

Austin Water Resource Planning Task Force

May 12, 2014

Demand-Side Management

- Water Conservation and Drought Response
- Water Reclamation Initiative (Direct Reuse Program)
- Drought-related Operational Impacts
- Water Loss Management: Infrastructure Leak Index(ILI)/Water Loss Tracking

Water Conservation and Drought Response

Staff Presentation

What's the Right Approach?

Conservation	Drought Response
Long-term	Short-term
Slower implementation	Quickly implemented
Savings realized gradually	Savings realized immediately
Focus on cost-effective strategies	Focus on amount of possible savings
Emphasis on technology	Emphasis on behavior

Austin's Conservation Programs

- Started in early 1980s
- Expanded in mid-90s with focus on consumer incentives & household conservation
- 2006-2007 Task Force renewed interest
 - **Council goal: Reduce Peak Use 1% annually over 10 years (25 MGD)**
 - Achieved an estimated **35 MGD** peak reduction by 2011
 - Mandatory watering restrictions, acceleration of reclaimed water lines, plumbing code changes, irrigation design requirements

Austin's Conservation Programs

- 2009 Resolution & Citizen Task Force
 - **Council goal: Reduce average use to 140 GPCD by 2020**
 - Evaluated existing, pending and new strategies
 - Recommended cost-beneficial, flexible programs
 - Found most savings strategies were already implemented or recommended
- 2011 Resource Management Commission Workgroup
 - Met with 3-member panel of RMC to present accomplishments, unify various MGD/GPCD goals
 - Continue to update with monthly reports and quarterly presentations

Documented Savings in 2011

- Multivariate regression analysis developed to support baseline adjustment to pro-rata curtailment plan
- Models used historical data to predict monthly consumption by customer class as a function of weather, growth and conservation measures
- Verified total impact of programs, not individual measures

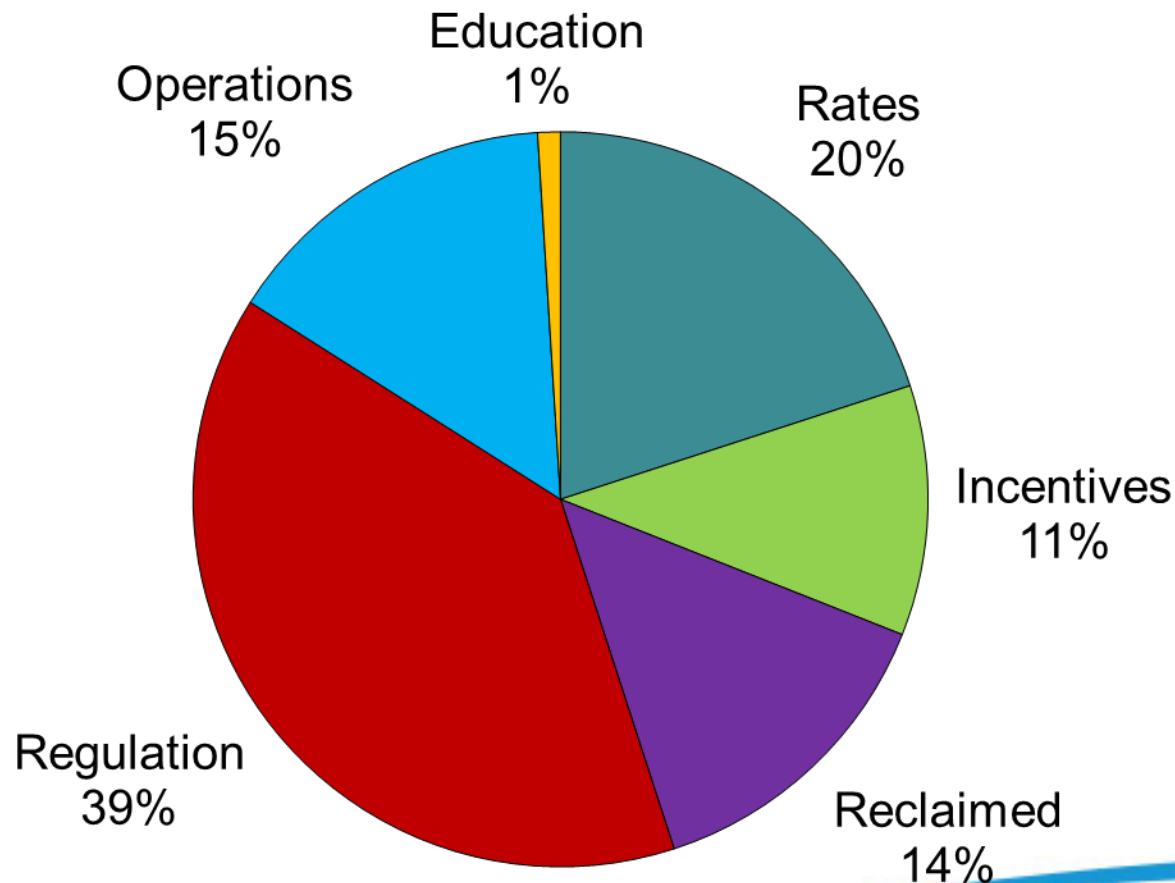
Contribution	Source	Savings (AF)
Conservation Efforts	Econometric Models	18,196
Reclaimed Water	Meter Data & Eng. Calcs.	4,989
Water Loss Reduction	Meter Data & Eng. Calcs.	3,081
TOTAL		26,266

Savings Estimates

- Three primary sources:
 - National end-use and bench-testing studies
 - Results from other cities adjusted for Austin
 - Pilot testing & bill analysis of AWU customers
- Examples:
 - **Rainwater harvesting**
 - Initial estimates based on TWDB manual not realized post-installation; need to adjust for cost-benefit
 - **“Evolve” showerhead adapter**
 - Manufacturer savings claims; preliminary data shows water increase



Estimated Breakdown of Savings



Major Conservation Efforts

- Accelerated plumbing fixture replacement
- Plumbing code efficiency & irrigation design requirements
- Voluntary & mandatory irrigation evaluations
- Car wash efficiency requirements
- Year-round irrigation & water waste restrictions and enforcement
- Aggressive residential pricing structure & seasonal commercial rates
- Reclaimed water system expansion
- Faster leak response & proactive leak detection
- Accelerated water line replacement
- Incentives for landscape conversion and rainwater harvesting
- Incentives for commercial audits & upgrades
- Universal metering, separate irrigation meters
- Public & school education

Drought Contingency Planning

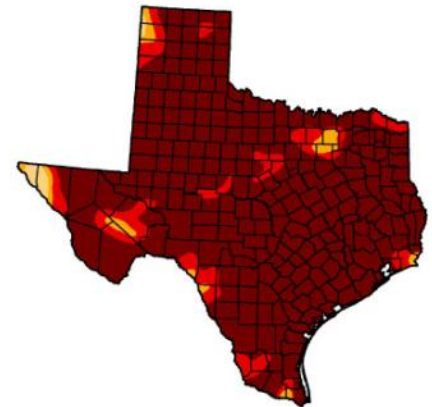
- Record low inflows to Highland Lakes in 2011
- Once/week watering creating pressure on distribution system
- Potential for pro-rata curtailment
- Then-current Stage 3 would have virtually eliminated outdoor watering
- Public calls for earlier drought response

U.S. Drought Monitor Texas

October 4, 2011
Valid 7 a.m. EST

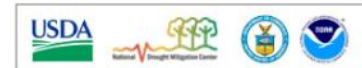
	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	99.16	96.99	87.99
Last Week (09/27/2011 map)	0.00	100.00	100.00	99.16	96.65	85.75
3 Months Ago (07/05/2011 map)	2.41	97.59	95.73	94.39	90.21	71.30
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00
Start of Water Year (09/27/2011 map)	0.00	100.00	100.00	99.16	96.65	85.75
One Year Ago (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, October 6, 2011

Drought Plan Changes

- Stronger conservation measures outside of drought
 - Commercial irrigation evaluations & car wash standards, towel/linen reuse & water on request, max. 2x/week watering, water waste prohibited
- Stronger restrictions in early drought
 - Earlier trigger point at 1.4 MAF – 5% reduction target
- Status quo in moderate/severe drought
 - Continue to go to 1x/week watering at 900,000 AF – 15% reduction target
- Less stringent in catastrophic conditions
 - Allow some watering at 600,000 AF – 20% reduction from baseline year
- Align precisely with LCRA triggers
 - Maximizes media coverage, minimizes impact to citizens

Drought Stage 3 Measures

- Reduced irrigation hours (10-15 to 6)
- Reduced patio mister hours (4pm-8pm)
- No filling of spas
- Restrictions on splash pads
- Increase in violation fine amounts

Emergency Stage 4 Measures

- No outdoor irrigation, no system testing or repair
- No vehicle washing
- No fountains, splash pads, misters
- No water use to repair or operate pools, spas, fountains
- No washing of outdoor surfaces
- Athletic fields for health/safety; variances possible for foundation, tree disease treatment, pest control
- Increase in violation fine amounts

Fines for Violations

(Residential/Commercial)

	1 st	2 nd	3 rd	4 th
Stage 2	\$75 / \$200	\$150 / \$400	\$300 / \$500	\$500
Stage 3	\$150 / \$300	\$300 / \$500	\$450 / \$500	\$500
Stage 4	\$500 / \$2000	\$750 / \$2000	\$1250 / \$2000	\$2000

