A Look to the Future: Draft 2035 Water Demand Forecast

SDCWA Water Planning and SANDAG Regional Planning Committee Joint Meeting
February 11, 2011
Land-Use and Water Supply Coordination San Diego Region

CITIES/COUNTY GENERAL PLANS

SANDAG’S REGIONAL GROWTH FORECAST

PROJECTED WATER DEMANDS

URBAN WATER MANAGEMENT PLAN & FACILITIES PLANNING (CIP)

WATER ASSESSMENT (SB 610)
WRITTEN VERIFICATION (SB 221)

WATER SUPPLY ELEMENT
SANDAG REGIONAL COMPREHENSIVE PLAN

CITIES/COUNTY PLANS & POLICIES
Baseline Demand Forecast

- Econometric Model (CWA-MAIN)
- Water Authority forecast = sum of member agency level projections
- Forecast generated by major sector
  - Single-family
  - Multi-family
  - Non-residential
  - Agriculture
## Influence of SANDAG Series 12 Projections on Draft Normal Year Baseline Demands

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direction of SANDAG Projections</th>
<th>Influence on Demand Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied Housing Units</td>
<td>+</td>
<td>🚀</td>
</tr>
<tr>
<td>Real Household Income</td>
<td>+</td>
<td>🚀</td>
</tr>
<tr>
<td>Multi-Family Housing Density</td>
<td>+</td>
<td>🚪</td>
</tr>
<tr>
<td>Total Employment</td>
<td>+</td>
<td>🚀</td>
</tr>
</tbody>
</table>
Forecast Development Process

- Member Water Use Survey
- Historic SANDAG Demographics
- Historic Price and Weather

Water Use Modeling Database

Development of Predictive Models

Testing and Calibration of Predictive Models

SANDAG Forecast

Retail Water Price Estimates

Baseline Water Demand Forecast
Comparison of Forecasted Normal Year and Actual Total Demands (thousand acre-feet)

Rainfall at Lindbergh Field:
- 1985: 7.8 in.
- 1990: 17.1 in.
- 1995: 5.8 in.
- 2000: 22.5 in.
- 2005: 10.6 in.
- 2010: 6 in.
- 2015: 5 in.

- ♦ Forecasted Normal Year Demand
- □ Actual Demand (normalized for weather)
Draft Normal Year Baseline Total Demand (thousand acre-feet)

<table>
<thead>
<tr>
<th>Year</th>
<th>Single Family</th>
<th>Multifamily</th>
<th>Non-Residential</th>
<th>Agriculture</th>
</tr>
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<tbody>
<tr>
<td>2015</td>
<td>300</td>
<td>100</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>400</td>
<td>200</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>2025</td>
<td>400</td>
<td>200</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>2030</td>
<td>500</td>
<td>300</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>2035</td>
<td>600</td>
<td>400</td>
<td>800</td>
<td>0</td>
</tr>
</tbody>
</table>
Comparison of 2005 & Draft 2010 UWMP
Total Demand (excluding future conservation)
Demographic and Economic Factors Influencing the Baseline Demand Forecast

- Current economic recession
- Lower number of projected single family units
- Greater proportional share of future housing units designated as multi-family
- Rate of growth in household income
Our Region. Our Future.

2050 Growth Forecast

February 2011
San Diego County Water Authority
Topics

- Purpose of the SANDAG forecast
- Regionwide projections 2008-2050
Purpose of SANDAG Forecast
San Diego region weathered past booms and busts

Source: California Employment Development Department; National Bureau of Economic Research
Today more than half of San Diegans were born outside of California

- Born in California: 45%
- Born in other state (in US): 3%
- Native; born outside the United States: 2%
- Foreign born: 23%

Source: U.S. Census Bureau, Census 2000
In the future, most growth will be home grown

Source: SANDAG, 2050 Regional Growth Forecast, February 2010
Regionwide age structure: 2008 and 2050

- **85+**
- 80 to 84
- 75 to 79
- 70 to 74
- 65 to 69
- 60 to 64
- 55 to 59
- 50 to 54
- 45 to 49
- 40 to 44
- 35 to 39
- 30 to 34
- 25 to 29
- 20 to 24
- 15 to 19
- 10 to 14
- 5 to 9
- Under 5

**Populations:**
- 2008 = 3.13 mil.
- 2050 = 4.38 mil.

Source: SANDAG, 2050 Regional Growth Forecast, February 2010
2050 population, jobs, housing

Source: SANDAG, 2050 Regional Growth Forecast, February 2010
Shift in structure types affects water demand projections
Accurate population forecast track record

Population (in millions)


Actual Series 4 Series 5 Series 6 Series 7
Series 8 Series 9 Series 10 Series 11
Regional projections

- National Economic Projections 2008-2050
- Regionwide Projection 2008-2050
- Existing Demographic Characteristics (2008)
- Demographic Trends 2008-2050
- Peer Review
Subregional forecast starts with local land use inputs
Forty years in San Diego: Past, Present, and Future

