

Water Supply

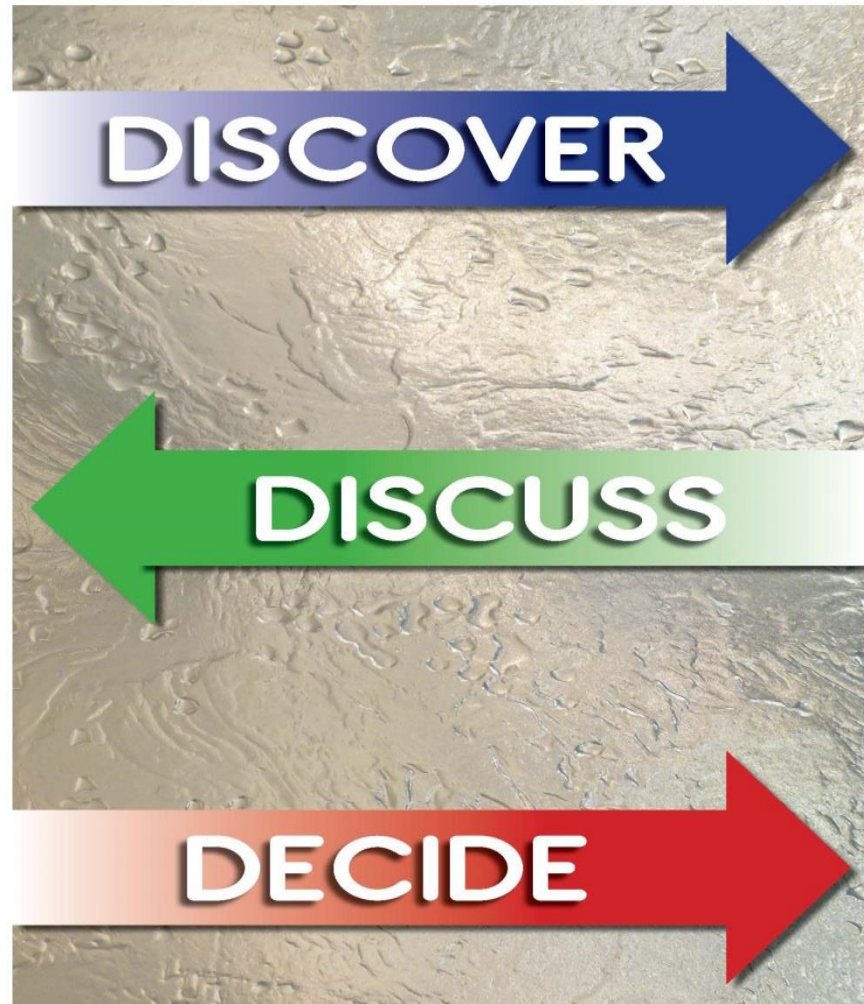
Discovery – Water Management Strategies
Discovery and Discussion – RFI Approach



Council Presentation
September 27, 2016



Discover, Discuss, Decide





Presentation Schedule

| Date | Topic |
|---------------------------|--|
| May 10, 2016 | Discovery – Texas Water Planning |
| July 19, 2016 | Discovery – Demands |
| August 30, 2016 | Discussion – Demands Discovery – Agreed Order |
| September 27, 2016 | Discovery – Water Management Strategies Discovery and Discussion – RFI Approach |
| December 13, 2016 | Discovery – Current Supplies and Model Updates |
| January 2017 | Discovery – Current Water Management Plan Discussion – Updated Water Management Plan |
| February 2017 | Decide – Adopt Water Management Plan |



Future Water Supply Strategies Evaluated by Region N

Note: Information for this section developed by the Coastal Bend Regional Planning Group (Region N) for the 2016 Region N Plan.



Water Management Strategies Identified and Evaluated by Region N (2001- 2016 Plans)

| Water Management Strategies | 2001 Plan | 2006 Plan | 2011 Plan ^A | 2016 Plan |
|---|--------------|--------------|---------------------------|--------------|
| <i>Recommended Strategies (2001, 2006, 2011, or 2016 Plans)</i> | | | | |
| Municipal Water Conservation | √ | √ | √ | √ |
| Irrigation Water Conservation | √ | √ | √ | √ |
| Manufacturing Water Conservation and Nueces River Water Quality Issues | √ | √ | √ | √ |
| Mining Water Conservation | | √ | √ | √ |
| ON Stevens WTP Improvements | | | √ | √ |
| SPMWD Industrial WTP Improvements | | | | √ |
| Reclaimed Wastewater Supplies and Reuse | | √ | √ | √ |
| Gulf Coast Aquifer Supplies | √ | √ | √ | √ |
| Modify Existing Reservoir Operating Policy | | √ | √ | √ |
| CCR and LCC Pipeline | | √ | √ | |
| Voluntary Redistribution of Available Supplies (and Federal or State Opportunities to Participate in Regional Projects) | √ | √ | √ | √ |
| Nueces Off-Channel Reservoir near Lake Corpus Christi | | √ | √ | |
| Stage II of Lake Texana | | √ | √ | |
| Lavaca River Diversion and Off-Channel Reservoir | | | √ | √ |
| Mary Rhodes Phase II Pipeline (and other interbasin transfers) | √ | √ | √ | |



