This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Dirt Cheap Water:
The MWDOC WUE Master Plan - $415/AF - What?

Water Smart Innovations Conference
2014

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Tom Chesnutt, A & N Technical Services, Inc.
Presentation Content

• Who is the Municipal Water District of Orange County?

• Why Water Use Efficiency?

• What is a Water Use Efficiency Master Plan?

• Master Plan Development

• What is in the Master Plan?

• First year implementation progress report
Municipal Water District of Orange County, California

Water wholesaler and resource planning agency

- Ensure a reliable supply of imported water
- 28 cities/retail water agencies

Governed by seven-member elected board of directors

Service area: 600 sq. miles

Service area population:

- Nearly 2.3 million
Background – Why Water Use Efficiency?

• California Constitution: Article 10 Water –
  ▪ “......waste or unreasonable use ...... be prevented, and that the conservation of such waters is to be exercised”

• Water Demand Management Measures: Water Management Grant or Loan Funds (2007, AB 1420) –
  ▪ Conditions eligibility for water management grants or loans

• The Water Conservation Act of 2009 (SBx 7-7) –
  ▪ Requires urban retail water providers to achieve a 20% reduction in per capita water use by 2020
Background – Why Water Use Efficiency?

It is part of Southern California’s Integrated Resources Plan for water supply reliability.

It is the least expensive water supply opportunity in OC.

It provides multiple benefits:
- Energy savings
- Dry-weather runoff reduction
- Non-point source pollution prevention

It helps to manage water supply costs to water agencies and consumers.
What is a Water Use Efficiency Master Plan?

A 5-year road map for implementation of cost-effective, stakeholder-supported, water use efficiency programs for Orange County, California
Process for Developing the Master Plan

Steps

• Hired a Technical Consultant and Facilitator
• Held three stakeholder meetings to gather input
• Utilized the Alliance for Water Efficiency Water Conservation Tracking Tool

Themes

• Rigorous Analytics and Open Process
• Participatory
• Transparent and Empirical Planning Basis

A & N Technical Services Inc.

Alliance for Water Efficiency
What is in the Water Use Efficiency Master Plan?

- Executive Summary
- Overview and Strategy
- Planning Process
- Demand Assessment and Savings Potential
- Water Savings Goal and Compliance Assessment
- Possible Projects, Programs, and Policies
- Recommended Projects, Programs, and Policies
- Implementation Plan
Program Evaluation Criteria

Criteria considered in selecting Programs

- Cost – Effectiveness from different perspectives
- Certainty of Savings—Measurement, Evaluation, and Verification
- Innovation—Breaks new ground, removes implementation uncertainty, transforms market
- Market Potential – Possible savings based on segment
- Ease of Implementation, Adaptability
- Potential for Future Grant Funding
- Complies with Local, State, and Federal
- Collaboration — Avoids mandates, empowers implementers
- Broad Support – Water agencies, customers, stakeholders, builds a common understanding of WUE in OC
Past Achieved Program Activity

Incentive Funds by Sector

- Landscape
- CII
- Residential

Incentive Funds ($)

Years: 1990-2012
# Understanding Demand: Use by Market Sector

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Share (%)</th>
<th>Demand (AF)</th>
<th>Number of Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family Indoor and Outdoor</td>
<td>43.9%</td>
<td>237,658</td>
<td>612,389</td>
</tr>
<tr>
<td>Multi-Family Indoor and Outdoor</td>
<td>15.8%</td>
<td>85,462</td>
<td>65,026</td>
</tr>
<tr>
<td>Commercial, Industrial and Institutional Indoor and Outdoor</td>
<td>21.5%</td>
<td>116,226</td>
<td>63,426</td>
</tr>
<tr>
<td>Dedicated Irrigation</td>
<td>6.0%</td>
<td>32,638</td>
<td>12,680</td>
</tr>
<tr>
<td>Recycled</td>
<td>6.7%</td>
<td>36,010</td>
<td>7,597</td>
</tr>
<tr>
<td>Non-Revenue Water</td>
<td>6.1%</td>
<td>32,982</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>540,976</strong></td>
<td><strong>761,118</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Orange County Water Suppliers Water Rates and Financial Information (2011) MWDOC
## Estimated Customer Water Use by MWDOC-Defined Market Sectors

