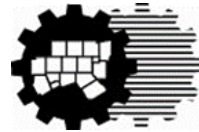


**North Central Texas Council of
Governments
16th Annual Public Works Roundup
Colleyville Center**



North Central Texas
Council of Governments

Water

Buster & Carman

Fort Worth Water Management Team

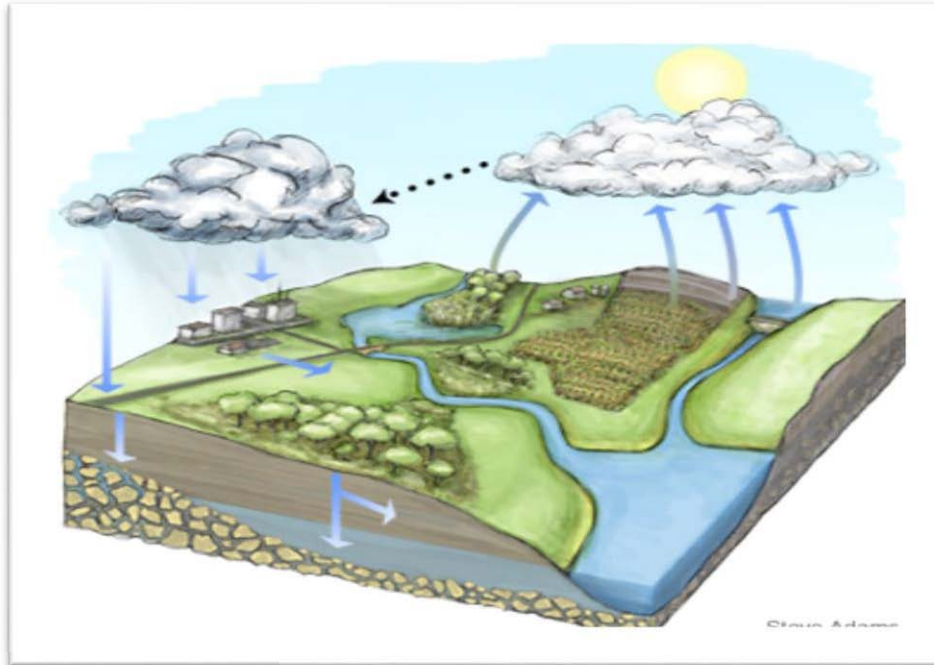
July 16, 2015

Water Is The Driving Force of All Nature

..... Leonardo da Vinci



Hydrologic Cycle As We Have Known It



Through the natural water cycle, the earth has recycled and reused water for millions of years.

Newspaper Headlines in the Past Year

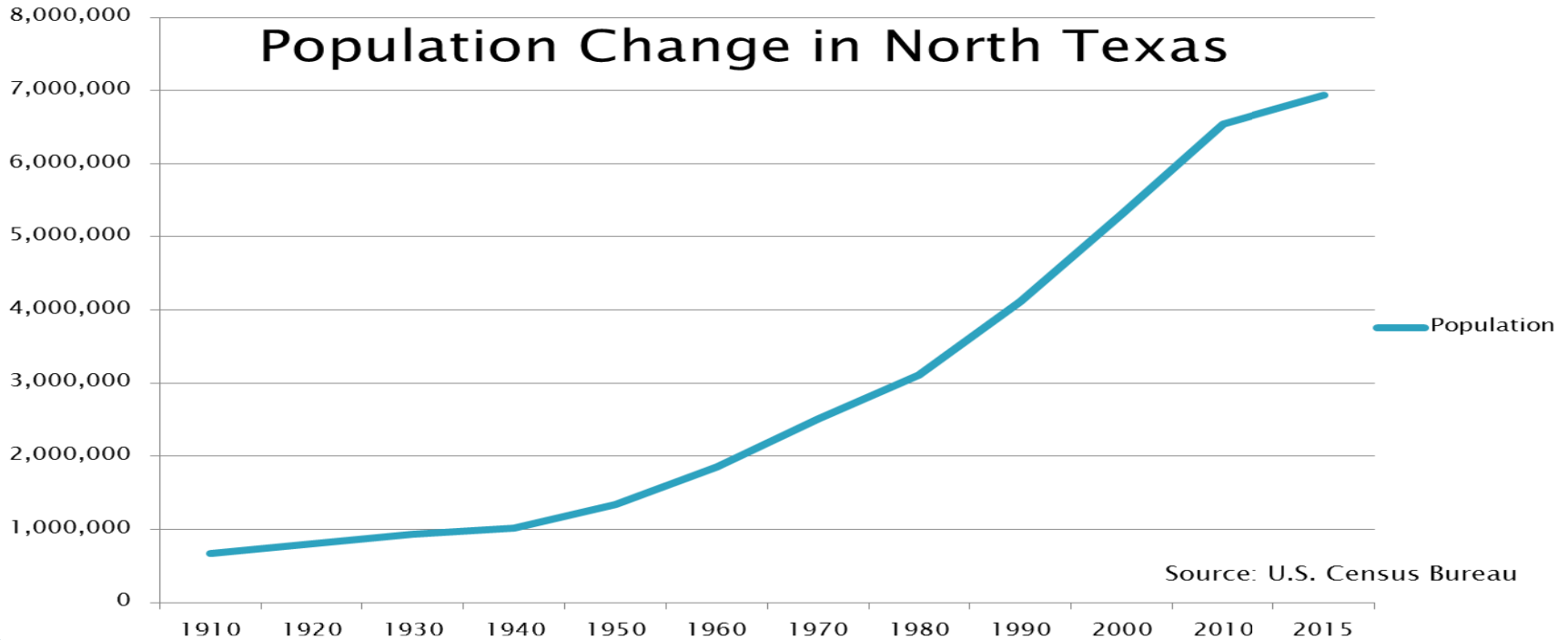
Drought among the worst in Texas in past 500 years.