Future Demand Projections

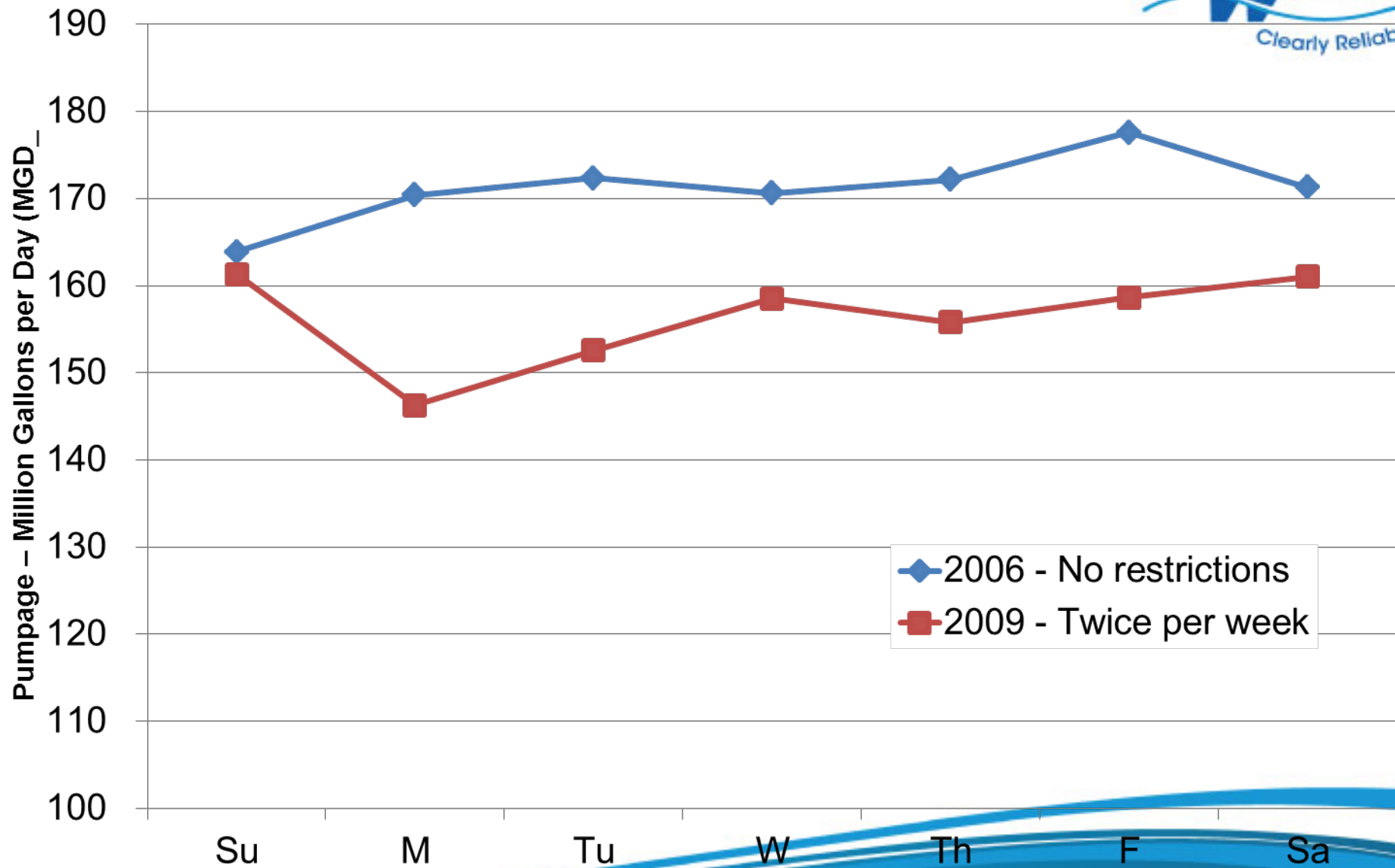
- 5-yr financial forecast assumes Stage 2
- Estimated water use reductions by customer class and drought stage through 2019
- Adjusted for diversion, pumping, billing variance

Projected Diversions in Thousand Acre-Feet					
	2015	2016	2017	2018	2019
Stage 2	144.5	145.7	147.0	148.3	149.7
Stage 3	125.5	126.8	128.3	129.7	131.1
Stage 4	100.3	101.2	102.5	103.5	104.6

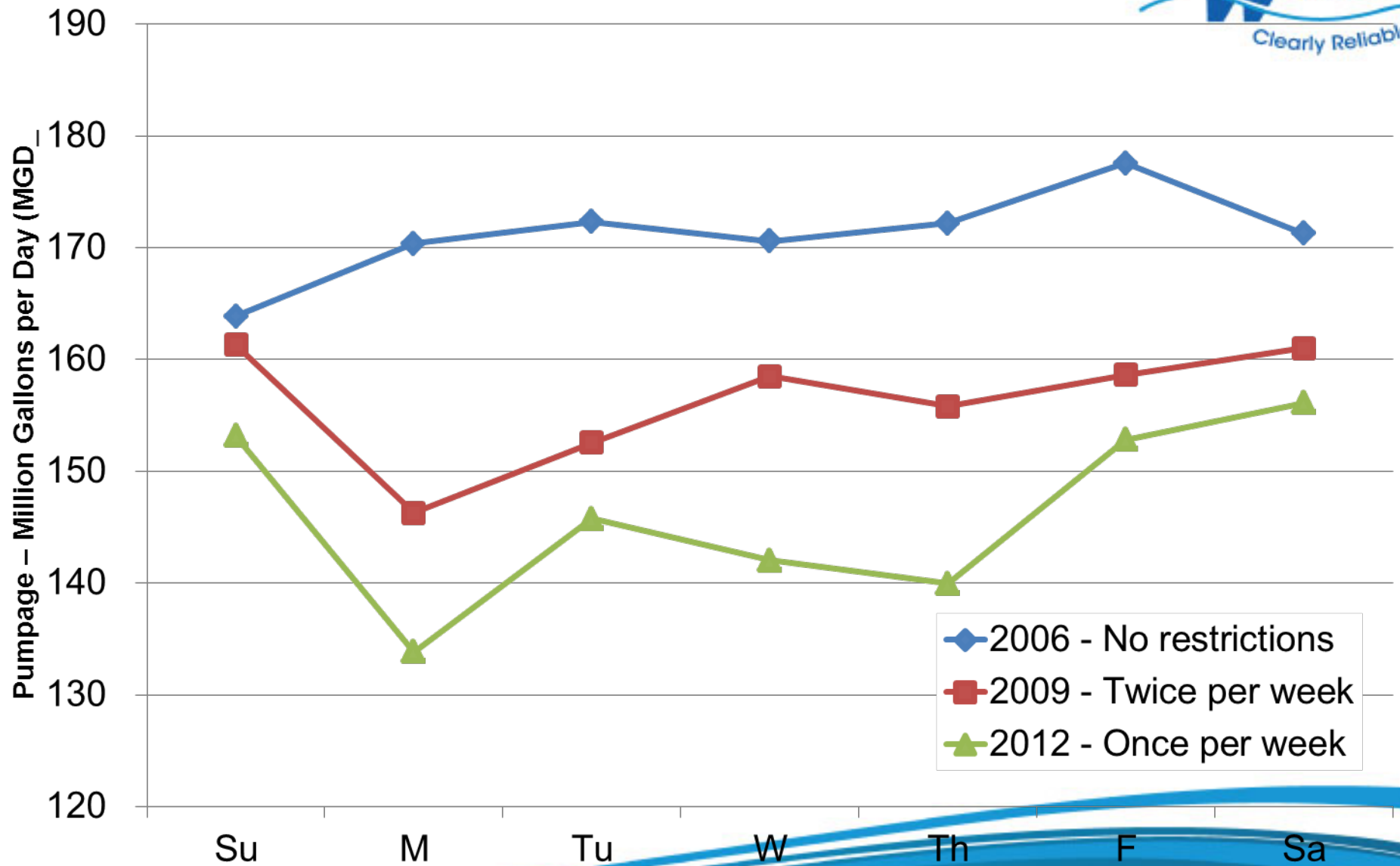
* As of 5/2014, estimates subject to change



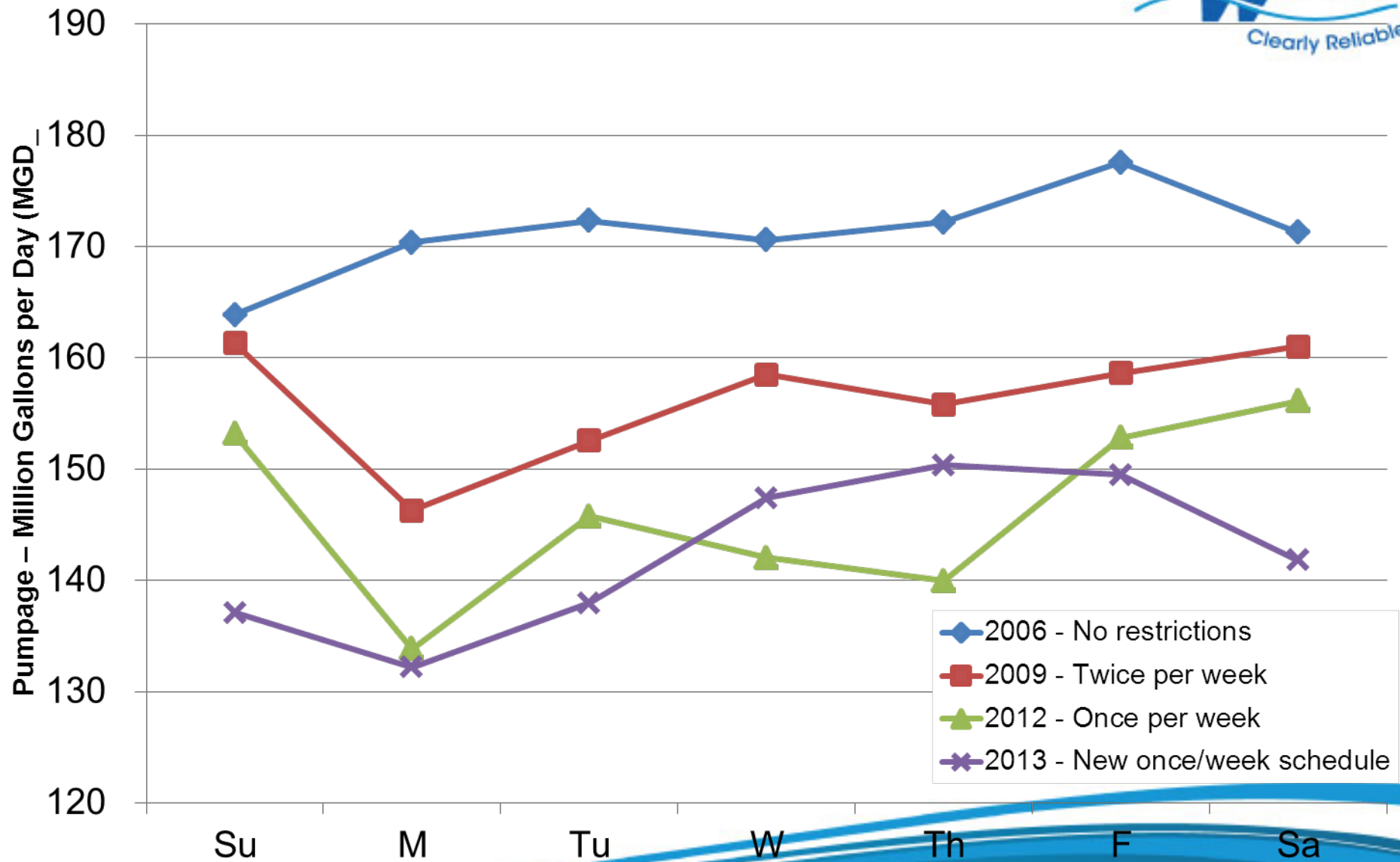
Daily Average Pumpage – May through October



