Scottsdale Water Campus
20 Years of Sustainable Water Management

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Agenda

• About Scottsdale Water
• 1980 Groundwater Management Act
• Water Campus Concept
• Recharge and Reuse in Scottsdale
• Overall Water Management
Learning Objectives

• Scottsdale's commitment to Sustainable Water Mgmt
• Understand how long term planning and commitment produce results
• Reuse/recharge as part of an overall water resource strategy
• Success of private/public partnerships
City of Scottsdale
About Scottsdale

- Population ~ 231,000
- Build Out ~ 285,000
- New Growth - North
- 184.5 square miles
- Elevation change 3,727 feet
Scottsdale Water

- Active water accounts: ~90,000
  - 78,500 single-family residential
  - 5,000 multifamily residential
  - 6,000 commercial, nonresidential
- Average potable water delivery: 67 mgd
- Water distribution lines: 2,100 miles
- Active sewer accounts: ~80,000
- Sewer collection lines: 1,455 miles
- 2016 total potable water delivery: 23.2 billion gallons
Water Sustainability
About Scottsdale Water
Platinum Award for Utility Excellence
Association of Metropolitan Water Agencies

- Must demonstrate excellence in ten Attributes of Effective Utility Management and Keys to Management Success
- Progressive award, at least three years after receiving Gold Award
- Scottsdale Water awarded October 2015
Utility of the Future Today

Recognized in four activity areas:
• Organizational Culture
• Community Partnering and Engagement
• Energy Efficiency
• Water Reuse

Awarded by a global partnership of water agencies in partnership with the Environmental Protection Agency:
• Water Environment Federation
• National Association of Clean Water Agencies
• WateReuse Association
• Water Environment and Reuse Foundation
WateReuse Public Education Program of the Year

- Awarded September 2017
- Applicants were judged on:
  - Curriculum
  - Classroom instruction
  - Tours
  - Onsite participation
  - Peripheral materials
  - How the outreach enhances a better appreciation of water resources, management and conservation.
Arizona’s Historical Water Supply

- Historically most Arizona communities were dependent on groundwater
- 1970s – Discussions begin surrounding groundwater pumping in Arizona
Subsidence

West Valley

East Valley
Groundwater Management Act of 1980

- Created the Arizona Department of Water Resources
- Identified Active Management Areas with goals and requirements to address groundwater overdraft (safe yield)
- Established 100-year Assured Water Supply provision
- Required management plans that include mandatory conservation measures
- Encouraged practices to augment groundwater levels through water supply development
Arizona Active Management Areas
Arizona Active Management Areas
Scottsdale Water Supply Portfolio
1996

- Groundwater: 52%
- Surface Water: 46%
- Recycled Water: 2%
Master Planning Efforts

• Capture our own water resource: Recycle our wastewater
• Establish a plan to reuse our effluent and replenish the aquifer
• Partnership with developers
• Birth of the Water Campus concept
Water Campus Concept

- Potable Water Treatment Plant (70 mgd)
- Water Reclamation Plant (23 mgd)
- Advanced Water Treatment Plant (20 mgd)
- State-of-the-art Water Quality Laboratory
- Injection and ASR wells
Water Campus Requirements: Pumpback System
Water Campus Requirements: Water Reclamation Plant

- Phased approach to 23 mgd
- State Regulatory Parameters – somewhat in flux
- Future Regulatory Requirement
- Tertiary Treatment
- Odor control
Water Campus Requirements: Advanced Water Treatment Facility

- Meet water quality requirements
- State regulatory parameters
  - somewhat in flux
- Best available technology and processes
  - Ozonation/Chloronation
  - Ultrafiltration
  - Reverse Osmosis
  - Ultraviolet Disinfection
Indirect Potable Recharge

• Indirect potable recharge began in 1998
• Over 1.7 billion gallons of ultrapure recycled water recharged annually
Onsite Recharge Wells

- 63 Vadose Zone Well Field
- 180 feet in depth
- Groundwater depth at roughly 500 feet BLS
- Over 400 feet natural filtration
Vadose Zone Schematic

Approximate depth (feet):
- 0
- 3'
- 5'

