Jumpstart Water Shortage Toolkit

Photo credit – Department of Water Resources

Tool #1:

Model Water Shortage Contingency Plans

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California Urban Water Conservation Council

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CONTENTS

INTRODUCTION

Water shortage contingency plans (WSCP) have been required as part of the water contingency analysis specified by the California Water Code 10632 since the early 1980s for urban water suppliers.[1] Having a developed WSCP is an essential part of being prepared to respond to water shortages in a timely manner. This tool will provide an overview of WSCP development, reference resources and tools, and provide examples of WSCPs from around the state with the goal of helping agencies develop a WSCP quickly or refine an existing plan.[2] The DWR Urban Drought Guidebook (2008) and the (2011) AWWA M60: Drought Preparedness and Response Manual are key resources for developing and implementing a WSCP. This tool will refer to these key resources, but does not seek to duplicate them.

WATER SHORTAGE CONTINGENCY PLAN DEVELOPMENT OVERVIEW

The goal of developing a WSCP is to prepare in advance a response for various water shortage conditions. These shortages could be caused by dry years, natural forces, system interruptions or failure, chronic maintenance deferral, dropping groundwater levels, or regulatory action. The water contingency analysis specified in California Law is defined by six elements, as summarized by the DWR Urban Drought Guidebook:[3]

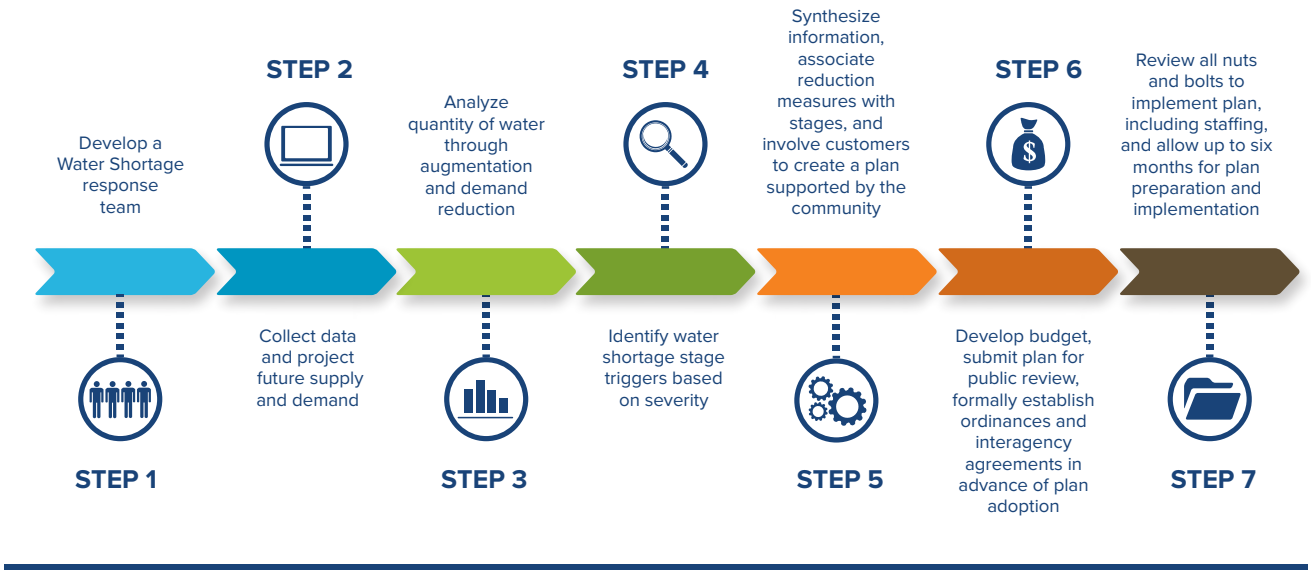
1. A description of the stages of action an agency will take in response to water shortages;
2. An estimate of supply for three consecutive dry years;
3. A plan for dealing with a catastrophic supply interruption;
4. A list of the prohibitions, penalties, and demand reduction methods to be used;
5. An analysis of expected revenue effects of reduced sales during shortages and proposed measures to overcome those effects; and
6. A description of how the water supplier will monitor and document water cutbacks.

Both DWR's Drought Guidebook and AWWA's M60 outline seven steps to develop and implement a WSCP. Figure 1: Water Shortage Contingency Plan Development and Implementation Process summarizes these seven steps. For a WSCP development and implementation check list, see the additional resources sections below.

Water shortage restrictions will result in limiting specific water uses for some or all customer types. Before drafting the restrictions, identify both the uses to limit and those to give priority to for continued uses. The following are sample priorities listed in both the DWR and AWWA guidelines:

1. Health and Safety – interior residential and fire fighting;
2. Commercial, Industrial, and Institutional – maintain economic base, protect jobs;
3. Permanent Crops – takes 5 to 10 years to replace;
4. Annual Crops – protect jobs;
5. Landscaping – direct water to trees and shrubs; and
6. New Demand – generally, two years of construction projects are already approved.

Figure 1: Water Shortage Contingency Plan Development and Implementation Process



WATER SHORTAGE STAGES

The California Water Code asks agencies to describe the stages and subsequent actions the agency will take to respond to the drought. These stages are a key framework for the WSCP. They typically include three to five increasing levels of water shortage with response actions. These stages may or may not include a 'normal' non-water shortage state. Developing the stages requires data collection and analysis to identify potential water availability during various water shortage scenarios. Key elements of a WSCP include:

- Triggers that signify when a stage will be entered;
- Demand reduction goals; and
- Water use restrictions.

The example below shows common descriptions and demand reduction goals for WSCP stages:

Normal: Typical water restrictions with local water waste ordinances or regulations. See Tool 2 for more information.

Stage 1: This stage is often used to raise awareness of emerging water shortage conditions and often relies on voluntary measures with demand reduction goals, commonly 10-15%.

Stages 2 and 3: Often begin or increase mandatory water restrictions with higher demand reduction goals, commonly 15-30%.

Stages 4 and/or 5: Often includes extensive restrictions on water use, and possible water rationing, and high demand reduction goals, commonly 35-50%.

Water Shortage Stage Triggers

Comparing forecasted water supply with demand forms the basis of determining when to intensify a water shortage emergency. While this comparison of supply and demand is the key factor in establishing water shortage triggers, triggers can include a variety of other factors, such as water quality conditions, supply interruptions, and regional agreements. Several of the WSCP tables from sample agencies show examples of stage reduction goals. See Table 2 on page 5.

Water shortage stages can include the declaration of a water shortage emergency. Several sections of the California Water Code apply to an agency's initiation of a water shortage emergency.

Table 1: California Water Code Key Sections for Water Shortage Triggers

Section	Summary of Key Points for Initiating Water Shortage Emergency
350	Governing body of water supply distributor has authority to declare water shortage emergency condition. Defines water shortage emergency condition as when there would be "insufficient water for human consumption, sanitation, and fire protection."
351	A public hearing is required prior to a water shortage emergency condition declaration.
352	Advertisement of the public hearing must follow certain notification and distribution procedures.
355	Regulations and restrictions are in effect until the emergency is over and the water supply has been replenished or augmented.

http://www.leginfo.ca.gov/cgi-bin/isplaycode?section=wat&gro

Demand Reduction Goals

Demand reduction goals help agencies provide a target for customers during the different stages of a water shortage. Smaller reduction goals during early stages may help agencies delay or avoid drastic reductions later. Table 2: Sample Demand Reduction Goals shows sample water reduction goals.

Table 2: Sample Demand Reduction Goals

	Santa Rosa[1]	Redding[2]	Roseville[3]	San Diego County WA[4]
Stage 1	10 % V	15% V	10%	Up to 10% V
Stage 2	20% M	25% M	20%	Up to 20% M
Stage 3	30% M	35% M	30%	Up to 40% M
Stage 4	40% M	50% M	40%	Above 40% M
Stage 5	50%+ M		50%	

M = Mandatory V = Voluntary

1 http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Santa%20Rosa,%20City%20of/CityofSantaRosa2010%20UWMP.pdf. Page 348.
2 http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Redding,%20City%20of/Redding%202010%20UWMP.pdf. Page 59.
3 http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Roseville,%20City%20of/UWMP%20SECTION%205%20Final%20draft_REV.pdf. Page 5-11.
4 http://www.water.ca.gov/urbanwatermanagement/2010uwmps/San%20Diego%20County%20Water%20Authority/11_ShortageContingency.pdf. Page 11.