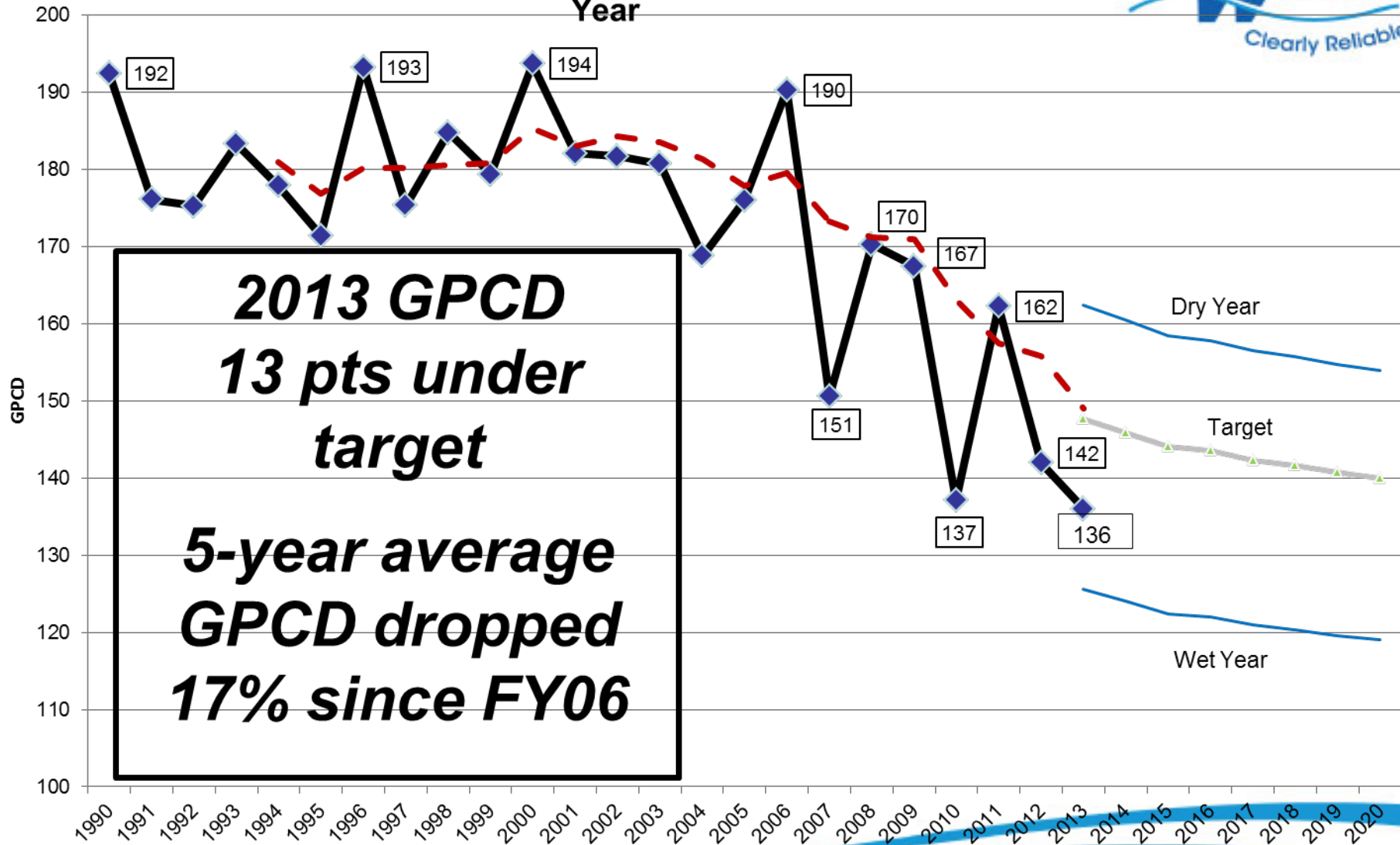
Daily Average Pumpage – May through October



Daily Average Pumpage – May through October



Austin Conservation History and Expected GPCD Progress by Fiscal Year



Questions and Discussion

Water Reclamation Initiative (Direct Reuse Program)

Staff Presentation

What is Reclaimed Water ?

- Highly treated wastewater effluent
- Quality – akin to river water
- Demand management tool
- Major uses
 - Irrigation
 - Cooling
 - Manufacturing
 - Toilet flushing



The Current System

Miles of trans. main – 48

Customers – 61

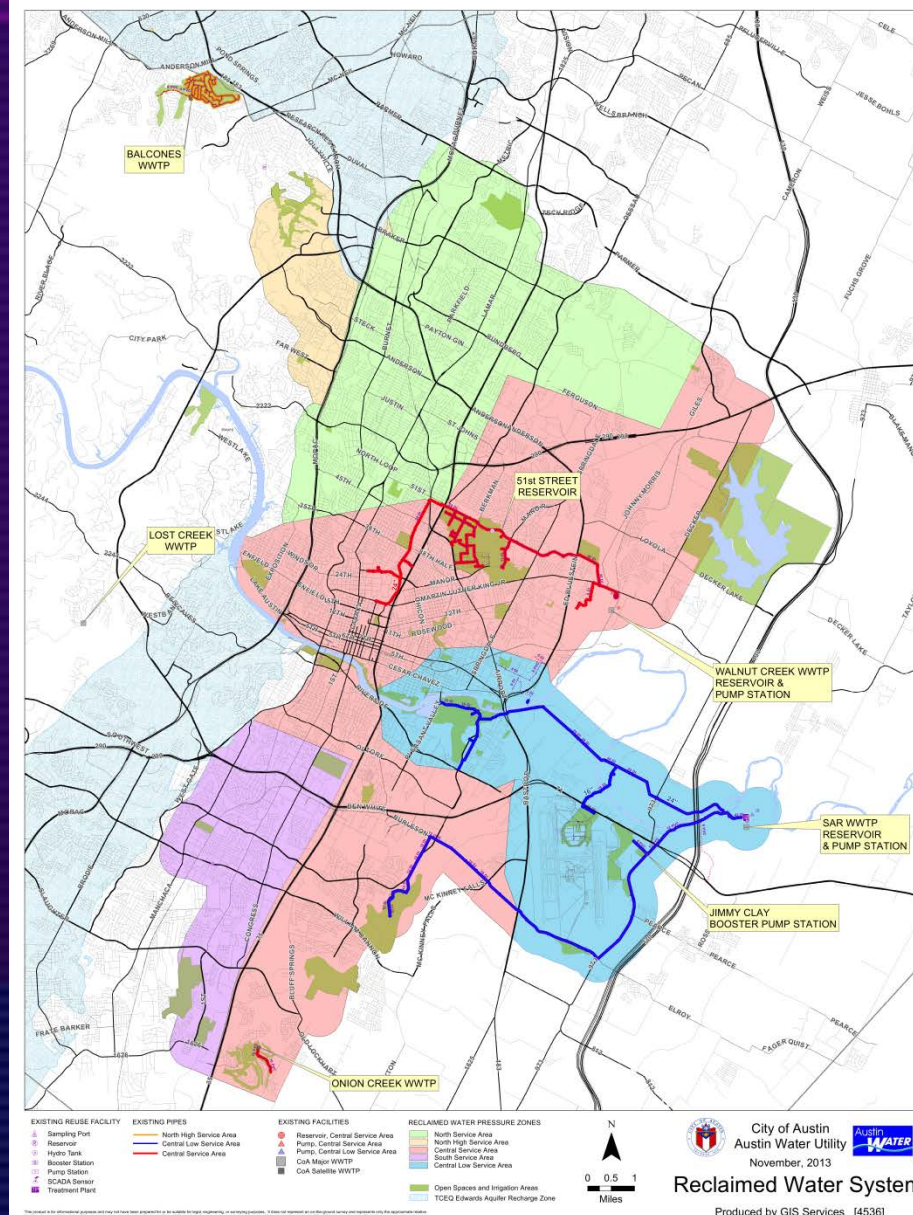
Annual use – 1.47 billion gallons (FY13)

How much water is that?