<table>
<thead>
<tr>
<th>Estimated Use by MWDOC Market Sector</th>
<th>Demand (AF)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (Indoor)</td>
<td>181,363</td>
<td>36%</td>
</tr>
<tr>
<td>Landscape</td>
<td>246,075</td>
<td>48%</td>
</tr>
<tr>
<td>Commercial, Industrial, Institutional (Indoor)</td>
<td>80,556</td>
<td>16%</td>
</tr>
</tbody>
</table>
### Indoor vs Outdoor Water Use

<table>
<thead>
<tr>
<th></th>
<th>Average Annual Water Demand</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor</td>
<td>309,667</td>
<td>52%</td>
</tr>
<tr>
<td>Outdoor</td>
<td>291,227</td>
<td>48%</td>
</tr>
</tbody>
</table>

#### Total Use (5 Year Average)

- **Winter Irrigation**
- **Indoor**

![Graph showing total water use over 5 years with indoor and winter irrigation highlighted]
What is the Conservation Potential?

<table>
<thead>
<tr>
<th>Sector, Measures, End Uses</th>
<th>Stage</th>
<th>Description of Potential</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Indoor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilets</td>
<td>Late</td>
<td>Small number 3.5gpf, ULF to HET, &gt;HET?</td>
<td>Low</td>
</tr>
<tr>
<td>Faucets, Aerators, Flow Restrictors</td>
<td>Late</td>
<td>Small remaining potential</td>
<td>Low</td>
</tr>
<tr>
<td>Showerheads</td>
<td>Late</td>
<td>Very low flow rates, behaviour</td>
<td>Low</td>
</tr>
<tr>
<td>Clothes Washers</td>
<td>Mid</td>
<td>Low saturation</td>
<td>High</td>
</tr>
<tr>
<td>Pressure Regulating Valves</td>
<td>Pilot, Research</td>
<td>Covers all end uses</td>
<td>High</td>
</tr>
<tr>
<td>Surveys, Education, Outreach</td>
<td>Ongoing</td>
<td>Gateway program, behaviour</td>
<td>Low</td>
</tr>
<tr>
<td>Conservation Rates</td>
<td>Developing</td>
<td>Covers all end uses</td>
<td>High</td>
</tr>
<tr>
<td>Landscape</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controllers</td>
<td>Mid</td>
<td>SF Residential large remaining potential</td>
<td>High</td>
</tr>
<tr>
<td>Nozzles</td>
<td>Early</td>
<td>Large remaining potential</td>
<td>High</td>
</tr>
<tr>
<td>Turf Replacement, Low Water Plants</td>
<td>Early</td>
<td>Huge technical potential; small economic potential</td>
<td>High</td>
</tr>
<tr>
<td>Artificial Turf</td>
<td>Early</td>
<td>Huge technical potential; small economic potential</td>
<td>High</td>
</tr>
<tr>
<td>Pressure Regulating Valves</td>
<td>Pilot, Research</td>
<td>Covers all end uses</td>
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<tr>
<td>Conservation Rates</td>
<td>Developing</td>
<td>Covers all end uses</td>
<td>High</td>
</tr>
<tr>
<td>CII (Non-Landscape)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilets</td>
<td>Late</td>
<td>Small number 3.5gpf, ULF to HET, &gt;HET?</td>
<td>Low</td>
</tr>
<tr>
<td>Urinals</td>
<td>Mid</td>
<td>High traffic sites</td>
<td>Mid</td>
</tr>
<tr>
<td>Faucets, Aerators, Flow Restrictors</td>
<td>Late</td>
<td>Small remaining potential</td>
<td>Low</td>
</tr>
<tr>
<td>Showerheads</td>
<td>Mid</td>
<td>Sports facilities, accomodation</td>
<td>Mid</td>
</tr>
<tr>
<td>Food Service Equipment</td>
<td>Mid</td>
<td>Needs short pay back</td>
<td>Mid</td>
</tr>
<tr>
<td>Laundry</td>
<td>Mid</td>
<td>High water use is economic incentive</td>
<td>High</td>
</tr>
<tr>
<td>Industrial Processes and Manufacturing</td>
<td>Early</td>
<td>Acceptance, regulatory issues, competitiveness</td>
<td>High</td>
</tr>
<tr>
<td>Cooling</td>
<td>Mid</td>
<td>Needs short pay back</td>
<td>High</td>
</tr>
<tr>
<td>Pressure Regulating Valves</td>
<td>Pilot, Research</td>
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Technical Potential in the Rough

