



**SOUTHMOST REGIONAL  
WATER AUTHORITY  
1255**

Desal Plant Operations  
& Expansions  
September 11, 2014

# OUTLINE

- SRWA Brackish Groundwater Desalination
- SRWA Microfiltration Project
- Benefits and Challenges
- Seawater Desalination
- Long-Term Water Supply Strategy



# Southmost Regional Water Authority Partners

**Valley Municipal Utility District No.2**

**2.51%**



**City of Los Fresnos**

**2.28%**



**Town of Indian Lake**

**0.20%**



**Brownsville Public Utilities Board**

**92.91%**



**Brownsville Navigation District**

**2.10%**

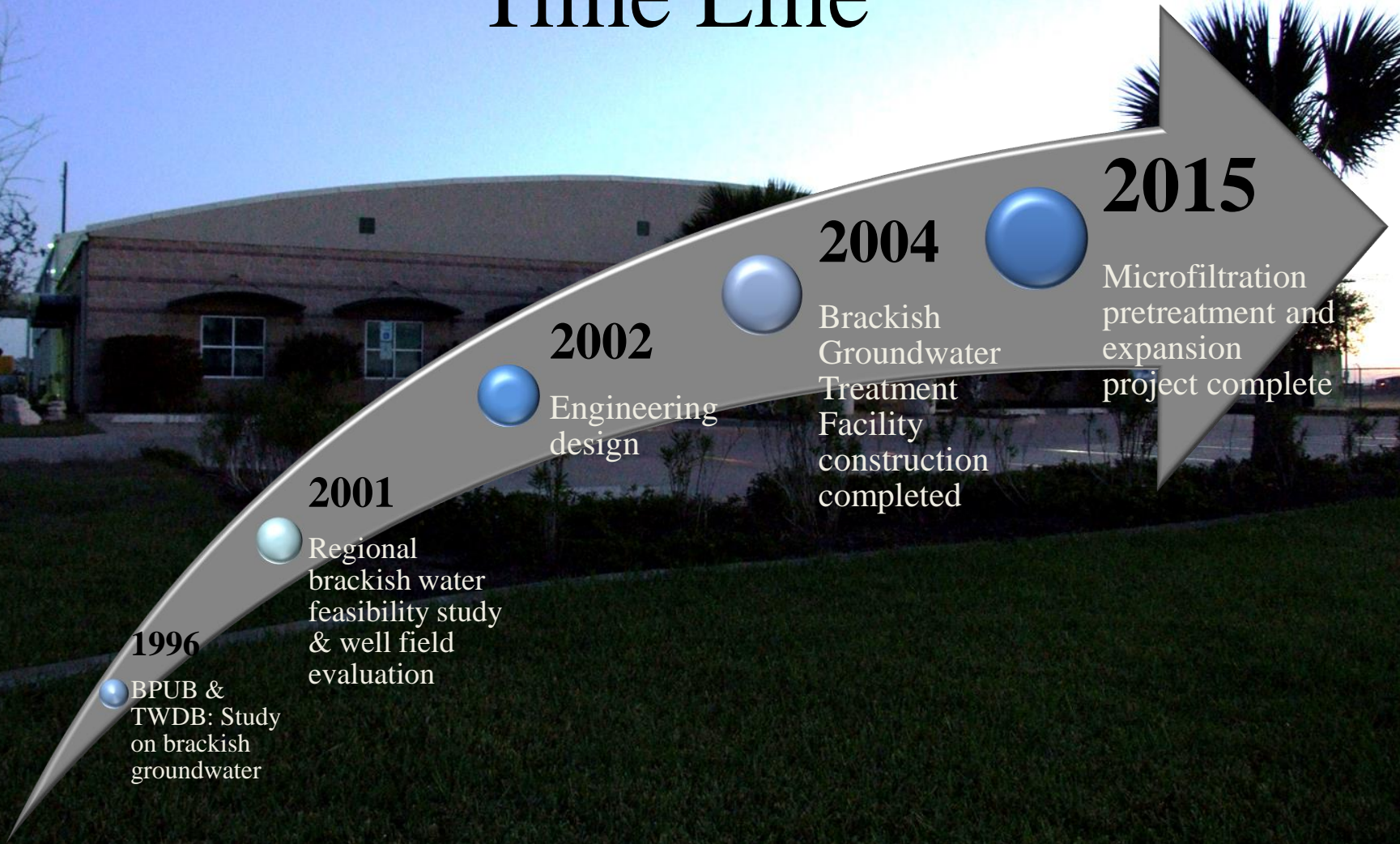


# SRWA Background

- SRWA: Conservation and Reclamation District formed in 1981 to address long-term regional water supply issues for southern Cameron County
- Dormant until 2000, then resurrected in response to the extended drought of the late 1990's
- Partners came together to consider using brackish groundwater as an alternate water supply



# Time Line



# SRWA Brackish Groundwater Treatment Facility



# Brackish Groundwater Desalination

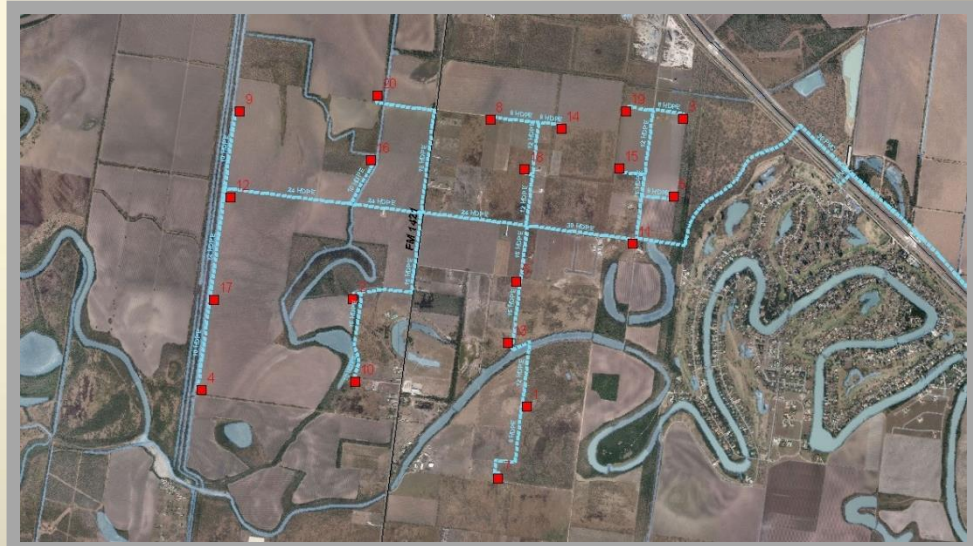


## RO Membrane Treatment Facility

- Construction completed in 2004
- 7.5 MGD Design Capacity
- 20 Brackish groundwater wells