2,186 olympic-sized swimming pools

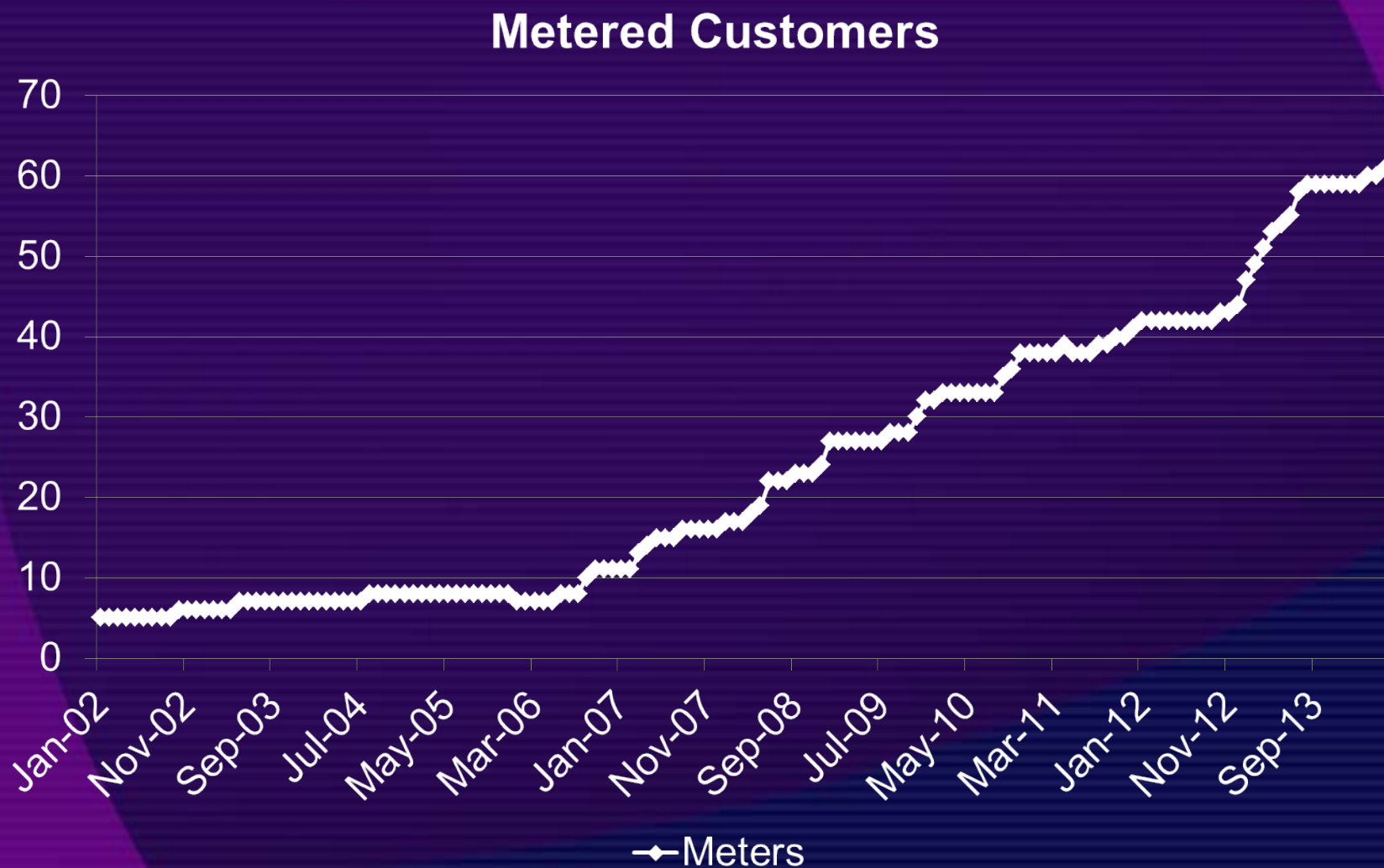
29 million car washes

0.9 billion toilet flushes





Metered Customer Accounts





Reclaimed Water Customers

Existing (60)

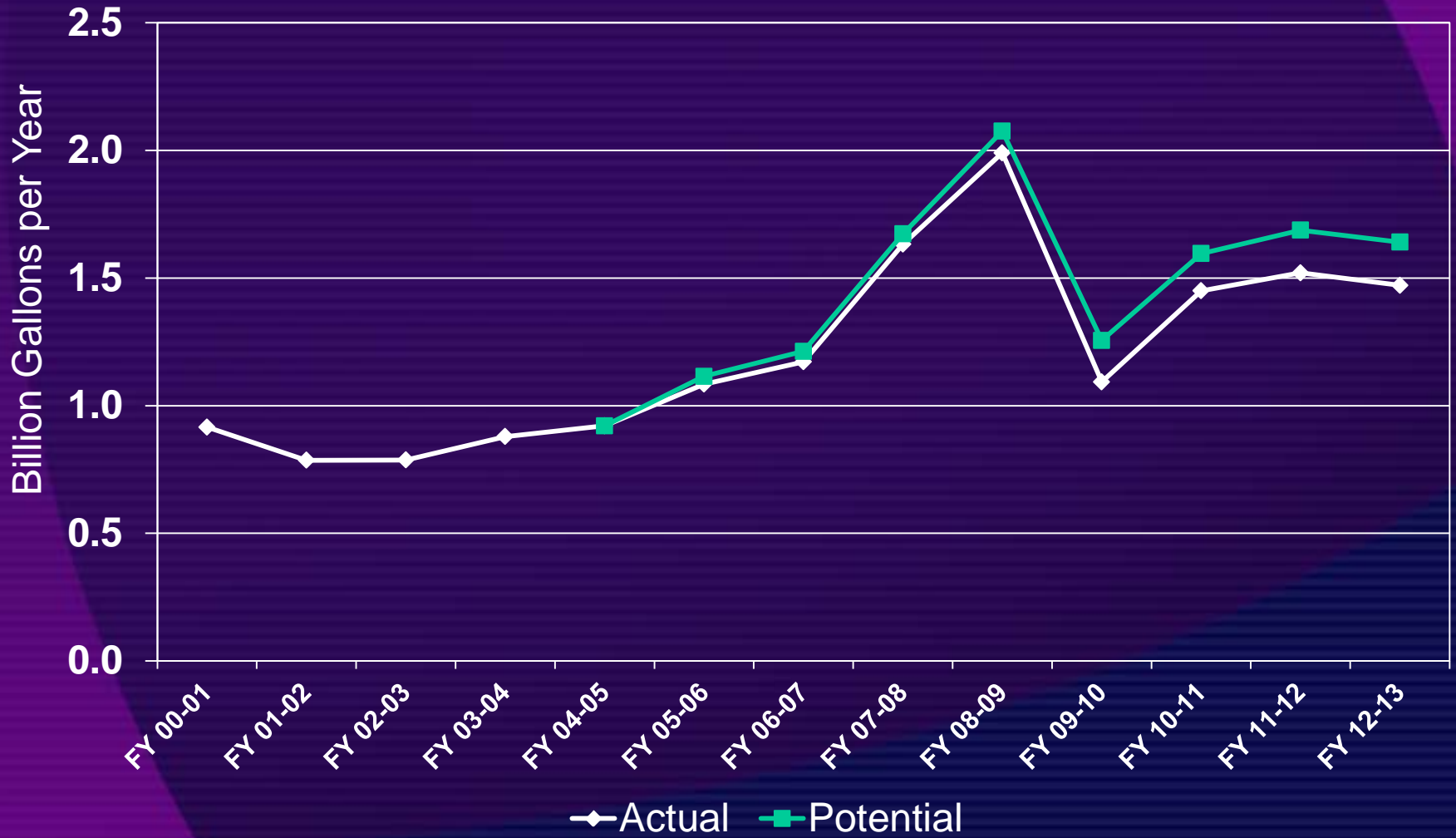
- Clay/Kizer Golf Course
- Sand Hill Energy Center
- Hornsby Bend
- Mueller Shopping Center
- Krieg Fields
- HEB Mueller
- BAE Systems
- University of Texas
- Frost Bank
- ABIA
- Thinkery

Planned (300+)

- Central Library
- State Capitol
- Governor's Mansion
- Republic Park
- State Cemetery
- Travis County Complex
- Capital Complex
- Downtown
- Guerrero Park
- ACC Riverside
- ACC Rio Grande



Usage





Completing the Core

- Near-term construction program, \$5-8 million/yr
- 19 miles of main, one tank and pump station
- Improve customer service
- Increase customers to 135
- Increase volume to 2.2 BG/yr



Projects Under Design

- Montopolis Tank and Pump Station
- Burleson Road Pressure Conversion
- Capitol Complex Main
- Junction 420 Main
- Cemetery Main
- FM 973 Relocations





Projects Under Construction

- Walnut Tank and Pump Station Upgrade
- UT Medical Center (Red River)
- Smith Road Extension
- 2nd Street (Library)
- \$5-8 million /year





2007 Water Cons. Task Force Projects

- UT Transmission Main
- ABIA Transmission Main
- Smith Road Extension
- Main to Colorado River Park (aka Montopolis Main)
- 24" Main Rehabilitation
- 12" Main Rehab – Clay/Kizer
- 12" Main Rehab – Hwy 183





