Water Finance Conference
Carlsbad Desalination Project
August 30, 2016
Agenda

I. Introduction

II. Market For Seawater Desalination

III. Carlsbad Desalination Plant
   I. Development
   II. Financing
   III. Construction
   IV. Completion
Poseidon at a Glance

Leading water infrastructure developer and manager with significant experience partnering with water agencies to deliver essential water infrastructure projects

- Founded in 1995 to develop water infrastructure projects through a Public-Private Partnership approach
- Use best available technology in an environmentally sensitive way
- Senior management team has collectively developed, financed and constructed over $10bn in infrastructure projects
- Primary focus on seawater desalination project development but with experience in other water treatment project opportunities
- Headquartered in Boston, MA with regional offices in California and Texas
- Brookfield Asset Management affiliates acquired majority ownership in December, 2015
MARKET FOR SEAWATER DESALINATION
Problem - Strained Water Supply

Stressed: Drought, Environmental Concerns, Federal Pumping Restrictions, Oversubscription

Bay Delta Area

Transfers & Storage

Colorado River Aqueduct (1941)

Conservation (Water Use Efficiency)

Local Supplies
Groundwater, Recycling & Ocean Desalination (future)

State Water Project Entitlement (1972)

Source: Municipal Water District of Orange County, March 2012 and Poseidon Water
Problem - Strained Water Supply
Desalination Offers a Reliable Solution
Poseidon’s Value Proposition

Why Desalination?

- San Diego County imports approximately 85% of its water supply
- Current water supply dependent upon rainfall and snowpack
- Desalination a reliable, drought-proof, clean and safe source of water
- Limited incremental land needs
- Competitive with other locally available water supply options
Carlsbad Desalination Plant
Public Private Partnership Overview

Project Summary

- **Project Capacity**: 54 MGD
- **Water Purchase Agreement**: 30-year take-if-delivered contract for water, minimum purchase of 48,000 AF, option up to 56,000 AF with San Diego County Water Authority
- **Poseidon to Construct**:
  - 54 MGD desalination plant located on the site of the Encina Power Station
  - 10 mile 54-inch diameter conveyance pipeline to connect to existing aqueduct pipeline
- **Water Authority to Construct**:
  - Relining of 5.5 mile reach of aqueduct pipeline
  - Water Treatment Plant improvements to accommodate desalinated water flows

Key Responsibilities

**Poseidon**:
- Permit, Design and Build the Desalination Plant
- Permit, Design and Build the Product Water Pipeline
- Own, Operate and Maintain the Desalination Plant
- Supply Product Water

**San Diego County Water Authority**:
- “Take or Pay” for Product Water (minimum commitment of 48,000 AF/Yr)
- Timely construction of water treatment plant improvements and pipeline rehabilitation
- Receive Product Water
- Own, operate and maintain the Product Water Pipeline, the water treatment plant improvements and pipeline

Overhead Rendering

Site Aerial
Carlsbad Desalination Plant
Project Development

- 1998: Idea emerges for seawater desalination plant in Carlsbad
- 2000: Desalination feasibility study complete
- 2002: Project approved by Carlsbad City Council, Regional Water Quality Control Board and California Coastal Commission
- 2004: Desalination project environmental review process begins
- 2006: Regional Water Quality Control Board approves Poseidon Water’s environmental stewardship package
- 2008: Water Purchase Agreement executed between Poseidon Water and the San Diego County Water Authority
- 2010: $734 million in private bonds sold
- 2012: Construction begins on Carlsbad Desalination Project
- 2014: Plant begins delivering 50 million gallons per day of drought-proof water
- 2016: Commercial operation
Carlsbad Desalination Plant
Success Deploying PPP Approach

Carlsbad Desalination was developed through a public private partnership between the San Diego County Water Authority and Poseidon Water.