The actual amount of demand reduction that can be achieved will vary from agency to agency and from year to year. Table 3: Requested and Actual Water Reduction during 1976-77 Drought illustrates requested and actual demand reductions during the 1976-77 drought for a sampling of California agencies. The percentage of reduction achieved for these agencies frequently met or exceeded the agency's targets. Some factors that can affect this include: prior patterns of water use; prior experience with water shortages; length of time since the preceding water shortage; the saturation of water efficiency measures in the service area; the extent of agricultural and landscape areas; and the types of industries and businesses in the water service area. The effectiveness of each water use restriction should be periodically re-evaluated. The DWR Urban Drought Guidebook also notes that agencies may find that customers are more likely to exceed demand reduction goals in warmer months, whereas they may not achieve the demand reduction goal in cooler months.

Table 3: Requested and Actual Water Reduction during 1976-77 Drought

Supplier	Residential Rationing Program	Achievement Percent
Marin Municipal Water District	Mandatory 57% per capita	**65%**
East Bay Municipal Utility District	Mandatory 35% per household	**40%**
Contra Costa County Water District	Mandatory 30%	**25%**
San Francisco Water Department	Mandatory 25%	**30%**
Los Angeles DWP	Mandatory 10%	**16%**
Sunnyvale Water Department	Voluntary 25%	**26%**
Santa Clara Valley Water District	Voluntary 25%	**30%**
City of Pleasanton	No program	**19%**

Water Restrictions

Water restrictions complement demand reduction goals by limiting wasteful practices. During a water emergency, the California water code gives priority to domestic uses, sanitation, and fire protection. Water restrictions integrated in WSCPs typically limit specifically identified wasteful or lower priority water uses, such as frequent landscape irrigating, and outdoor surface washing. Table 4: Sample Water Use Restrictions and Earliest Implementation Stage lists restrictions common to at least three of the six example agencies. For more information on water restrictions, see the Appendix and Tool 2, Water Ordinances. This tool focuses on restrictions that produce short term demand reduction; for information on long term demand reduction, see additional resources on page 14 of this tool.

Photo credit – Rainbird

Table 4: Sample Water Use Restrictions and Earliest Implementation Stage

	Water Use Restriction Type	Santa Rosa	Long Beach	Calaveras County WD	Redding	San Diego City	Roseville
Outdoor	Limit irrigation to specified times of day	1 M	N	3M		2	
	Limit irrigation to specified days of week			3 M	3	2	
	Prohibit washing down of hardscapes	1 M	N	3 M		N	1
	Prohibit the use of potable water for street washing	1 M			2		1
	Require hose-end shut-off nozzles on all garden and utility hoses	1 M	N		2	N	N
	Irrigating landscape in a manner that results in unreasonable runoff, where (potable or reclaimed) water flows onto adjacent property, non-irrigated areas		N		2	N	N
	Prohibit operating a fountain or other water feature that does not re-circulate the water		N		2	N	N
CII	Require "Water-on-Request" programs at restaurants	1 M	1M			N	1
	Operate a conveyor type car wash system that does not re-circulate the wash and/or rinse water		N			N	4
Other	Quickly repair loss of water through breaks, leaks or other malfunctions in the water user's plumbing.		N			N	N

Normal (N) refers to permanent restrictions, even with normal water availability.

M = Mandatory V = Voluntary # = Stage Numbers indicate the earliest water shortage stage that the restriction is active.

CPUC Drought Procedures Standard Practice U-40-W

Water providers operating under the regulations of the California Public Utilities Commission should refer to CPUC Drought Procedures Standard Practice U-40-W for typical water use restrictions under voluntary and mandatory rationing. The water use restrictions are similar to those available to non-regulated water providers.

- Standard Practice U-40-W specifies that notice of activation for "mandatory rationing and associated public hearing (if required) shall be provided to customers as a bill insert at the earliest billing cycle possible or through direct mailing, and shall include:
  - How penalties (or other instrument of compliance) will be assessed
  - What is the allocation
  - How the allocation was determined
- Fines for non-volumetric non-essential or unauthorized water use infractions (i.e. use of potable water to wash structures or driveways) may consist of flat fee fine; fines for exceeding the volumetric allotment shall consist of a penalty based upon a multiple of the authorized top tier quantity rate applied to all usage exceeding the allotment."

Standard Practice U-40-W contains examples of a voluntary water conservation plan and staged mandatory rationing of water use. The examples state that "each utility/district shall propose its own unique amounts for each of these items."[4]

Applicable sections of the California Water Code for water restrictions include:

Table 5: California Water Code Key Sections for Water Restrictions

Section	Summary of Key Sections for Water Restrictions
353	Governing body of water supply distributor must adopt regulations and restrictions to "conserve the water supply for the greatest public benefit." Priority uses are domestic, sanitation, and fire protection.
354	Option given to governing body of water supply distributor to establish additional water allocation, distribution, and delivery priorities. Method of allocation cannot discriminate "between customers using water for the same purpose or purposes."
355	Regulations and restrictions are in effect until the emergency is over and the water supply has been replenished or augmented.
356	Regulations and restrictions allow prohibiting new or additional service connections. Enforcement of regulations and restrictions may include discontinuing service to customers willfully violating them.
357	Regulations and restrictions must prevail over allocation provisions of laws pertaining to water rights of individual customers. Water distributors subject to regulation by the State Public Utilities Commission (PUC) need prior approval by the PUC before adopting regulations and restrictions of this type.
358	Review of an emergency declaration or adopted regulations and restrictions adopted by a court is not prohibited.

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=00001-01000&file=350-359

SAMPLE WATER SHORTAGE CONTINGENCY PLANS

The following examples provide excerpts from tables taken from various WSCPs around the state. These examples show a variety of approaches to stages, trigger conditions, demand reduction goals, restrictions, and related plan elements. These tables are snapshots of each WSCP. A more complete understanding of statewide WSCP development and implementation will come from review of the hyperlinked full plans.

Retail Examples

City of Clovis

Service Area Population (2010): 99,519

2010 UWMP Water Shortage Contingency Plan. Section 6.2, page 55 (PDF page 67)

City of Clovis WSCP Stages

Stage	Conditions	Percentage Shortage
1 Minor (voluntary)	Groundwater in overdraft or available production within 10% of peak hour demands	10%
2 Moderate (mandatory)	Groundwater in overdraft in second consecutive year or available water production is 10% less than the peak hour demands	10% to 20%
3 Severe (mandatory)	Available water production is 20% less than peak hour demands	20% to 35%
4 Critical (mandatory)	Available water production is 35% less than peak hour demands or surface water supply is 50% of required.	35% to 50%

City of Clovis Mandatory Prohibitions by WSCP Stage

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Using a hose without a nozzle	Stage 1
Outdoor water use on a non-watering day	Stage 2
Broken sprinklers or other leaks	Stage 1
Excessive runoff from property	Stage 1
Evaporative cooler overflowing	Stage 1

City of Clovis Water Shortage Stages and Reduction Objectives

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Customer allotments/Rate Changes	Stage 3 and 4	25% to 40%
No refilling of pools	Stage 3 and 4	1%
Irrigation reduced to 2 or 1 day per week	Stage 3 and 4	18% to 35%
No new connections w/o offsets	Stage 3	None but no increase
No new connections	Stage 4	None but no increase
Main flushing only on complaint basis	Stage 3 and 4	50%

Marin Municipal Water District

Service Area Population (2010): 190,600

2010 UWMP Water Shortage Contingency Plan. See Section 5-1, pdf page 61

Table 5-2 | Water Shortage Contingency — Water Supply Conditions and Rationing Levels