Recent rain relieves drought conditions.

Waterlogged Texas warily awaits Tropical Storm Bill.

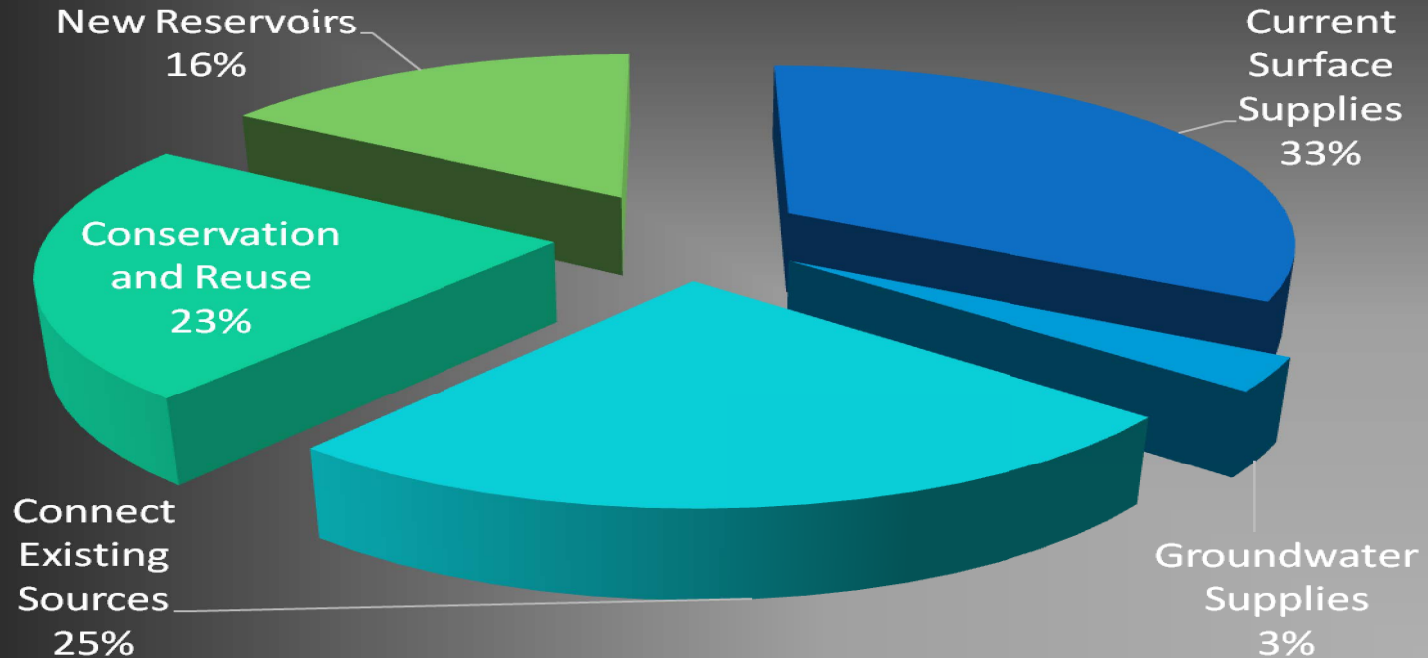
Is The Drought Over?

More People.....Same Water



Planned Region C Water Sources 2060

(from 2011 Region C Water Plan)

