

Expanding Opportunities for Recycled Water Use

July 23, 2010
 Dave Smith
 Managing Director,
 WaterReuse California
dsmith@waterreuse.org
 916 669-8401



Overview

- WaterReuse Association
- Water recycling in California
 - Current uses
 - Opportunities
- New regulatory requirements
 - Salt and nutrient management plans
 - CEC monitoring



WaterReuse Association

- Advocacy (Lobbying) -- National & State
 - Regulations for safety and efficiency
 - Funding for research and projects
 - Influence national water policy
- Research (through WaterReuse Research Foundation)
- Education & Outreach (Publications, Conferences)



Membership

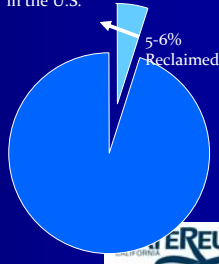
- Evolved from California to National to International Association
- Total Membership >380
 - ~180 Water Agency Members
 - Major Consulting Engineering Firms
 - Major Equipment Suppliers
- Membership Growth 10%/Year



Potential for Water Reuse

- About 5-6% of municipal wastewater effluent in the U.S. is reclaimed and beneficially reused
- Israel reuses more than 70%
- Singapore reuses 15%, but plans to double that rate by 2010
- Australia, now at 8%, has a national goal of 30% by 2015

About 34.9 bgd Municipal Effluent in the U.S.



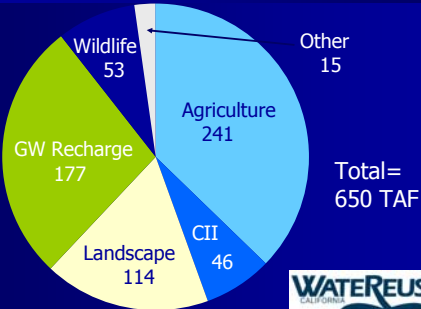
California Water Facts (all values MAF/Yr)

- Urban water use 9
- Agricultural water use 34
- Total water use (current) 43
- Recycled water use 0.65
- WW Discharge to ocean 3.5
- 2050 incremental demand: -2 to +8*

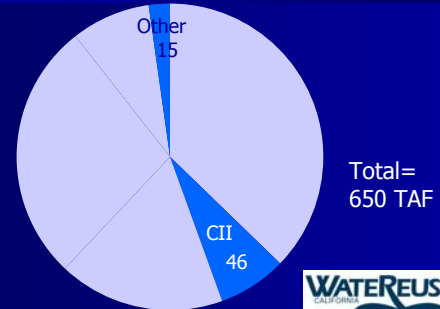
*3 growth scenarios in 2009 California Water Plan, including estimated effect of climate change



Recycling in California (2008 data in TAF)



Opportunities



Opportunities

- Dual-plumbed
 - Commercial
 - Indoor residential
- Concrete
- Cooling
- Carpet dying
- Composting
- Commercial laundry
- Car Wash
- Geothermal power
- Direct potable



Dual-Plumbed Commercial (IRWD)



Number of Meters: 50 (+17 in Marin County)

Uses: Toilet/Urinal Flushing & Cooling Towers

Avg. Demand: 5 gal./ft²/year

Issues: Open reservoir use resulting in color, some odor, distribution interruption, C.T. treatment schemes, shut-down



Dual-Plumbed Residential (IRWD, MMWD)



Number of Meters: 100's outdoor, 0 indoor

Uses: Irrigation, toilet/urinal flushing

Avg. Demand: 30 gal./ft²/year irrigation

Issues: plumbing code recently amended, amendment of DPH regulation pending, shut down



Cooling Towers (IRWD, MMWD)



Number of Meters: 15

Use(s): Cooling Tower Make-Up Water

Demands: approx. avg. 11 gal./ft²/year or 4 AF/100k ft²

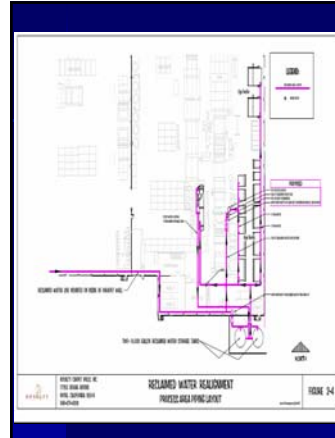
Water Quality Issues: Salt/mineral deposits (scaling), biological growth (algae), chemical treatment schemes and chemical blowdown





Concrete Mixing
(IRWD)

Number of Meters: 1
 Uses: Concrete Batch Mixing
 Demands: 20 AFY
 Issues: Reliability (Domestic as backup),
 Water Quality (Customer performed lab
 test), meets or exceeds criteria set by
 Cal Trans, LADWP



Carpet Dyeing
(IRWD)

Number of Meters: 1
 Demand: Up to 300 AFY
 Issues: Should anticipate significant
 water quality concerns.



