Public Workshop on issues related to the Carlsbad Desalination Project

San Diego County Water Authority
Special Water Planning Committee Meeting
October 10, 2012
San Diego County Water Authority

- Wholesale water agency created by State Legislature in 1944
  - 24 member agencies
  - 36-member board of directors
  - 3.1 million people
  - $186 billion economy
- Mission is to provide safe and reliable water supply to member agencies
- Service area
  - 950,000 acres
  - 97% of county’s population
California Water Facilities: San Diego County Imported Sources

State Water Project Facilities

Colorado River Aqueduct

Water Authority Facilities

MWD Water Facilities

San Francisco

Lake Shasta

Lake Oroville

Bay-Delta

California Aqueduct

San Diego

Colorado River

Los Angeles

Colorado River Aqueduct

Water Authority Facilities
1990–91: Bottom of the Basket Falls Out

State to Shut Off Water Delivery to Southland

By VIRGINIA ELLIS and TED ROHRICH TIMES STAFF WRITERS

SACRAMENTO — Gov. Pete Wilson on Monday announced new and unprecedented cutbacks of state water deliveries so drastic that Southern California will be cut off from this traditional source of water by mid-March.

Wilson said that heightened drought conditions had forced the state to notify cities and industry of the water cutbacks.

Limits on tap water use urged by staff

By Steve LaRue

Staff Writer

The staff of the San Diego County Water Authority (CWA) will continue to recommend a blanket ban of tap water on private lawns and golf course roughs and fairways despite intense opposition by landscaping contractors and others at a hearing last week.

50% Water-Delivery Cut Will Be Blow to San Diego

- Drought: Metropolitan Water District directors also vote a 90% cut in allocation for agricultural users.

Water Dependence Bodes a Dry San Diego Future

Grim water outlook is getting even worse

S.D. Faces 31% Cut in Imported Water Supply

By JENIFER WARREN TIMES STAFF WRITER

Faced with record-low rainfall and no prospects for relief, the Metropolitan Water District declared a water emergency on Tuesday and cut by 31% the amount of water it delivers to 27 agencies from Ventura to San Diego.

L.A. Ready to Battle San Diego Over Water

- Conservation: DWP officials weigh legal action as southern neighbor refuses to impose rationing.

State Water Project cuts off water to farms; urban slash expected

Water: Authority to Vote Today on Mandatory Restrictions
Progress Towards Diversification

Resource Strategies to Manage Shortages

<table>
<thead>
<tr>
<th>Strategy</th>
<th>1991</th>
<th>2012</th>
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</thead>
<tbody>
<tr>
<td>Long-term Conservation</td>
<td>875</td>
<td>69,680</td>
</tr>
<tr>
<td>Recycled Water</td>
<td>1,170</td>
<td>24,010</td>
</tr>
<tr>
<td>Brackish Groundwater</td>
<td>0</td>
<td>6,280</td>
</tr>
<tr>
<td>Colorado River Transfers</td>
<td>0</td>
<td>165,000</td>
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<tr>
<td>TOTAL (Acre-Feet)</td>
<td>2,045</td>
<td>264,970</td>
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1991 Supply Portfolio
- MWD 95%

2012 Supply Portfolio
- MWD 45%
High reliance on single supply source
- MWD imported supplies from SWP and Colorado River
- Potential for imported supply shortages
  - Recurring droughts
  - Regulatory restrictions on SWP deliveries
  - Delta levee failure due to earthquake
  - Limited storage reserves on the SWP

Future water demand increases
Potential effects of climate change
SWP Lake Oroville  June 2005
3.6 Million Acre-Feet – 99% Capacity
Dry Conditions on Colorado River
7 of Last 10 Years

% of Average Inflow at Lake Powell

Water Year

San Diego County Water Authority
State Water Project and Central Valley Project Reliability
South Exports

- Pre-Court (D-1641): 6.0 million AF
- Existing (Bio Op): 4.7 million AF
- Potential Future Fish Listings: 2.0 – 3.0 million AF
- Earthquake Risk: 1.0 – 1.5 million AF

Metropolitan’s share ~ 25%

Exports will be minimal for 1.5 to 3 years following an earthquake

Source: Metropolitan Water District Presentation 09-25-12
Future Water Demand

Even with Rising Water rates and Mandated Conservation
Future need for water will increase

Total Demand (TAF)

- Baseline Demand without Price Effect
- Baseline Demand with Price Effect
- SBx 7-7 Compliance Demand
Employ resource strategies unique to local conditions

No single resource strategy can manage all uncertainties

Multi-faceted approach required
  - Conservation
  - New supplies
  - Supply diversification
  - Infrastructure improvements
Seawater Desalination as Resource Strategy