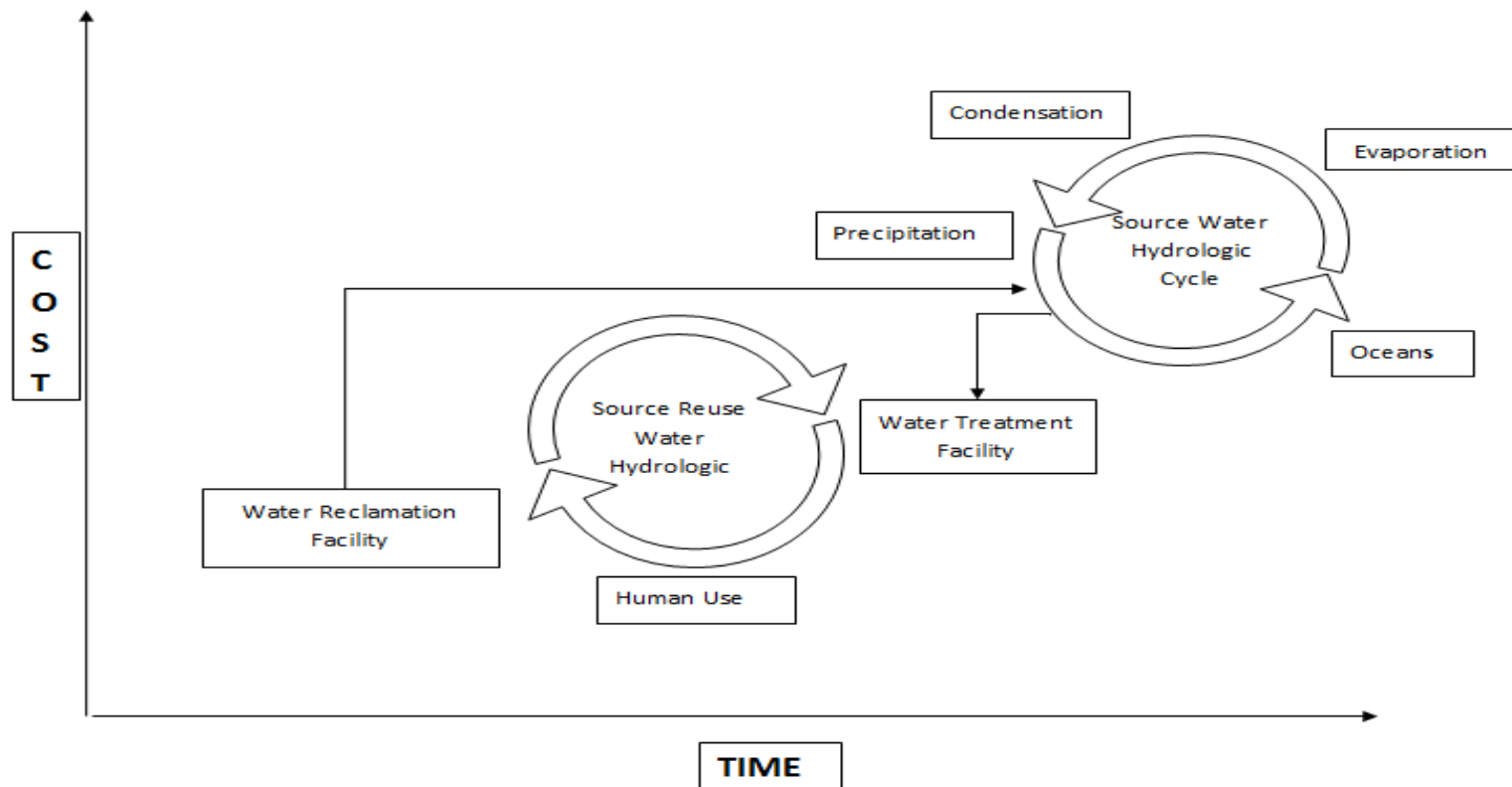


Reused, Recycled, Reclaimed or Natural

It's all about Treatment

- ▶ Reuse, Recycled or Reclaimed is water used more than one time before it re-enters **natural water cycle**
- ▶ Reusing water is **not a new concept**
 - Pasture irrigation for over 100 years
 - Urban Reuse Systems since 1912
- ▶ Modern Reuse is Direct Reuse
 - Big Springs, Wichita Falls,

