

## Desalination of Brackish Groundwater

汽水の淡水化

Edmund Archuleta, El Paso Water Utilities,

Awwa Research Foundation, US

エル・パソ上下水道局、米国水道協会研究財団

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## Desalination of Brackish Groundwater

Oahu, Hawaii

July 12-15, 2004

Ed Archuleta, P.E.  
General Manager  
El Paso Water Utilities



## City of El Paso and Utility Background

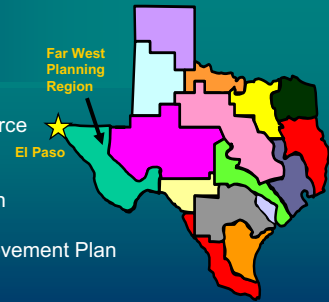


## Water Resources Available to the El Paso/Cd. Juárez/Las Cruces Region



## Planning

- 50 – Year Water Resource Management Plan (updated every 5 years)
- 10 – Year Strategic Plan (updated every year)
- 10 – Year Capital Improvement Plan (updated every year)
- 5 – Year Financial Plan (updated every year)
- Formal Customer Surveys (updated every two years)



## Major Issues Over the Next 10 Years

- Drought
  - Worst western drought in 300 years
- Arsenic rule implementation
  - Online by 2006
  - Capital costs of \$76 million

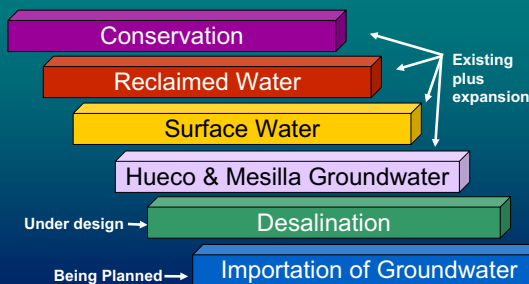


## Major Issues Over the Next 10 Years

- New water resource development
  - Designing 27.5 MGD desalination plant
  - Capital costs of \$72 million
  - Planning for 2015 importation of water
    - Capital costs of \$400 - \$500 million
- Rapid population growth
  - 3.5% annual service area growth rate



## El Paso's Priorities for Additional Water Supply



## Key Principles Outlined by Western U.S. Water Managers\*

\*National Salinity Management and Desalination Summit,  
Las Vegas, Nevada, December 8-9, 2003



- Water Supply Challenges
- Detrimental Impact of Rising Salinity Levels in Current Supplies
- Desalination Technology is one of several tools
- Supporting Programs that advance water resource Diversification



## Water Supply Challenges

- Management of water resources increase as demands grow for additional water supplies.
- Growth, hydrologic and geographic factors, are key drivers to stretch existing supplies and offer new alternatives.
- Diversification of water resources will be an essential planning objective.



## Detrimental Impact of Rising Salinity Levels in Current Supplies

- Accumulation of dissolved minerals in our water poses a threat to water supply sustainability.
- Source control strategies and desalination technologies are critical tools in reducing salinity in our water and soils.



## Desalination Technology is one of Several Tools

- Desalination of seawater, brackish and impaired water will continue to be pursued to protect existing sources and create new supplies for coastal and landlocked communities.
- Addressing the water supply challenge requires maintaining and conserving existing supplies and creative exchanges of supplies between entities.
- Concentrate management solutions will be as important as desalination technology in protecting and enhancing water supplies.
- A sustained focus on technological innovations and management strategies is critical to reduce costs.



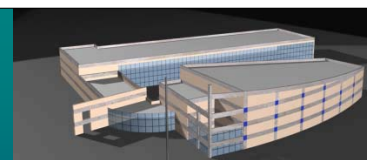
## Supporting Programs that Advance Water Resource Diversification

*Meeting water supply challenges will require collaborative support programs that diversify and conserve water resources. Key areas include:*

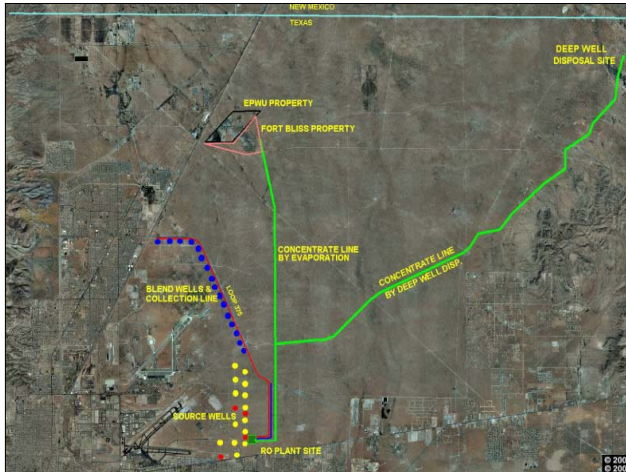
- Desalination technology and salinity management solutions that address water supply challenges and conditions.
- Research and development funding that brings solutions on promising technologies that are easily scalable and adoptable for commercial purposes.
- Managing concentrate byproduct through efficient disposal practices or creative reuse strategies.