Sources: Caltrans photo archives (1966 and 1993); SANDAG Smart Growth Photo Gallery (2008), County Water Authority photo archives
2008 Housing Distribution

Housing Density 2008
Dwelling Units/Acre
- 0.5 - 2
- 2 - 5
- 5 - 10
- 10 - 20
- 20 - 100
- 100 - 242

Existing Infrastructure
- Highway/Freeway
- Major Arterials

Housing Distribution 2008

SANDAG
December 2010

Riverside Co.
2050 Housing
96% housing growth in County Water Authority area
56% within 10-min. walk of existing high-frequency transit

Housing Distribution 2050

December 2010
2050 Jobs
96% job growth in County Water Authority area
40% within 10-min. walk of existing high-frequency transit
Summary

- Recession affects short term, but long-term growth continues
- Growing and aging population
- More multi-family housing and urban infill
Our Region. Our Future.

2050 Growth Forecast
Innovation at Play: New Technologies and Programs In Water Supply Reliability

SDCWA Water Planning and SANDAG Regional Planning Committee Joint Meeting

February 11, 2011
Historic Approach to Water Planning

The Original Vision (1960s)

- Large North Coast Storage
- Ultimately Deliver 4 MAF
Drought Headlines from 1990-91

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

Limits on tap water use urged by staff

By Steve Lamee

The staff of the San Diego County Water Authority (CWA) will continue to recommend a blanket ban on tap water use on private lawns and golf courses, 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

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.

Grim water outlook is getting even worse

By Steve Lamee

SACRAMENTO – Southern Californians are likely to be ordered to cut back on water consumption by an unprecedented 30 percent this spring unless snow falls on the Sierra Nevada, the area’s chief water official said yesterday.

Companies cringe at 50 percent cut in water

Firms offer conservation plans to mayor; some say cutbacks could cripple growth

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
Uncertainties and Challenges to Water Supply Reliability

- Growth
- Regulations
- Recurring Drought
- Increased Cost of New Supply
- Climate Change
Strategies to Improve Reliability

- Conduct Comprehensive Long-Term Supply Planning
- Encourage Water Efficiently and Pursue Innovative New Supplies
- Diversify Supply Sources
- Invest in Regional Infrastructure

Supply Reliability
Proposed 2010 Urban Water Management Plan

Main Elements

- **Demand Forecast**
  - Econometric Model utilizing SANDAG Regional Growth Forecast

- **Water Use Efficiency Target**
  - Compliance with SBX7-7: 20% savings by 2020

- **Resource Mix and Scenario Planning Process**
  - Identify resource mix to meet demands and plan for supply uncertainties
Innovative Supply Development
Water Authority/Local Retail Agencies

Existing:
- Long-Term Transfer of Conserved Supplies
- Recycled and Brackish Groundwater Projects

Proposed:
- Seawater Desalination
- Indirect Potable Reuse
Driving Water Conservation Ethic 1991-2010

- Comprehensive, multi-decade investment in water conservation
- Focusing on sustained water conservation ethic throughout region
- 2007-2009: enhanced, mass communications campaign
  - 20-Gallon Challenge
- 20% Reduction by 2020:
  - behavioral changes and market transformation

**Stop Water Waste**
Reduce Sprinkler Times

[www.20gallonchallenge.com](http://www.20gallonchallenge.com)

**Dear Neighbor:**

- Overnight is a great time to water. This reduces evaporation and makes water more efficient. While watering by your home, I noticed the following:
  - No automatic sprinkler head or timer:
    - Turn off the sprinkler head or timer.
  - If you have a broken sprinkler head or your irrigation system is leaking:
    - Please make repairs right away. If broken sprinkler has waste 30 gallons per minute or 100 gallons in a three-minute cycle.
  - If your sprinkler is spraying water too high:
    - Please adjust sprinkler heads to prevent over-spray and waste.
  - Lawn sprinklers are on during the day. Most landscapes require watering only 2 to 3 days per week, even less in the winter. To determine where to water, check soil moisture by sticking a shovel or your finger into the dirt. When the soil is dry 1 to 2 inches deep, it’s time to water.
  - Lawn sprinklers are on during the day. Please water only in the late evening or early morning to reduce water loss from evaporation and wind.
  - See the menu for more outdoor conservation tips.