The Hydro Logical Cycle



Village Creek Water Reclamation Facility

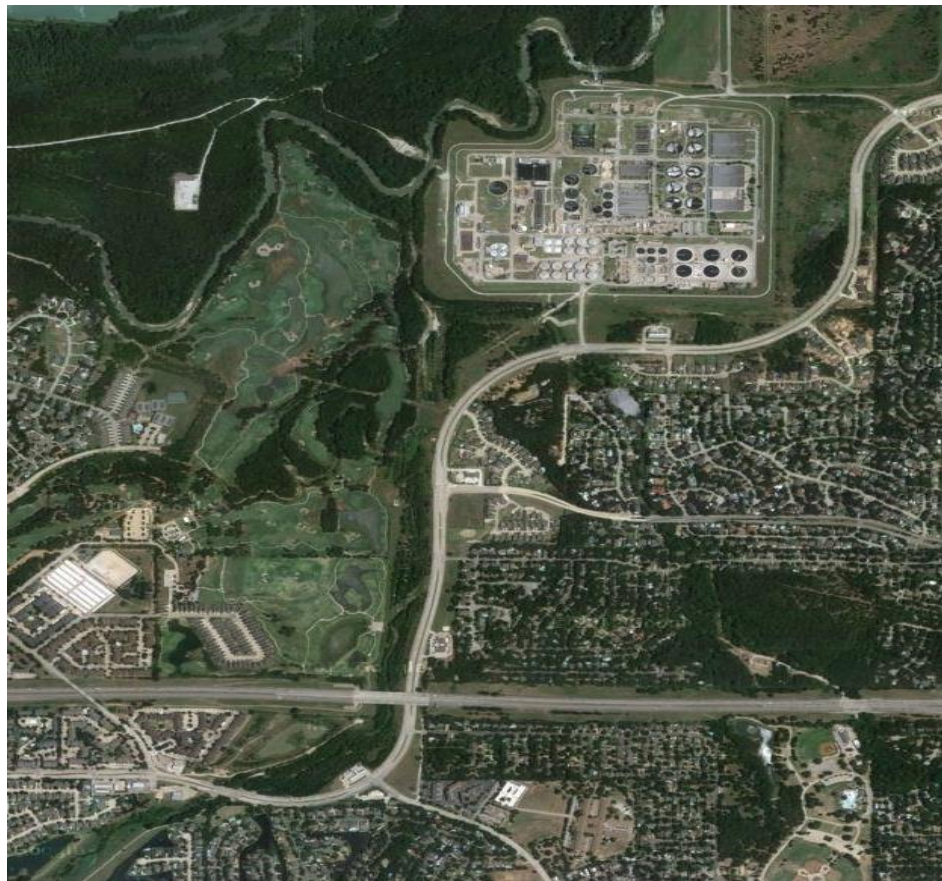
**166 MGD
Treatment
Capacity**

**10 MGD
In-Plant Reuse