- Technical potential does not consider economics, institutional constraints, implementation feasibility, regulatory issues, and some esthetic qualities.

- It is meant to provide enough water to sustain health, lifestyle, and the economy.

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<th>Low</th>
<th>High</th>
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<tr>
<td>Residential (Indoor)</td>
<td>181,363</td>
<td>18,136</td>
<td>36,273</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>246,075</td>
<td>36,911</td>
<td>123,038</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>CII</td>
<td>80,556</td>
<td>8,056</td>
<td>24,167</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>507,994</strong></td>
<td><strong>63,103</strong></td>
<td><strong>183,477</strong></td>
</tr>
</tbody>
</table>
Cost Effectiveness Analysis-Existing Programs

Conservation Activities Sorted by Unit Cost
($ per acre foot saved)

- SoCal WaterSmart In-Stem Flow Regulators, CII: $91
- SoCal WaterSmart HE Large Rotary Nozzles (Set of 2), CII: $90
- SoCal WaterSmart HET (Tank-Type), CII: $34
- FreeSprinklerNozzle.com Voucher Program: $180
- SoCal WaterSmart UL or Zero Water Urinal (Retrofit), CII: $185
- SoCal WaterSmart Laminar Flow Restrictors, CII: $222
- SoCal WaterSmart Cooling Tower pH Controller, CII: $230
- SoCal WaterSmart Cooling Tower Conductivity Controller, CII: $248
- Industrial Pay for Performance: $249
- Large Landscape Customized Incentive: $249
- WaterSmart Industrial Program: $249
- SoCal WaterSmart HE Pop Up Spray Heads, CII: $256
- SoCal WaterSmart HE Nozzle, Res: $256
- SoCal WaterSmart Dry-Vacuum Pumps, CII: $259
- SoCal WaterSmart HET (Flushometer), CII: $268
- Smart Timer Home Certification: $271
- SoCal WaterSmart WBIC <1 Acre, Res: $271
- SoCal WaterSmart WBIC, CII: $272
- SoCal WaterSmart Connectionless Food Steamer (per Compartment), CII: $272
- Spray Head Incentive, Pressure Regulating Body for nozzles: $355
- Water Loss Control - Low*: $379
- SoCal WaterSmart HE Clothes Washer, Res: $406
- SoCal WaterSmart WBIC >= 1 Acre, Res: $423
- Urinal Valve Retrofit Program: $429
- Water Loss Control - High*: $487
- Water Smart Hotel Program: $505
- Water Budget Calculator Irrigation Schedule Modification: $608
- SoCal WaterSmart Air Cooled Ice Machines, CII: $910
- Spray to Drip Program: $1,025
- So Cal WaterSmart_Turf Removal: $1,679
Program Implementation Approaches

- CII
- Landscape
- Residential
- Utilities Operations

- Device Rebates
- Perform. Based Incentives
- Audits & Education

Water Savings
Orange County Water Use Efficiency Goal
Metropolitan Integrated Resources Plan (IRP)

(1) Represents today’s achievements in recycled water and water use efficiency from a base year of 1990.
FY 13-14 Lifetime Active Water Savings

**Goals:**
- High Efficiency Toilet, Tank Type (963 AF)
- Industrial Process Improvement (450 AF)
- UL/Zero Water Urinals (118 AF)

**Actual Savings:**
- Rotating Nozzles (1,227 AF)
- Turf Removal (592 AF)
- HOA Landscape Budget Reports (484 AF)
Questions?

Contact Information

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