Water Conservation BMPs: Wholesale Agency Assistance Programs

RWSPG Meeting
March 25, 2008

Presented by Ylda Piñeyro, CMAP
Presentation Overview

- About Wholesalers
- Benefits of Water Conservation Programs
- Wholesale Agency Assistance Programs
- Case Studies
- Recommendation Statements Discussion
Wholesale Water Agency

- Quasi-governmental agencies
- Import water large quantities of water, typically from remote sources, rivers and manmade reservoirs
  - Requires extensive water conveyance systems, like canals, aqueducts, and large transmission pipelines
- Provide a reliable and safe water source for local water agencies where the local supply is insufficient
- Each wholesale water agency sets the rates for purchased water to recover operational and maintenance expenses and infrastructure costs
Local Wholesalers in Our 11-County Region

• City of Chicago
• DuPage Water Commission
• Village of Bedford Park Water Department
• Oak Lawn Water Utility
• Central Lake County Joint Water Agency
Elements of Successful Water Conservation Programs

• Political leadership
• Stakeholder involvement in the planning and implementation stages
• A detailed policy outlining goals and conservation measures
• Detailed water data, demand forecasting, and monitoring
• Stable funding sources for water conservation initiative
• Sufficient staff and technical assistance to implement programs
• Broad-based education and outreach

(Hinkle, Keyes, Schmitt, 2004)
Benefits of Water Conservation Programs to the Wholesaler

• Economies of scale for program implementation
• System-wide water savings
• Significant avoided costs of water
• Good environmental stewards
• Positive public perception
Benefits to Retailers Partnering with a Wholesaler

- Economies of scale for program participation
- Avoided costs of water
- Access to technical support
- Utilization of specialized staff
- Administrative savings
- Good environmental stewards
- Positive public perception
Additional Benefits

- Reduction in wastewater collection and treatment
- Energy savings – industry, customers, water providers, etc.
- Customer benefit – potentially lower bills through credits or rates
- Nature’s benefit – water is a natural resource, abundant in some cases, but also finite
Wholesale Agency Assistance Programs
Types of Assistance Programs

- Program Management
- Financial Support
- Technical Support
- Water Shortage Allocations
Program Management

• Develop regional goals in cooperation with partners
  – Water savings plan to be accomplished over a period of time, i.e., 10 years or 20 years
  – Water consumed per capita per day
  – Unaccounted for water loss (UAW)

• Identify effective measures and incentives
  – Conservation measures (delivery systems)
  – Incentives/disincentives (landscape rebates or rates structures)
Financial Support

• Provide financial incentives to advance water conservation efforts and effectiveness
  – Retrofit programs
  – Grant or matching programs
  – Low or no-interest loans
Technical Support

• Provide training or tools available to retail systems
  – Water Conservation Plans
  – Retail System Water Loss
  – Industrial Water Audits
  – Public Information and School Education
  – Drought/Emergency Contingency Plans

• Offer specialized staff, such as water conservation experts
Water Shortage Allocations

• Identify solutions with retail partners for long-term conservation policies and goals
• Drought allocation evaluations
  – Communities participating in conservation programs are not asked to conserve water twice during drought
Case Studies
Wholesale Water Agency Program Case Studies

• Metropolitan Water Resources Authority (MWRA) – Boston region
• Metropolitan Water District of Southern California (MWD) – Orange County region
• Seattle Public Utilities (SPU) – Seattle region
Massachusetts Water Resources Authority (MWRA)

**Water Savings Results**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total demand reduction (1987 – 1997)</td>
<td>85 MGD</td>
</tr>
<tr>
<td>Capacity reduction of planned treatment facility</td>
<td>95 MGD</td>
</tr>
</tbody>
</table>

**Capital Savings Results (2002)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present value savings of deferring supply expansion</td>
<td>$75-$117 million</td>
</tr>
<tr>
<td>Present value savings of reducing treatment plant capacity</td>
<td>$36 million</td>
</tr>
<tr>
<td>Total Savings (deferring water supply and reducing treatment plant capacity)</td>
<td>$1.39 mil./MGD to $1.91 mil./MGD</td>
</tr>
</tbody>
</table>