Service Water**



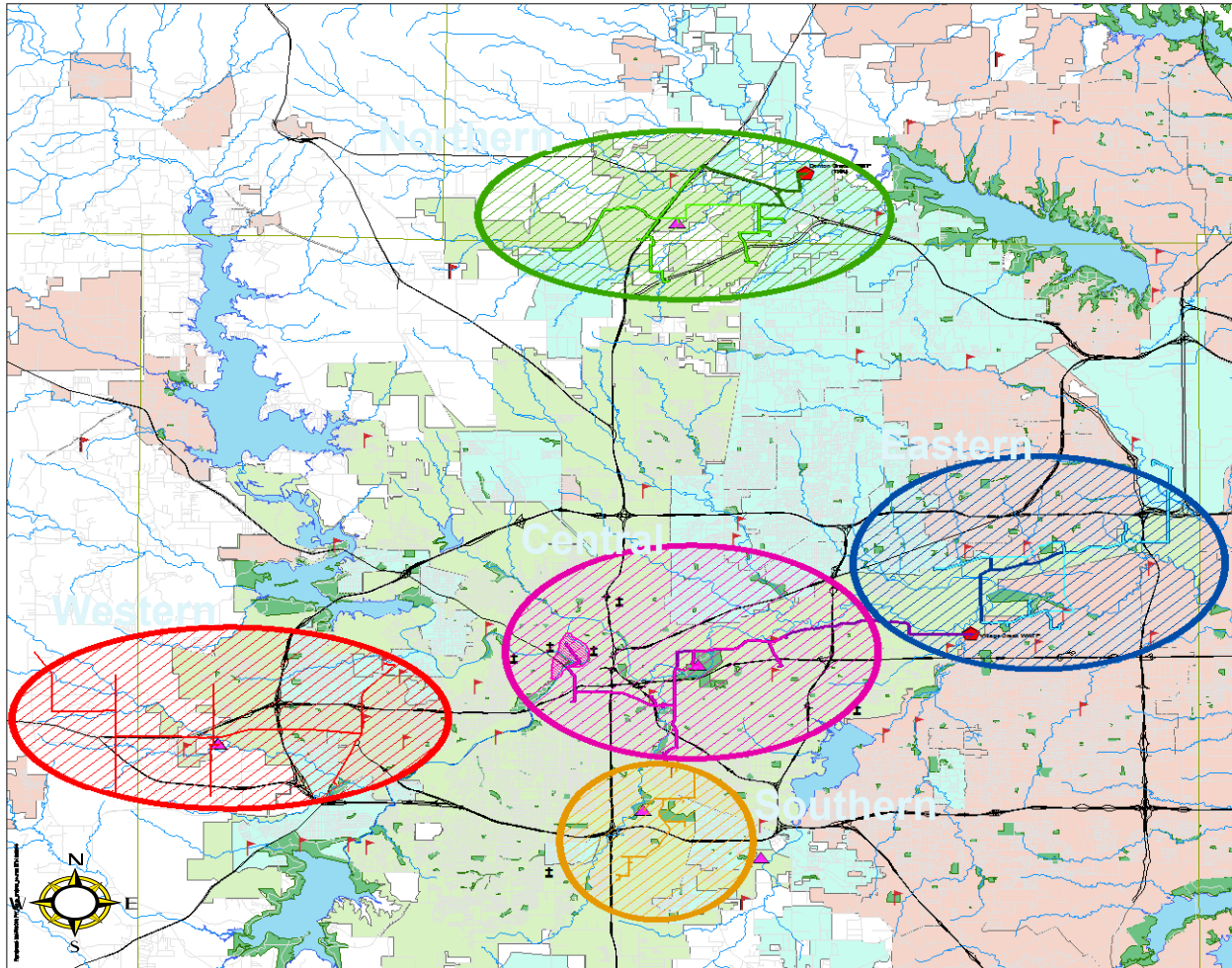


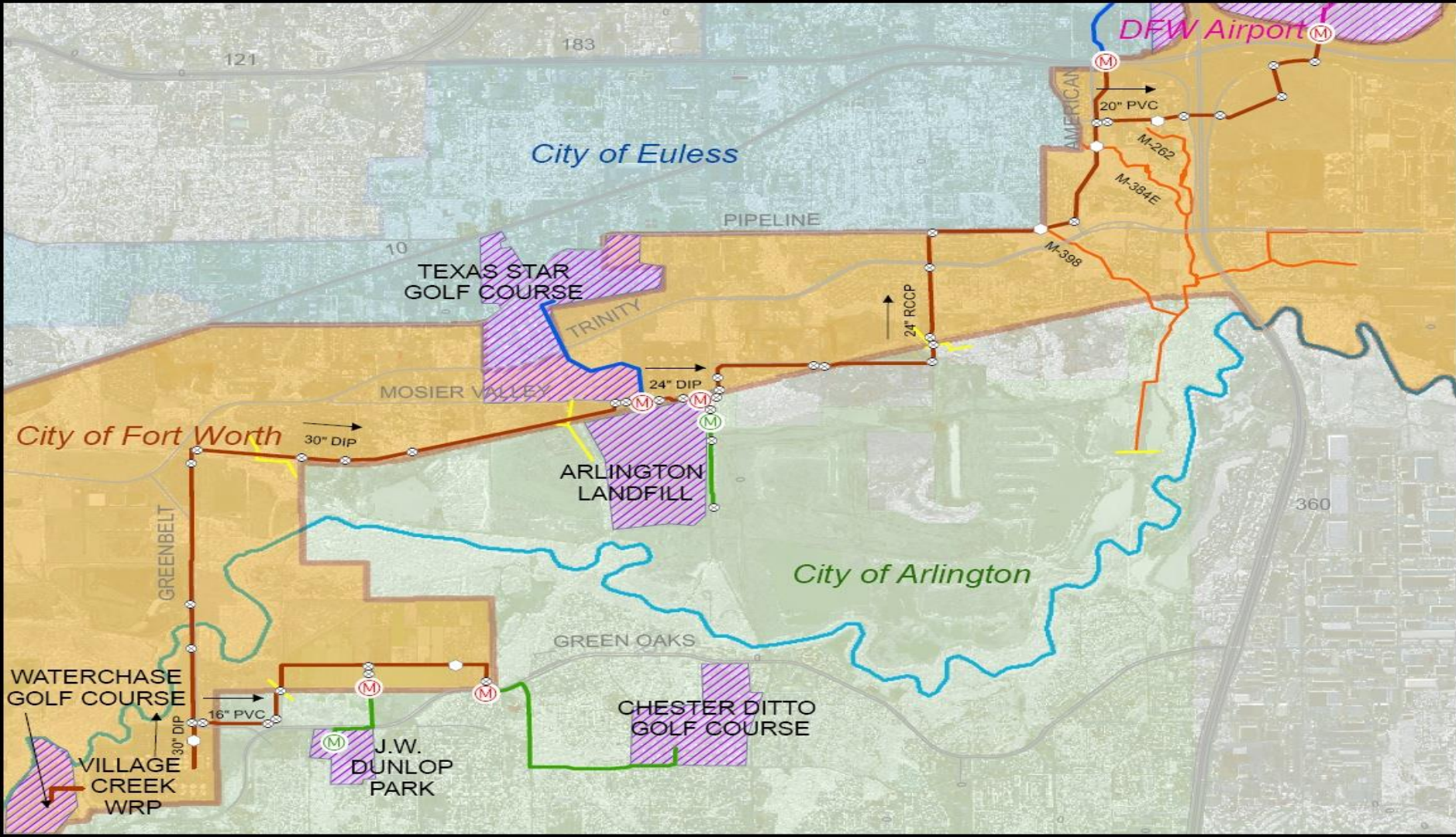
Waterchase
Golf Course
(Type II Since 1998)



