

# This presentation premiered at WaterSmart Innovations

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# **Recycled Water & Cross Connection Control:**

## **Problems and Solutions**

**October 3 – 5, 2012**

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**ABPA Region IV Director**

**Supervisor Recycle Operations – SAWS**



**WaterSmart Innovations 2012 Conference  
Las Vegas, Nevada**

- Water types and quality
- The System
- The Laws
- The Team
- The Possible Solutions



# DEFINITION – ONCE AND FOR ALL

- Black Water – Water from toilets and urinals
- Grey Water – Untreated water from showers, sinks, and clothes washers
- Reclaimed/Reuse/Recycled Water – Highly treated effluent that meets or exceeds stream standards
- Rain Water Collection/Harvesting – Collecting in rain barrels, harvest to storage tanks



# Recycled Water Quality

- Regulated by Texas Administrative Code Chapters 210

Ch. 210 Constituent	Regulatory Standard	SAWS 2009 Analytical Results
BOD 5	5 mg/L	2.01 mg/L
Turbidity	3 ntu	< 1 ntu
Fecal Coliform	< 20 cfu/100ml	< 2 cfu/100ml



# Recycled Water Quality

- Additional contractual standards

SAWS' Contractual Standards	
NH <sub>3</sub> -N	< 2.0 mg/L
pH	6.0 to 9.0 su
Total Suspended Solids (TSS)	< 15 mg/L
Total Dissolved Solids (TDS)	< 1500 mg/L
Sodium Adsorption Ratio (SAR)	< 5 meq/L
Residual Sodium Carbonate (RSC)	< 1.5 mg/L



# Recycle Vs Potable

- Nitrates/Nitrites

- MCL 10/1

- Actual

•Water	Recycled
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•1.8/<0.01	14/0.03
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- Mercury

- MCL 0.002

- Actual

•Water	Recycled
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•<0.00013	<0.0002
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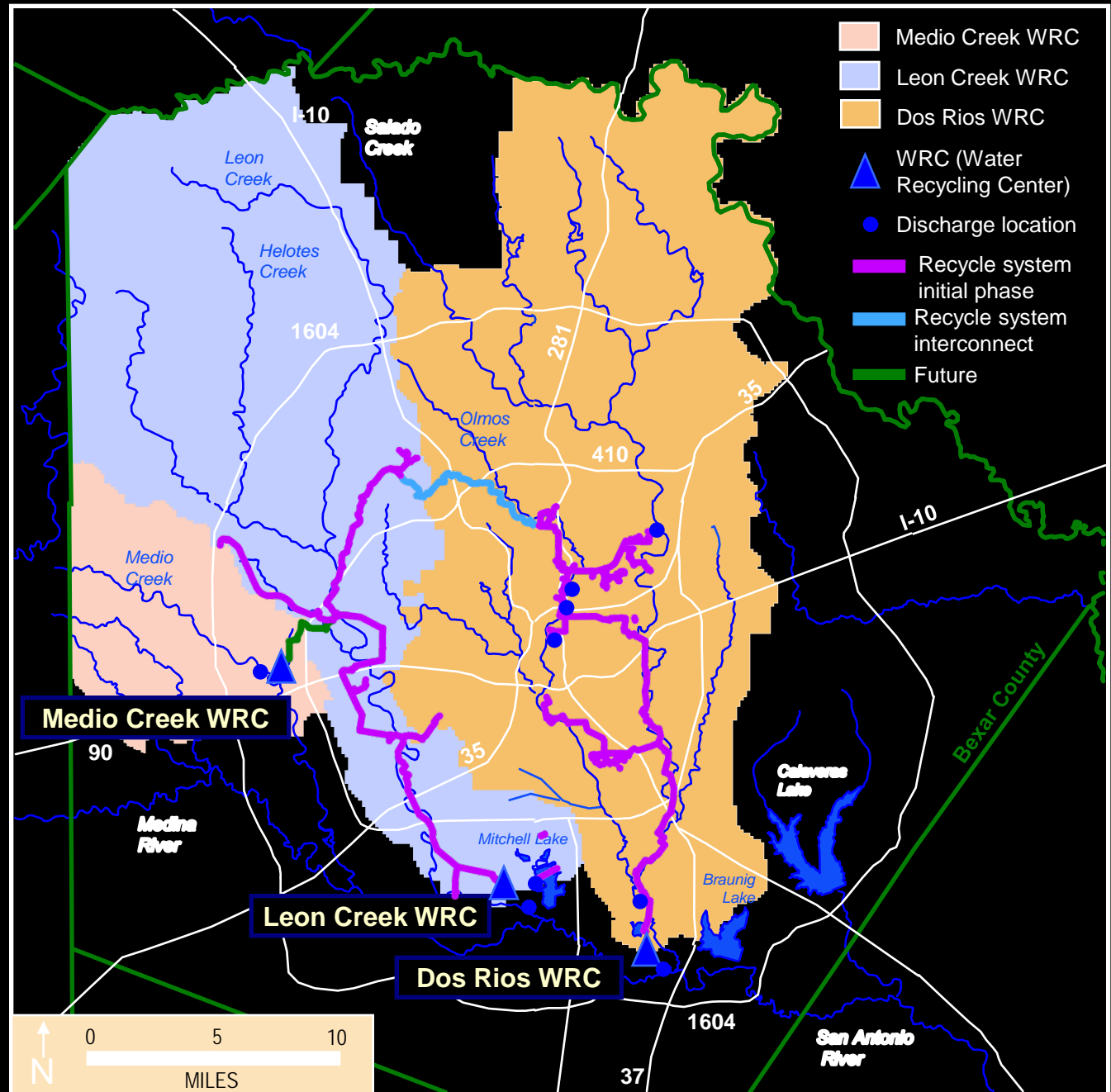
# Recycle Vs Potable