Plans and Opportunities

Miles of trans. main – 130

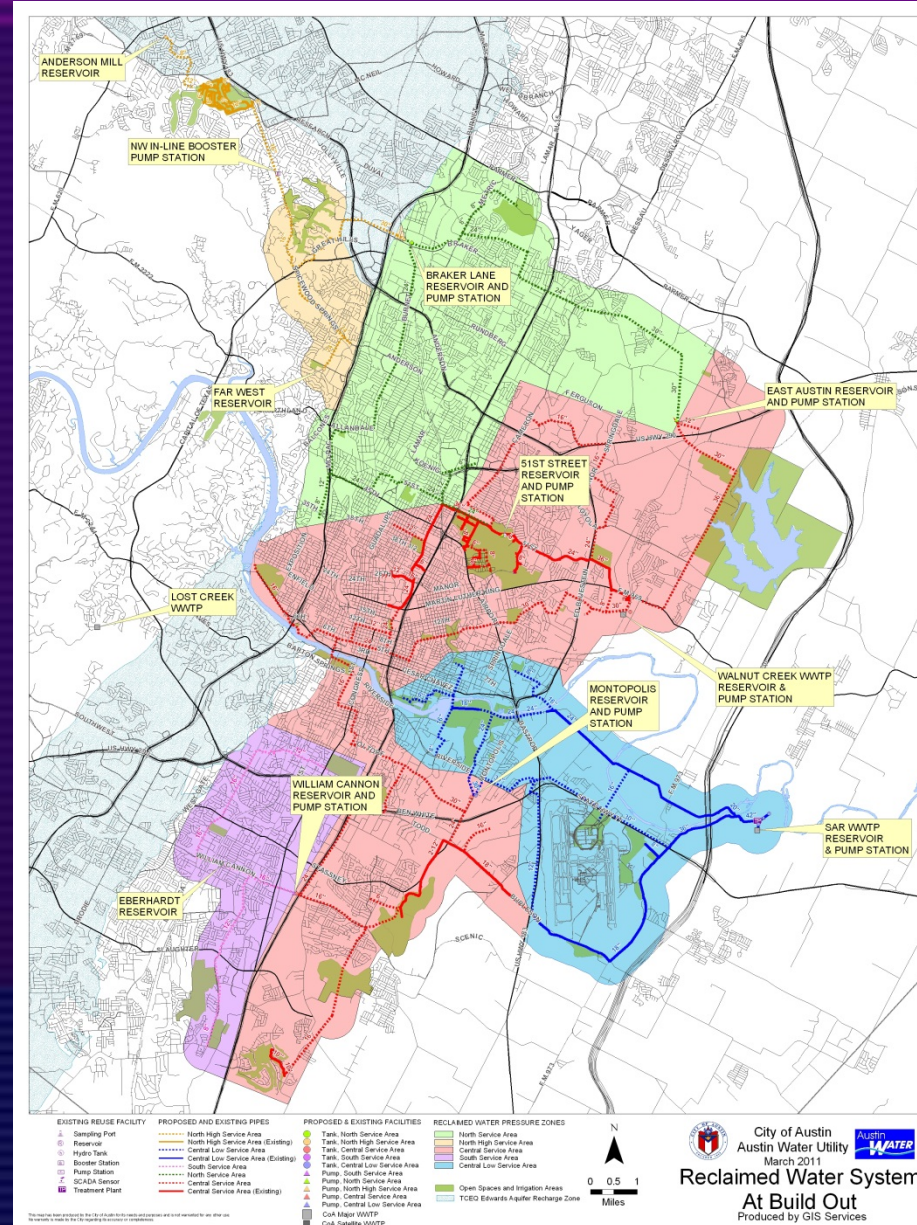
Annual use – 8.34 billion gallons

How much water is that?

12,400 olympic-sized swimming pools

208 million car washes

5.21 billion toilet flushes





Bulk Water Fill Stations

Station Location	Annual Usage (gal)
Hergotz Lane	847,870
Hornsby Bend	24,360
PARD	1,424,900
Walnut Creek WWTP	under construction

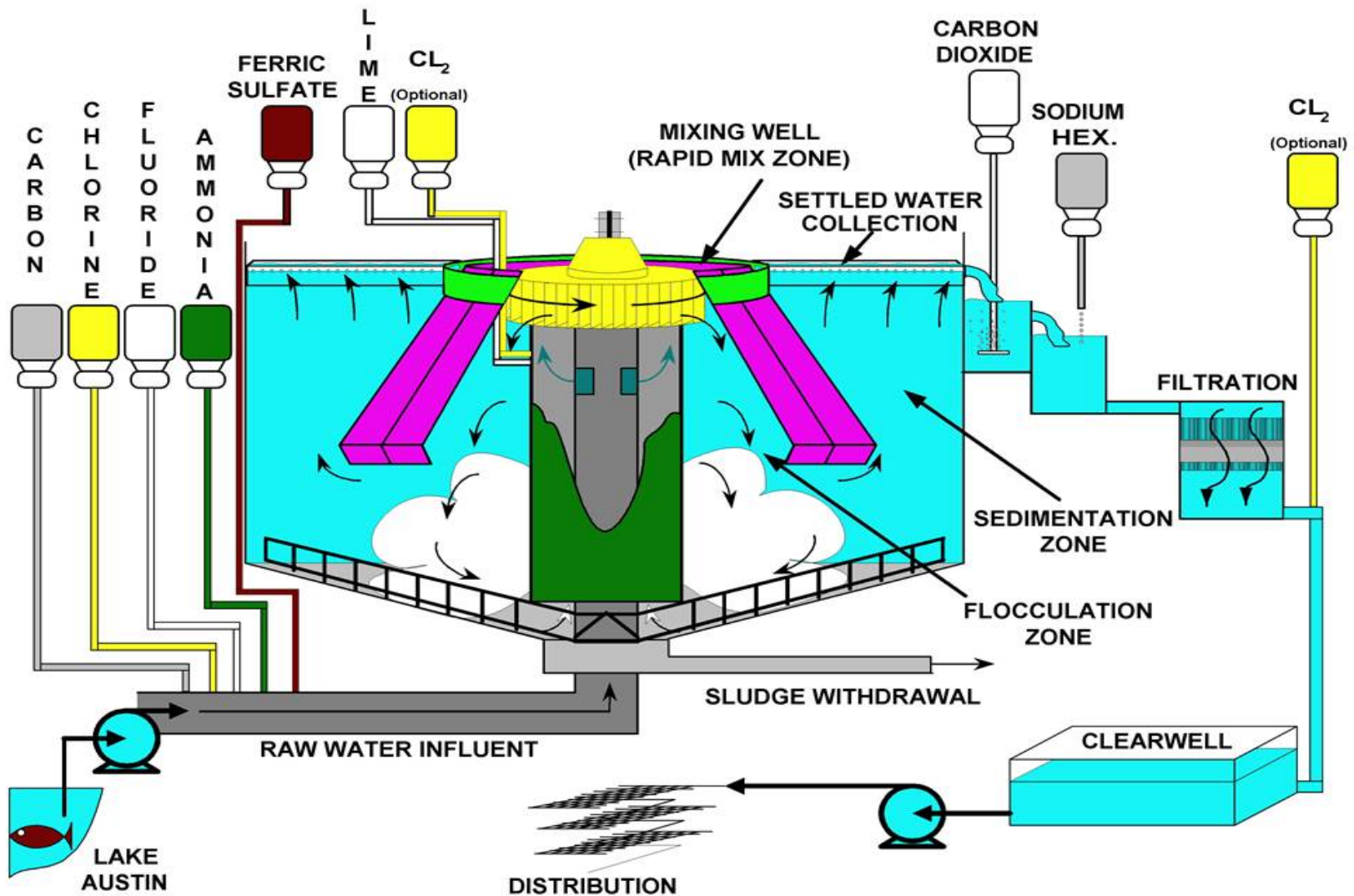


Questions and Discussion

Drought-related Operational Impacts

Staff Presentation

Process Overview

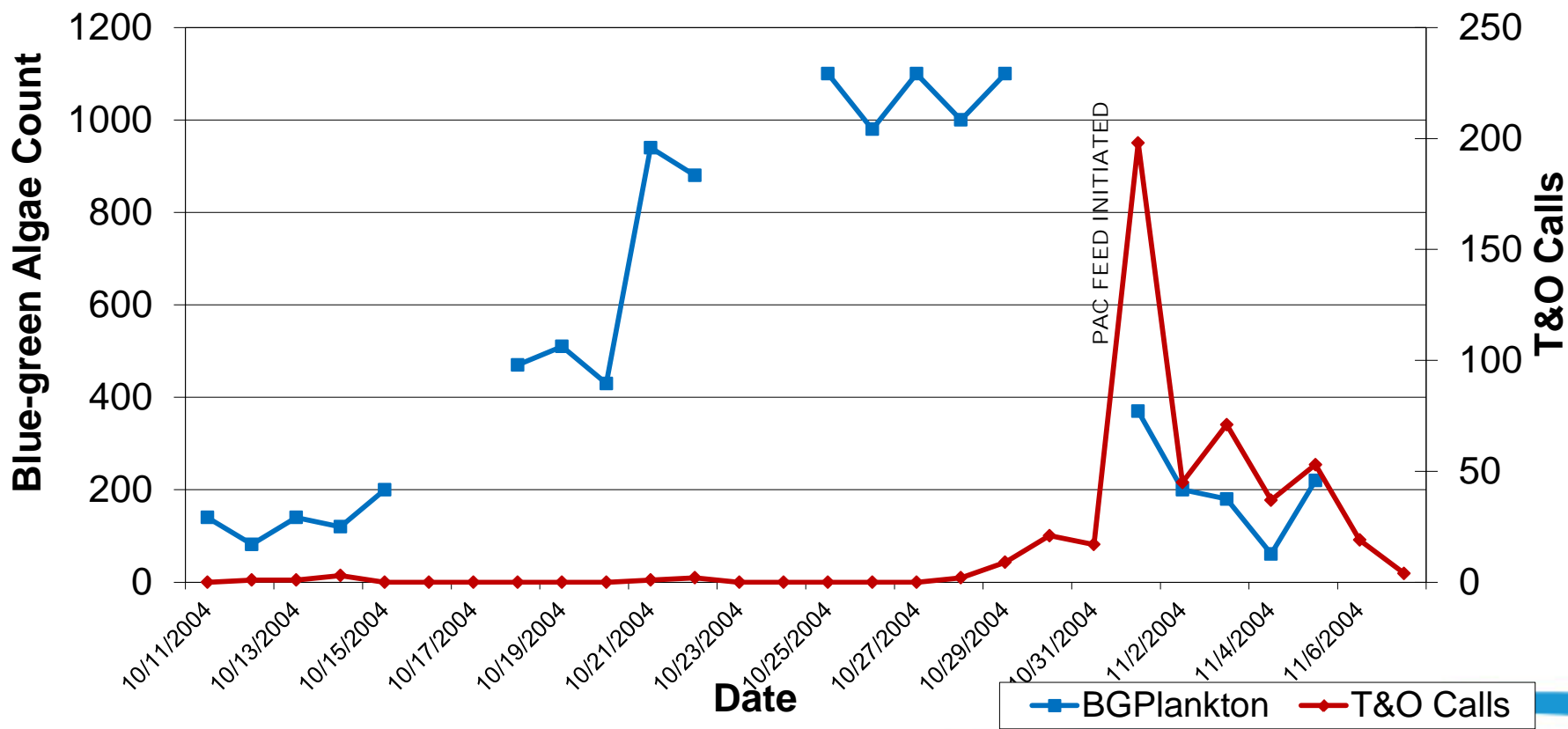


Water Treatment Impacts

- Raw Water Quality Changes
 - Higher levels of algae that can lead to taste and odor
 - Increased total trihalomethane formation
 - Increased hardness
- Chemical Demand Increase
 - Powdered Activated Carbon
 - Chloramine