2007 Reclaimed Water Priority & Implementation Plan

Reclaimed Water Service Areas





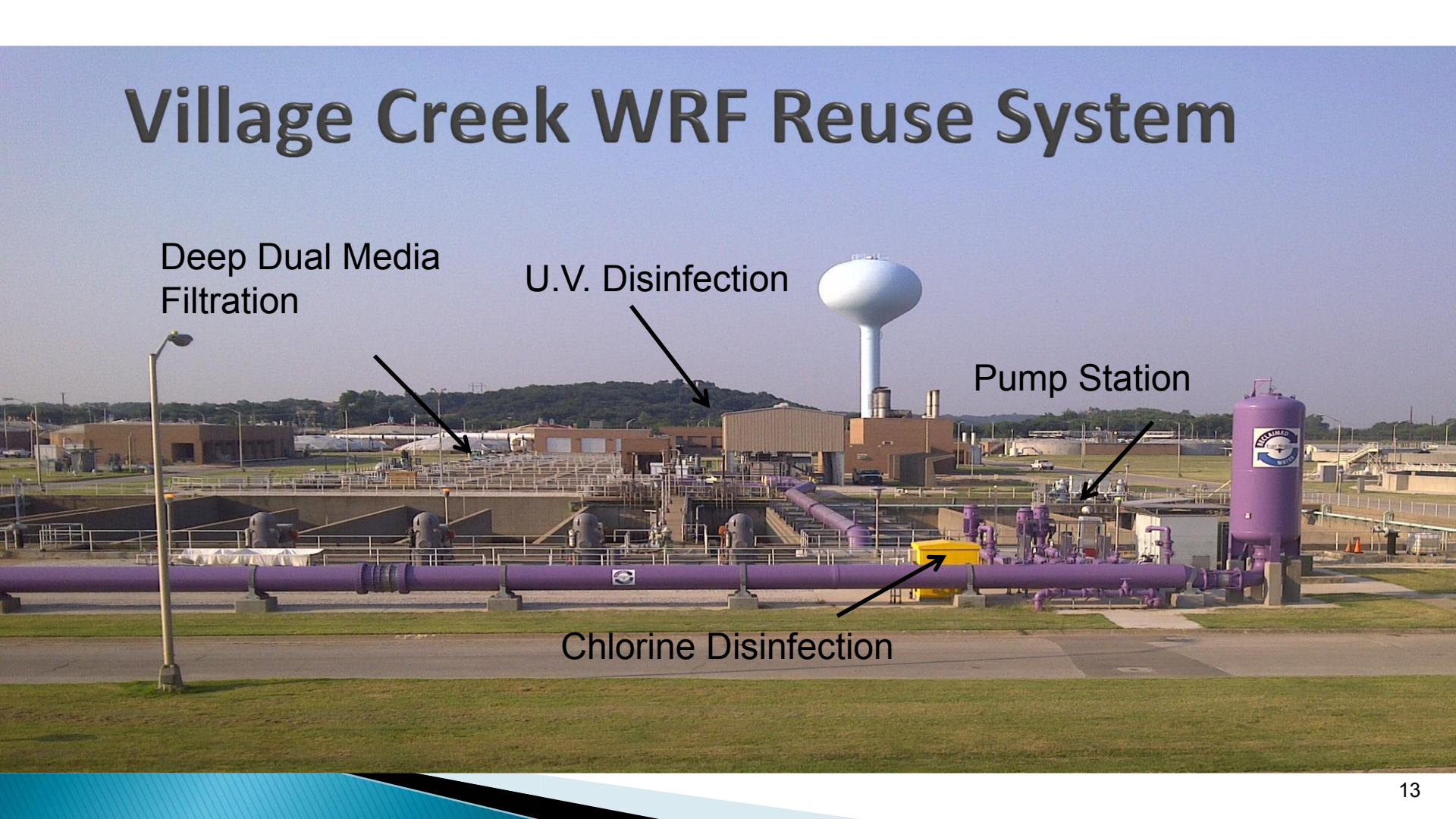
Village Creek WRF Reuse System

Deep Dual Media
Filtration

U.V. Disinfection

Pump Station

Chlorine Disinfection



UV Disinfection



**Currently capacity of 6
MGD**

**Expandable to
18 MGD**

Pump Station

- Three 200 hp pumps
- Total Capacity 12 MGD



Fort Worth Reuse Customers

	Avg. MG/year since 2011
▶ Wholesale Customers (City of Arlington, City of Euless, DFW Airport)	▶ 169
▶ Retail Customers (Energy Drilling, Waterchase Golf Course)	▶ 125
▶ Village Creek WRF (Service Water)	▶ 3,600
▶ Total Reused Water/year	▶ 3,894
	▶ 12,275