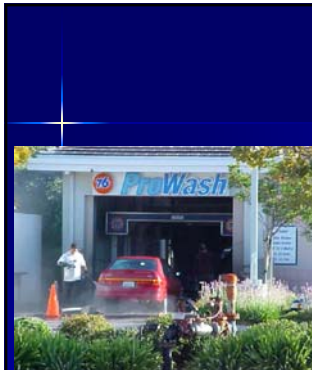
Composting
(IRWD)

Number of Meters: 1
 Demands: 30 AFY
 Water Quality Issues:
 None reported
 Application Method:
 Water Truck (balloon
 optional)



Commercial Laundry
(Marin Municipal WD)

Number of Meters: 1
 Demands: 5 AFY at Nazareth House,
 a care facility for the needy, disabled
 infants and children, including those
 who are HIV-positive
 Issues: Separate water heater



Car Wash
(Marin Municipal WD)

Number of Meters: 3
 Demands: 1-6 AFY per
 facility
 Issues: Reverse osmosis for
 final rinse



Geothermal Power
(City of Santa Rosa,
 Lake County Sanitation District)

Demands: 70,000 AFY
 150 megawatts
 Issues: remote site (41-mile, 3,000-
 foot lift), cost \$300-million
 public/private partnership

What is Direct Potable Reuse? Why Do We Need It?

- Introduction of recycled water directly into a potable water distribution system
- Indirect PR compliance not feasible for all
 - Wrong geology
 - Insufficient surface storage capacity
 - Poor quality diluent
- Purple pipe systems
 - Expensive
 - Won't alone achieve 20-year goal of 4-fold increase in water recycling (0.6 to 1.5 MAF/Yr)



DPR Development Process

- WaterReuse California establish goal (8/09)
 - Assess barriers to DPR
 - Eliminate barriers as appropriate
- Funding solicitation
- Conduct workshop to identify barriers (4/10)
- Develop workplan (summer '10)
 - Define research/studies
 - Identify potential funding sources
 - Schedule, roles
- Implement workplan



April 2010 Workshop

- Planned jointly: WRCA, NWRI, CUWA
- Two 'white papers' as foundation
 - Regulatory issues (Jim Crook - NWRI)
 - Public acceptance (Margie Nellor, Mark Millan - WaterReuse California)
- 52 invited experts
- Breakout groups: Four topic areas



Workshop Results: Four Topic Areas

- Public acceptance
- Regulatory
- Treatment
- Monitoring



Example Workshop Recommendations

- Do available treatment processes reduce/remove constituents?
- Are monitoring methodologies adequate to reduce risks and eliminate need for environmental buffer and retention time?
- Develop ways to mitigate public perception of the loss of natural/environmental barrier



Next Steps in DPR Development Process

- California's SB 918
- Report Workshop Findings (August)
- Workplan (2010)
- Implementation (2011 and beyond)
- Consider new regulations (2016)



New Requirements

- Recycled Water Policy (Feb '09)
- General Permit for landscape irrigation
- Salt and nutrient plans
- CEC Panel → monitoring



CEC Monitoring

- "CEC Panel" created under SWRCB's Recycled Water Policy
- Address monitoring issues only (ie no controls required as in Oregon's SB 737)
- Report issued June 2010
- State Policy expected Fall 2010



Panel's Recommendations

- *Known knowns* – Priority monitoring list
- *Unknown knowns*
 - PR Projects: Indicator compounds and surrogates
 - Irrigation: Surrogates
- *Unknown unknowns* – Bioanalytical tools as they are developed – favored by regulators and regulated community



Panel's Recommendations

Basis	Irrigation	Potable Reuse
Human Health	none	17 beta-estradiol, caffeine, triclosan, NDMA
Treatment Plant Perform	turbidity, coliform, chlorine	Δ gemfibrozil, DEET, caffeine, iopromide, sucralose, NH ₃ , NO ₃ , DOC



Contact:

Dave Smith
dsmith@watereuse.org
916 669-8401



Workshop Results: Public Acceptance

1. Develop a message regarding industry standard and status regarding direct potable reuse
2. Broaden internal communication within water industry regarding direct potable reuse
3. Determine whether we need a different name for the water that is produced as direct potable reuse versus indirect potable reuse
4. Resolve and/or conform terminology against regulatory framework
5. Survey public for perception of DPR vs IPR and environmental buffer



Workshop Results: Public Acceptance (cont.)

6. Develop ways to mitigate public perception of the loss of natural/environmental barrier from technical and message perspective
7. Propose and determine minimum reliability time barrier and build public acceptance plans based on technical recommendation
8. Ensure direct potable reuse uses best practices learned from indirect potable reuse projects
9. Develop out of the box or new ways to inform public about direct potable reuse that are not project specific



Workshop Results: Regulatory

1. Evaluate California and federal statutes, regulations and policies to
 - Identify limitations (including water rights, and concentrate/residual management system permit) in implementing DPR, and
 - Investigate regulatory alternatives that are protective and effective.
2. Determine optimum/appropriate regulatory scheme and whether CDPH and Water Board authority may need to be harmonized
3. Expand the scope of the SWCRB blue ribbon panel on CECs to include reservoir augmentation and DPR



Workshop Results: Regulatory (cont.)

4. Determine if available treatment processes reduce/remove constituent and monitoring methodologies are adequate to reduce risks and eliminate need for environmental buffer and retention time. Also consider risk of treatment failure
5. Develop source control to include building on current research on Green Chemistry (extended manufacturer responsibility) and source reduction concepts to address environmental fate and transport for PPCPs, pesticides, etc
6. Develop communication protocol to inform all needed agencies of off-spec water or supply interruption
7. Develop treatment performance standards to be evaluated by surrogates



Workshop Results: Treatment & Monitoring

1. Define or specify the water quality treatment performance goals for potable reuse
2. Define substitute for environmental buffer: treatment, time, monitoring, reliability, and response
3. Define treatment performance monitoring
4. Define public health assurance monitoring
5. Define need for enhanced source control
6. Define direct potable reuse