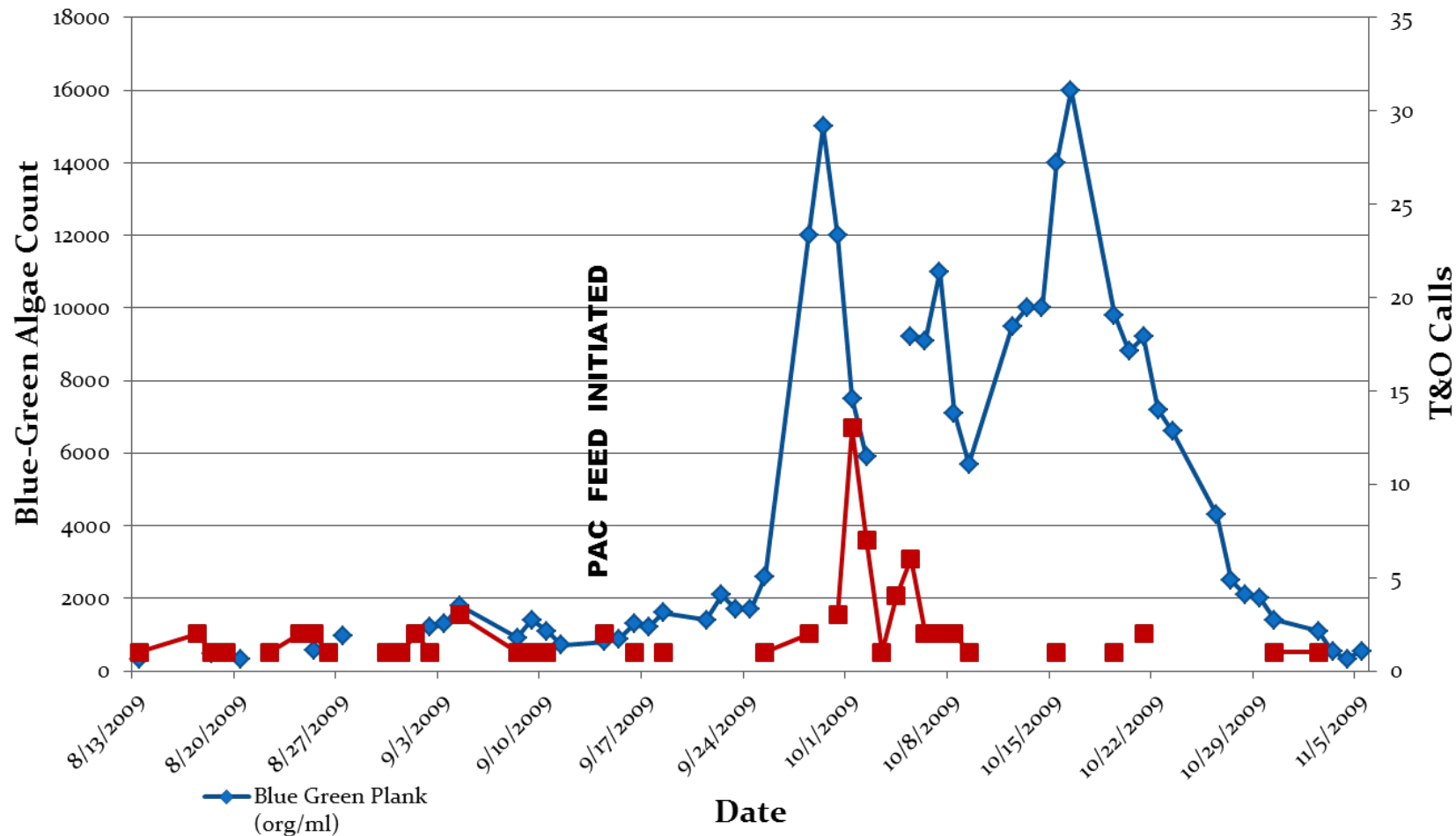
2004 Algae Related Taste & Odor Event

T&O Calls and Blue Green Plankton Counts



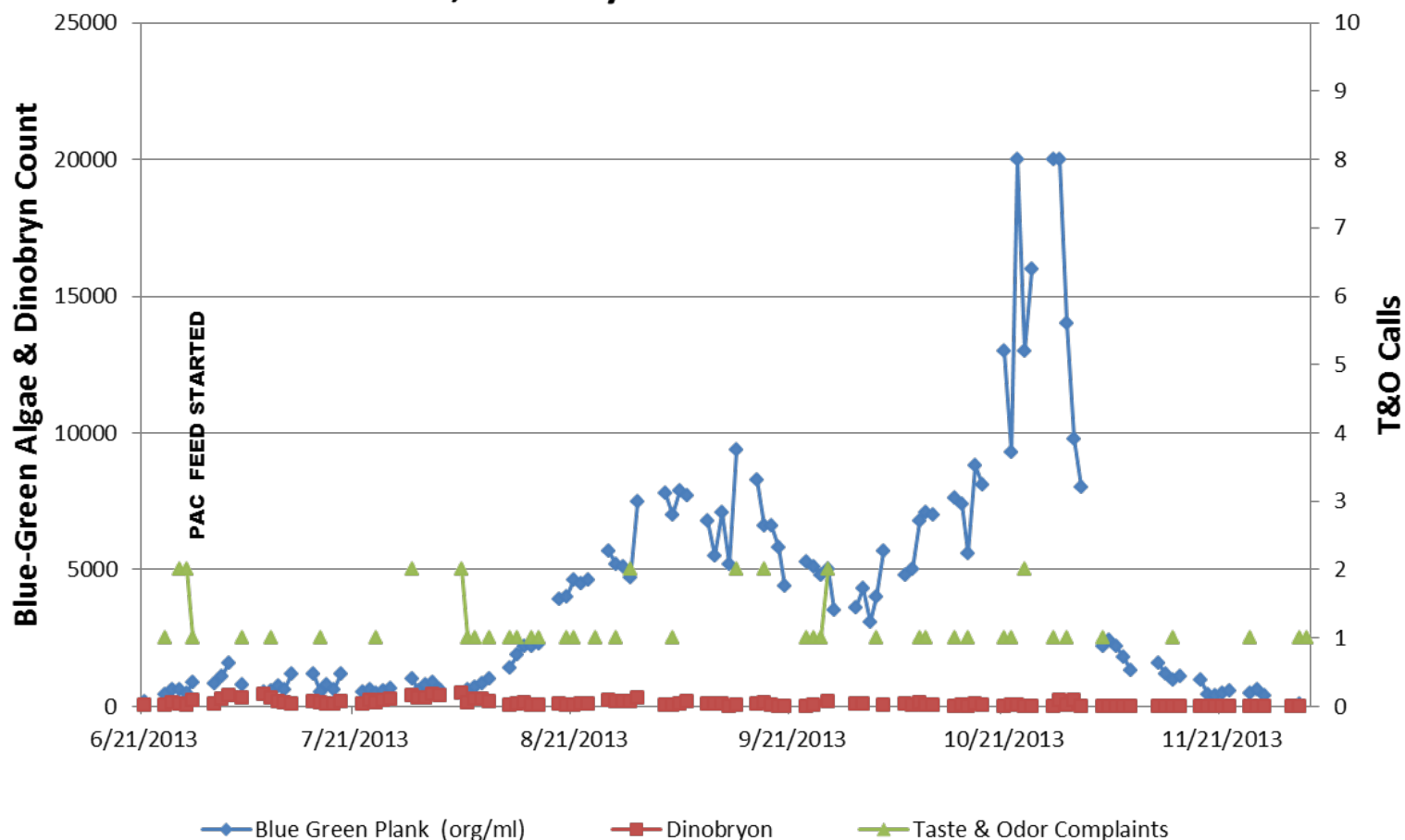
2009 Algae Related Taste & Odor Event

T&O Calls and Blue Green Plankton Counts



2013 Algae Related Taste & Odor Event

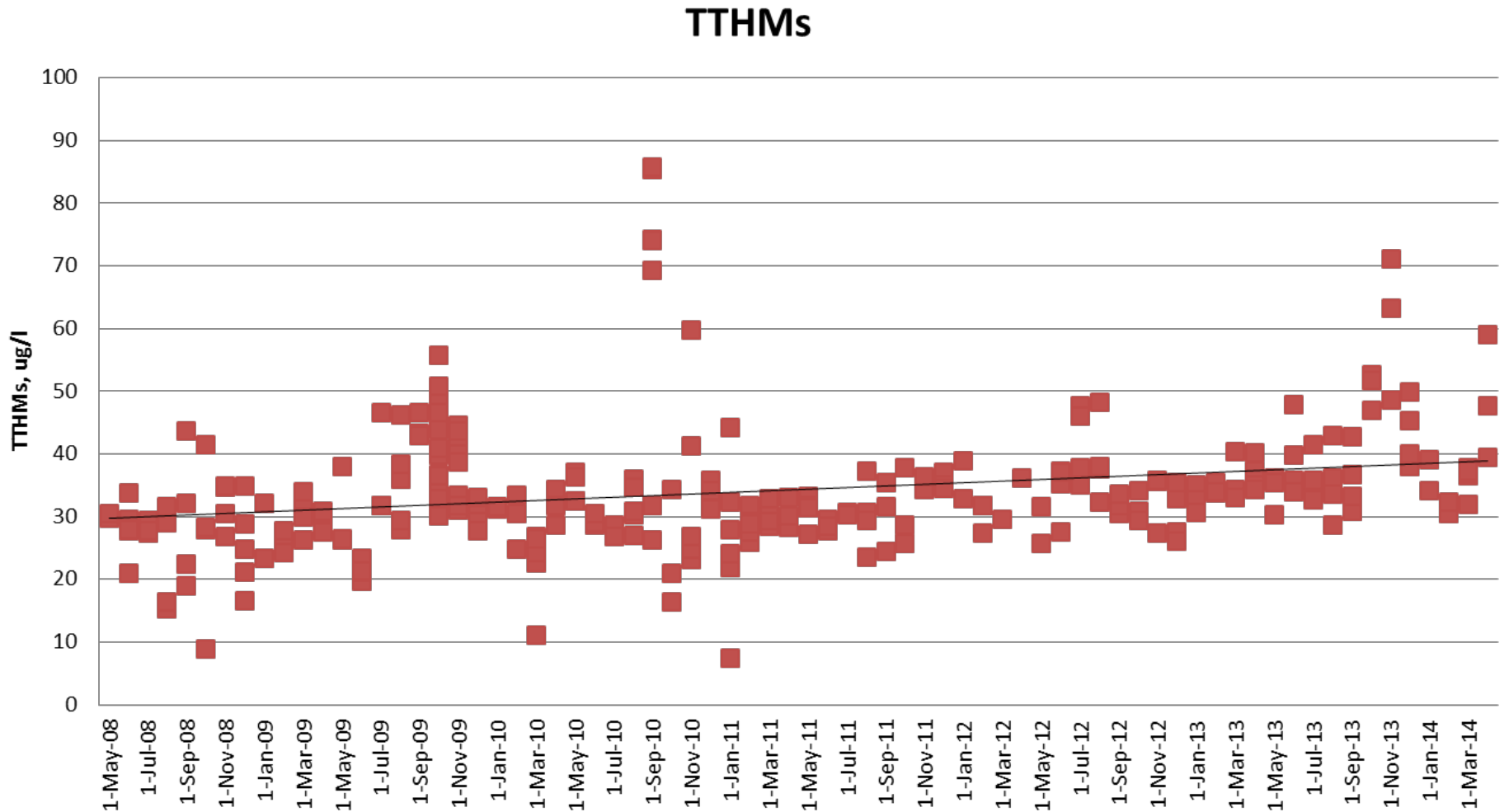
T&O Calls, Dinobryon & Blue Green Plankton Counts



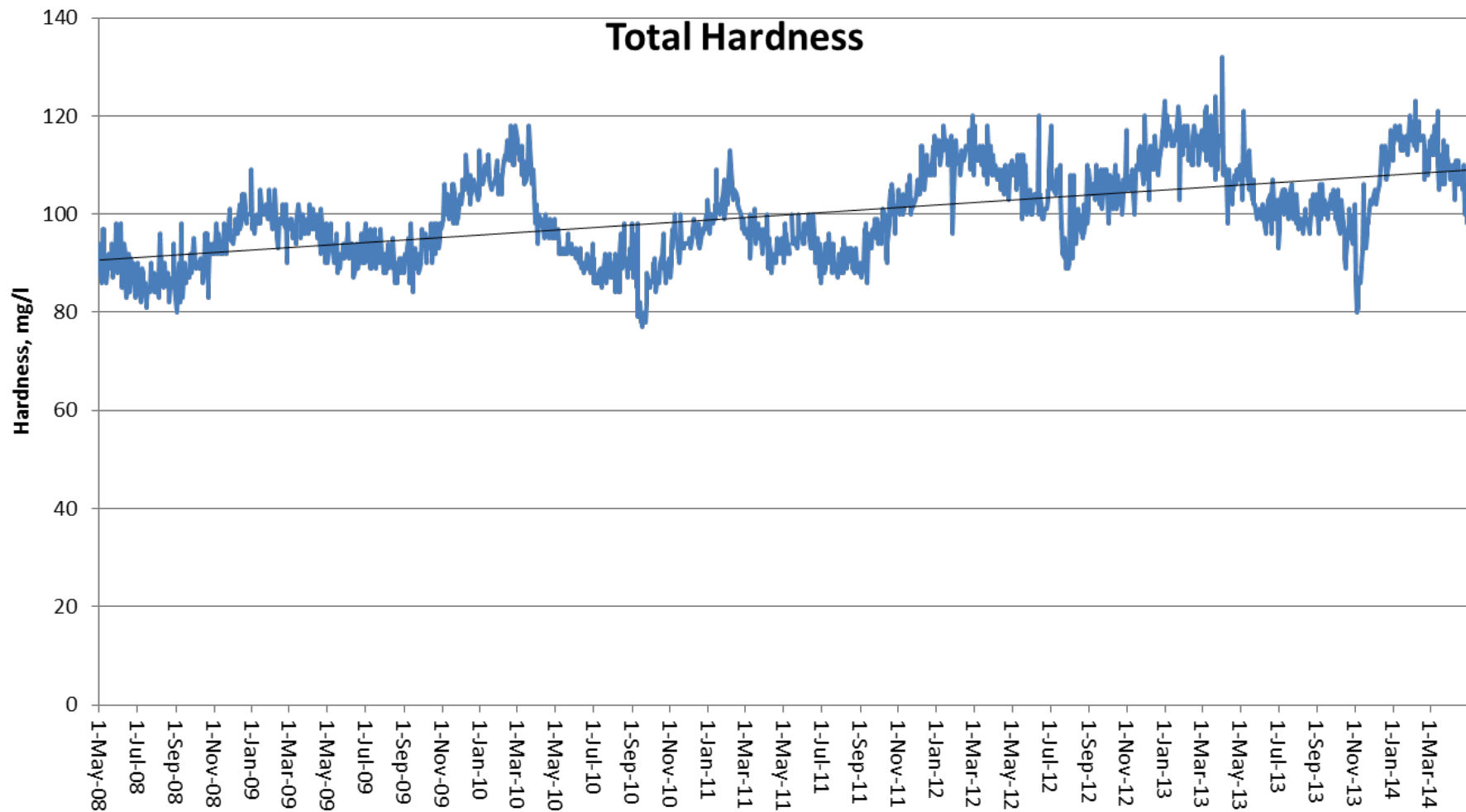
Algae Taste & Odor Events Summary

- Variety and Counts
 - Counts increased: 1,000 to 16k to 20k, more variety
- Duration
 - Increasing: 2 wks to 2 months to 6 months
- Cost
 - Increasing: \$50k to \$100k to \$250k

Increased Trihalomethanes



Increased Hardness



System Impacts

- Lower flows lead to longer water age
- Longer water age in warmer temperatures leads to decline in chlorine residuals
 - Prior to FY 2010, target for chlorine residual leaving the plant was 2.2 mg/l
 - In December 2010, increased the target for chlorine residual leaving the plant to 2.5 mg/l
 - In 2013, raised the target to 2.75 mg/l for 4 months