- Fecal Coliform
  - MCL 0
  - Actual
    - Water Recycled
    - 0 <2.0 Mg/l
    - Beaches are closed when fecal counts reach 200

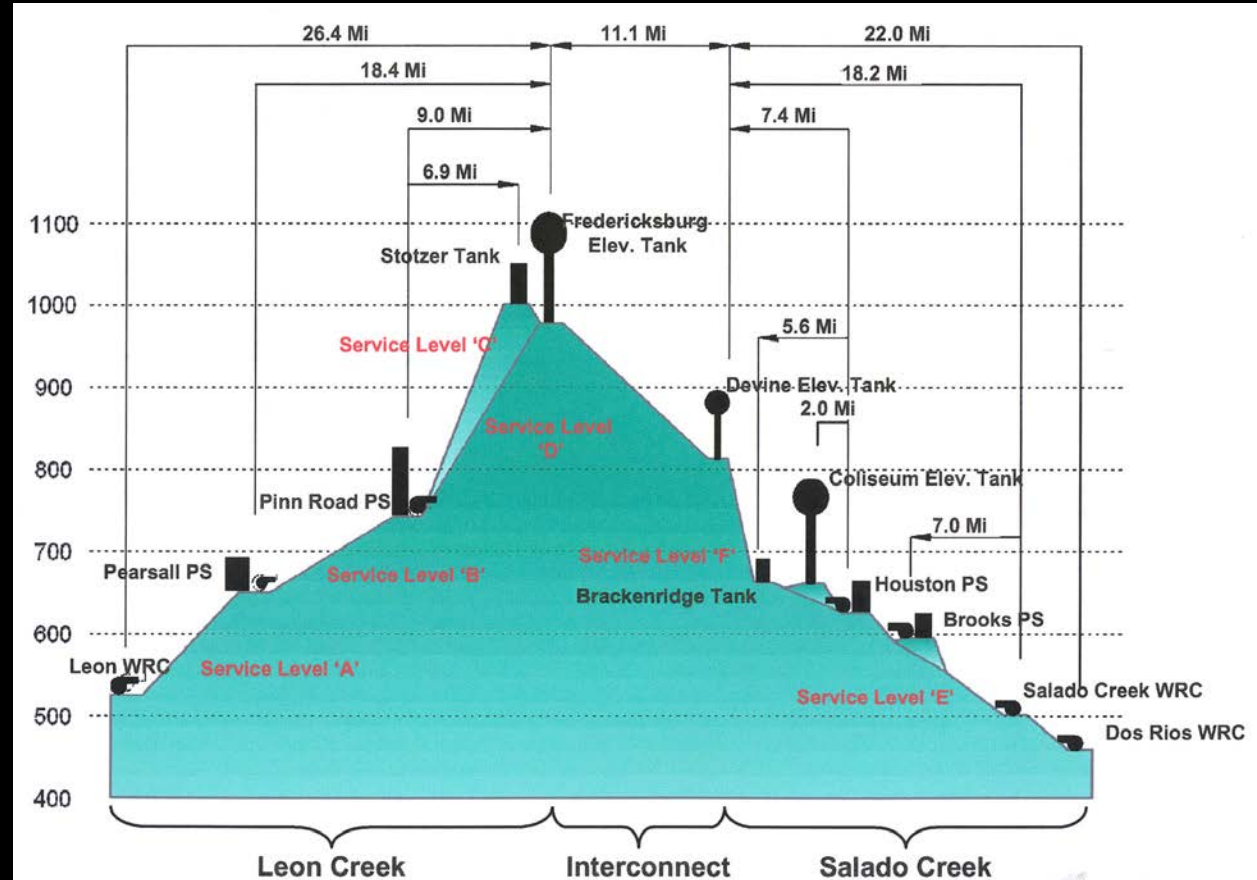




# SAWS Recycled Water System



# How it is Laid Out



# Regulatory Guidelines

- Texas Administrative Code Chapter 290 for Potable Water
- Texas Administrative Code Chapter 210 for Reclaimed Water
- Local Chapter Code 34 and TAC 217
- International Plumbing Code (2009 with amendments)
- SAWS Backflow and Cross-Connection Control Program
- AWWA Cal/Nevada Guidelines
- USEPA 2004 Guidelines for Reuse Water



# Chapter 290 particulars

- Separation requirements
- Texas PE requirement for stamp and signature
- Safe Drinking Water Act
  - Cross connection control & backflow back siphonage
  - Customer service inspections



# Chapter 210 particulars

- Contract
- Uses of recycled water
- Color coding
  - Potable and recycled water
  - Above and below grade
- Signage





# Uses of Recycled Water



landscaping



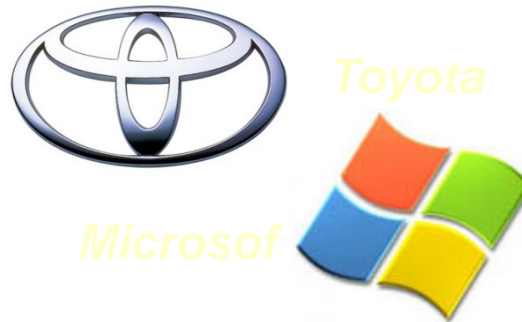
River Walk



cooling towers



golf courses



Microsoft

Toyota



grass farming

# Team Members

- Customer Development
- Recycle Operations & Treatment Support
- Backflow Protection/Cross Connection Control
- Emergency / Operations Control Center
- Master Planning & CIP
- Construction Inspections



# Team Members: Other Agencies

- Design Engineers
- Contractors
- Plumbing Inspections
- Customer Representative
- Other Water Purveyors





# Program Requirements should include:

- Required training
- System modifications
  - Physical separation between potable and recycle
- Onsite wells require protection



# Solutions

- An ounce of prevention!
- Educate Educate Educate



# Annual Workshop

- Inform the users of recycled water background
- Provide refresher on the rules and regulations that cover use of recycled water
- Discuss contract obligations and notification requirements
- Discuss best practices to maximize use of recycled water
- Discuss recent upgrades and future plans for the system
- Update POC list for each entity served
- Answer any questions
- Required before meter is set for new customers



# Steps to Contact

1. 1st Contact Water Purveyor OR contact by potential customer
2. Favorable response/interest by customer received.
3. In-depth interview and site visit scheduled
  - a. Evaluation Team may include:
    1. COSA Plumbing Inspector
    2. Engineering Representative
    3. Backflow/Cross Connection control Supervisor and area Inspector
    4. Distribution and Collection General Foreman
    5. Manager or Coordinator – Recycle Program
  - b. Designated responsible person from potential customer (familiar with site and actual layout of system)
  - c. Required information from potential customer  
New – Proposed plans and any existing as-built drawings  
Conversion – As-built plans of existing system