MGD = million gallons per day

- Water Conservation Program
  - Leak detection surveys
  - Retrofitting plumbing devices
  - Public information and school education
  - Plumbing code updates
  - New rates structures for retailers
  - Water audits

(Source: EPA832-B-02-003 July)
Accomplishments of MWRA

- Initial leak detection saved 30 million gallons of water
- Since 1987, MWRA has seen a cost savings of $700-$800 million
- Water demand is well below reliable yield – 220 million gallons water per day
- Massachusetts Department of Environmental Protection requires conservation goals for water withdrawals
  - Current standards:
    - Residential goal – 85 gal/capita/day
    - System-wide – unaccounted for water loss to not exceed 15%
  - New Standards:
    - Residential goal – 65 gal/capita/day
    - System-wide – unaccounted for water loss to not exceed 10%
- MWRA exceeds the new standards for residential goal – 61 gal/capita/day
### Metropolitan Water District of Southern California (MWD)

- **Water Conservation Program**
  - 50% of water conservation project or $195 per acre-foot on conserved water or whichever is less
  - Education and training
  - Support for new legislative initiatives or improved fixture standards
  - Water efficiency surveys
  - Toilet retrofit and washing machine rebates, irrigation equipment improvements

### Conservation Program Activities and Water Savings Results (2001)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td># of pre-toilets replaced</td>
<td>2 million</td>
</tr>
<tr>
<td># of high-efficiency showerheads</td>
<td>3 million</td>
</tr>
<tr>
<td>distributed</td>
<td></td>
</tr>
<tr>
<td># of faucet aerators distributed</td>
<td>200,000</td>
</tr>
<tr>
<td># of clothes washer rebates issued</td>
<td>20,000</td>
</tr>
<tr>
<td># of residential water-use surveys</td>
<td>60,000</td>
</tr>
<tr>
<td>conducted</td>
<td></td>
</tr>
<tr>
<td># of large landscape irrigation audits</td>
<td>2,000</td>
</tr>
<tr>
<td># of commercial water use</td>
<td>1,000</td>
</tr>
<tr>
<td>surveys conducted</td>
<td></td>
</tr>
<tr>
<td>Total water savings from</td>
<td>66,000 AFY</td>
</tr>
<tr>
<td>conservation program</td>
<td>(59.1 mgd)</td>
</tr>
</tbody>
</table>

AFY=acre-feet per year
mgd=million gallons per day

(Source: EPA832-B-02-003 July)
Current Savings and Accomplishments

- MWD has invested about $205 million in conservation activities, saving nearly 1 million acre-feet of water since 1990.
- MWD’s plan goal for water conservation is 1.1 million acre-feet annually by 2025, with about 300,000 acre-feet available from incentive-based programs.

<table>
<thead>
<tr>
<th>Metropolitan-Assisted Local Resources</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Active Conservation</td>
<td></td>
</tr>
<tr>
<td>FY 2006/07 New Water Saved from Active Conservation Programs</td>
<td>8,300 acre-feet</td>
</tr>
<tr>
<td>FY 2006/07 Water Saved from New &amp; Existing Active Conservation Programs</td>
<td>118,000 acre-feet</td>
</tr>
<tr>
<td>Cumulative Water Saved from Active Conservation Programs</td>
<td>977,000 acre-feet</td>
</tr>
<tr>
<td>FY 2006/07 Active Conservation Investment</td>
<td>$15.4 million</td>
</tr>
<tr>
<td>Cumulative Active Conservation Investment</td>
<td>$205 million</td>
</tr>
<tr>
<td>Total FY 2006-07 Conservation Investment</td>
<td>19.9 million</td>
</tr>
</tbody>
</table>
# MWD’s Water Savings Since 1991

## Water Saved From New & Existing Active Conservation Programs (Acre-Feet)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>300</td>
<td>15,400</td>
<td>12,600</td>
<td>17,800</td>
<td>20,100</td>
<td>31,000</td>
<td>50,800</td>
<td>51,200</td>
</tr>
<tr>
<td>1999</td>
<td>63,200</td>
<td>67,000</td>
<td>81,600</td>
<td>88,800</td>
<td>96,200</td>
<td>100,900</td>
<td>104,600</td>
<td></td>
</tr>
</tbody>
</table>