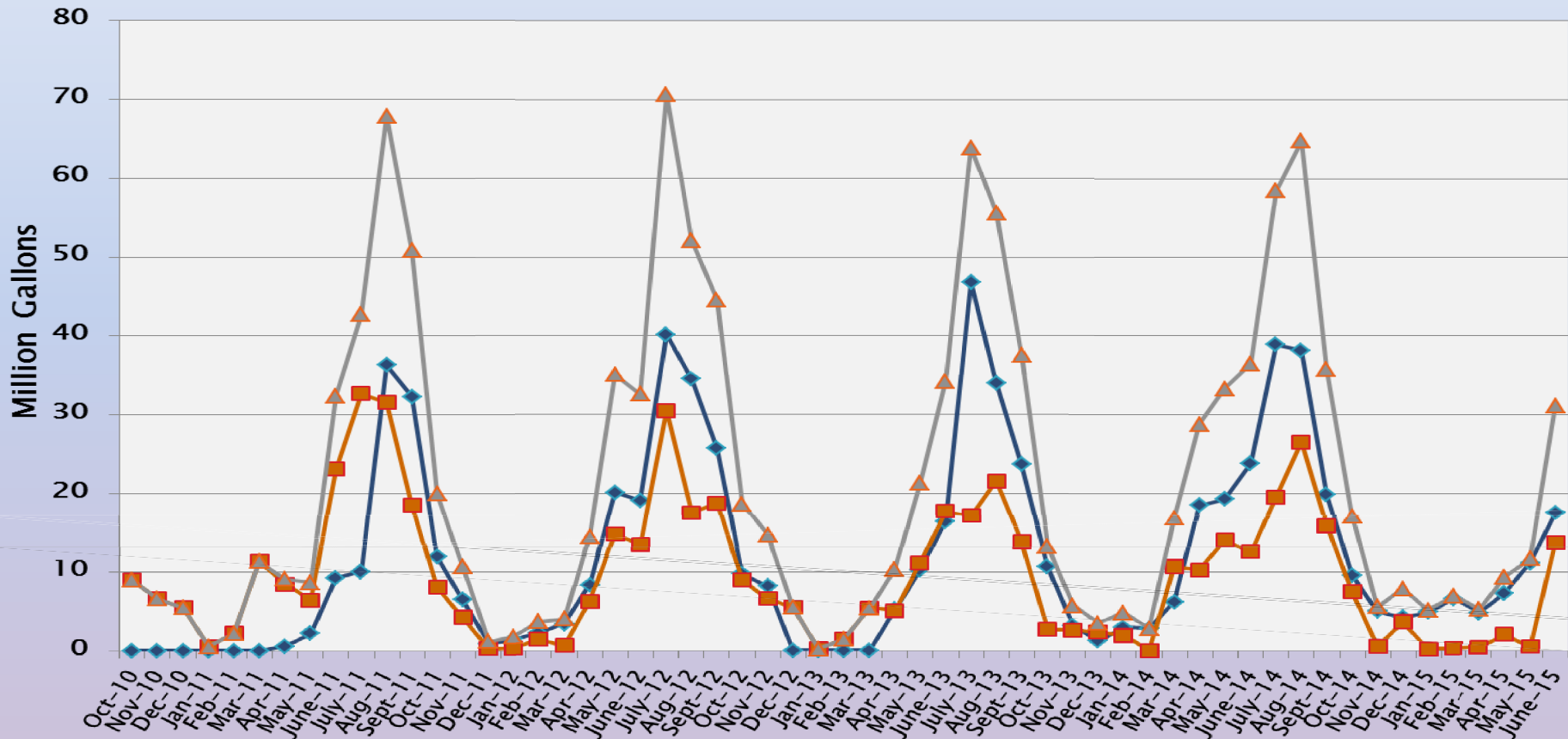
Lake Arlington
45,710 acre-feet



RECLAIMED WATER CONSUMPTION

TYPE I & TYPE II

- Type I
- Type II
- Type I + Type II



Moving Forward

Being Smart about Water

In-Direct Potable Reuse
Direct Potable Reuse

**It's all about
Perception**

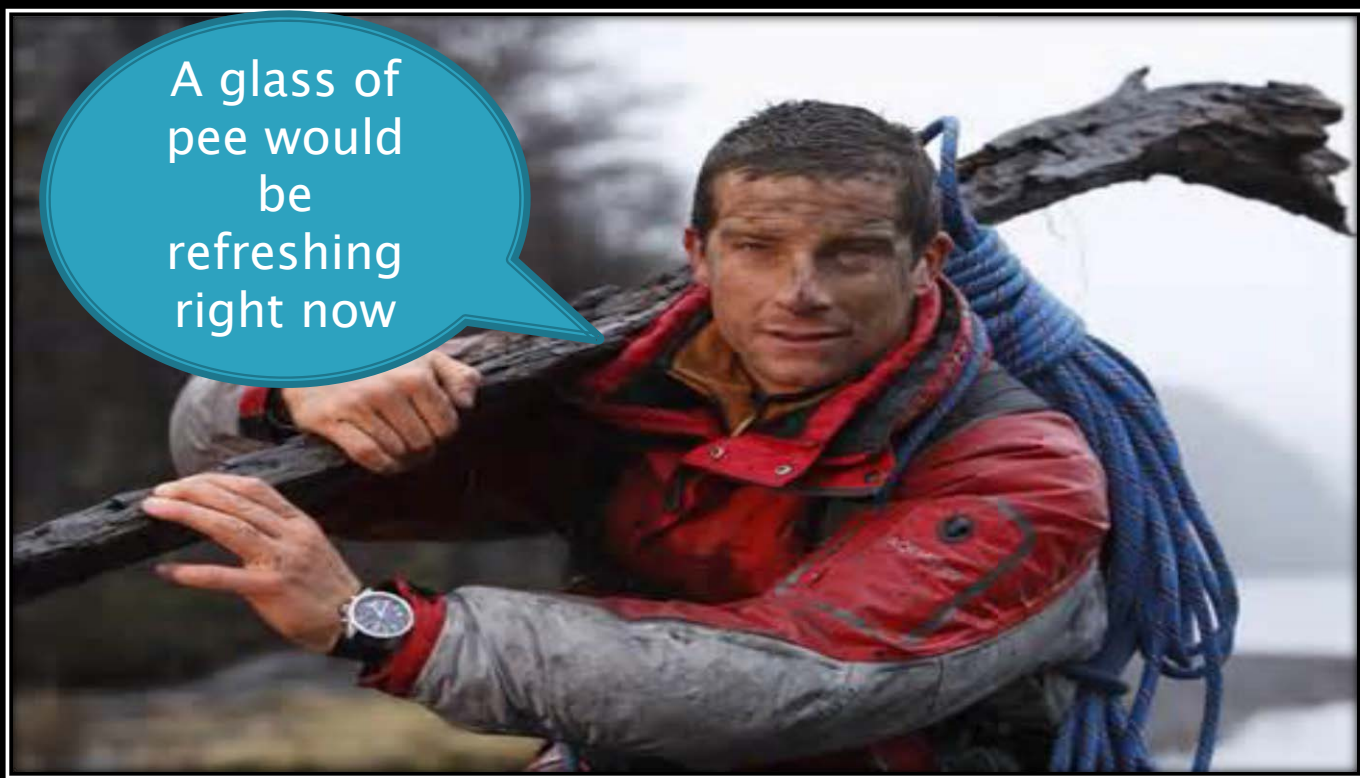
“I never drink water because of the disgusting things that fish do in it.”