Stage	Water Supply Conditions	% Reduction
Alert Stage (Voluntary Rationing)	Total reservoir storage is less than 50,000 ac-ft on April 1	**10%**
Mandatory Rationing	Total reservoir storage is less than 40,000 ac-ft on April 1	**25%**
Water Shortage Emergency	Total reservoir storage on December 1 is projected to be in the vicinity of, or less than 30,000 ac-ft	**up to 50%**

Table 5-3 | Allocation Plan — Proposed Cutbacks at Different Rationing Levels

Billing Codes	20% Rationing	25% Rationing	30% Rationing	40% Rationing	50% Rationing
Billing Code 1-5 (Residential)	25%	32%	32%	46%	55%
Billing Code 6 (Institutional)	20%	25%	30%	40%	50%
Billing Code 7 (Business)	15%	20%	25%	35%	45%
Billing Code 8 (Irrigation)	45%	50%	60%	75%	90%

Table 5-4 | Water Shortage Contingency — Mandatory Prohibitions

Prohibitions	When Prohibition Becomes Mandatory
No Non-Essential Uses: • Washing sidewalks, walkways, driveways, parking lots, and all other hard-surfaced areas by direct hosing, except to properly dispose of flammable or other dangerous liquids or substances or to prevent or eliminate materials dangerous to public health and safety. • Escape of water through breaks or leaks within the consumer's plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of forty-eight hours after the consumer discovers such a leak or break, or receives notice from the District of such leak or break, whichever occurs first, is a reasonable time within which to correct such leak or break. • Non-recycling decorative water fountains.	**On-Going**
Restrictions on Irrigation: Irrigation shall not be conducted in a manner or to an extent that allows water to run off or overspray the areas being watered. Every consumer is required to have his/her water distribution lines and facilities under control at all times to avoid water waste.	**On-Going**
Restrictions on Reverse-Osmosis Units: The installation of reverse-osmosis water purifying systems not equipped with an automatic shutoff unit is prohibited.	**On-Going**
Prohibitions for New Connections: • Single-pass cooling systems for air conditioning or other cooling system applications unless required for health or safety reasons; • Non-recirculating systems for conveyor carwash applications.	**On-Going**
Twenty-five Percent or Greater Water Use Reduction Program: Every consumer shall eliminate water wastage and non-essential use of potable water from the District in an effort to aid the District in achieving a twenty-five percent reduction in the amount of water used by all consumers in the last year in which no restrictions in water use were required.	**Mandatory Rationing Stage**
Additional Prohibited Nonessential Uses Applicable to All Consumers: Use of potable water for: refilling or as make-up water for decorative fountains or pools; irrigation between the hours of 11 AM and 7 PM; irrigation of new turf areas; washing of cars, boats, airplanes with hose without a shut-off nozzle; or serving water to restaurant patrons, except on request.	**Mandatory Rationing Stage**

City of Roseville

Service Area Population (2010): 114,078

2010 UWMP Water Shortage Contingency Plan. See Section 5-1

Table 5.5 | Water shortage contingency — penalties and charges – RMC 14.08.095

Penalties or Charges	Stage When Measure Takes Effect	Measure Description
Water Shortage Surcharge	Stage 2 - 5	A temporary increase in per unit water rates to stabilize water revenues when customers are successful in reducing water demands.
Excess Water Use Charge	Stage 3 - 5	A temporary increase in the top tiers of water use to provide further incentives for users in these categories to find ways of reducing demands.

Table 5.7 | Supply reliability — historic conditions

Folsom Reservoir Unimpaired Inflow Average Year = 1,886,210 AF Roseville Surface Water Available Average Year = 58,900 AF[2]	Single Dry Water Year 1977 (AFY)	Multiple Dry Water Years (AFY)			
		1990	1991	1992	Average of 3 Years[1]
Unimpaired Inflow	289,740	822,331	1,185,926	604,927	871,061
Percent of UI Average Year	15.4%	43.6%	62.9%	32.1%	46.2%
Surface Water Allocation	39,800	54,466	58,900	46,917	56,159
Percent of Available Average Year Supply	67.6%	92.7%	100%	79.7%	95.3%

[1] Average available surface water for the 3 years is based upon the average of the unimpaired inflow value.
[2] Available surface water supplies are based upon the City's Water Forum Agreement and the allocation of supplies are based on unimpaired inflow.

Table 5.8 | Water shortage contingency — rationing stages to address water supply shortages

Stage No.	Water Supply Conditions	% Shortage
Basic Stage	Full surface water supply allocation of 58,900 AF[1]	**0%**
Stage 1	Surface water supply availability of 53,000 AF	**10%**
Stage 2	Surface water supply availability of 47,120 AF	**20%**
Stage 3	Total water supply availability of 41,230 AF	**30%**
Stage 4	Total water supply availability of 35,340 AF[2]	**40%**
Stage 5	Total water supply availability of 29,450 AF[2]	**50%**

[1] Surface water availability consistent with Water Forum Agreement for water taken from the American River system.
[2] Based on water supply portfolio available it is not projected or anticipated that shortages would ever get to levels of 40 – 50% shortage. Measures are planned, however, to meet regulatory requirements or UWMP.

South Tahoe Public Utility District Population (2010): 33,124

2010 UWMP Water Shortage Contingency Plan. See Section 5.4, pdf page 56

Water Shortage Contingency – Rationing Stages to Address Water Supply Shortages		
Stage No.	**Water Supply Conditions**	**% Shortage**
Continuous	Water Waste Prohibited	**NA**
1 Normal Conditions	Prohibiton against runoff from site	**10%**
	Prohibition against irrigating non-landscaped property except to mitigate fire risk	
	Inspection/repair/adjustment of irrigation systems	
	Shutoff nozzle required on hoses used for vehicle washing	
	Encouragement to report water leaks/waste	
2 Minor Water Supply Shortage	All Stage 1 Restrictions	**20%**
	Designated irrigation days	
	Prohibition against washing hard surfaces except to mitigate fire or sanitation concerns	
	Restaurant water service on request	
3 Severe Water Supply Shortage	All Stage 1 and 2 Restrictions	**30%**
	Weekend irrigation prohibition	
	Prohibition against filling outdoor swimming pools	
	Prohibition against operating non-recirculating fountains and ornamental water features	
4 Critical Water Supply	All Stage 1, 2 and 3 Restrictions	**40%**
	Outdoor irrigation limited to once per week	
	Prohibition against water use for landscaping for new construction	
	Prohibition against hydrant use except for firefighting	
5 Water Emergency	All Stage 1, 2, 3 and 4 Restrictions	**50%**
	Prohibition against water use for other than domestic and commercial purposes (no irrigation)	
	Prohibition against water use for construction dust control	
	Prohibition against hydrant flushing	
	Prohibition against water use for air conditioning where an alternate source of fresh air is available	

[a] One of the stages of action must be designed to address a 50 percent reduction in water supply.