Water Management Strategies Identified and Evaluated by Region N (2001- 2016 Plans), cont.

| Water Management Strategies | 2001 Plan | 2006 Plan | 2011 Plan ^A | 2016 Plan |
|---|-----------|-----------|------------------------|-----------|
| <i>Recommended Strategies (2001, 2006, 2011, or 2016 Plans) (continued)</i> | | | | |
| Seawater Desalination | √ | √ | √ | √ |
| Brackish Groundwater Desalination | | | √ | √ |
| Potential Water System Interconnections | √ | | | √ |
| Interruptible Lake Texana Supplies (2001 Plan) | √ | | | |
| Recycle and Reuse of Groundwater or Use of Non-Potable Supplies (for Mining Water Users) | √ | | | |
| Aquifer Storage and Recovery (ASR) | √ | √ | | |
| Local Balancing Storage Reservoir (Nueces County WCID #3) | | | | √ |
| GBRA Lower Basin Storage Project | | | | √ |
| <i>Studied and Considered (Not Recommended in 2001, 2006, 2011, or 2016 Plans)</i> | | | | |
| Carrizo-Wilcox Aquifer Supplies | √ | √ | √ | |
| Sediment Removal in Lake Corpus Christi | √ | | | |
| Brush Management | √ | √ | √ | |
| Weather Modification | √ | √ | √ | |
| Water Quality (TDS Study) - Lake Corpus Christi, Lake Texana, and Calallen Pool | | | √ | |