 - 2014, will monitor system and make decision accordingly

Impacts to Wastewater System

- Increased strength of influent stream to wastewater treatment plants
- Dillo Dirt sales down due to outdoor water restrictions
- Experienced delays in land application on contracted site due to inability to move livestock with lack of grasses with drought

Questions and Discussion

Water Loss Management

Infrastructure Leak Index (ILI)/Water Loss Tracking

Staff Presentation

Summary

- Terminology
- Water Losses – Apparent and Real
- Real Loss Management Strategies – PM, ALC, Speed/Quality, R&R
- Real Loss Management Strategies - Austin Water
- Leak Management Performance
- Questions?

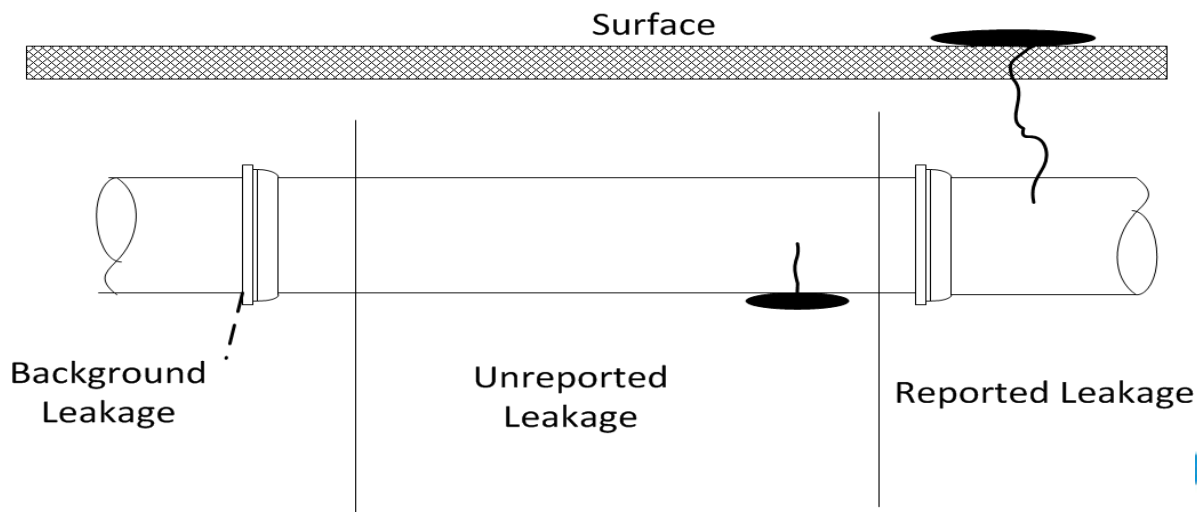
Terminology

- Real Water Loss – Physical losses of water from leakage from pipes, joints, fittings, reservoirs, hydrants etc.
- Apparent losses – Accounting losses of water that is being used but not billed. This is caused by inaccuracies with customer metering, consumption and billing data handling errors, assumptions of unmeasured use, and any unauthorized use such as theft.