Wholesale Examples

San Diego County Water Authority

Service Area Population (2010): 3,200,000

Model Drought Response Ordinance

Model Drought Response Ordinance: Drought Response Levels and Water-Use Restrictions.[5]

Drought Response Levels		Trigger	Voluntary or Mandatory Restrictions	Customer Conservation Targets	Water Authority DMP Stage
Level 1	**Drought Watch**	• Level 1 applies when the Water Authority notifies its member agencies that due to drought or other supply reductions, there is a reasonable probability of supply shortages and that a consumer demand reduction of up to 10% is required in order ensure that sufficient supplies will be available to meet anticipated demands. • The [AGENCY GENERAL MANAGER] shall declare the existence of Level 1 and take action to implement the Level 1 conservation practices identified in this ordinance.	**Voluntary**	**Up to 10%**	**Stage 1 or Stage 2**
Level 2	**Drought Alert**	• Level 2 applies when the Water Authority notifies its member agencies that due to cutbacks caused by drought or other reduction in supplies, a consumer demand reduction of up to 20% is required in order to have sufficient supplies available to meet anticipated demands. • The [AGENCY BOARD OF DIRECTORS] shall declare the existence of Level 2 condition and implement the mandatory Level 2 conservation measures identified in this ordinance.	**Mandatory**	**Up to 20%**	**Stage 2 or Stage 3**
Level 3	**Drought Critical**	• Level 3 applies when the Water Authority notifies its member agencies that due to increasing cutbacks caused by drought or other reduction of supplies, a consumer demand reduction of up to 40% is required in order to have sufficient supplies available to meet anticipated demands. • The [AGENCY BOARD OF DIRECTORS] shall declare the existence of a Level 3 condition and implement the Level 3 conservation measures identified in this ordinance.	**Mandatory**	**Up to 40%**	**Stage 3**
Level 4	**Drought Emergency**	• A Level 4 condition applies when the Water Authority Board declares a water shortage emergency pursuant to Water Code Section 350 and notifies its member agencies that Level 4 requires a demand reduction of more than 40% in order for the [AGENCY] to have maximum supplies available to meet anticipated demands. • [AGENCY] shall declare a Drought Emergency in the manner provided in Water Code Section 350.	**Mandatory**	**Above 40%**	**Stage 3**

Santa Clara Valley Water District

Service Area Population (2010): 1,822,000

2010 UWMP Water Shortage Contingency Plan. See Section 6.3, pdf page 72

Santa Clara Valley Water District, Water Shortage Contingency Plan

URBAN WATER MANAGEMENT PLAN 2010					
Stage	**Stage Title**	**Projected GW Reserves**	**Response**	**Suggested Reduction in Water Use(1)**	**Communication and outreach effort**
Stage 1	Normal	Above 300,000 AF	Continue regular outreach activities in this stage to promote ongoing implementation of conservation and implementation of BMPs.		• Maintain public information and outreach focused on long term, ongoing conservation actions (e.g., water saving appliances, repairing leaks, and low-water use landscaping).
Stage 2	Alert	250,000 to 300,000 AF	This stage is meant to warn customers that current water use is tapping into groundwater reserves – a signal that groundwater levels are dropping to meet demands. Communications are needed to set the tone for the onset of shortages. Request water users to reduce water use by as much as 10%. Coordinate ordinances with cities and warn and prepare for a stage 3 situation.	0-10% demand reduction	• Expand on Stage 1 efforts • Intensify public information and advertising campaign • Focus messages on shortage situation and immediate behavioral changes
Stage 3	Severe	200,000 to 250,000 AF	Shortage conditions are worsening, requiring close coordination with retailers and cities to enact	10-20% demand reduction	• Expand and intensify Stage 2 activities • Further expand outreach efforts • Modify messages to reflect more severe shortage condition and need for immediate behavioral changes
Stage 4	Critical	150,000 to 200,000 AF	This is the most severe stage in a multiyear drought. Encourage retailers and cities to enforce their plans which could include fines for repeated violations.	20-40% demand reduction	• Strengthen and expand Stage 3 activities • Further expand outreach efforts • Open drought information center
Stage 5	Emergency	Below 150,000 AF	This last stage is meant to address a more immediate crisis such as a major infrastructure failure. Water supply would be available only to meet health and safety needs.	Up to 50% demand reduction	• Daily updates on water shortage emergency (media briefings, web update, social media outlets) • Activate EOC

Notes: (1) When the District Board calls for short-term water conservation, the cities and water retailers will consider the implemention of water contingency plan actions identified in their Urban Water Management Plans in order to achieve the necessary shortage response. The District works with the water retailers and cities to help coordinate these activities.

RESOURCES FOR WATER SHORTAGE PLANS

Foundational resources for developing a WSCP include the DWR Urban Drought Guidebook (2008) and the (2011) AWWA M60: Drought Preparedness and Response Manual. The AWWA M60, 72 pages, contains much of the same language as the DWR Guidebook, and also some new content. The DWR Guidebook, 207 pages, is available for free download below. Additional resources are listed below.

WSCP Development and Implementation:

AWWA M60: Drought Preparedness and Response (2011)

DWR Urban Drought Guidebook: 2008 Updated Edition

DWR WSCP excerpt from Urban Drought Guidebook, includes WSCP Development and Implementation Checklist

Related California Law:

Declaration of Water Shortage Emergencies

California Water Code Section 350-359

California Government Code, Section 8550-8551

Urban Water Management Planning, California Water Code Sections 10610-10656

UWMP staff contact at DWR: Gwen Huff, **ghuff@water.ca.gov**

Water Shortage Triggers:

Data Collection: DWR Urban Drought Guidebook, page 29. AWWA M60, page 8.

Data Analysis: DWR Urban Drought Guidebook, page 31. AWWA M60, page 10.

Establish Triggers: DWR Urban Drought Guidebook, page 65. AWWA M60, page 35.

Demand Reduction Goals

Demand Reduction: DWR Urban Drought Guidebook, pages 43, 73. AWWA M60 pages, 20, 41.

Pricing: Drought Tool Kit Tool 3. DWR Urban Drought Guidebook, page 51. AWWA M60 page 25.

AWE Financing Sustainable Water, Rates Handbook and Model

Example WSCPs

Review 2010 Urban Water Management Plans

Partnership Opportunities

Santa Ana watershed **"One Water, One Watershed"**

Regional Coordination: DWR Urban Drought Guidebook, page 27. AWWA M60, page 5.

Actions by Wholesalers: DWR Urban Drought Guidebook, page 35. AWWA M60, page 13.

PARTNERSHIP OPPORTUNITIES

Water provider partnerships allow local and regional organizations to work together to deliver water conservation messages and measures. If an agency does not already have a WSCP, it may want to consider reviewing WSCPs in neighboring communities. Alignment of stages, demand reduction goals, and restrictions allows for a consistent regional water shortage response messages. See the San Diego County Water Authority model drought response ordinance on page 12.

APPENDIX

Table 6: Sample Water Use Restrictions and Earliest Implementation Stages shows some water use restrictions and the associated stages from several utilities.

Table 7 shows water use restrictions by water shortage stage for San Juan Water District.

Table 6: Sample Water Use Restrictions and Earliest Implementation Stages

Water Use Restriction Normal (N) or Basis (B) refers to permanent restrictions, even with normal water availability. M = Mandatory V = Voluntary # = Stage # = Stage Numbers indicate the earliest water shortage stage that the restriction is active.	Santa Rosa	Long Beach	Calaveras County WD	Redding	San Diego City	Roseville
Outdoor irrigation to occur between specified times of day	1 M	N	3 M		2	
Restrict landscape irrigation to specified days			3 M	3	2	
Prohibit washing down of hardscapes	1 M	N	3 M		N	1
Reduce residential water use by X percent						2
Prohibit the use of potable water for street washing	1 M			2		1
Require the use of hose-end shut-off nozzles on all garden and utility hoses	1 M	N		2	N	B
Require “Water-on-request” programs at restaurants	1 M	1M			N	1
Restrict irrigating landscape October – March with potable water to specified days of week.		1M			2	
Filling residential swimming pools and spas with potable water		1 M	3 M			
Overfilling of swimming pools and spas is strictly prohibited					N	
Prohibit operating a fountain or other water feature that does not re-circulate the water		N		2	N	B
Stop operation of ornamental fountains, except to the extent needed for maintenance purposes.					2	3
Quickly repair loss or escape of water through breaks, leaks or other malfunctions in the water user’s plumbing or distribution system.		N			N	B
Irrigating landscape with potable water for specified time periods per authorized day if using sprinkler heads that emit ≥ 1 gpm or longer periods if more efficient emitters are used.		1 M				
City uses (except active sports fields) reduced by percent stages.						1
Irrigating commercial landscape, schools parks reduced by 30+ %			3 M			2
Golf course irrigation restricted to greens and tees if raw water is sole source.			3 M			
Except where recycled water is used, golf courses shall reduce irrigation by 30+ percent.						3
Golf course irrigation reduced by 35 % if treated effluent is used.			3 M			
Irrigating landscape in a manner that results in unreasonable runoff, where (potable or reclaimed) water flows onto adjacent property, non-irrigated areas, private and public walks, roadways, parking lots or structures		N		2	N	B