# Steps to Contract (cont.)

4. Evaluation of Site Visit
  - a. Determine gpm requirements for customer
  - b. Determine capacity of SAWS delivery availability
  - c. Determine pressure in area
  - d. DETERMINE LEVEL OF COMFORT WITH PROPOSED SITE
5. Contract Development – AFTER TEAM DECIDES IF VIABLE
6. Contract Signed and Delivered to Connection Team
7. Phased Step Procedure for Connection
8. Follow-up Testing after Service begins
9. Annual Site Visits



# New Construction Procedures

1. Plan review
2. Pre construction conference
3. Site visits during construction
4. Water use survey and sampling
5. Punch list for site compliance
6. Test reports on backflow preventers
7. Perform two way shut down testing
8. Dye test system with potable water
9. Sign off on site compliance / set meter

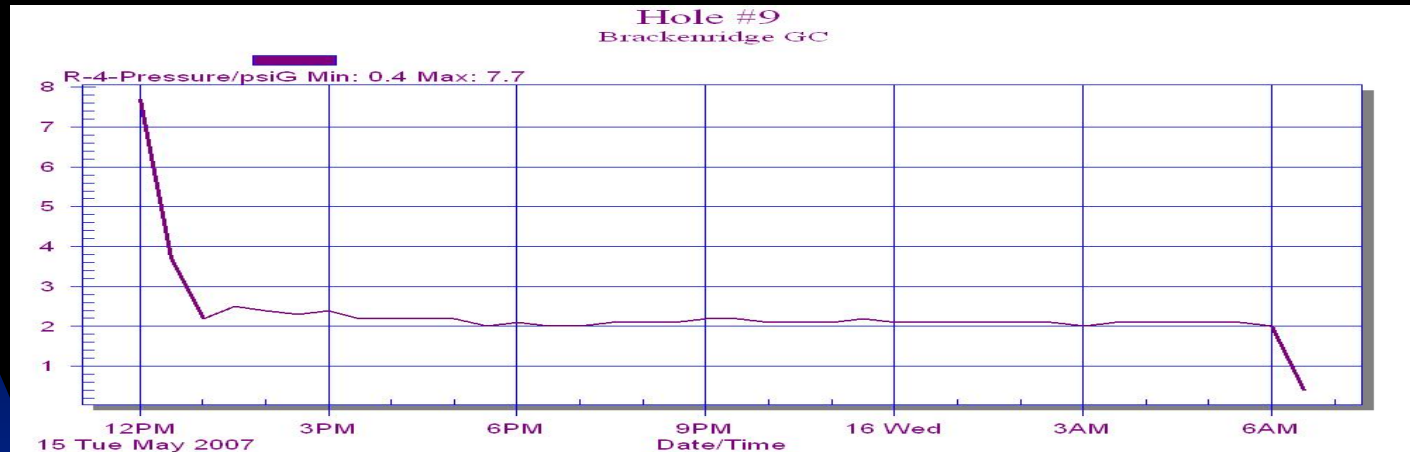


# Retrofit System Procedures

1. Initial meeting and as-built review
2. Water use survey and sampling
3. Punch list for site compliance
4. Test reports on backflow preventers
5. Perform two way shut down testing
6. Dye test system with potable water
7. Sign off on site compliance
8. Set meter



# Annual Shutdown Test Procedure



- Contact customer 30-60 days ahead
- Customer provides T&M reports for ALL containment devices BEFORE shutdown
- Scheduling of customer personnel (1/1)
- Install data loggers and take samples
- Perform two way shutdown on potable and recycle services and restore service





# Key Customer Components

- Customer must have key personnel with a basic knowledge of plumbing and/or irrigation and hopefully backflow prevention
- No fear. But awareness is vital to a successful site certification process and a long term and safe use of reclaimed water
- A Designated Site Representative that has a full understanding of the designated use of reclaimed water



# Key Components

- Provide customer orientation
- Site certification personnel are responsible for process
- Trained site certification personnel must have professional licenses or recognized certifications in:
  1. Backflow testing and regulatory provisions of backflow prevention
  2. Cross connection control
  3. Site certification
  4. Water quality testing
  5. Associated licenses in Water Operations, Plumbing, and/or Irrigation



# Monitoring and Sampling Protocol

- Take samples every week for the first month and then once a month
- Take samples as needed during the course of the year
- Check site every two months for first year
- **Schedule annual shutdown test**
  - **Meters will be pulled if shutdown test not performed**
- Test all on-site backflow preventers
- Perform annual shutdown test



# Summary

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# Questions and Discussion

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