- Groundwater: 3,000 mg/L total dissolved solids (TDS)
- Concentrate waste stream 13,000 mg/L TDS drain ditch
- TCEQ Discharge Permit: TDS Daily Max—35,339 mg/L

# SRWA Brackish Groundwater Wells

- 20 Brackish groundwater wells
- Well depth: approximately 250-300 feet
- Well pump rate: 330 – 400 gpm
- Groundwater: 3,000 mg/L total dissolved solids (TDS)





# SRWA Cost Summary

- Original Construction Costs:  
\$29 Million
- Funding Source: Revenue Bonds
- 8,400 acre-feet of water rights savings (equivalent to \$17 Million)
- FY 2014 O&M Budget: \$3 Million
  - Electrical: 23% of operational costs
  - Chemicals: 40% of operational costs
- FY2013 Unit Costs:
  - \$1.42 per kgals (O&M)
  - \$2.46 per kgals (Debt Service and O&M)



# SRWA Microfiltration Project

## Pretreatment for RO process

- USEPA reduced arsenic level in drinking water standards in 2006
- Install 12 MGD Pall microfiltration system for arsenic and iron removal
- Expands plant capacity to 11 MGD
- Cost - \$13 million
  - \$9,295,000 No-interest TWDB Loan
  - \$3,795,000 Low-interest (below market) TWDB Loan
- Estimated construction costs: \$11,413,578.15
  - Construction Start Date – May 2013
  - Completion Date – January 2015