Table 6: Sample Water Use Restrictions and Earliest Implementation Stages, continued

Water Use Restriction Normal (N) or Basis (B) refers to permanent restrictions, even with normal water availability. M = Mandatory V = Voluntary # = Stage # = Stage Numbers indicate the earliest water shortage stage that the restriction is active.	Santa Rosa	Long Beach	Calaveras County WD	Redding	San Diego City	Roseville
Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.						**4**
Irrigating landscape in a manner that is unreasonably water-inefficient, such as:. excessive over spray, excessive misting, over pressurization, misalignment or tilted spray heads, or other malfunction or out-of-adjustment condition which results in unreasonable waste of potable water		**N**				
New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover. No new turf shall be planted, hydroseeded, or laid.						**3**
Hotel or motel, failing to provide customers the option of choosing not to have towels and linens laundered daily.		**N**			**NI**	
Restaurants and all other commercial, industrial, institutional food preparation sites using pre-rinse heads having flow-rates greater than 1.5 gallons of water per minute		**NI**				
Operating a commercial laundry system installed after specified date that does not re-circulate wash and/or rinse water		**N**				
Operating a conveyor type car wash system that does not re-circulate the wash and/or rinse water		**N**			**N**	**4**
Installing a single-pass cooling system in a building requesting a water connection after specified date						
Using potable water, rather than reclaimed water, where reclaimed water is a cost-effective alternative to potable water and the customer has had a reasonable amount of time to make the conversion to reclaimed water		**N**				
Discontinue line flushing			**3 M**			
New building permits not issued						**4**

Table 7: San Juan Water District Water Restrictions

San Juan Water District Water Conservation Stages							
	Stage 1	Stage 2	Stage 3	Stage 4		Stage 5	
				ST	LT	ST	LT
Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.	✓	✓	✓	✓	✓	✓	✓
Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.	✓	✓	✓	✓	✓	No outdoor water-ing	No outdoor water-ing
Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.	✓	✓	✓	✓	✓	✓	✓
Customers shall repair all leaks within specified working days (see table at right) or less, if warranted by the severity of the problem. Water service will be suspended until repairs are made.	5 days or less	5 days or less	2 days or less	24 hrs. or less	24 hrs. or less	Immedi-ately ✓	Immedi-ately ✓
Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic or sanitary purposes, is prohibited. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health or sanitary purposes, is prohibited.	✓	✓	✓	✓	✓	✓	✓
Customers are encouraged to take advantage of the District's free conservation services and rebate programs.	✓	✓	✓	✓	✓	✓	✓
All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. No potable water from the District's system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds and fountains is prohibited.	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Reduce indoor and outdoor water use by specified percentage as determined (see table at right). Contact the District or visit our website at **www.sjwd.org** for additional tips and techniques to reduce water use.		5-10%	25%	26-50%	26-50%	50% or more	50% or more
Customers with "smart" irrigation timers or controllers are asked to set their controllers to achieve specified percentage reduction (see table at right) of the evapotranspiration (ET) rate.		90-95%	75%	50-74%	50-74%		
Landscape and pasture irrigation is prohibited.						✓	✓
Restaurants shall serve water only upon request.			✓	✓	✓	✓	✓
Construction meters and fire hydrant meters will be monitored for efficient water use. Use of reclaimed water for construction purposes is encouraged.		✓	✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Water Emergency tiered pricing will be implemented pursuant to requirements of Proposition 218 in accordance with California law.			✓		✓		✓
Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.				✓	✓	✓	✓
Installation of new turf or landscaping is prohibited (Discourage at Stage 3).				✓	✓	✓	✓
Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.				✓	✓	✓	✓
No commitments will be made to provide service for new water service connections.					✓		✓
New connections to the District water distribution system will not be allowed.							✓

ST = Short Term (< 45 days) / LT = Long Term (> 45 days)

NOTES

1. Urban Water Suppliers with 3000 or more connections or that deliver 3000 or more acre feet of water.
2. This primer attempts to give readers a jump start on developing a WSCP, this is not a comprehensive resource for all legal and implementation issues.
3. DWR, *Urban Drought Guidebook*: 2008 Updated Edition. 2008
4. **California Public Utilities Commission Drought Procedures Standard Practice U-40-W**
5. Model Drought Response Ordinance: Drought Response Levels and Water-Use Restrictions

The complete
Jumpstart Water Shortage Toolkit includes:

#1 – Model Water Shortage Contingency Plans
#2 – Water Waste Ordinances and Enforcement Primer
#3 – Water Shortage Pricing Primer
#4 – Water Loss and Supply Alternatives Primer
#5 – Customer Programs and Communication/Outreach Primer
#6 – Local Water Supply Fact Sheet
#7 – Water Use and Loss Awareness Resources
#8 – Water School Curriculum
#9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

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Jumpstart Water Shortage Toolkit

Photo credit – Rain Bird

Tool #2:

Water Waste Ordinances and Enforcement Primer

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – Rain Bird

CONTENTS

INTRODUCTION

This tool provides a survey of the water conservation ordinances[1] that authorize local governments to discourage water waste and reduce overall demand. It is designed as a reference to assist water service providers in developing policies to meet their conservation goals.[2] *(Local districts are not empowered to enact ordinances, they can, however, promulgate regulations. For convenience in this tool we use the term ordinance to refer to all of these actions.)*

This tool contains four principal parts. The first part briefly introduces the state statutes that mandate water conservation. The second contains a summary of a broad survey of water conservation ordinances, including notable distinctions in their contents. The third section briefly summarizes trends observed in recent ordinances, points to additional resources, and notes partnership opportunities. The final part contains an appendix that details actual language from water conservation ordinances from across the state. It is not meant as a "model" ordinance. Rather, it's more of a "cafeteria" where would-be ordinance enactors or amenders can select from a wide array of choices.

A. LEGISLATIVE AND RULEMAKING BACKGROUND

The Water Conservation in Landscaping Act,[3] the 2009 Water Conservation Act,[4] and the Urban Water Management Planning Act[5] respectively require local water providers to limit irrigated landscape,[6] cut daily urban per capita water consumption,[7] and to plan future uses based on anticipated supply.[8] The collective effect of these statutes has been to require water providers to address demand-side reduction through a variety of approaches. One prominent method of addressing demand is to enact an ordinance prohibiting certain uses of water. As a result, the water conservation ordinances discussed in this report can assist water providers in meeting the water use reduction requirements described above.

In separate rulemakings in 2014 and 2015, the California State Water Resources Control Board prohibited certain water uses except where necessary to address an immediate health and safety need or to

comply with a term or condition in a permit issued by a state or federal agency. These include:

1. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
2. The use of a hose that dispenses potable water to wash motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;
3. The application of potable water to driveways and sidewalks;
4. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system; and
5. Using outdoor irrigation during and 48 hours following measurable precipitation

The prolonged and increasing severity of the current drought and the Governor's mandated 25% reduction (statewide) over 2013 levels, call for much more stringent water use restrictions.

B. SURVEY OF WATER CONSERVATION ORDINANCES

This report is based on data gathered from over 200 water waste ordinances.[9] This data, discussed in detail below, highlights the diversity of approaches for implementing mandatory conservation measures.

B.1 WATER WASTE ORDINANCES

A water waste ordinance is a law that is designed to reduce consumer demand by imposing penalties on those that use water in ways that are defined as "wasteful" or "non-essential."[10] To this end, conservation ordinances often contain: (a) a definition of wasteful or non-essential uses; (b) penalties; (c) an enforcement mechanism; and (d) exemptions. Examples of elements for each of these components are discussed in the following sub-sections.

1.1 Definition of Waste

Instead of providing one overarching definition for waste, most water conservation ordinances define waste by listing specific uses for water that are never permitted. The uses that are commonly identified as wasteful either lack social value or can be accomplished with significantly less water usage. Examples of how waste is defined are discussed below, and Appendix A contains a collection of the definitions for water waste that were encountered during the survey of ordinances.

