



# Future Plant Improvements at the Kay Bailey Hutchison Desalination Plant-El Paso, TX

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# Kay Bailey Hutchison Desalination Plant

Opened in 2007 to deal with:

- Drought
- Emergency situations
- Growth
- Brackish water intrusion



# EPW/Army Partnership Agreement



- All facilities to be constructed on Fort Bliss
- EPW leases land from the Army
- All facilities owned and operated by EPW
- EPW sells water to Fort Bliss



# Benefits of Desalination Plant



- Reserves fresh water in Hueco Bolson for drought periods
- Prevents brackish water from encroaching on fresh water wells
- Reliable water supply during river drought



NEW MEXICO

TEXAS

DEEP WELL  
DISPOSAL SITE

BLEND WELLS &  
COLLECTION LINE

Loop 375

CONCENTRATE LINE  
BY DEEP WELL DISP.

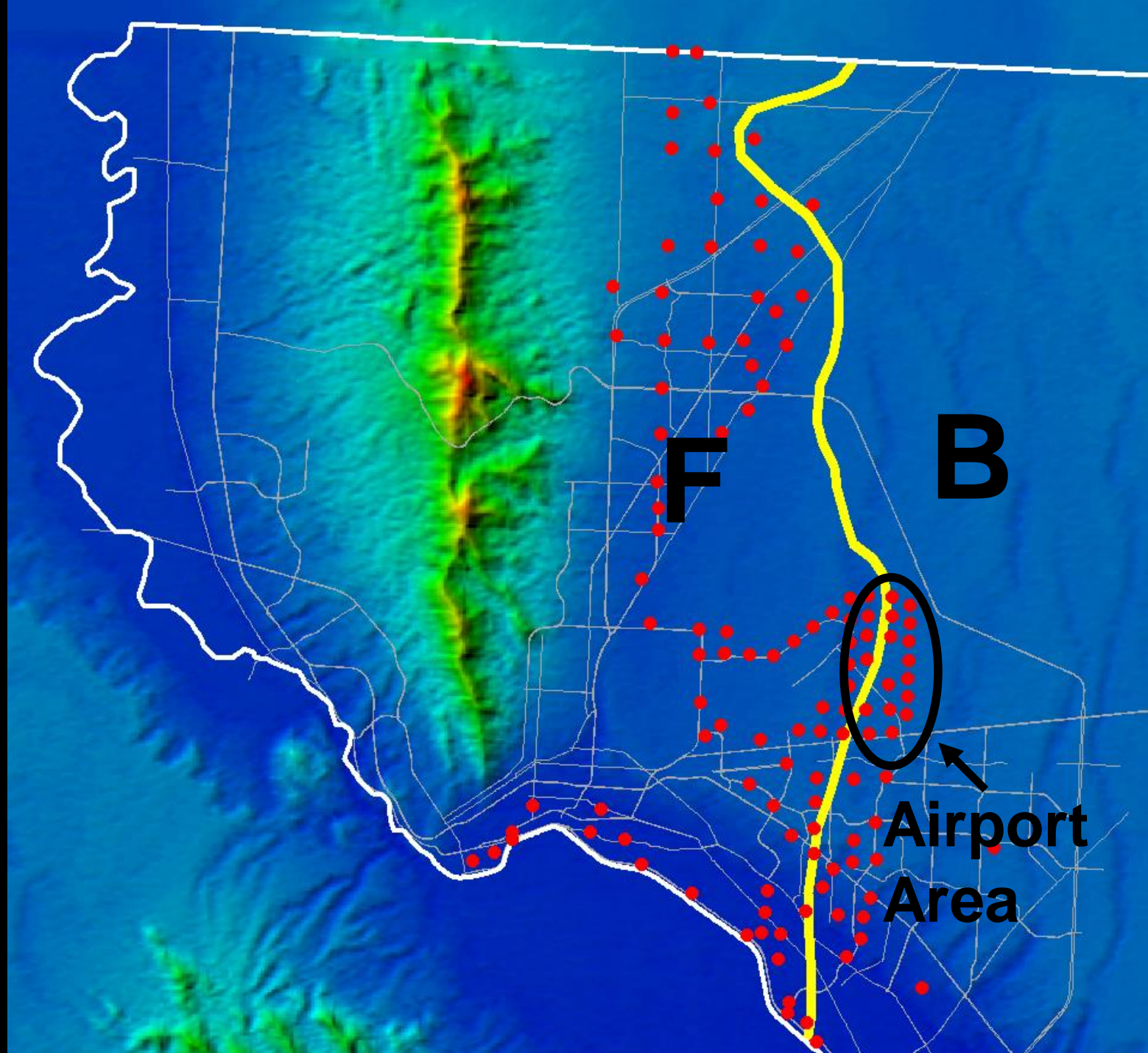
SOURCE WELLS

RO PLANT SITE

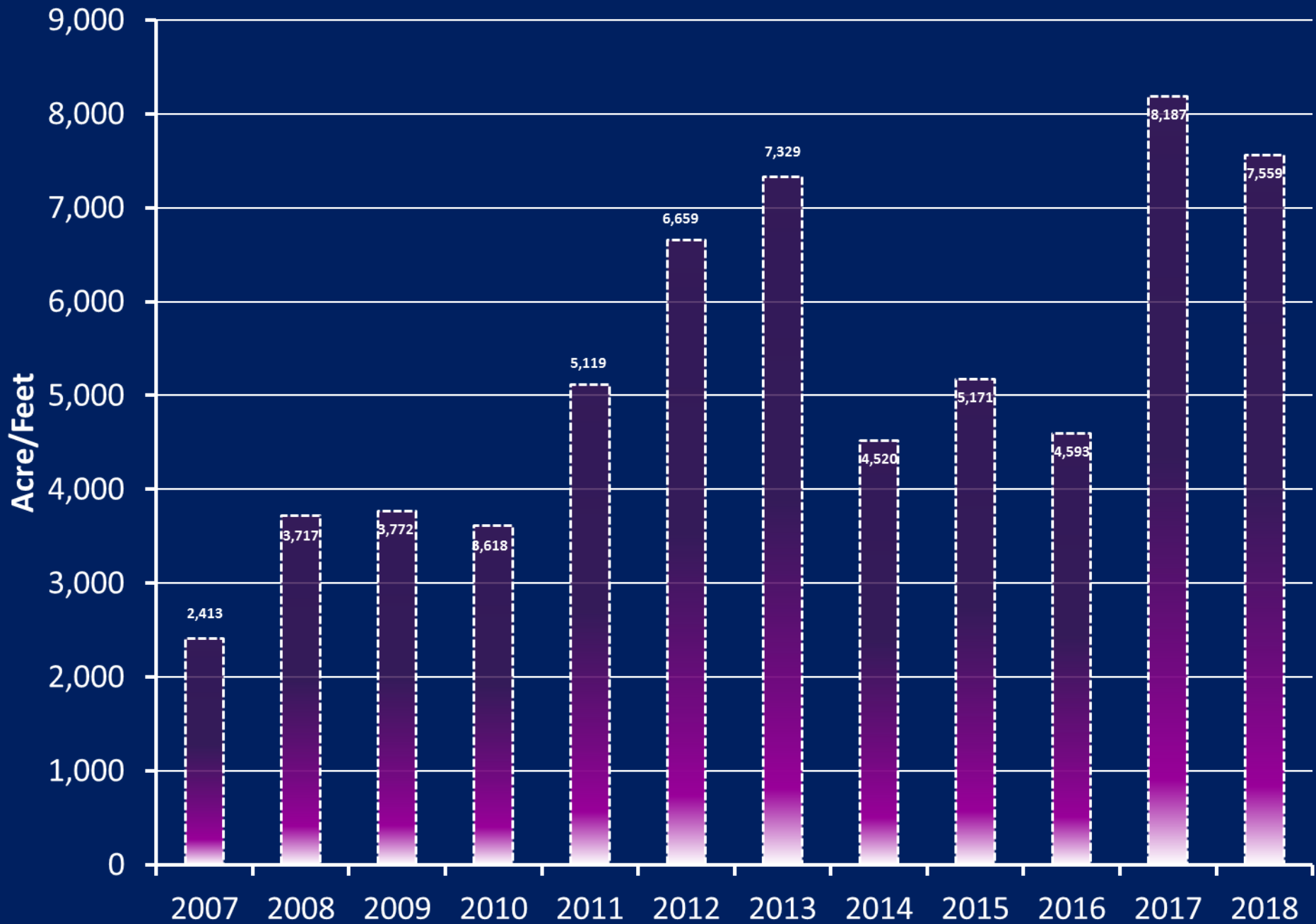
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# Kay Baily Hutchinson Desalination Plant



# Highlights of 10 year Plant Operation

- Typical Operation- 8 MGD
- February 7, 2011- Big Freeze-22 MGD to help restore water supply in EP.
- Drought Conditions - May 2012, No surface water in May- 19 consecutive days of production over 20 MGD





# Highlights of 10 year Plant Operation

- Peak Annual Production was 2013 (7329 acre-feet) corresponding to lowest river supply in 100 years.
- Over 53,000 acre-feet of finished water produced in 10 years.