- New, local water supply
- Reduces need for imported water from environmentally sensitive areas
- Drought-proof supply
- Improved water quality
- Cost on par with other new, local water supplies
  - Energy use higher than other supply sources
- Enhances regional supply reliability and local control
Proposed Carlsbad Desalination Project and San Diego Supply Reliability

- Consistent with diversification strategy
- One of few options in San Diego region that can provide large amounts of local supply
- Included in approved 2010 SDCWA Urban Water Management Plan
  - Identifies reliable resource mix to meet existing and future demands
Cost of the Next Increment of Local Supply
Actual Proposed San Diego Region Project Unit Costs – $/AF

Before incentives, grants, or netting out avoided costs
2011 dollars unless otherwise noted

- Carlsbad (Poseidon)
  - Brackish Groundwater: $2,041
  - Recycled / IPR: $2,290
- Mission Basin Narrows
  - Brackish Groundwater: $1,717
- Otay River
  - Brackish Groundwater: $1,475
  - Recycled / IPR: $2,086
- City of SD RWS*
  - Brackish Groundwater: $1,975
  - Recycled / IPR: 2,375**
- North San Diego County Regional Reuse
  - Brackish Groundwater: $1,628
  - Recycled / IPR: $1,730
- Camp Pendleton Desalination
  - Brackish Groundwater: $1,900
  - Recycled / IPR: $2,340
  - Seawater Desalination: (100 mgd) $2,041, (50 mgd) $1,717

*Cost range includes wastewater related costs that may reduce the unit cost by up to $600/AF.

**Incentive funding reduced at 2011 value of $275. RWS assumes deduction for incentives on 20 year NPV basis.
Energy as a Percentage of Unit Cost

Existing/Proposed Water Supplies for the San Diego Region

<table>
<thead>
<tr>
<th>Energy as a percent of Total Unit Cost</th>
<th>Otay River Brackish Groundwater Desalination</th>
<th>Indirect Potable Reuse</th>
<th>State Water Project</th>
<th>Carlsbad Desalination Project</th>
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<tbody>
<tr>
<td>0%</td>
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</table>
58% respondents indicated willingness to pay an additional $5 or more per month for seawater desalination.
Significant uncertainties over current supplies affect regional reliability

Seawater Desalination is important part of strategy to address uncertainties

Important to continue multi-faceted approach

- Conservation
- New supplies
- Supply diversification
- Infrastructure improvements

2020 Diverse Supply Portfolio

- MWD 30%
- IID Transfer 24%
- Canal Lining Transfer 10%
- Seawater Desalination 9%
- Recycled Water 6%
- Local Surface Water 6%
- Groundwater 2%
- Conservation 13%

San Diego County Water Authority
Project Participants

- Water Authority
- Project Company: Poseidon
- Plant EPC Contractor: Kiewit-Shea Joint Venture
- Process Engineering and Equipment: IDE
- Operating Services Provider: IDE
Poseidon Resources LLC

- Poseidon is the developer and manager of the Project
- Founded in 1995 with a sole focus on development, management and investing in water infrastructure
- Portfolio and pipeline include domestic and international projects, with specific focus on seawater desalination
  - Currently developing other desalination projects in California and Florida using similar development, construction, operation and ownership approach
- Senior management team has developed, financed, and constructed over $10 billion in infrastructure projects

Stonepeak Infrastructure Partners LLC

- Stonepeak will be principal new equity investor in the project
- Invests in traditional infrastructure assets with a focus on North America
- TIAA–CREF is a founding investor in the fund
- The firm was previously the infrastructure division of Blackstone
- The Firm’s founding partners have invested over $2 billion of equity into North American infrastructure.
Kiewit is one of the largest EPC companies in the U.S. with over 125 years of experience

- Kiewit ranks as the country’s top contractor in the delivery of water supply projects, according to *Engineering News-Record* magazine

- Over the last ten years, Kiewit has provided procurement, construction and start-up services for more than 280 public and private water supply projects totaling more than $6.3 billion in contract revenue
  - Includes over $240 million of construction work for the SDCWA in the past decade

- Projects include water and wastewater treatment facilities, dam/viaduct construction, pipeline/aqueduct development and pump station implementation

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**Select Kiewit Experience**

**Bakersfield Wastewater Treatment Plant, California**
Doubling the plant’s capacity and providing secondary and tertiary treatment processes

**South Bay Water Reclamation Plant, California**
Constructed equalization tanks, sedimentation basins, aeration basins, secondary clarifiers, and an effluent pump station

**P1-102 Activated Sludge Treatment Facility, California**
Upgrading the existing facility and adding a secondary treatment facility with a 60 MGD capacity
J.F. Shea is a California-based construction company with over 100 years of experience constructing water and wastewater projects

