Recycled and Purified Water Development in Santa Clara County

WateReuse Chapter Meeting
August 21, 2015

Garth Hall, Deputy Operating Officer
Water Supply Management Division
Presentation Outline

• District Water Supplies
• Recycled Water
• Potable Reuse
• Silicon Valley Advanced Water Purification Center
• Drought Response: Launch IPR
Secure Existing Supplies & Infrastructure

Maintain and rehabilitate existing infrastructure and supplies

Increase non-potable recycled water use to 30,000 acre-feet per year

Increase annual conservation savings to 99,000 acre-feet per year
Santa Clara County Groundwater

- Nearly half the water used in the county (150,000 AFY)
- Primary reserve for multi-year droughts
- The District protects and augments groundwater per our governing act and Board policy
Extended Droughts are the Greatest Challenge to Supply Reliability

Our mission is to provide Silicon Valley safe, clean water for a healthy life, environment, and economy.
Wastewater Treated vs. Recycled Water for 2014

- **San Jose/Santa Clara Regional Wastewater Facility**: 120,975
- **South County Regional Wastewater Authority**: 8,000
- **Sunnyvale Water Pollution Control Plant**: 15,832
- **Palo Alto Regional Water Quality Control Plant**: 30,000

Wastewater Treated (AF) vs. CY 2014 Recycled Water (AF)
Background

Goals and Targets

Recycled Water Use (acre-ft/year)

- Non-Potable Reuse
- Potable Reuse

WSIMP Goal 2035

Calendar Year

1995 2005 2015 2025 2035
Potable Reuse
Rationale for Potable Reuse

• Non-potable recycled water (purple pipe) expansion insufficient to meet future needs
• Additional water conservation efforts insufficient to meet future needs – need the “wet stuff”
• Potable reuse (using purified water) identified as most reliable and cost-effective option, per the District’s Water Supply & Infrastructure Master Plan
Public Outreach

- Expand Tour Program
- Further Develop Community Outreach Program
- Develop Stakeholder Outreach & Engagement Program
- Produce Collateral Materials
- Provide Optional Support Services
Education Leads to Public Acceptance

% of Public Acceptance

<table>
<thead>
<tr>
<th>Percent</th>
<th>Before Information</th>
<th>After Information</th>
<th>After Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>31%</td>
<td>53%</td>
<td>69%</td>
</tr>
</tbody>
</table>

Legend:
- Oppose
- Neutral
- Favor

Education leads to public acceptance after an explanation.
Benefits of the SVAWPC

- Water quality benefit
- Operational benefit
- Demonstration of potable reuse benefit

The highest quality water tomorrow from the best available technology today
Outgoing TDS = 40 ppm

Incoming TDS = 750 ppm

0.1 micron

0.0001 micron
Drought Response: Launch IPR
Potential Groundwater Impacts Due to Extended Drought

Water Shortage Contingency Plan Stage

- NORMAL: Above 300,000 AF
- ALERT: 250,000 – 300,000 AF
- SEVERE: 200,000 – 250,000 AF
- CRITICAL: 150,000 – 200,000 AF
- EMERGENCY: Below 150,000 AF

Projected Continued Drought

- 2014
- 2015
- 2016
- 2017
- 2018
- 2019

Increased Subsidence Risk

- 0%
- 13%
- 20%
- 20%

IPR could raise groundwater storage by 35,000 AF each year

Scenarios of Different Water Use Reductions

(with 25,000 AF additional imported water)
Expedited IPR projects could produce up to 45,000 AFY by 2020
Proposed Purified Water Projects

- Mid-Basin Injection Wells IPR - 5,600 AFY
- DPR to Central Pipeline - 5,000 AFY
- Ford Recharge Pond IPR – 4,200 AFY
- Los Gatos Recharge Ponds IPR - 20,200 AFY
- Sunnyvale IPR
- Westside Injection Wells IPR
- Sunnyvale WPCP
- Palo Alto WPCP

Legend:
- IPR/DPR Purified Water Pipeline
- Future Wolfe Road Pipeline
- Existing Recycled Water Pipeline
- District Raw Water Pipeline
- Expanded SVAWPC
- Water Pollution Control Plant
- Water Treatment Plant
- Pump Station

Map showing the locations and connections of various water management projects.
## Proposed Projects for Purified Water Expansion

