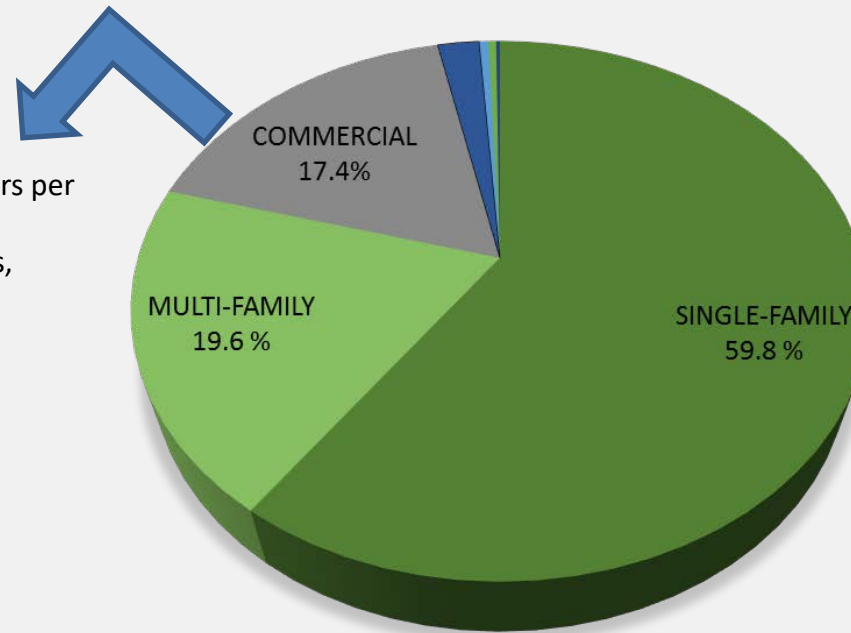
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- Until early 1980s, 100% reliant on groundwater
- Today, 90% of total water supply comes from renewable surface water and recycled water
- Operates one of the most advanced recycled water treatment facilities in the world
 - 2.5 billion gallons for turf irrigation
 - 1.5 billion gallons for recharging Scottsdale's aquifer
 - DPR (One Water Brewing Showcase- Nov)
- First city in AZ to meet safe yield – putting more water in the aquifer than we take out
 - Since 2006, nearly 20 years ahead of the state-mandated deadline

Potable Water Metered Use Per Sector

**We have an average of 2.7 meters per commercial account, but that can vary widely and in some strip malls, there's only one meter serving multiple businesses



■ SINGLE-FAMILY 59.8 %	■ MULTI-FAMILY 19.6 %	■ COMMERCIAL 17.4%
■ GOVERNMENT 2.2%	■ CONSTRUCTION 0.5%	■ INDUSTRIAL 0.4%
■ TURF-RELATED 0.2%		

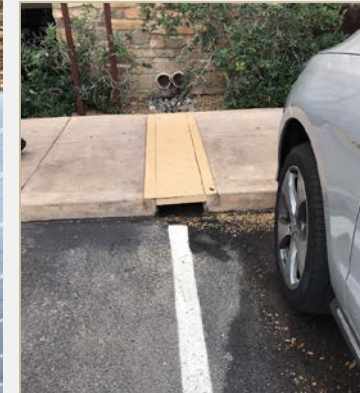
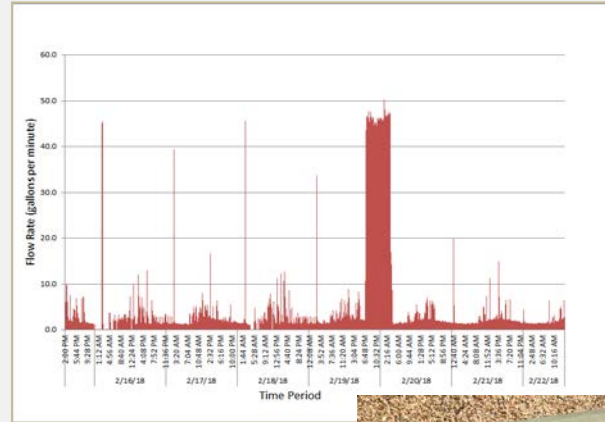
Water Audit Goals

- Help customer understand facility's INDOOR water use
- Determine cost-effective methods to reduce water use
- Uncover leaks or other hidden excessive water uses

