

# Seawater Desal for Texas

Thursday, September 21

Can Texas be the lowest cost producer of Desalinated seawater in the World?

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### Agenda

- 1. First where are some of the lowest cost Desal plants in the world?
- 2. What makes up the cost of a Desal plant?



Project Examples – SWRO



WateReuse, White Paper "Seawater Desalination Costs" Revised January 2012

# What Makes up the Cost of a Desal Plant?

- Scope 25 MGD seawater reverse osmosis (SWRO) desalination plant full turn-key with an open intake, DAF, media filtration/ ultra filtration, cartridge filtration as pre-treatment, building, post-treatment, storage and discharge piping.
- Energy consumption 3.5 kWh/m3 or 13.23 kWh/1,000
- Energy cost \$0.035/kWh
  - ERCOT reported "Average "ERCOT Hub Average 345 kV Hub" Settlement Point Price in Real-Time (\$/MWh)" – 2016 Avg. \$23.51 (\$0.0235/kWh)
  - ERCOT reported "Average "ERCOT Hub Average 345 kV Hub" Settlement Point Price in Day-Ahead Market (\$/MWh)" – 2016 Avg. \$24.56 (\$0.02456/kWh)
- CAPEX \$181M (WDR comparison of a recent tender in Saudi for comparable sized plant, 36 MGD)
- **OPEX** For 1<sup>st</sup> year \$9.5M (based on industry information)
- Other Assumptions:
  - Cost of lease of land, permitting and legal is not included
  - Capital recovery 1/3, power 1/6 (\$0.035/kWh), direct staff 1/12, maintenance, including chemicals, consumables 1/4, misc. 1/6 (based on industry information).

### Summary – Cost Analysis

	Cost
Capex (cost per 1,000 gal)*	\$1.22
Opex (cost per 1,000 gal)	\$1.04
Power (cost per 1,000 gal)	\$0.46
Totals	\$2.72/ 1,000 gal

- Using a simple mortgage calculator to develop the payback of the capital cost over a 30 year term\*
- Rates used 4.5%
- TWDB Swift Funds 3%

#### Hybrid financing through a P3 or P4

## Conclusion

#### Texas can be the lowest cost producer of Desalinated Seawater by:

- Managing and mitigating risk by using experienced and knowledgeable teams that have a track record of developing, permitting, designing, constructing, financing and operating similar Desal facilities.
- This can be done by using a P3/P4 model and having the selected team put "skin in the game".
- Engage an owners engineering company that has experience in managing teams in constructing comparable facilities.
- Don't build the Taj Mahal or a Trump Tower!
- Don't take a risk on the process train. Go with a robust proven and piloted design.
- Use a mix of private and public funds to finance the project.