- Shea has completed in excess of 441,000 linear feet of pipeline construction for water system throughout the southern California area
  - These pipelines range in size from 36 to 192 inches in diameter
    - The Poseidon pipeline will be 54 inches in diameter
  - Includes over 70,000 linear feet in various projects for the SDCWA

- J.F. Shea has also recently completed the world’s largest reverse osmosis wastewater (75 MGD) to drinking water treatment plant

Select J.F. Shea Experience
Advanced Water Treatment Plant, Fountain Valley, California

San Diego Pipeline No. 6, Winchester, California

Walnut Hill Water Treatment Plant, Boston, Massachusetts
IDE Technologies Ltd.

IDE is an internationally recognized leader in the turnkey delivery and operation of large scale seawater desalination projects

- IDE has developed nearly 400 plants in more than 40 countries worldwide over its 45 years of operation

- The installed capacity of IDE plants is over 530 MGD
  - Includes 3 reverse osmosis projects of similar or larger size than the Carlsbad project

- Currently designing and constructing the Soreq Desalination Project which will be a 109 MGD seawater reverse osmosis plant

- Named the “Desalination Company of the Year” for 2010 Global Water Intelligence

**Select IDE Projects**

**Hadera Desalination Plant, Israel**
The world’s largest (92 MGD) reverse osmosis desalination plant completed in 2010

**Ashkelon Desalination Plant, Israel**
The world’s then-largest (87 MGD) seawater reverse osmosis desalination plant completed in 2006

**Reliance Industries Desalination Plant, India**
India’s largest seawater desalination plant, and one of the world’s largest multi effect distillation (MED) plants completed in 1998; last expanded in 2008
Project Setting
Site Configuration
Project Video
Carlsbad

Desal WTP
Encina Power Station

54-inch steel pipe
10-miles

San Marcos
Pipeline 4
Pipeline 3

P3 relining
5-miles

TOVWTP

Pipeline Interconnection

Pipeline 3

Pacific Ocean
Desal Conveyance Pipeline
10-miles of new 54-inch pipe
Desalination Conveyance Pipeline

- 10-miles of 54-inch welded steel pipeline
- Poseidon / Kiewit-Shea will be responsible for design and construction
- SDCWA will own, operate and maintain
- Built entirely within existing city streets
  - Carlsbad
  - Vista
  - San Marcos
- Traffic control measures to minimize public impacts
- Approximately 2-year construction duration
- Two construction headings working simultaneously
Pipeline 3 Relining
Twin Oaks Valley Water Treatment Plant Improvements

- New facilities and modifications to existing facilities
  - New connection to P3
  - New pipeline from P3 to existing treated water storage tanks at TOVWTP
  - Modification to existing treated water flow control facility
  - New water conditioning chemical feed systems
Aqueduct Connection Facilities
Project Schedule

- Approximately 36 months to construct Plant and Pipeline
  - Plant must pass a 30 day performance test to begin commercial operations
- Approximately 30 months to complete Water Authority improvements
# Historical review

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005–2008</td>
<td>• Environmental review and permitting</td>
</tr>
<tr>
<td>2010</td>
<td>• Member Agencies request Water Authority involvement</td>
</tr>
<tr>
<td>July 2010</td>
<td>• Board approved Term Sheet</td>
</tr>
<tr>
<td>2010–2011</td>
<td>• 17 Public meetings</td>
</tr>
<tr>
<td>January 2012 – present</td>
<td>• 15 Public meetings</td>
</tr>
</tbody>
</table>
Balancing Price and Risk

Pursuing an Appropriate Risk/Reward Tradeoff

Why a Water Purchase Agreement?

*Project Risks Assumed by the Water Authority*

*Financial Feasibility of the Project*
Contract Term

- 30 years from the date of commercial operation
- Subject to early buy-out provisions
- Can be extended for up to 3 years due to force majeure events
Poseidon Responsibilities

- Permit, Design and Build the Desal Plant (WPA)
- Permit, Design and Build the Product Water Pipeline (Design-Build Agreement)
- Operate and Maintain the Desal Plant
- Supply Product Water
Water Authority Responsibilities

- “Take or Pay” for Product Water if it meets specifications (minimum of 48,000 AF/Year)
- Timely Construction of TOVWTP Improvements and Pipeline 3 Rehabilitation
- Physically be able to receive Product Water
- Operate and Maintain the Conveyance Pipeline, the TOVWTP Improvements and Pipeline 3
Security for Contract Performance

- Equity Investment: $164 Million
- Project Financing: Non-Performance Risk Incentivizes Bondholders to Cure Breaches
- Letter of Credit to Secure Performance
- Letter of Credit to Assure Financing
Performance Guarantees