<table>
<thead>
<tr>
<th>Description</th>
<th>Capacity (AFY)</th>
<th>Ext. Capital Costs ($M)</th>
<th>Est. Total O&amp;M Costs ($M/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ford Recharge Ponds IPR</td>
<td>4,200</td>
<td>$70</td>
<td>$4.0</td>
</tr>
<tr>
<td>Mid-Basin Injection Wells IPR</td>
<td>5,600</td>
<td>$140</td>
<td>$3.5</td>
</tr>
<tr>
<td>Los Gatos Recharge Ponds IPR</td>
<td>20,200</td>
<td>$260</td>
<td>$10.0</td>
</tr>
<tr>
<td>Westside Injection Wells IPR (or Central Pipeline DPR)</td>
<td>5,000 (5,000)</td>
<td>$120 ($65)</td>
<td>$4.0 ($4.5)</td>
</tr>
<tr>
<td>Sunnyvale IPR</td>
<td>10,000</td>
<td>$210</td>
<td>$2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>45,000</td>
<td><strong>$800</strong></td>
<td><strong>$23.5</strong></td>
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</table>

1, 2, 3, 4 South Bay Water Recycling Master Plan; 5 IPR Treatment Study, Carollo Engineers; 6 As presented in the March 12, 2015 agenda memo, these costs are at a planning level of development and should be considered within a range of -20% to +100%
# Preliminary Timeline

## Preliminary Timeline Without CEQA Exemption and Permit Streamlining

<table>
<thead>
<tr>
<th>Year/Month</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Preliminary Engineering Work (RMC/CDM)</td>
<td>Operations Studies (Maine)</td>
<td>Groundwater Studies (Todd Engineers)</td>
<td>Pursue Grants and Other Funding (Carollo/Gutierrez)</td>
<td>Outreach (Katz &amp; Associates)</td>
<td>SC RW Master Plan Amendment (MWH)</td>
</tr>
<tr>
<td>2</td>
<td>Financial Services to Evaluate Public-Private Partnerships</td>
<td>Project Management Services (may continue)</td>
<td>Legal Services</td>
<td>Brine Studies</td>
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<tr>
<td>3</td>
<td>Purified Water Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>SVAWPC Exp. - Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Sunnyside IPR - Design &amp; Construction</td>
<td>To 2026</td>
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*Note: With CEQA Exemption, Construction Could Begin and Complete Earlier.*

*The Sunnyvale IPR Project Schedule may be extended to 2026.*

- = Securing Contract. This includes Request For Qualifications (RFQ), negotiations, and contract execution.
- = Conducting Work. This includes work prepared by consultant(s).
- = Work underway.
Key Technical Questions

- Reverse Osmosis Concentrate Management
- Groundwater Analysis and Injection Well Siting
- Operational Studies
Groundwater IPR Technical Questions

• Use groundwater models to evaluate movement of purified water, retention time, and proximity to water supply wells

• Conduct lab testing of soil cores to assess potential effects on groundwater quality or permeability
Well Drilling and Monitoring Wells

Well drilling

Monitoring wells

Monitoring well vault in sidewalk
RO Concentrate Management Alternatives

- Discharge to existing shallow water Bay outfall with dilution water
- Treatment wetlands, then discharge to the Bay
- Pre-treatment to produce a brackish supply for wetlands restoration
- Discharge to a sewer line that goes to a regional wastewater treatment plant
- Discharge to deep Bay outfall
### Permits

<table>
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<tr>
<th>Permits</th>
<th>Required</th>
<th>Potential</th>
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<td>CEQA</td>
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<tr>
<td>NPDES (Clean Water Act Section 402)</td>
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<td>CA Fish &amp; Wildlife Streambed Alteration Agreement</td>
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<td>CDFW (Section 1602 Agreement )</td>
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<td>Valley Habitat Plan</td>
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<td>Air Quality Control Permit</td>
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<td>Clean Water Act Section 404 Permit</td>
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<tr>
<td>401 Water Quality Certification</td>
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<td>Report of Waste Discharge (ROWD)</td>
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<tr>
<td>Engineering Report-Approval under Title 22</td>
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<tr>
<td>401 Water Quality Certifications and Wetlands Program</td>
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<tr>
<td>Public Water System (PWS) permits</td>
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<td>✓</td>
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</table>
Independent Advisory Panel Assures Quality

Nationally recognized experts review the District’s approach to potable reuse – assess, review, and guide District’s efforts

April 30, 2013

May 29, 2014
Questions