Brine disposal methods and challenges in Texas

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Unless specifically noted, this presentation does not necessarily reflect official Board positions or decisions.
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
Desalination Plant Database
Desalination growth in Texas

![Graph showing desalination growth in Texas with data for the years 1999 to 2016. The graph includes the number of facilities and plant capacity in million gallons per day (mgd).]
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
Concentrate disposal methods for existing desalination plants
Concentrate disposal methods
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

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

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Innovative Water Technologies – Desalination Program
https://www.twdb.texas.gov/innovativewater/desal/index.asp