Brine disposal methods and challenges in Texas

Erika Mancha/Kevin Kluge Innovative Water Technologies Texas Desal 2018 September 13, 2018

Unless specifically noted, this presentation does not necessarily reflect official Board positions or decisions.

www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

Texas Wa

# **Desalination Plant Database**

- Initially developed in 2005
- Updated in 2009/2010 by TWDB staff
- Updated in 2015/2016 by TWDB staff
  Interactive database
- Municipal desalination plants with a capacity ≥ 0.023 million gallon per day
- Self reported surveys
- Future may update on biennial basis

#### Access to the database





Home Board SWIFT Financial Assistance Water Planning Groundwater Surface Water Flood Conservation Innovative Water

#### Desalination



In April 2002, Governor Rick Perry tasked the Texas Water Development Board (TWDB) with developing a proposal to build Texas' very first large-scale seawater desaination plant to produce drinking water. The following year, the Texas Legislature passed @ House Bill 1370 directing the agency to undertake or participate in research, feasibility and facility planning studies, investigations, and surveys as needed to advance the development of cost-effective water supplies from seawater desaination in the state. TWDB has expanded its scope of desaination activities to include brackish groundwater, an abundant source of water supply in many areas of the state.

#### 2018 Meeting Announcements

- South Central Membrane Association 2018 Annual Conference and Expo "Membranes: Mystery to Mastery", August 22-24, 2018, San Antonio, Texas
- E Texas Desal 2018, September 13-14, 2018, Austin, Texas

#### Worth Its Salt:a column spotlighting desalination plants

San Antonio Water System's H20aks Center





Aquifer Storage and Recovery Brackish Resources Aquifer Characterization System

Desalination

- Desalination Facts
- Desalination FAQs
- Desalination Projects
- Desalination Maps
- Desalination Plant Database
- Desalination in 2017 State Water Plan
- Worth Its Salt
- Desalination TWDB Documents
- Desalination Useful Links



nnovative Water Technologies Staff



Texas Water Development Board

www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

### **Desalination Plant Database**





www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

### **Desalination growth in Texas**



Year

www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

5

**Texas Water** 

# Highlights of database update

- Existing plants increased capacity
  - Southmost Regional Water Authority
  - Brazos Regional Public Utility Agency
  - City of Robinson
- New plants constructed
  - H2Oaks Center / San Antonio
  - City Benjamin
  - City of Rule
  - Mitchell County
  - Raw Water Production Facility /Big Springs
- Plant closures
  - City of Laredo Santa Isabel
  - Windermere Water System

www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

Texas Water Development Board

# Concentrate disposal methods for existing desalination plants



www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

### **Concentrate disposal methods**



www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

Texas Water

# Challenges to concentrate disposal

- High costs
- Access to land and surface water body
- Salinity and volume limitations
- Permitting process
- Environmental issues

# TWDB-funded studies on concentrate

Contractor	Report title	Project description	Year funded	Funding amount
CDM Smith, Inc.	Permitting Guidance Manual to Dispose Desalination Concentrate into a Class II Injection Well	Develop an instruction manual and road map for permitting a Class II injection well as a Class I for disposal of concentrate.	2010	\$130,000
Ch2M Hill	An assessment of osmotic mechanisms pairing desalination concentrate and wastewater treatment	Investigated the use of RO concentrate as a draw solution in a forward osmosis process for recovering water from wastewater.	2010	\$90,000
San Antonio Water System	Evaluation of Concentrate Management and Assessment of the Vibratory Shear Enhanced Process	Conducted a pilot test to assess the cost and technical feasibility of the Vibratory Shear Enhanced Process as a tool for reducing the volume of desalination concentrate.	2007	\$205,000
University of Texas at Austin	Improving Recovery: A Concentrate Management Strategy for Inland Desalination	Investigated anti-scalant precipitation, and electrodialysis to increase recovery in reverse osmosis desalination of brackish groundwater.	2007	\$238,500
El Paso Public Utilities Board	Pilot Study to Demonstrate Volume Reduction of Reverse Osmosis Concentrate	Evaluated silica reduction in RO concentrate through the addition of lime, and application of the Vibratory Shear Enhanced Process. Also tested the use of seawater RO membranes to increase water recovery.	2007	\$228,557
University of Texas at Austin - Bureau of Economic Geology	Self-Sealing Evaporation Ponds for Desalination Facilities in Texas	Investigated regulatory requirements for developing a self- sealing evaporation pond.	2005	\$49,928

Texas Water Development Board

www.twdb.texas.gov f www.facebook.com/twdboard 🈏 @twdb

## **Contact information**

Erika Mancha erika.mancha@twdb.texas.gov

Innovative Water Technologies – Desalination Program

https://www.twdb.texas.gov/innovativewater/desal/index.asp



**Texas Wat**