## Cumulative Water Saved From Active Water Conservation Programs (Acre-Feet)

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>300</td>
<td>15,700</td>
<td>28,300</td>
<td>46,200</td>
<td>66,200</td>
<td>97,300</td>
<td>148,100</td>
<td>199,400</td>
</tr>
<tr>
<td>1999</td>
<td>199,400</td>
<td>256,600</td>
<td>319,700</td>
<td>468,400</td>
<td>557,200</td>
<td>653,300</td>
<td>754,200</td>
<td>858,900</td>
</tr>
</tbody>
</table>
Seattle Public Utilities

<table>
<thead>
<tr>
<th>Regional 1% Conservation Program Savings and Cost</th>
<th>Annual Avg. MGD</th>
<th>Program Cost in Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential indoor</td>
<td>0.21</td>
<td>$1,196</td>
</tr>
<tr>
<td>Landscape</td>
<td>0.04</td>
<td>$400</td>
</tr>
<tr>
<td>Commercial non-landscape</td>
<td>0.28</td>
<td>$981</td>
</tr>
<tr>
<td>Behavior</td>
<td>0.40</td>
<td>$542</td>
</tr>
<tr>
<td>Total in 2006</td>
<td>0.93</td>
<td>$3,119</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Long-term Savings</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seattle Ordinance</td>
<td>0.05</td>
<td>-</td>
</tr>
<tr>
<td>Price Impact</td>
<td>0.23</td>
<td>-</td>
</tr>
<tr>
<td>Plumbing Code</td>
<td>0.74</td>
<td>-</td>
</tr>
<tr>
<td>Total in 2006</td>
<td>1.02</td>
<td>-</td>
</tr>
</tbody>
</table>

- **1% Water Conservation Program**
  - Hardware incentives
    - Residential indoor
    - Landscape
    - Commercial non-landscape
  - Behavior
    - Pricing
    - Public information and education
  - Other Long-term Savings
    - Seattle ordinance
    - Price impacts
    - Plumbing code improvements

(Source: Saving Water Partnership 2006 Annual Report)
Growth in Population and Water Consumption
Seattle Regional Water System 1975-2006
Cumulative Water Savings Since 1999

1 Chart 3 provides historical progress rather than an absolute count of cumulative savings. All program categories are shown as annual average savings.
Regional 1% Program
Cumulative Savings

<table>
<thead>
<tr>
<th></th>
<th>2000-01 “Ramp-Up” (2-yr total)</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual 1% Savings Cumulative in MGD</td>
<td>2.1</td>
<td>3.1</td>
<td>3.7</td>
<td>4.4</td>
<td>5.3</td>
<td>6.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target 1% Savings Cumulative in MGD</td>
<td>1.6</td>
<td>2.5</td>
<td>3.6</td>
<td>4.5</td>
<td>5.4</td>
<td>6.5</td>
<td>7.7</td>
<td>8.8</td>
<td>9.9</td>
<td>11.0</td>
</tr>
</tbody>
</table>

- Year-by-Year savings targets and actual accomplishments
Conclusions

• Significant avoided cost of water to wholesalers and retailers
• Goal-setting to address crisis or for precautionary measures
• Programs are a mix of various elements and change with new tools and technologies
• Water conservation programs require an investment similarly to large construction projects
Recommendation Statements

• The Northeastern Illinois RWSPG and CMAP, in cooperation and coordination with other appropriate stakeholders should develop conservation potential assessment tool to determine cost, volume and reliability of conservation savings that will help to direct demand reduction programs toward the most cost-effective conservation strategies.

• Based on the conservation savings tool assessment wholesale water agencies, in cooperation with state and regional partners, should design and implement locally cost-effective BMP conservation programs for retail utilities.
Questions or Comments?
THANK YOU!

Water Conservation BMPs:
Wholesale Water Agency Assistance Programs

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