San Diego County Water Authority
Infrastructure Investments in Reliability

$3.8 billion Capital Improvement Program

- $1.5 billion Emergency Storage Project
- New and expanded surface storage
- Regional Water treatment
- Additional Pipelines and system enhancements
- Pump stations
- Clean Energy - hydroelectric generation
- Aqueduct Protection Program
  - Pipeline relining program
- NCCP/HCP mitigation coverage
| Project: Olivenhain Dam & Reservoir | Complete: 2003 | Cost: $198 million | Benefit: 22,000 AF of storage |
Project: Lake Hodges Projects
Complete: 2011
Cost: $196 million
Benefits: 20,000 AF ESP storage; 40MW of power
<table>
<thead>
<tr>
<th>Project: All American &amp; Coachella Canal Lining Projects</th>
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<tbody>
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<td>Complete: 2010 (AAC) and 2006 (CC)</td>
</tr>
<tr>
<td>Cost: $452 million total, including $198 million from Water Authority</td>
</tr>
<tr>
<td>Benefits: 80,000 AF/Y for 110 Years</td>
</tr>
</tbody>
</table>
Project: Twin Oaks Water Treatment Plant
Complete: 2008
Cost: $179 million
Benefit: 100 MGD advanced membrane treated supply for region
Project: Pipeline Relining Program
Complete: Ongoing
Cost: $780 million
Benefit: Extend the life of 82 miles of large-diameter imported water pipeline by 100 years
Project: San Vicente Tunnel & Pipeline System
Complete: 2011
Cost: $459 million
Benefit: Improved Water Delivery
Project: San Vicente Dam Raise
Complete: 2013
Cost: $482 million
Benefit: 152,000 AF of new storage
Diversifying San Diego County’s Water Supply Portfolio

1991

- 5% Metropolitan Water District
- 95% Local Surface Water

2010 (Allocation Year)

- 52% Metropolitan Water District
- 13% Imperial Irrigation District Transfer
- 3% All American & Coachella Canal Lining
- 4% Seawater Desalination
- 6% Local Surface Water
- 11% Recycled Water
- 5% Groundwater

2020 Goal (2005 UWMP)

- 23% Metropolitan Water District
- 22% Imperial Irrigation District Transfer
- 17% All American & Coachella Canal Lining
- 10% Seawater Desalination
- 6% Local Surface Water
- 6% Recycled Water
- 9% Groundwater
- 7% Conservation
Conclusion

• Strategies are working
  • Diversified supply sources
    • Reduced reliance on MWD
    • Decreased shortage level during cutbacks
  • Achieved sustained conservation and developed innovative supply sources

• Continued implementation of strategies
  • Long-term comprehensive planning through preparation of Urban Water Management Plans
  • Maintain diversification efforts
  • Pursue further innovative supply sources
Conclusion (cont.)

- Coordination between SANDAG and Water Authority critical to ensuring reliable supply for the region
- Staff will continue to coordinate to ensure adequate supplies for future growth
Innovation at Play: New Technologies and Programs in the Respective Fields

February 11, 2011 Joint Meeting
San Diego Regional Comprehensive Plan

Adopted by SANDAG in 2004

- Urban Form
- Transportation
- Housing
- Health Environment
- Economic Prosperity
- Public Facilities
- Borders
The RCP Approach

- Connect transportation and land use plans
- Guide infrastructure investments
- Provide incentives and collaboration

Smart Growth and Sustainability
Smart Growth Concept Map

Smart Growth Areas

<table>
<thead>
<tr>
<th>Existing/Potential</th>
<th>Metropolitan Center</th>
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<tbody>
<tr>
<td></td>
<td>Urban Center</td>
</tr>
<tr>
<td></td>
<td>Town Center</td>
</tr>
<tr>
<td></td>
<td>Community Center</td>
</tr>
<tr>
<td></td>
<td>Rural Village* (with core area)</td>
</tr>
<tr>
<td></td>
<td>Mixed Use Transit Corridor</td>
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<tr>
<td></td>
<td>Special Use Center</td>
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Smart Growth Place Types

- **Urban Center**
- **Town Center**
- **Community Center**
- **Rural Village** (with core area)
- **Mixed Use Transit Corridor**
- **Special Use Center**

Transit Service

- P=Priority Transit (35+ SP)
- M=Metropolitan Transit (35+ FF)
- Light/Commuter Rail Route
- Rapid Transit Route
- High Frequency Local Service
- Existing Major Employment Areas
- Habitat Planning Preserve Areas
- Transit Priority Areas

Smart Growth Concept Map

**SANDAG**

July 20, 2005
Visual Simulation
Euclid Ave Trolley Station at Market Street
Euclid Ave Trolley Station at Market Street San Diego, CA
Smart Growth Incentive Program

Capital Improvements:
- Sidewalks, plazas
- Streetscape enhancements
- Improvements to transit stations
- Other community initiatives

Planning Grants
- General plan updates
- Specific plans
- Zoning regulations

$280 million
Environmental Mitigation

$850 million

Regional Habitat Conservation Fund $200 million

Major Highway & Transit Project Mitigation $450 million

Local Transportation Project Mitigation $200 million
Healthy Neighborhoods
For More Information

- Muggs Stoll
  mst@sandag.org

- SANDAG Web site
  sandag.org