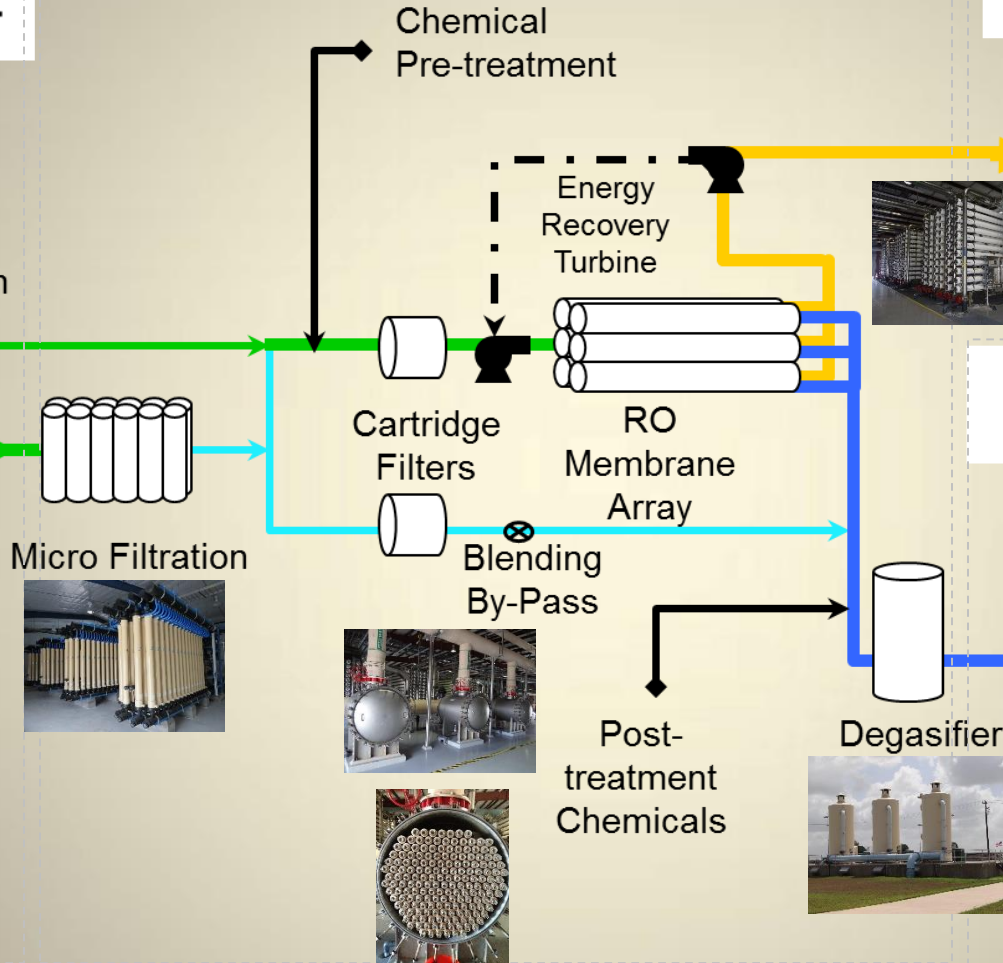


# GROUNDWATER DEVELOPMENT

Collection and Conveyance System

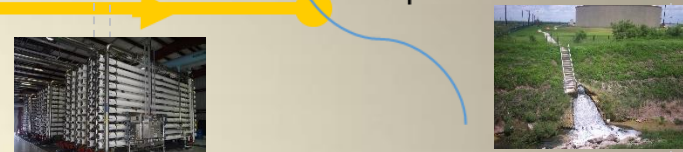


# BRACKISH WATER TREATMENT



# CONCENTRATE MANAGEMENT AND DISPOSAL

Concentrate Disposal



# DELIVERY OF POTABLE WATER

Treated Water Storage

To Distribution System



# SRWA Benefits and Challenges

## ***Benefits***

- Alternate water supply
- Independent of Rio Grande
- Water rights savings
- Produces high quality water
- Modular design