W. C. Fields

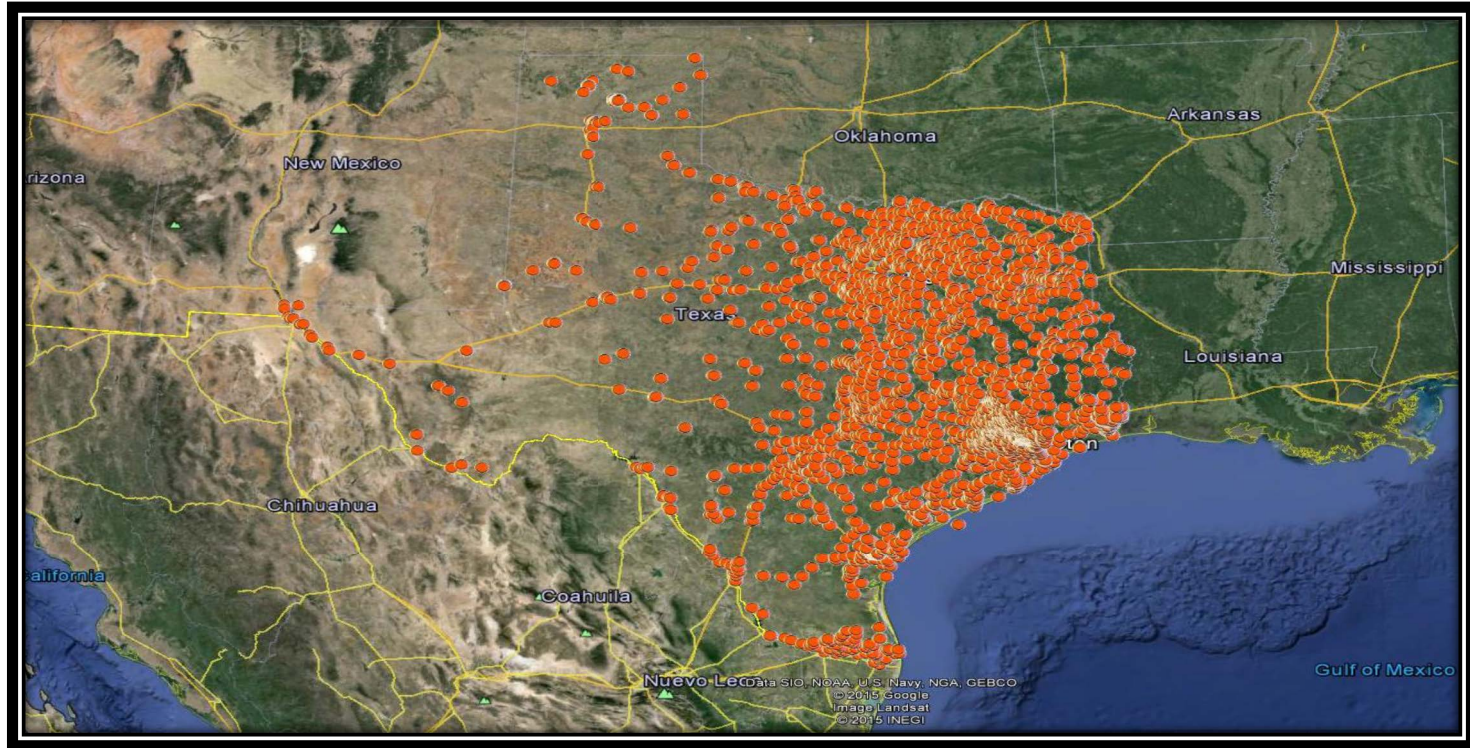


Bear Grylls Supports Direct Reuse

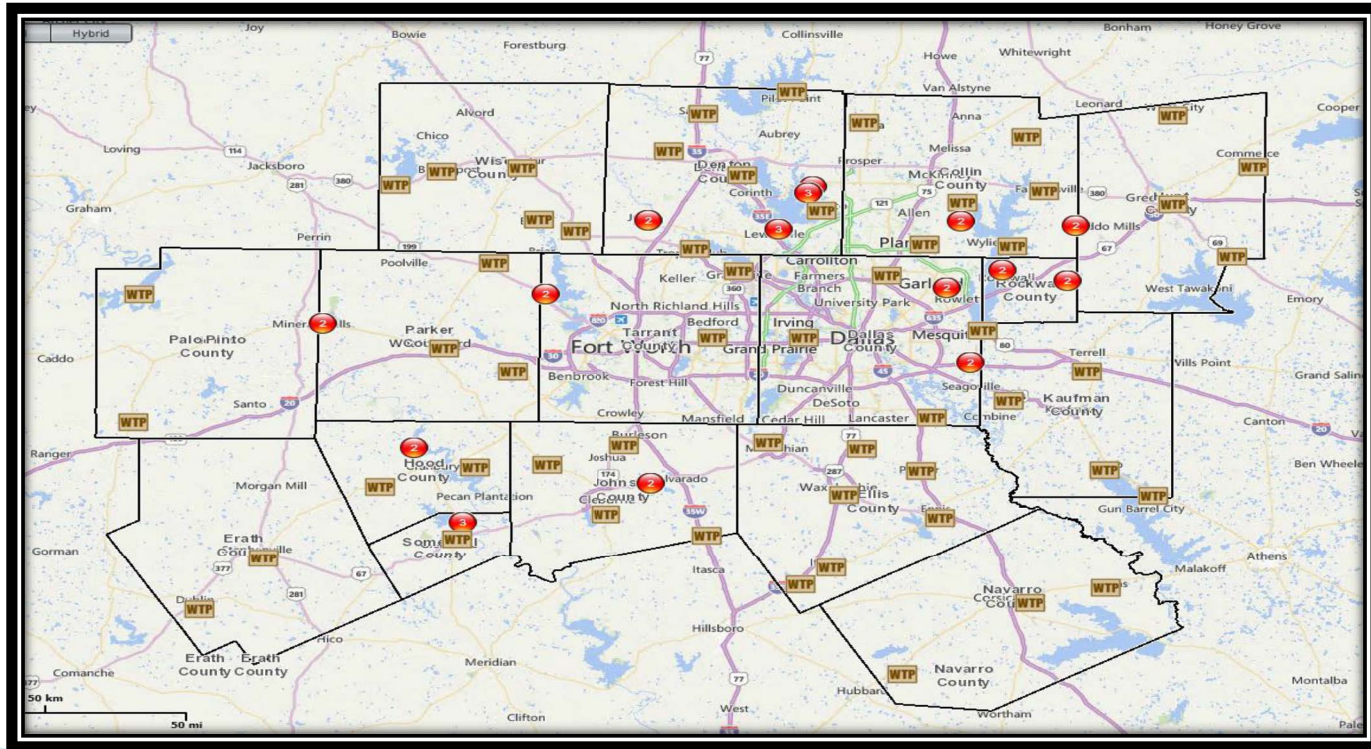
A glass of
pee would
be
refreshing
right now



TPDES Wastewater Dischargers



In-Direct Reuse is the Reality



WaterReuse Association

- ▶ Water that is perceived as raw water has often been used recently. The quality of the water is much more important than the source of the water.
- ▶ Water utilities employ the best technology and follow stringent guidelines to treat water to a quality commensurate with the intended use.

Water Reuse Treatment Technology

- ▶ Basic Camp Technology
 - Filter and Boil
- ▶ Conventional Water Treatment Technology
 - Flocculation
 - Sedimentation
 - pH adjustment
 - Filtration
 - Disinfection

Water Reclamation Technology

▶ Conventional Treatment

- Settling
- Activated Sludge
- Filtration
- Disinfection (Chlorine, Hypochlorite)

▶ Reuse Treatment

- Membrane Bio-reactors
- Filtration (Ultra, Nano & R.O.)
- Disinfection (Chlorine, U.V., Ozone, H₂O₂, Para-Acetic Acid combinations)

New Technology

Membrane Bio-Reactors and Reverse Osmosis



**Compact
Footprint**



Efficient



**High Quality
Water**

Filtration of Bacteria, Viruses & Molecules

	Cut-offs of different liquid filtration techniques							
Micrometer logarithmic scaled	0,001	0,01	0,1	1	10	100	1000	
Angstroms logarithmic scaled	1	10	100	1000	10 ⁴	10 ⁵	10 ⁶	10 ⁷
Molecular weight (Dextran in kD)	0,5	50	7.000					
Size ratio of substances to be separated								
Separating process								

How Can Reuse be brought to your Community

- ▶ Support Direct and Indirect Reuse (Best Option)
 - Utilizes existing infrastructure
 - Defers construction of reservoir
- ▶ Be a part of a Reuse System
- ▶ Scalping Plants
- ▶ Local Programs
 - Encourage smart water use

Questions?