# Plant Improvements



- Membrane Replacement
- Interstage Booster Pumps
- Upgrade of 4 source well pumps
- Removal of bottleneck in collector piping
- Brackish Blendwell Collector Line

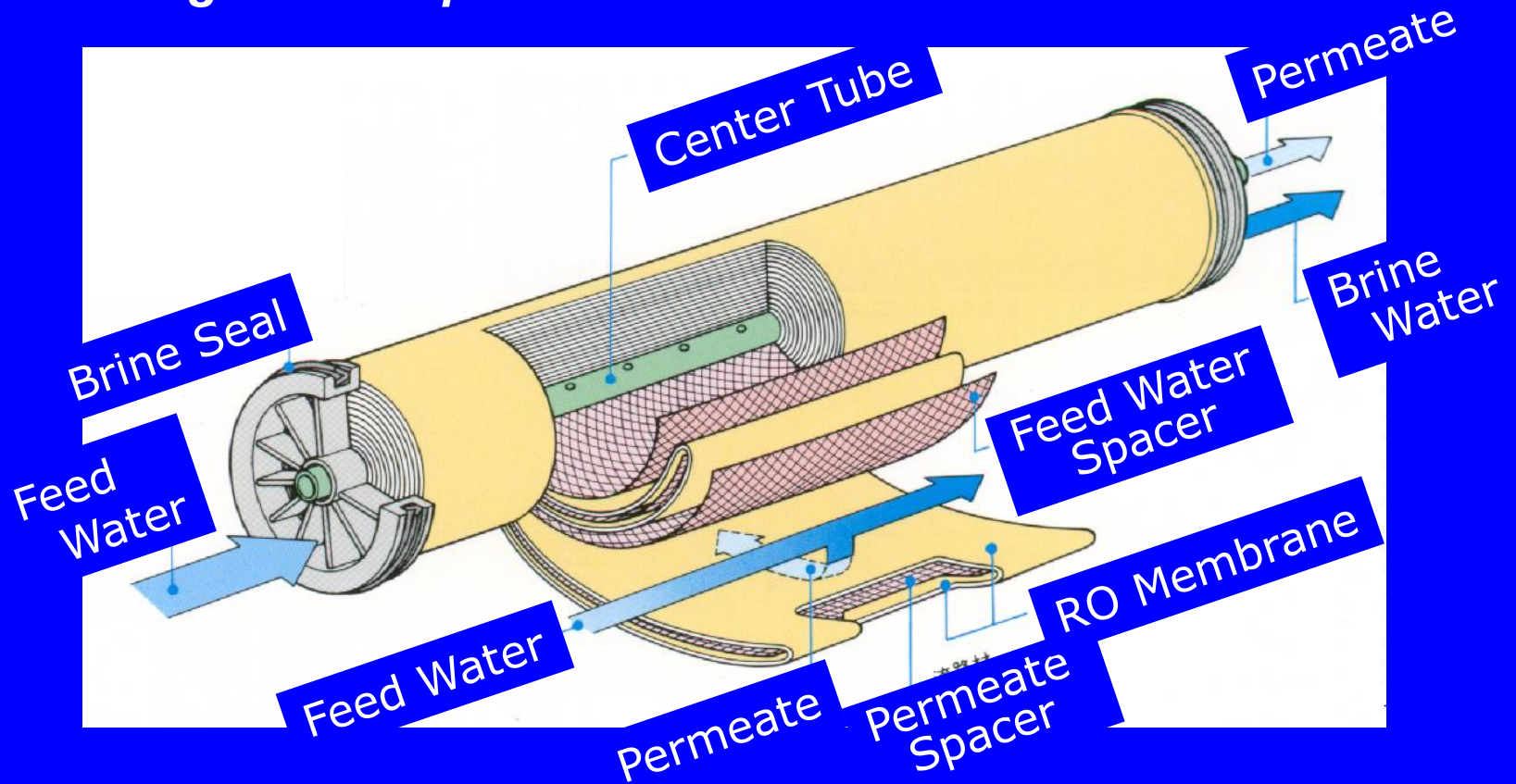
# Membrane Replacement



- Current membrane have been in service for 10 years.
- Source Water TDS ranges from 2000 to 4000 mg/l.
- Some fouling of membranes has occurred.
- Higher recovery rates needed to meet future water quality challenges.