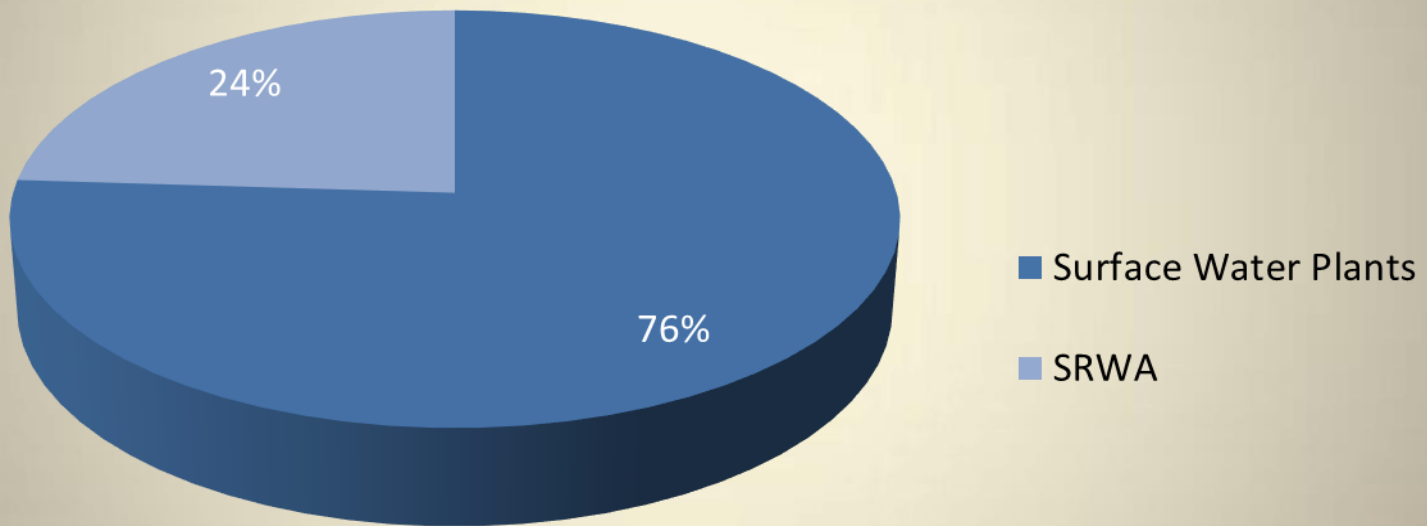
## ***Challenges***

- Arsenic levels in groundwater
- Higher operating costs
- Discharge permit
- Specialized training (SCMA)