APPARENT LOSS MANAGEMENT



REAL LOSS MANAGEMENT



Source: M36, Third Edition, p. 116



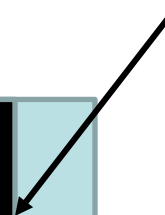
REAL LOSS MANAGEMENT

Losses flex with
Pressure



**Pressure
Management**

Economic level of real
losses



Speed and
quality of
repairs

**Unavoidable annual
real losses**

Potentially recoverable real
losses

Active
Leakage
Control

Pipeline and
asset
management
selection,
installation,
maintenance,
renewal,
replacement

Active Leakage Control

- Leak detection Services – 5 year program starting point (20% per year) completed 2012.
- Last 2 years – 1500 miles inspected using acoustic technology.
- Large diameter leak detection started three years ago.



Renew Austin - Water Main Rehabilitation and Replacement

- In 2012, Austin Water launched Renewing Austin
- Five year program to upgrade aging water mains
- Approx. \$125 Million investment to rehabilitate or replace about 75 miles of water pipe

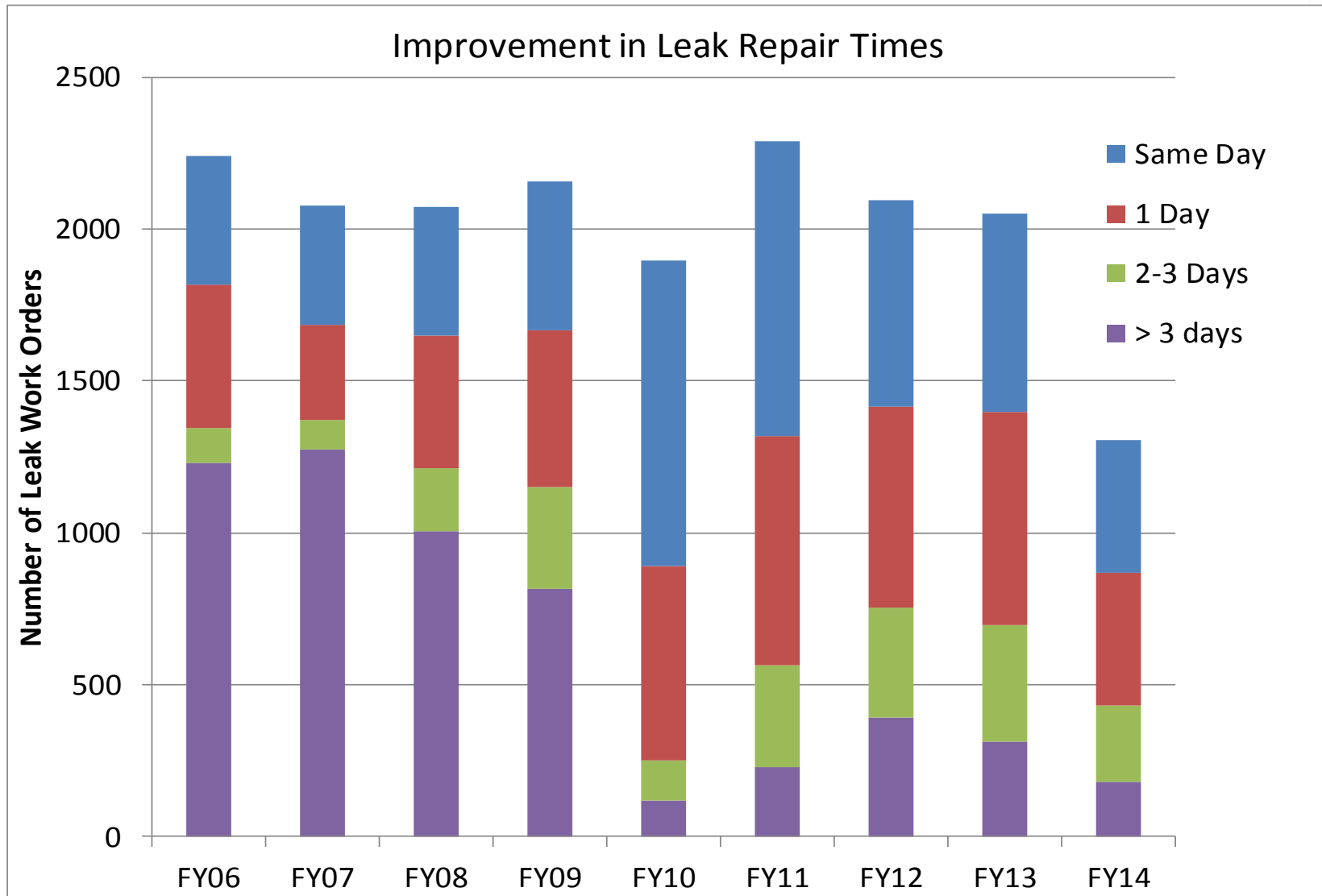


Leak Response and Repair

- In FY 2009, Austin Water added a second shift to its leak response
- Most leaks now repaired in one day or less.
- Valve Exercising Initiatives



Leak Work Order Repair Times

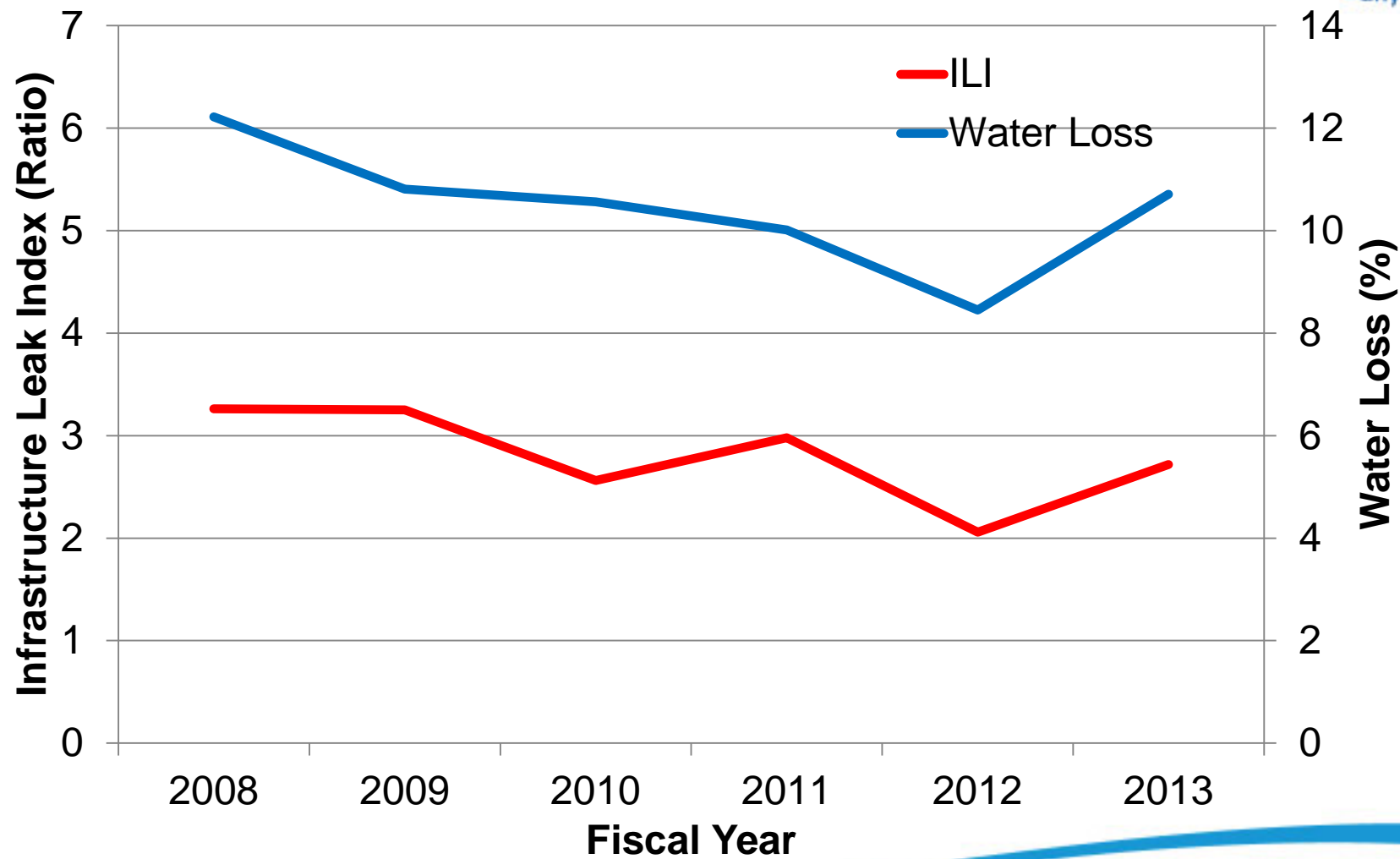


Pressure Management

- Overflow Control
- Monitoring Tank Levels, pressure points (SCADA)
- Calibration of tank level sensor
- Calculating or trending water loss from overflows



Austin Water Leak Performance Indicators



Questions and Discussion