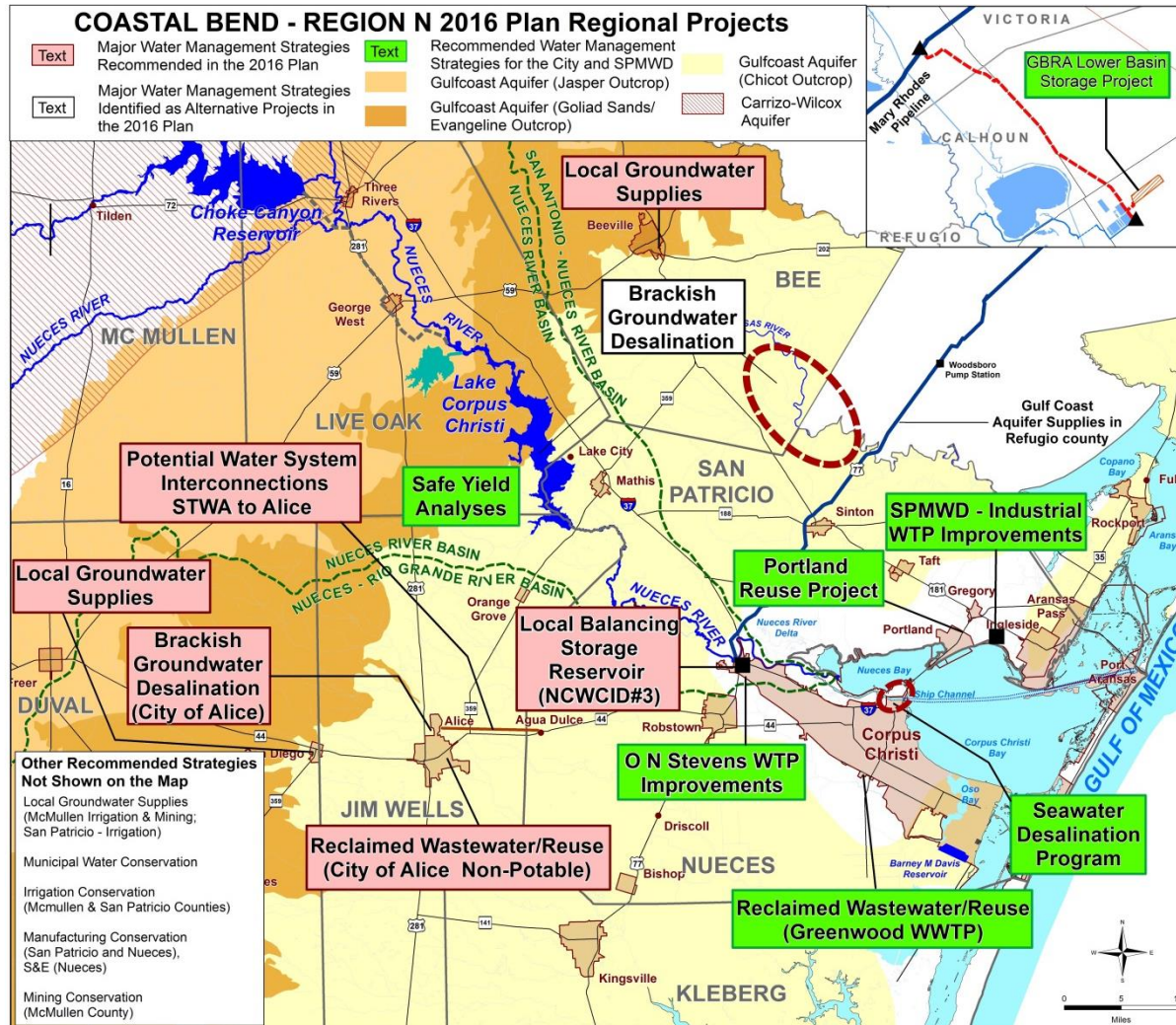


Region N Categories for Evaluating Water Management Strategies

| |
|---|
| a. Water Supply |
| 1. Quantity |
| 2. Reliability |
| 3. Cost of Treated Water |
| b. Environmental factors |
| 1. Instream flows |
| 2. Bay and Estuary Inflows |
| 3. Wildlife Habitat |
| 4. Wetlands |
| 5. Threatened and Endangered Species |
| 6. Cultural Resources |
| 7. Water Quality |
| a. dissolved solids |
| b. salinity |
| c. bacteria |
| d. chlorides |
| e. bromide |
| f. sulfate |
| g. uranium |
| h. arsenic |
| i. other water quality constituents |
| c. Impacts to State water resources |
| d. Threats to agriculture and natural resources in region |
| e. Recreational impacts |
| f. Equitable comparison of strategies |
| g. Interbasin transfers |
| h. Third party social and economic impacts from voluntary redistribution of water |
| i. Efficient use of existing water supplies and regional opportunities |
| j. Effect on navigation |