## Fort Bliss/EPWU Joint Desalination Facilities







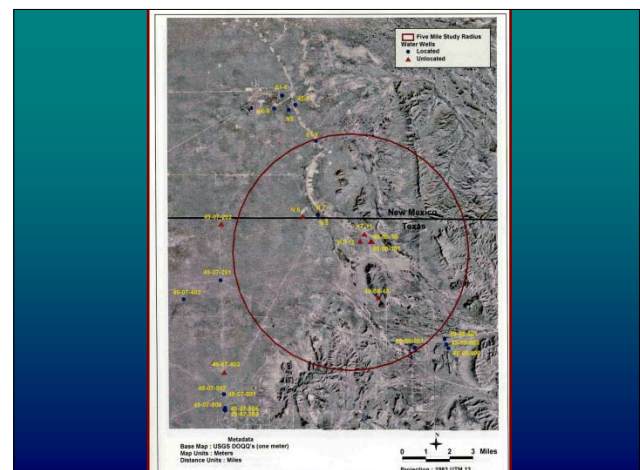
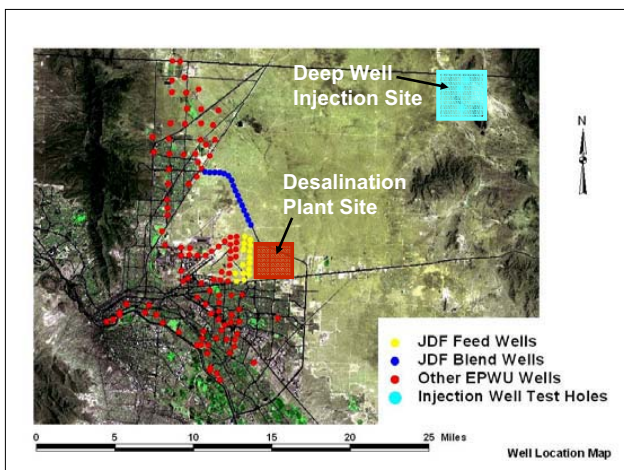
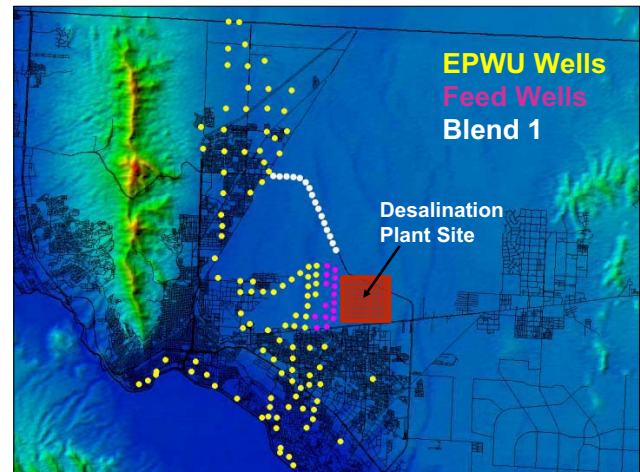
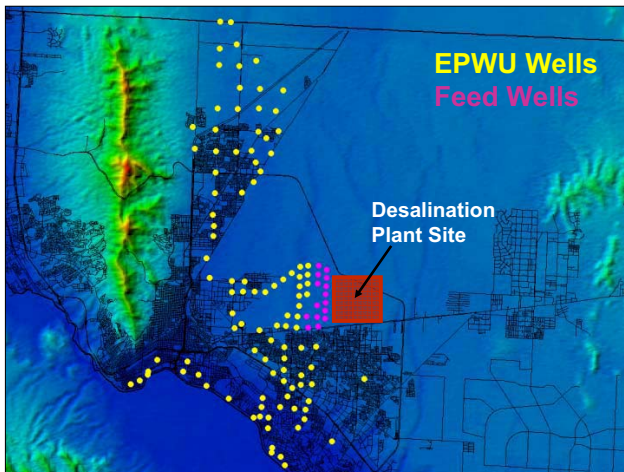
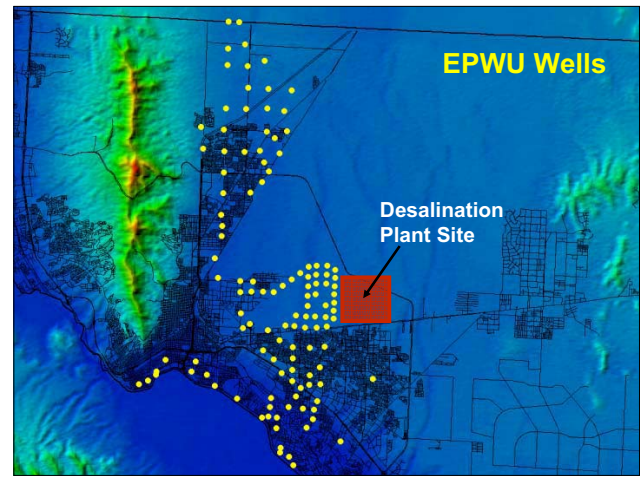
## Facilities Included In Project