1.1.1 Outdoor Water Usage

The most common mandatory prohibitions on the use of water are associated with the irrigation of outdoor landscaping. Although the State Water Resource Control Board's (SWRCB) 2014 emergency drought regulations[11] temporarily prohibit certain water uses, almost all[12] water providers who have enacted water waste ordinances already restrict the over-irrigation of landscaping by characterizing any water flowing off of the property or onto an impermeable surface as per se waste.[13] Further, a majority of jurisdictions already ban other wasteful uses targeted by the emergency drought regulations, such as running a hose that is not equipped with a shut-off nozzle.[14] In addition to the prohibitions described in the regulations, municipalities frequently enact more detailed restrictions addressing, for example, technical specifications for irrigation equipment,[15] evaporation from pools,[16] or recreational uses.[17]

Although not usually considered part of "water waste ordinances," additional restrictions apply to properties that are subject to a given jurisdiction's version of the Model Water Efficient Landscape Ordinance (MWELO), required under the Water Conservation in Landscaping Act.[18]

1.1.2 Indoor Water Usage

A number of jurisdictions have enacted detailed requirements for indoor water usage by requiring homeowners to replace plumbing fixtures that do not meet efficiency standards.[19] These requirements generally apply only to newly developed structures,[20] or to existing structures that are sold or substantially remodeled.[21] However, some jurisdictions have required all homes

to retrofit plumbing fixtures regardless of sale or substantial remodel.[22] Additionally, some homeowners are required to ensure that their indoor plumbing is free of any leaks.[23]

1.1.3 Water Usage at Commercial Facilities

Water usage at car washes, commercial kitchens, hotels, coin-operated laundries, and restaurants is explicitly restricted under many water waste ordinances. Most common are the requirements that hotels and restaurants only perform water intensive activities, such as deliver a glass of water or launder towels, at the request of the customer.[24] Also common are technical requirements for sinks at commercial kitchens, washing machines in coin-operated laundries, or water reuse at car wash facilities.[25] The fines for violations in commercial facilities are typically identical to those for violations on residential properties,[26] but some ordinances require larger penalties for commercial users receiving high volume service.[27]

1.1.4 Volumetric Restrictions

In addition to defining waste by type of use, it is often also defined by volume used. In areas where all or most water service connections have been equipped with a water meter, water providers can discourage wasteful uses through excess use charges based on the volume of water consumed at each connection.[28] However, in some instances, single-family residences are exempted from water waste prohibitions if their monthly usage is less than a fixed allotment.[29]

1.2 Exceptions

In order to avoid unduly harsh enforcement of water waste regulations, most jurisdictions include exceptions that are designed to address extenuating circumstances that justify what is otherwise considered a wasteful use of water.

1.2.1 Outdoor Exceptions

The prohibitions on outdoor water use are explicitly relaxed for certain categories of water users, such as cemeteries,[30] registered historic sites,[31] commercial nurseries and growers,[32] botanical gardens,[33] or golf courses.[34] Certain uses are also frequently exempted from water waste prohibitions, including water used for public health or safety,[35] new landscaping,[36] or fire suppression.[37] Lastly, recycled water users[38] or those employing a rain water system[39] are generally not subject to the same usage restrictions as potable water users.

1.2.2 Indoor Exceptions

The water use restrictions that apply to indoor water usage tend to restrict water consumption overall, as opposed to particular uses.[40] However, some exceptions, such as "to avoid an undue hardship to the owner,"[41] or because the "use is necessary for the medical needs of the customer,"[42] potentially apply to indoor uses.

1.3 Penalties

The penalties attached to water conservation ordinances vary greatly, both in type and severity. Many jurisdictions reserve the authority to apply multiple types of penalties, often depending on whether or not the customer is a repeat offender,[43] while other ordinances only reserve the authority to fine[44] or to terminate service.[45]

1.3.1 Written Warning

Many jurisdictions explicitly provide that a written warning be given to the customer on his or her first violation, and that any fines or other punishments only be administered once this warning has first been delivered.[46] Some jurisdictions require two written warnings before a penalty can be applied.[47]

1.3.2 Fines

A single violation of the SWRCB's emergency drought regulations can lead to fines of up to $500,[48] while state law permits a maximum fine of $1000 for local water conservation ordinances.[49] The majority of jurisdictions have adopted a fine schedule that begins at well-below $500 for the first violation, with fines increasing per violation,[50] or during an official water shortage.[51] Additionally, although the 2014 drought regulations specifically designate water waste as a misdemeanor, many ordinances define it as an infraction.[52] Lastly, some jurisdictions explicitly state that each violation, or each day that a violation continues, is an additional offense with which the customer may be charged.[53]

1.3.3 Surcharges

In addition to or in lieu of fines, some ordinances either levy a surcharge on the volume of water actually wasted or add a flat fee or percentage increase onto the customer's bill after a confirmed incident of waste.[54] For jurisdictions where most or all service connections have a water meter, a surcharge can be added that is equivalent to the amount of water used in excess of a fixed allotment.[55] In jurisdictions where most customers do not have a water meter, the surcharge is a flat-fee either in lieu of[56] or in addition to fines.[57] See Tool #3 *Water Shortage Pricing Primer* for more information.

1.3.4 Flow Restrictor Installation

The option to install a flow restrictor on a customer's connection, at that customer's expense, is reserved by many jurisdictions.[58] Although most ordinances require that the customer have multiple violations before a flow restrictor is installed,[59] some ordinances allow the water provider to install a flow restrictor after only one violation.[60] Furthermore, these ordinances often provide for a minimum amount of time that the restrictor must remain on the connection.[61] Most ordinances specify that the customer is responsible for the installation and removal costs.[62]

1.3.5 Water Meter Installation

In service areas where connections are being retrofitted with meters, the city will install a water meter on any flat-rate connection, at the customer's expense, if that customer violates water waste restrictions.[63]

1.4 Enforcement Mechanisms

The enforcement mechanisms within the ordinance identify either the individuals that have the authority to enforce the law or the procedure for prosecuting violators, or both. Enforcement mechanisms vary widely, but the most common approaches are captured by the headings below.

1.4.1 Enforcement by Government Officials

Most ordinances expressly authorize a specific government official or office to design a program to issue citations for violations.[64] The officials most commonly given explicit authority to enforce the ordinance are code enforcement, the public works director, or city police.[65]

1.4.2 Citizen Enforcement

Citizen reports of water waste can assist in the enforcement of water use restrictions by reducing the amount of time spent identifying potential violators. For example, the City of Brea, has established a "water waste hotline" that allows residents to report water waste.[66] Another jurisdiction, the City of Palo Alto, requires its utilities department to investigate citizen reports of violations "to the extent possible."[67] Even without a requirement in their ordinance, city departments in other jurisdictions have established citizen reporting websites and hotlines.[68]

1.4.3 Planning Restrictions

Restrictions concerning landscape water use efficiency and indoor plumbing fixture efficiency can be enforced when a property owner is seeking local land use approval.[69] Following the enactment of the Water Conservation in Landscaping Act, many local governments have approved ordinances that restrict outdoor landscaping at new residential or commercial developments. The most common restrictions affect total water usage, setting a "Maximum Applied Water Allowance" (sometimes referred to as a "water budget"),[70] plant variety,[71] or the total amount of "turf" (grass) that may be installed.[72] Similarly, planning restrictions on indoor water use require applicants to install plumbing fixtures that meet predetermined efficiency criteria.[73] Compliance with both indoor and outdoor water conservation requirements is both the applicant's responsibility and a condition of approval.[74] Some ordinances require specific information from the applicant,[75] while others require a formal inspection by a licensed official.[76] As a result, enforcement of planning ordinances can prevent inefficient new uses by joining land use entitlements with water conservation requirements.