- Concrete vault with cast aluminum lockable hatch
- 3” PVC elbows with vent lines extending 5’ into gravel pack
- Cast in place concrete floor
- 8” SCH steel gravel pack eductor extending 20’ into gravel pack
- 3/4” washed river run gravel
- 48” diameter borehole
- 18” schedule 40 PVC casing
- Geotextile fabric lining
- Schedule 40 PVC well screen
- 30” diameter borehole
- PVC cap
Groundwater Recharge: CAP

- Scottsdale’s original CAP allocation: 19,700 AF (~6.4 billion gallons)
- Current CAP allocation: 81,000 AF (~26.4 billion gallons)
- Scottsdale holds third largest CAP allocation in the state.
- Unused allocation (about 20 percent) recharged for long-term storage credits.

2016 Total Recharge (all sources): 3.9 Billion Gallons
Since 2005: 39.2 Billion Gallons Recharged
Recharging Surface Water

Recharged Water Sources:
- Unused Colorado River allocation
- Ultrapure Recycled Water
Reclaimed Water Distribution System (RWDS)

- Desert Mountain signs initial agreement in 1991
- Expectations are 10 years to sell 100% capacity
  - Capacity sold in 18 months
- Delivery of raw CAP water begins in 1993
- Delivery of effluent begins in 1998
RWDS System Today

- 14 miles of pipe, 5 pump stations, 20 mgd capacity
- Irrigation for 23 golf courses, city-owned sports complex

2016 RWDS Water Delivery: 3.95 billion gallons

2016 AWT Recharge: 1.3 billion gallons

Courtesy: Desert Mountain
Scottsdale Water Supply Portfolio 1996

- Groundwater: 52%
- Surface Water: 46%
- Recycled Water: 2%
Scottsdale Water Supply Portfolio 2016

- Groundwater: 12,905 AF
- Recycled: 15,328 AF
- Surface Water: 100,110 AF
- CAP: 81,110 AF
- SRP: 19,000 AF

Total Available Water Supply 2016: 128,000 AF (~36 billion gallons)
Scottsdale’s Commitment to Safe Yield

- Phoenix AMA mandated to achieve safe yield by 2025.
- Scottsdale first city in Arizona to achieve safe yield (in 2006)
- Two reasons for success:
  - Reduced groundwater reliance by obtaining additional surface water supplies
  - Water Campus
Water Conservation and Drought Management
Rebates

Installations:
- Toilets – up to $75
- Urinals – up to $200 (waterless qualify)
- Showerheads – up to $25
- Irrigation Controller – up to $250

Removals:
- Water softeners – up to $250
- Pool/spa* – up to $1,500
- Turf – up to $1,500 residential, up to $5,000 multifamily/commercial

*single-family residential only
Water Sustainability through Stewardship, Innovation and People

Water Efficiency Workshops

65 percent of residential water use is outdoors!

- Teach residents about:
  - Efficient water use
  - Low-water-use plants
  - Irrigation maintenance

- Workshops held throughout the year

- Free to Scottsdale residents
Youth Education Program

- Water Conservation hands-on activities
- Free educational booklets to schools
- Garden tours
- Scouts and troops talks
WaterSmart Software

- Three-year pilot
- 3,500 participants
- Social norm-based comparisons
- Consumption and demographics
- Customized reports
- Encourage water efficient behaviors
- Control group

Did you know? Low-water-use plants adapted to the Sonoran Desert require less maintenance, water, fertilizers and pesticides than non-desert-adapted varieties. They are also more drought-tolerant.

What to do next:
- Select the right plants for your landscape, lifestyle and vision.
- Install a step-by-step guide will help you design, install and maintain a beautiful low-water-use landscape.
- Saturate - proper watering and care are the keys to landscape success.
Proactive Drought Management Plan

- Identifies four stages of shortage:
  - Stage One: 0-5 mgd water supply reduction
  - Stage Four: reduction > 30 mgd
- Each stage has corresponding water use reduction responses, which increase with each stage
- No residential watering restrictions until Stage Two
Learning Objectives

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Questions?
Project Implementation Lessons Learned

• Public outreach and education
  – Buy in and support from community
  – Input from academic community

• Treat to potential future standards

• Identify opportunities for potential commercial/industrial partnerships within your community