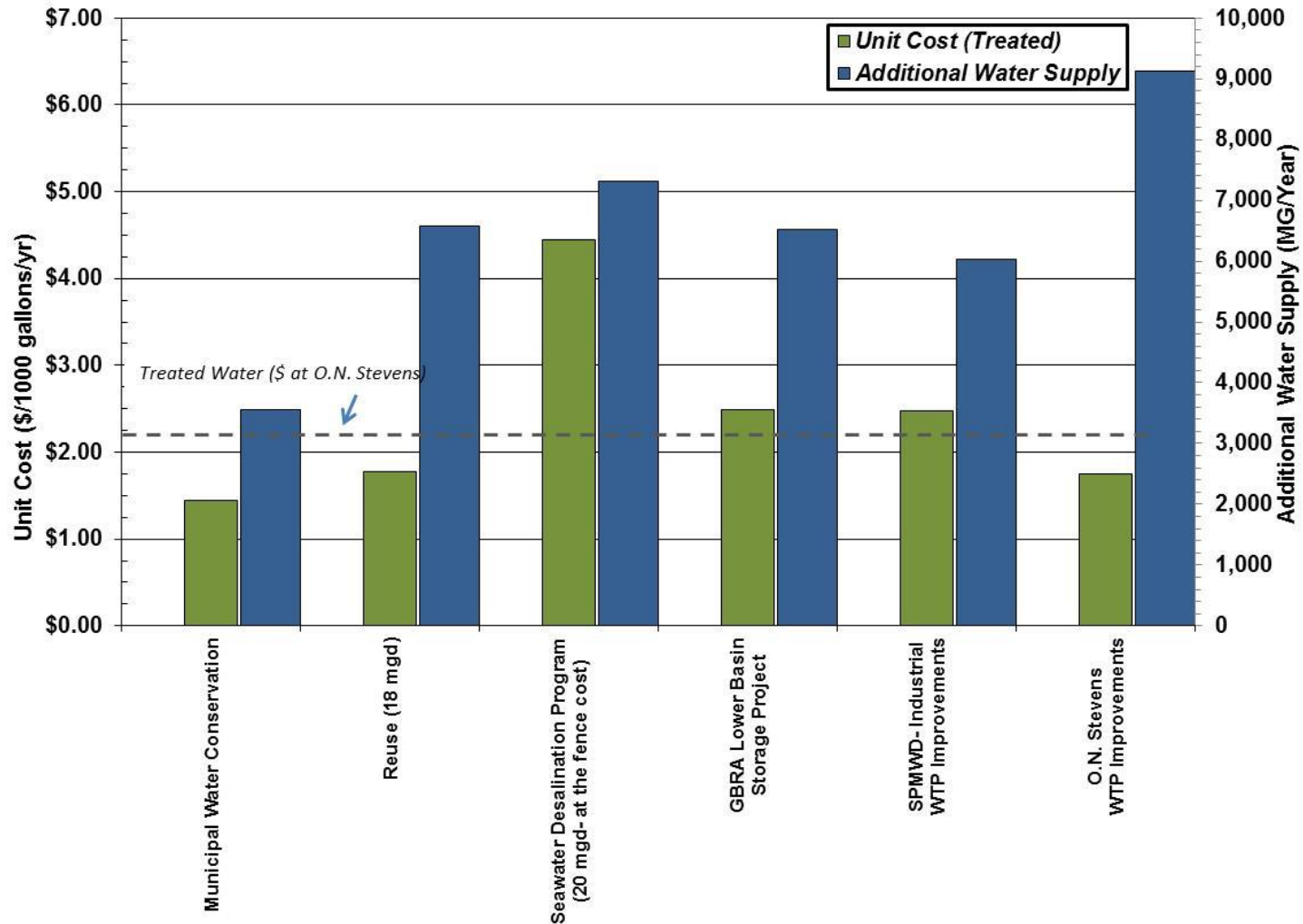


2016 Region N Plan Recommended Water Management Strategies





Unit Cost and Water Supply Yield for City- Related Water Management Strategies from the 2016 Region N Plan





WMS Evaluated During Previous Plans (No Longer Actively Being Considered)

- Campbellton Wells Carrizo- Wilcox Aquifer Supplies
 - Potable-Quality Gulf Coast Aquifer Supplies in Refugio County (28,000 ac-ft/yr) and Bee/San Patricio County (18,000 ac-ft/yr)
 - Potential Aquifer Storage and Recovery near Driscoll
 - CCR/LCC System Yield Recovery through Delivery of Treated Wastewater Effluent to the Rincon Delta
 - Pipeline between Choke Canyon Reservoir and Lake Corpus Christi
 - Nueces Off-Channel Reservoir near Lake Corpus Christi
 - USACE Nueces Feasibility Study- Federal Opportunities to Participate in Regional Projects (bundling Nueces off-channel reservoir, CCR/LCC pipeline, seawater desalination, and brackish groundwater desalination projects)
 - Palmetto Bend Stage II On-Channel Reservoir (Lavaca- Navidad River Basin)
 - Brush Management
 - Weather Modification
 - Desalination in conjunction with Barney M. Davis Power Station (25 to 100 MGD). Conjunctive Seawater and Brackish Groundwater Project for 14 to 25 MGD
 - Sediment Removal in Lake Corpus Christi (from 2001 Plan)
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Request for Information (RFI) Solicitation Process- *Considerations*



Objective

- Acquire information related to potential water supplies for the Coastal Bend
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City of Corpus Christi's Water Supply Planning History

- The City has achieved tremendous success in developing raw water supplies in advance of need, in reasonable increments for debt service, and at lower cost than many other municipal systems in Texas.
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Key Considerations for RFI

- Determine goal and objectives
 - City-desired information to gather from RFI;
 - Critical success factors; and
 - City-approved issuance process
 - Affordability and Cost
 - Most developers require take-or-pay contracts and include developer surcharges
 - What happens if the City and its customers don't need the water?
 - Opportunities to study in conjunction with Region N
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San Antonio Water System RFI Experience

- Process driven by an imminent water supply need with limited options
 - RFI method/approach included:
 - Dedicated 8 staff for RFI process
 - Numerous Workshops and Public Information Meetings
 - Request for Information
 - Competitive Sealed Proposal
 - Length of Time for Process: ~ 4 years
 - Vista Ridge selected
 - Up to 50,000 ac-ft/yr supply
 - Cost of \$2,200 to \$2,307 per ac-ft (\$6.75 to \$7.03 per 1000 gallons)
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Preliminary Activities for RFI Process

- Workshop to identify:
 - City-desired information to gather from RFI;
 - Critical success factors; and
 - Issuance/selection process
 - Draft language for request
 - Prepare Staff directives, including protocol for reviewing submittals and/or Council presentations
 - Schedule
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Discussion