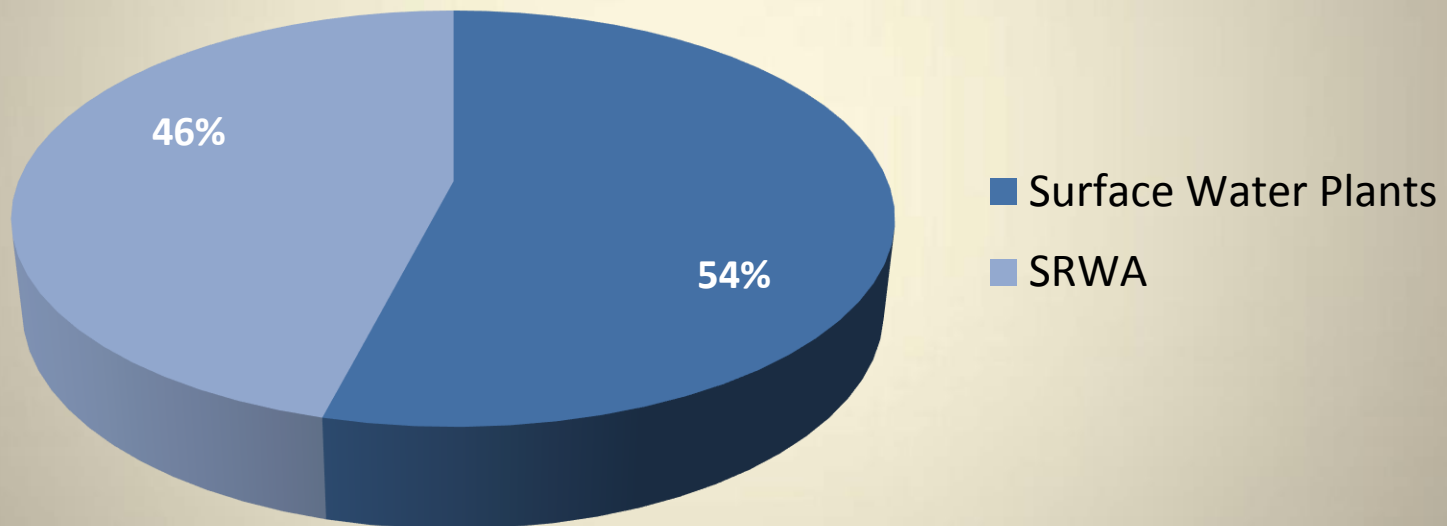
# Brownsville Public Water Supply

**2013 Average Water Consumption: 22.4 MGD**



# Brownsville Public Water Supply

## Projected Proportions after SRWA Expansion



# Seawater Desalination

Pilot Study: \$3,177,408 (Actual)

- TWDB Funding \$1,340,000

25 MGD Full-scale facility: \$151.4 Million

- (Feasibility Study Report, 2004)

25 MGD Full-scale facility: \$182.4 Million

- (Pilot Study Report, 2008)

2.5 MGD Demonstration: \$22.5 Million

- (Project Update, 2011)



# Long-Term Water Supply Strategy

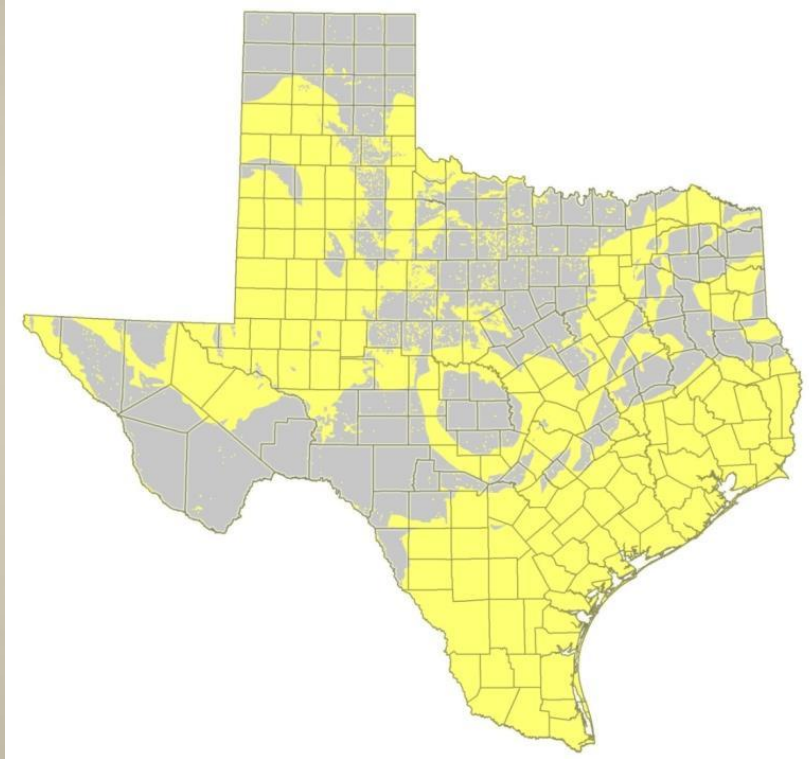
## ***Diversification***

- Surface Water
  - Purchase water rights
  - Increase storage capacity in resacas
- Brackish Groundwater Desalination
  - Southmost Regional Water Authority RO Treatment Facility
- Seawater Desalination
  - Pilot plant – Port of Brownsville
  - Texas desal project – proactively identify environmental concerns
  - Phase 1: 2.5 MGD SWRO Plant
- Water Reuse – 8 MGD for Tenaska Project