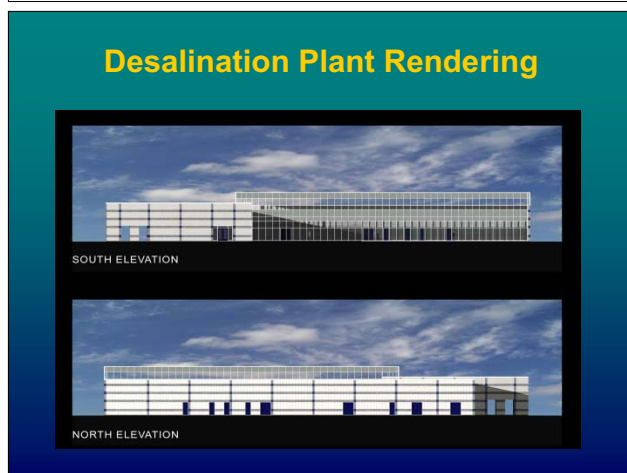
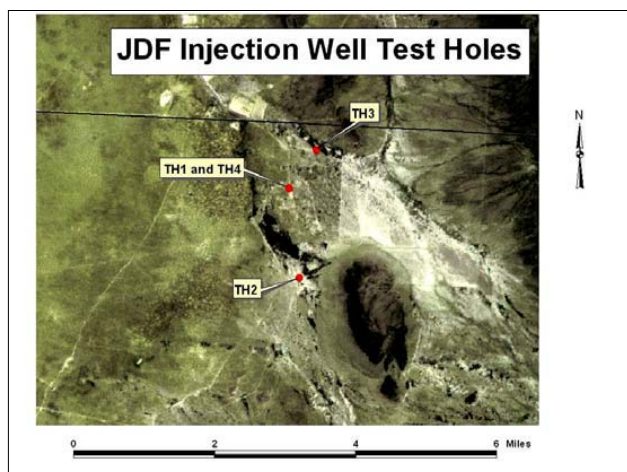
- Rehabilitate 15 Existing Wells – 18.5 MGD
- 16 New Blend Wells - 12.0 MGD
- 3 New Source Wells @ Airport - 3.0 MGD
- RO Plant - 15.5 MGD
- Brine Disposal Facilities
- Pipelines - Collection, Transmission, Brine Disposal
- Water Resources Learning Center



## Blend Well Analysis

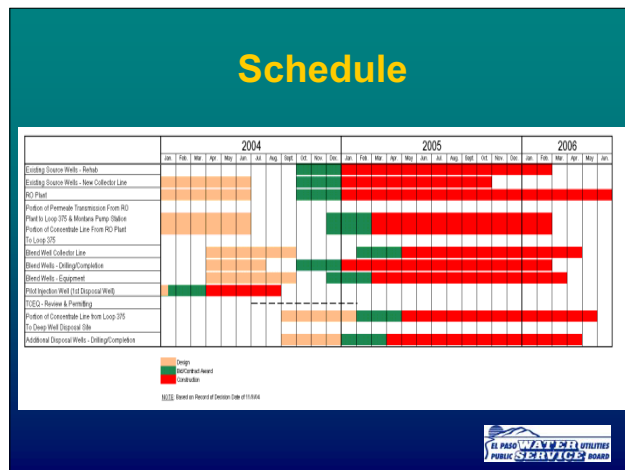
- Considered 5 alternatives
- Evaluated with simulations
- “Blend 1” recommended





### Estimated Project Costs

Blend Wells	\$13.0 M
Supply Wells	\$6.0 M
Pipelines	\$15.0 M
Desalination Plant	\$26.5 M
Disposal (By Wells)	\$11.5 M
<b>Estimated Total</b>	<b>\$72.0 M</b>



## Most Recent Planned Work of the AWWA Research Foundation (AWWARF) on Desalination and Salinity Management

- ### General – Workshop on Salinity Control (AWWARF and U.S. Bureau of Reclamation)
- Workshop to be convened in 2004
- ### Treatment
- Desalination of Product Water Recovery and Concentrate Volume Minimization
  - (Request for Proposals Accepted until July 15)
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## Concentrate Management

Concentrate disposal for Inland Areas (AWWARF, WERF, and WateReuse Foundation) Four projects to be awarded Summer 2004

- Zero Liquid Discharge and Volume Minimization for Water Utility Applications
- Beneficial Uses of Non-Traditional Uses of Concentrate
- Impacts of Membrane Process Residuals on Wastewater Treatment
- Benefits of Regional Solutions in Disposing of Concentrate



# Questions