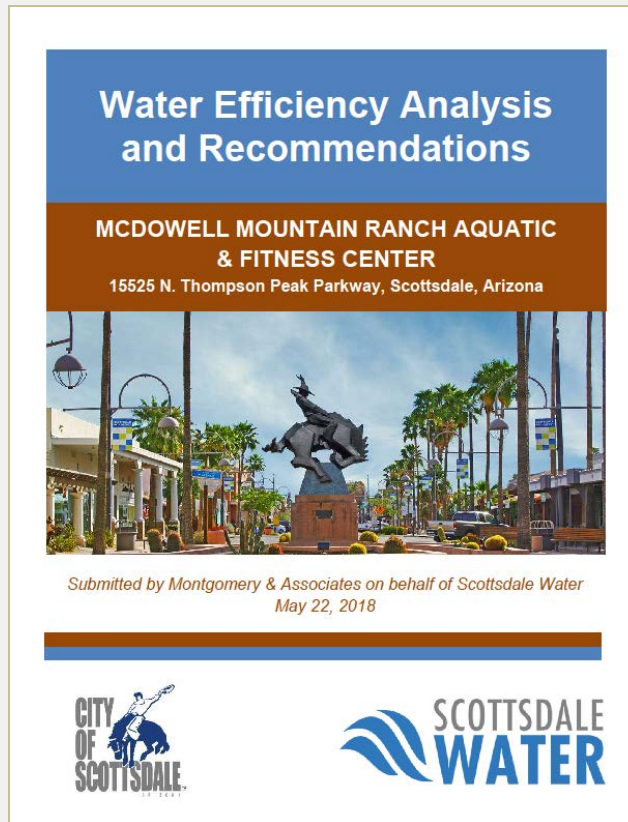


Commercial Audit Program

- City data
 - Meter location
 - Water use
 - Sewer fees (and category)
- Pre-audit questionnaire
- Audit (City Reps and Contracted Expert)
 - Facilities Manager
 - Understand water needs
 - Walk through, collect data
- Data analysis
- Report w/recommendations
 - Submeters, leaks, rebates
 - ROI
- Follow up



Audit Report



Example of Proposed Water-Saving Measures

Proposed Measure	Units	Calculated Savings (gpy)	Estimated Measure Cost	Estimated Annual Cost Savings ³	Approx. Payback (yrs)
1. Upgrade pool backwash controller to include a turbidity sensor	1	243,282 ¹	\$1,500	\$1,932	0.8
2. Replace existing 1.0-gpf urinals with 0.125-gpf urinals	3	66,872	\$750 ²	\$531	1.4
3. Investigate cause of continuous 0.4 gpm cold water flow and repair as appropriate.	1	218,124	NA (repairs)	\$1,732	NA (repairs)
4. Eliminate underground irrigation leak	1	551,880	NA (repairs)	\$2,231	NA (repairs)
Total		1,080,158	\$2,250	\$6,426	4 months

1 Assuming a 15% reduction in water use for filter backwash.

2 After a potential incentive of \$200 per urinal through Scottsdale Water.

3 Using a combined cost for water and sewer

Challenge: Size and Pricing

Original goal: To audit a few customers in each size category

CII Size Categories	Annual "Sewered" Water Use (Kgals/Year)	Proposed Audits	Actual Audits
Small	< 250	1	1
Medium	250 – 2,500	3	1
Large	2,500 – 10,000	3	6
Very Large	> 10,000	3	2
TOTAL		10	10

Year 1

Year 2

CII Size Categories	Annual "Sewered" Water Use (Kgals/Year)	Proposed Audits	Actual Audits
Small	< 250	0	0
Medium	250 – 2,500	2	0
Large	2,500 – 10,000	4	2
Very Large	> 10,000	4	5
TOTAL		10	7

Challenge: Size and Pricing

What do you do when your categories don't fit as neatly as expected?

Expectation:

CII Size Categories	Annual Water Use (Kgals/Year)
Small	< 250
Medium	250 – 2,500
Large	2,500 – 10,000
Very Large	> 10,000

Reality:

CII Customers Requesting Audit	Annual Water Use (Kgals/Year)
Resort Hotel	120,000
Live, Work, Play Community	56,850
Medical Facility 1	52,000
Medical Facility 2	41,080

Significant Water Use Areas- Hospital Example



- 56 water-cooled ice machines
- 32 single pass H-VAC equipment
- 20 sterilizers
- 6 cooling towers
- 4 steam boilers
- 3 central kitchens
- 3 liquid ring vacuum pumps
- 2 water softeners
- 1 RO system
- 1 dialysis clinic

So, who did we audit?