- **Water Utility**: San Diego County Water Authority
- **Project Management**: Poseidon Water
- **Third Party Equity**: Stonepeak Infrastructure Partners
- **Energy Provider**: SDG&E (Sempra Energy utility)
- **Engineering, Procurement and Construction**: KSD
- **O&M Provider**: IDE Technologies ltd.
- **Private Activity Bonds (Conduit Financing)**
- **Loan Agreement**: EPC Agreement
- **Shareholder Agreement**: Water Purchase Agreement

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Carlsbad Desalination Plant
Financial Overview

Key Financial Metrics:
- **Project Capacity**: 54 MGD
- **Total Capital**: $922m
  - **Debt**: $755m
  - **Equity**: $167m

Financing Overview:
- **Project Equity**: 18%
- **Debt**: 82% funded through split tranche bonds issuance via the California Pollution Control Financing Authority (CPCFA), Non-recourse
  - Plant Bonds issued as Tax-Exempt Private Activity Bonds with Poseidon as the sponsor
    - Subject to Alternative Minimum Tax (AMT)
  - Pipeline Bonds issued as Tax-Exempt Governmental Purpose Bonds with the Water Authority as the sponsor
    - Not subject to the AMT, but issued with a 5 year early call option
    - Water Authority exempt from repayment obligations if Poseidon does not perform
- **33 year financing**
- **Interest Rates**:
  - Plant Bonds: 4.8%
  - Pipeline Bonds: 4.4%
- Bonds obtained two investment grade ratings
  - Moody’s Baa3, Fitch BBB-

1. Based on equity funding date, not closing date.
Cross Section of Water Price

Fixed & Variable Electricity Charge is Driven by:
- Power Consumption
- Cost of Power
- Terms of Poseidon’s O&M Agreement with Contractor

The Electricity Charge will vary with electricity prices

Fixed & Variable Operating Charge is Driven by:
- Terms of Poseidon’s O&M Agreement with Contractor
- Other operating expenses

Operating Charge is indexed to CPI

Capital Charge is Driven by:
- Poseidon’s Capital Budget
- Bond Issuance
- Equity Return/ Developer Fee
- Development period costs

Capital Charge is fixed at a pre-established escalation rate
Carlsbad Desalination Project Overview
Carlsbad Water Flow Diagram
Any chlorine remaining in the filter can damage the RO membranes. To protect the RO system, filter effluent will be dechlorinated using sodium bisulfate prior to treatment.

Desalinated water requires chemical conditioning prior to delivery to increase hardness and reduce corrosion potential. Chlorine is also added to meet the California Department of Public Health quality standards for potable water disinfection and to control biological growth in the transmission pipeline.

The RO treatment system will separate the pretreated and conditioned intake seawater in two streams: desalinated water, and concentrated seawater.

The finished water (product water) is held in a 3.4 MG storage tank prior to delivery to SDCWA.

The product water pump station pressurizes the water for delivery to SDCWA.
Plant Construction
Pipeline Construction
Carlsbad Desalination Project
Plant Complete
Carlsbad Project Impact

• Carlsbad Desalination Project will provide locally controlled, drought proof water supply for 10% of San Diego County’s water supply

• Restoration of 66 acres of intertidal Wetlands

• Carbon Neutral GHG Emissions

• Construction impact of $350 million to local economy and an estimated 2,500 jobs in desalination, engineering, construction and other services industries

• The project will have 36 full-time employees, support 500 direct, indirect and induced jobs, and contribute $50 million in estimated annual spending to the county's economy
Next: Huntington Beach Desalination Project
Questions?
Energy Use

• Greenhouse Gas Plan
  – Desalination Plants do not emit Greenhouse Gases
  – Project agrees to offset the incremental indirect greenhouse gases from the energy used by plant
  – Comparison is made to energy use of pumping water into San Diego from the State Water Project
Desalination Energy Improvements

Scale Economies of Desalination Plants

Reduced Cost of SWRO
California Duck Curve – Oversupply of Solar Power

Source: CalISO