- **Product Water Quality Guarantee**
  - Compliance with all federal and state drinking water regulations
  - Additional standards for certain water quality parameters

- **Minimum Product Water Delivery Guarantee**
  - Annual supply to meet Water Authority demands (between 48,000 and 56,000 Acre Feet)

- **Water Ordering Rights**
  - Water Authority rights to adjust delivery orders to reflect seasonal and daily demand changes
Termination & Purchase Options

- Purchase options at Water Authority sole discretion
- Convenience Termination
  - Early buy-out provision
- End of Term
  - $1 end of 30-year term
- Event of Default
Risks Transferred

- Construction and Operating Cost Overruns
- Timely Project Completion
- Regulatory and Law Compliance
- Regulated or Differing Site Conditions
- Capital Maintenance, Repair and Replacement
- Labor Supply and Relations
1. The Electricity Charge is driven by:
   - Terms of Poseidon’s O&M Agreement with IDE
   - SDG&E Rates
   - Water Authority’s option to select supplier

*The Electricity Charge will vary with electricity prices*

2. The Operating Charge is driven by:
   - Terms of Poseidon’s O&M Agreement with IDE
   - Other operating expenses

*The Operating Charge is indexed to CPI*

3. The Capital Charge is driven by:
   - Poseidon’s Capital Budget
   - Bond Issuance
   - Negotiated Equity Return/Developer Fee
   - Development period costs

*The Capital Charge is fixed at a pre-established escalation rate*
First 48,000 Acre Feet paid at Fixed and Variable Price

Next 8,000 Acre Feet paid at Variable Unit Price

If Poseidon does not deliver, Water Authority does not pay

Monthly Payments

Annual Projected Desal Purchases in AF Wet Weather Hydrology

- 2020: 49,328 AF
- 2021: 50,329 AF
- 2022: 49,583 AF
- 2023: 53,633 AF
- 2024: 54,068 AF
- 2025: 54,348 AF
- 2026: 51,373 AF
- 2027: 56,000 AF
- 2028: 55,261 AF
- 2029: 56,000 AF
Once First Year price is set Unit Price increases only with inflation

Cap on Uncontrollables

- Water Unit Price ($/AF)

- Unit Price Ceiling
- Base Unit Price
Cumulative Cap on Adjustment to the Price of Water

Intake System Modification

Water Unit Price ($/AF)

Year:
- 2013
- 2015
- 2017
- 2019
- 2021
- 2023
- 2025
- 2027
- 2029
- 2031
- 2033
- 2035
- 2037
- 2039
- 2041
- 2043
- 2045

Unit Price Ceiling
Intake System Modification
## Future Electricity Prices
### Key Drivers

<table>
<thead>
<tr>
<th>Factors driving higher growth rate</th>
<th>Factors driving lower growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Renewable Portfolio Standard (RPS)</td>
<td></td>
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<tr>
<td>• AB 32</td>
<td>• Natural Gas Prices</td>
</tr>
<tr>
<td></td>
<td>• Demand-Side Response</td>
</tr>
<tr>
<td></td>
<td>• Rate-Setting Process</td>
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</table>
California Energy Commission forecasts SDG&E industrial rates will escalate 0.5% - 1.7% annually.

Water Authority sensitivity analysis to double historic average.

Electricity charge escalation is expected to be comparable with Operating Charge escalation and the fixed escalation of the Capital Charge.

Electricity costs are expected to remain approximately 25% of the Water Unit price over the term of the WPA.

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**Projected Electricity Charge ($/AF)**

![Graph showing projected electricity charge over years (2012-2015)](image)
Total Capital Cost

- Plant and Pipeline Cost: $691 Million
- Financing Costs: $213 Million
- Water Authority improvements and construction oversight: $80 Million

Total Cost: $984 million

Total Unit Cost ¹

<table>
<thead>
<tr>
<th></th>
<th>48,000 acre feet per year</th>
<th>56,000 acre feet per year</th>
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<tr>
<td></td>
<td>$2,290/AF</td>
<td>$2,041/AF</td>
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¹Includes debt service, operations, Water Authority construction oversight and administrative costs
Upcoming Meetings

- **October Special Board Meeting – Oct. 11, 2012**
  - Australian Desalination experience
  - Detailed discussion on Draft WPA costs and terms
  - Continue discussions on financial components
  - Continue discussion on rate structure

- **October Regular Board Meeting – Oct. 25, 2012**
  - Review actions related to Pipeline 3 rehabilitation, Twin Oaks and other distribution system activities
  - Carlsbad Desalination Project Permit status
  - Continue discussions on financial components and rate structure

- **November Special Board Meeting – Nov. 8, 2012**