FY 18 (Year 1)

Type of Commercial Customer (10 total)	CII Size Categories
Restaurant 1	Small
Restaurant 2	Medium
3 Locations of Grocery Chain 1	Large (3)
Community Center	Large
2 City-Aquatic Facilities	Large (2)
Warehouse store with car wash	Very Large
Resort Hotel 1	Very Large

FY19 (Year 2)

Type of Commercial Customer (7 total)	CII Size Categories
2 Locations of Grocery Chain 2	Large (2)
3 Hospital Campuses	Extra Large (3)
Live, Work, Play Community	Extra Large
Resort Hotel 2	Extra Large

First Year Estimated Costs And Savings Summary

Facility	# of Proposed Measures	Calculated Savings (gpy)	Estimated Costs (\$)	Estimated Annual Savings (\$)	Approximate Payback (yrs)	Est. % Reduction
Restaurant 1	5	524,264	2,660	3,958	0.7	35
Community Center	4	2,648,645	9,500	14,214	0.7	18
Restaurant 2	0	-	-	-	N/A	0
Resort Hotel	2	1,420,685	8,400	10,220	0.8	6
Warehouse Store with Car Wash	5	1,378,662	unknown	15,306	N/A	8
Grocery Store 1	3	482,728	2,150	4,499	0.5	13
Aquatic Center 1	6	407,552	3,740	2,739	1.4	13
Aquatic Center 2	4	1,080,158	2,250	6,426	0.4	10
Grocery Store 2	3	1,165,344	105	8,112	0.0	24
Grocery Store 3	1	69,530	35	555	0.1	2
TOTALS	33	9,177,568	28,840	66,029	0.58 (avg)	10.8

Managing Customer Relationships



- Don't assume that your customers understand water specifics about their property
- Balancing staff interactions in other departments: e.g. meters vs billing, etc.
- Supporting customers who reach out to one contact for everything or who may not be aware of all city program offerings.
 - Network with your own staff too! Let them know about your programs.
- What happens when things go wrong? And they will!
 - Meter misread billed in midst of audit process
 - Gradual Meter Failure caught and replaced (usage and bill went “up”- How can one communicate conservation practices?)

Turn-Over and Customer Follow Up

- If you are working with a contractor- check their work!
- Timing is everything! How often is too often?
 - Within a month: Send the report
 - One month later: Reach out to see if there are questions
 - Six months later: Check on progress, send details on programs/events (rebates)
- Sometimes hard to know why you're not getting reply to audit follow-ups
 - Three of our 17 audit site contacts have left their companies.
 - Learn the “lingo” and practice with your facilities' staff.



Incentives may not expedite water savings measures



If you build it, they will come?
...Not exactly

WaterSense product	Rebate amount per unit
Irrigation Controller	Cost, up to \$400
Showerhead	Cost, up to \$25
Tank Toilet	Cost, up to \$75
Flushometer-Valve Toilet	Cost, up to \$250
Urinal	Cost, up to \$200

Removal	Rebate amount
Water Softener	Up to \$250 per softener removed
Warm- Season Grass	25% conversion cost, up to \$20,000

ROI calculations are only one piece of the puzzle

- Aesthetics matter!
 - Largely customers are quick to act on leaks
 - Large hotel and community center fixed irrigation leaks and 2 pool facilities fixed irrigation and backwash valve leaks
- Enthusiastic Employees vs Corporate Goals and Vision
 - Finding the right contact to make changes can be difficult!
- Pressure from residents or other stakeholders can cause inaction and status quo
 - Live, Work, Play Community's Landscaper and lushness factor for residents



Audit Requests May Come from Unexpected Areas

- Finance Department- Source of customers concerned about high bills
 - Take advantage of a larger reach/possible different pool of customers
- Professional organizations and work groups/Sustainability staff
 - Green Building meeting (get the right contacts in the room)!
- Contacts from other cities/agencies
 - Contacts for certain chain stores that are also in your area



Pool Your Resources and Work Together

CII Work Group with other Valley cities

- Guided Audit Walk-throughs
 - Hotels
 - Hospitals
 - High School
 - Your own facilities can be good practice too!
- Consider equipment needs
- Technology specific trainings
 - Cooling Towers



Other Important Lessons Learned

- Take PHOTOS (if appropriate)
- Have at least two staff members on each audit
- Understand your team's strengths and bring a good communicator
- Go for the biggest bang for your buck!
- Manage Expectations!



Top Five Lessons Summary:

1. Attend an in-person/interactive CII training or reach out to other utilities that have a CII program
2. Carefully craft your RFP and/or have realistic budget figures (equipment needs, contractor, trainings, etc)
3. Network with other departments, other cities, trade groups, etc.
4. Don't assume your customers are familiar with water meter locations or property specific information
5. Work to your strengths/budgetary capabilities- a small or very specific program can still be a good program!

Next Steps and Future Work



- Survey to audit customers to understand barriers to implementation of water saving recommendations
- Year three audits:
 - So far: 4 locations of another chain grocery store
 - Corporate headquarters of healthcare facility
 - Another Live, Work, Play Community

Questions?

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