1.5 Education

One major source of water savings has been voluntary reductions by conservation-conscious customers.[77] In recognition of the need to educate the public about

methods of realizing reductions in water use, many ordinances include provisions that mandate public outreach. Examples include: (1) requiring signage with tips on water savings at all public and quasi-public facilities;[78] (2) requiring new developments to install drought-resistant landscape at fifty-percent of model homes;[79] and (3) a general requirement that the city disseminate water savings information to the public.[80] Another notable method of public outreach is to offer "Conservation Seminars," popularly known as "Water School," i.e., courses that provide information about water conservation to water waste ordinance violators in exchange for waiving fines.[81]

B.2 DROUGHT ORDINANCES

Most water waste ordinances operate in conjunction with drought or water shortage ordinances.[82] Typically, when there is no drought declared, these ordinances merely recommend voluntary conservation measures[83] or impose only a limited number of prohibitions on use.[84] However, once a drought or water supply shortage is declared, more severe restrictions automatically come into place[85] or the governing body is given explicit authority to enact more stringent measures of their choosing.[86] A majority of these ordinances describe multiple drought or water shortage phases (e.g., Phases I – IV), and the procedures that must be observed by the governing body when declaring that a particular drought stage exists.[87]

2.1 Drought Restrictions

The severity of the restrictions that can be imposed under existing drought ordinances varies between jurisdictions. The subsections below highlight common drought restrictions found in existing ordinances.

2.1.1 Outdoor Restrictions

Drought ordinance prohibitions on outdoor water use become increasingly more restrictive as water shortages become more severe.[88] In the most severe drought stages, many ordinances completely ban outdoor watering,[89] except by bucket,[90] handheld hose with a shut-of nozzle,[91] or drip system;[92] or, by actively used sports fields,[93] commercial growers and nurseries,[94] or for erosion control.[95] These restrictions affect all outdoor water uses, including the filling of pools,[96] operation of outdoor water features,[97] or dust control during construction.[98]

2.1.2 Indoor Restrictions

Aside from restrictions on indoor uses that result from volumetric limits,[99] the responsibility to fix leaks,[100] or requirements to install high-efficiency fixtures,[101] none of the ordinances encountered explicitly restrict indoor water use by residential customers.

2.1.3 Commercial Restrictions

The water use restrictions that apply specifically to commercial users during drought stages are usually no different from the common restrictions that permanently apply to commercial uses in many areas.[102] A few ordinances explicitly state that production at industrial or commercial facilities may be curtailed to maintain adequate water supplies,[103] while others provide a specific exemption for industrial and commercial uses.[104]

2.1.4 Volumetric Restrictions

Volumetric restrictions are employed during drought stages and require customers to limit water usage to a predetermined volumetric limit,[105] or by a certain percentage compared to average use during a certain period.[106] The percentage reduction mandated by the ordinance increases as more severe drought stages are declared.[107]

2.1.5 Price-Signaling

A small number of jurisdictions use price signaling as their method of meeting reduction goals during water shortages. One approach to price signaling during drought that has been enacted by the City of Del Mar includes both a general ten percent surcharge for all users (to recover from losses associated with diminished sales) and a three-tiered price scale that is based on volume consumed (the per-unit price for water doubles once customers exceed a fixed allocation and enter a higher price tier).[108] Similarly, the Irvine Ranch Water District has enacted a permanent rate structure under which customers are assigned a "base allocation" depending on the size and character of their property (e.g., residential

or non-residential).[109] Once customers have been assigned a base allocation, then they will be charged for any water used in excess of that allocation at a higher pricing tier.[110] During drought stages, the water district has the authority to reduce base allocations and adjust pricing tier thresholds.[111] See Tool #3 *Water Shortage Pricing Primer* for more information.

C. FINDINGS AND FURTHER OPPORTUNITIES

C.1 SUMMARY OF FINDINGS

An in-depth analysis of the existing water conservation ordinances in California has revealed a clear trend: statutes enacted more recently tend to define violations in more specific terms,[112] while ordinances enacted less recently tend to define violations in an open-ended manner.[113] More specifically, newer ordinances list certain water uses that qualify as a per se violation,[114] while older ordinances simply note that wasteful or negligent use is not permitted.[115] Beginning in 2008 – 09, many jurisdictions revised or enacted local ordinances to include specific definitions of waste, whereas the ordinances in jurisdictions that have not recently revised their definition of water waste were open-ended.[116] This trend is likely due to the water conservation requirements that are placed on water providers as a result of the statutes discussed in Section 2. Therefore, local governments with a water waste ordinance that was enacted prior to 2009 may not currently have the authority to prevent common forms of water waste, and may consider adopting a definition of waste that explicitly restricts common wasteful uses.

C.2 ADDITIONAL RESOURCES:

Example Ordinances Submitted to the Council as part of Reporting on BMP 1.1: **http://cuwcc.org/LinkClick.aspx?fileticket=p-aeQK2A1PQ%3d&tabid=259&portalid=0&mid=1302**

Most ordinances will be viewable via a simple web search.

Example customer notice letters are available online at: **http://cuwcc.org/Portals/0/Document%20Library/Resources/Drought%20Resources/Tool%20Kit/Resources/Tool%203%20Example%20Notices.zip**

C.3 PARTNERSHIP OPPORTUNITIES:

While difficult, it may be useful to coordinate ordinances with other water agencies in a region. Exact ordinance language will likely not be the same, but having similar restrictions in place at the same time can make regional messaging more effective and limit customer confusion over water waste prohibitions.

D. APPENDIX A – SAMPLE WATER WASTE DEFINITIONS

Below is actual language from a wide variety of current California water waste ordinances. These are offered solely to illustrate the range of possibilities a jurisdiction might consider when revising its water waste ordinance. This appendix is *not* intended as a "model" or template, simply as a source.

D.1 PREAMBLE

1. **Continual Water-Use Practices**: More severe effects of a water shortage are often brought about due to wasteful use of water in times of sufficient supply. The use of water shall be done in an efficient manner, in order to eliminate unnecessary water use where possible. For this reason, certain water-use practices shall be prescribed.

2. The State Legislature has found, and the City Council concurs that: (1) The waters of the State are of limited supply and are subject to ever increasing demands; (2) The continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses; (3) It is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource; (4) Landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; (5) Landscape design, installation, maintenance, and management can and should be water efficient; and (6) Article X, Section 2 of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served, and the right does not and shall not extend to waste or unreasonable method of use of water.

D.2 OUTDOOR RESTRICTIONS

1. No customer shall use potable water to irrigate any lawn and/or ornamental landscape area using a landscape irrigation system or a watering device that is not continuously attended unless such irrigation is limited to no more than fifteen (15) minutes watering per day per station.

2. No person shall use water to irrigate any lawn and/or ornamental landscape area in a manner that causes or allows excessive flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.

3. No person shall use water to wash down hard or paved surfaces, including, but not limited to, sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, or a low-volume, high-pressure cleaning machine (e.g., "water broom") equipped to recycle any water used.

4. No person shall permit excessive use, loss or escape of water through breaks, leaks or other malfunctions in the person's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven days after receiving notice of the condition from the City.

5. No customer shall use potable water to irrigate lawns, groundcover, shrubbery or other ornamental landscape material during a rainfall event, or for 2 days thereafter.

6. By July 1, 2012, all landscape irrigation systems connected to dedicated landscape meters shall include rain sensors that automatically shut off such systems during periods of rain or include evapotranspiration systems that schedule irrigation based on climatic conditions.

7. No customer shall operate a water fountain or other decorative water feature that does not use a recirculating water system.