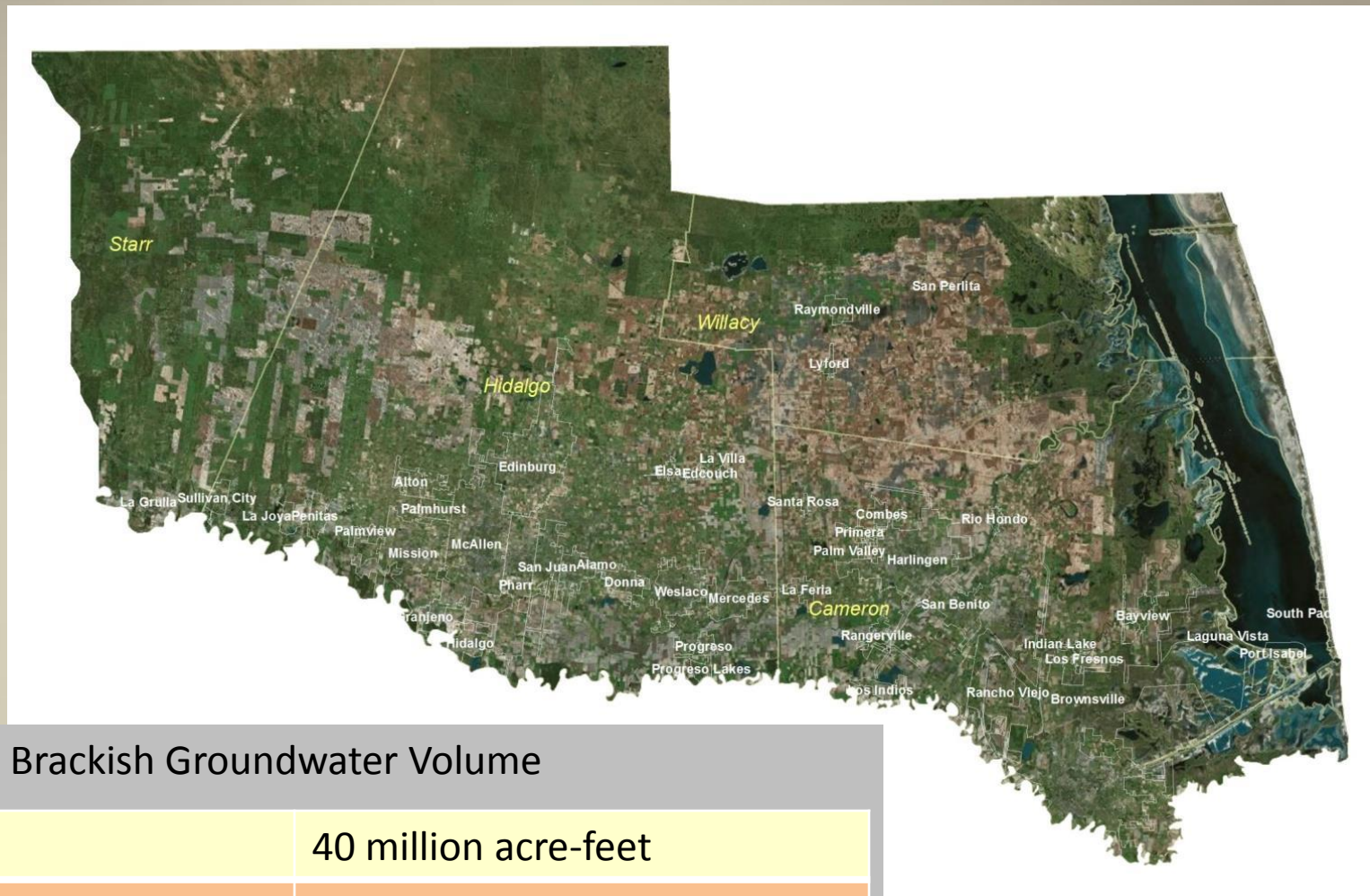
- 81<sup>st</sup> Texas Legislature (2009) provided funding to implement the TWDB Brackish Resources Aquifer Characterization System (BRACS) program
- 83<sup>rd</sup> Texas Legislature (2013) provided additional funding for personnel



2.7 billion acre-feet of brackish groundwater estimated in Texas

Brackish groundwater in the major and minor aquifers

*Source: modified from LBG-Guyton, 2003*



### Brackish Groundwater Volume

Slightly Saline	40 million acre-feet
Moderately Saline	112 million acre-feet
Very Saline	123 million acre-feet



THANK YOU