## Schematic Figure of a Spiral Wound RO Membrane Element



Toray's Patent (BCM)

Patented : JP3052958(2001), USP6277282(2001)

Pending : EP, RC, CN, CA etc. (Total 9 Countries)

**TORAY**

# Interstage Booster Pump and New Membranes



- The new membranes and the interstage boosters will allow 10% capacity increase in the future.
- New membranes will produce permeate with lower TDS. (Less blend water required).
- Toray Membranes will be used.

# Interstage Boosters



- KBH plant will be retrofitted with interstage booster pumps.
- ISB will provide the required pressures for optimal membrane performance.
- ISB will be equipped with VFD and automatic speed adjustment to allow operation for a variety of future water quality conditions





# Existing Blend Well Pipeline

Current blend well pipeline connecting 16 blend wells to the Kay Bailey Hutchison Desalination Plant to be used for blending purposes.

**Existing Blend Well Line**

- 600 Series Wells
- Blend Well Line





# Proposed Blend Well Pipeline

Proposed pipeline connecting wells 609 through 616 to the Kay Bailey Hutchison Desalination Plant to be used as brackish source water for the plant. (Wells 601 through 608 would continue to supply blend water to the plant through the existing pipeline.)

## Proposed Parallel Well Lines

- 600 Wells Blend
- 600 Wells Brackish
- Blend Well Line
- Brackish Well Line

0 1 2 4 Miles



el paso  
**WATER**

# Future Planning

- Increased salinity of source water during the first 10 years.
- Plant production to increase
- Continued to be used in drought relief and interruption of supply
- Planning for additional 8 MGD of plant capacity



# Questions



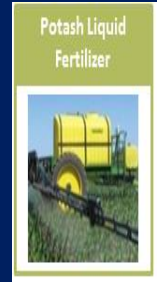
# Enviro Water Minerals Company (EWM), Public Private Partnership

- Enviro Water Minerals Company is using cutting edge technology to recover minerals from waste brine from desalination plants.



# Enviro Water Minerals Company (EWM)

- EWM chemically separates the concentrate
- into high-purity industrial grade minerals products that are highly valued in commercial markets.
- Potash Liquid Fertilizer
- Bromide Rich Brine (Power plant mercury scrubbing)
- Milk of Magnesia (Water treatment)

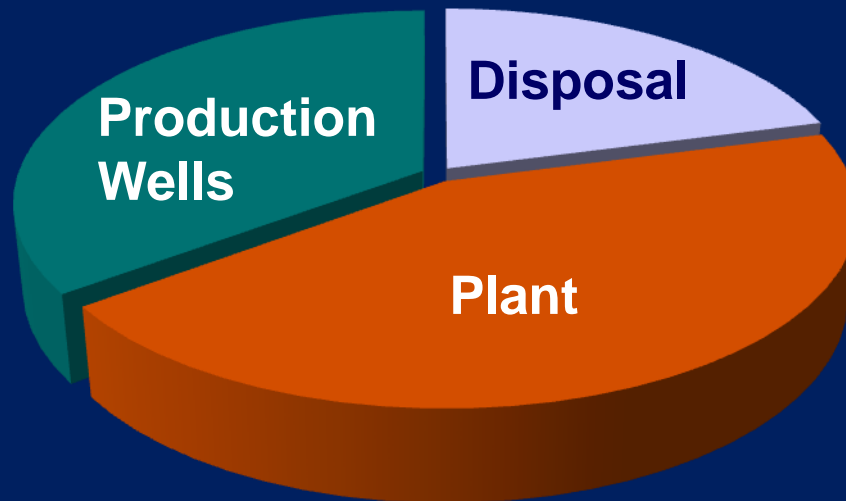




# Capital Costs (21 Contracts)

Production wells and collectors	\$ 32 Million
Plant and Near-Plant Pipes	\$ 40 Million
Concentrate Disposal	\$ 19 Million

**Total Cost \$ 91 Million**



# Financing for Desalination Facilities by Source (Million \$)

1.	Congressional Appropriations (requires 45% local match)	\$26.0
2.	Texas Water Development Board (interest free loan)	1.0
3.	EPWU Bonds and Cash	60.7
4.	Army's Contribution (in kind)	3.3
<b>Total</b>		<b>91.0</b>