8. No customer shall use water to clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device.
9. No customer shall install a new single pass cooling system in a building or premises requesting new water service. This provision shall not prevent the replacement or repair of single pass cooling systems that were installed prior to December 31, 2009.
10. No customer shall use water from any fire hydrant for any purpose other than fire suppression or emergency aid without first: (1) requesting and posting the appropriate fees at the City, and (2) obtaining a hydrant meter to record all water consumption for a specified project. Absent a meter, water theft and meter tampering fees will be applied as appropriate.
11. The filling of "slip-n-slides" is prohibited.
12. Lawns and landscaping shall be watered no more than ten (10) minutes per watering station or cycle per day.
13. No lawn, landscape, or other turf areas shall be watered or irrigated between the hours of 10:00 a.m. and 4:00 p.m.
14. Emptying and refilling swimming pools and commercial spas is prohibited except to prevent structural damage and/or to provide for the public health and safety.
15. Filling or refilling of private swimming pools, spas, ponds and artificial lakes is prohibited between 10:00 a.m. and one hour before sunset.
17. Swimming pools and spas should be equipped with covers to minimize evaporation and such covers should be used not less than five days a week unless the facility is in use.
18. Overfilling of any pond, pool or fountain which results in water discharging to waste.
19. There shall be no installation or use of outdoor evaporative cooling systems, often referred to as "mist coolers".
20. Prohibition of draining of swimming pools more than once every three years, except for structural repairs or to comply with public health standards determined by the County Health Officer. Residents with private swimming pools shall file a written application for a permit prior to draining their pools with the Water Division Manager. The application shall include the results of a pool water test conducted by an independent testing organization which shows a cyanuric acid level above 100 parts per million, total dissolved solids over 2,500 parts per million, or calcium over 450 parts per million, or stating the nature and duration of repairs to be made and the date on which the pool will be drained.
21. No person shall use water through a hose, including pressure-washing, to clean the exterior of any building or structure unless such hose is equipped with a shut-off nozzle.

D.3 COMMERCIAL RESTRICTIONS

1. All new commercial conveyor car wash systems in commercial car washing facilities shall be operational recirculating water systems.
2. All commercial conveyor car wash systems in commercial car washing facilities shall be operational recirculating water systems, or the customer must have secured an exemption from this requirement pursuant to Section 14.16.100.
3. Customers operating eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drinks are sold, served, or offered for sale, shall not provide drinking water to any person unless expressly requested by the person.
4. Customers operating hotel, motel, and other commercial lodging establishments shall provide persons the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option.

5. All new washing machines installed in commercial and/or coin-operated laundries shall be ENERGY STAR® and CEE Tier III qualified. By _____, all washing machines installed in commercial and/or coin-operated laundries shall be ENERGY STAR® and CEE Tier III qualified.

6. **Construction Site Requirements**. The requirements of this subsection apply to persons engaged in construction activities. A permittee's refusal or failure to comply with these requirements shall constitute grounds for revocation of a construction or grading permit. In addition, the City may withhold occupancy and inspections until such time as the permit holder has complied.
   a. No person shall use potable water for soil compaction or dust control in a construction site where there is an available and feasible source of recycled water or nonpotable water approved by the Department of Public Health and appropriate for such use.
   b. No person shall operate a hose within a construction site that is not equipped with an automatic shut-off nozzle; provided, that such devices are available for the size and type of hose in use.

7. **Commercial Kitchen Requirements**. No customer may operate a commercial kitchen that does not comply with the following requirements.
   a. Water-Conserving Pre-Rinse Kitchen Spray Valves. New or remodeled commercial kitchens shall be equipped with water-conserving kitchen spray valves. By January 1, 2010, all commercial kitchens shall either remove all existing kitchen spray valves or retrofit kitchen spray valves with water-conserving kitchen spray valves.
   b. **Best-Available Water-Conserving Technology**. New or remodeled commercial kitchens shall ensure that all water-using equipment in new or remodeled commercial kitchens uses the best-available, water-conserving technology.
   c. No customer operating a commercial kitchen shall defrost food or allow food to be defrosted with running water.
   d. Scoop sinks shall be set at minimum water flow at all times of use and shut off during non-working hours.
   e. When hosing or washing kitchen or garbage areas or other areas for sanitary reasons as required by the Department of Health, hoses shall be equipped with positive self-closing nozzles.
   f. All commercial kitchens with dishwashing facilities shall encourage the activity of scraping food waste into a garbage can rather than using a garbage disposal.
   g. Defrosting food with running water is prohibited.

D.4 EXCEPTIONS

The restrictions on landscape irrigation do not apply to landscape irrigation systems that exclusively use very low flow drip type irrigation systems in which no emitter produces more than two gallons of water per hour or weather-based controllers or stream rotor sprinklers that meet a seventy (70) percent efficiency standard.

The restrictions on landscape irrigation do not apply to registered local, state, or federal historical sites.

The restrictions on landscape irrigation do not apply to mined-land reclamation projects that do not require a permanent irrigation system.

The restrictions on landscape irrigation do not apply to ecological restoration projects that do not require a permanent irrigation system.

The restrictions on landscape irrigation do not apply to cemeteries.

The restrictions on landscape irrigation do not apply to plant collections open as part of botanical gardens and arboretums open to the public.

The restrictions on landscape irrigation do not apply to golf courses.

The restrictions on landscape irrigation do not apply to water used for public health and safety.

The restrictions on landscape irrigation do not apply to new landscaping for 21 days after it has been installed.

The restrictions on landscape irrigation do not apply to water used for fire suppression.

The restrictions on landscape irrigation do not apply to users of recycled water.

The restrictions on landscape irrigation do not apply to those utilizing a rainwater storage system.

The restrictions on water use do not apply to water used to meet the medical needs of the customer.

The restrictions on water use do not apply to the necessary use of water for the routine maintenance and/or repair of water distribution facilities, residential and commercial plumbing and existing landscape irrigation systems.

D.5 EXAMPLE PENALTIES

Penalties typically begin with a warning and may advance to fines or termination of service.

Example: City of Sacramento[117]

- First notice of violation – Written notice of violation, no fine is issued
- Second notice of violation – $50 fine, which can be waived by attending a Water Conservation Workshop
- Third notice of violation – $200 fine
- Fourth notice violation, and each subsequent notice of violation – $1000 fine

Example: Alameda County Water District[118]

- First notice of violation – written warning that identifies the wasteful use of water, requests that the customer stop the practice, and informs the customers about applying for an exemption.
- Follow-up visit and inspection – if wasteful use is still occurring issue a second written warning and charge the customer for a field service visit.
- If utility personnel observe continued waste of water that violates the mandatory restrictions more than 48 hours after the on-site notification, it shall be deemed to be a willful violation of the mandatory restrictions on water use, and the General Manager may authorize termination of water service.
- Restoring water service: the reconnection charge established in the Districts Rate and Fee Schedule must be paid before the District will restore the service.

Example: City of Long Beach[119]

- Ordinance established 'Prohibited Use of Water' (PUoW) charges;
- Prior to declared Stage 1 Water Shortage declaration, the PUoW Base Charge shall be $150.
- After a declared Stage 1 Water Shortage declaration, the PUoW Base Charge shall be $200.
- After a declared Stage 2 Water Shortage declaration, the PUoW Base Charge shall be $250.
- After a declared Stage 3 Water Shortage declaration, the PUoW Base Charge shall be determined by the Board.
- The PUoW charge shall equal the number of Notices of Violation multiplied by the Base Charge.

NOTES

1. Local districts are not empowered to enact ordinances, they can, however promulgate regulations. For convenience in this tool we use the term ordinance to refer to all of these actions.
2. For Council members, the Memorandum of Understanding sets forth "Best Management Practices" ("BMPs") that are designed to implement water conservation goals. BMP 1.1(A)(2) commits water supply providers to "enact, enforce, or support legislation, regulations, ordinances, or terms of service that prohibit water waste." BMP 1.1(A)(2), available at http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-1-Utility-Operations-Programs.

   Non-Council members who are required to file Urban Water Management Plans will find the survey useful in reporting on their Demand Management Measures. See Water Code §§ 10611.5 & 10631(f)(1)(m) (2010). Similarly, those water service providers who seek state financing must also report on their implementation of those same demand management measures. Water Code § 10631.5 (repealed effective July 1, 2016).
3. A.B. 1881 (Laird), adding Gov. Code §§ 65591 et seq. (2006); see Civ. Code § 4735 (2014); see also Water Code § 535 (2006).
4. Water Code §§ 10608 et seq. (2010).
5. Water Code §§ 10620 et seq. (2010).
6. Gov. Code § 65595.
7. Water Code § 10608.20.
8. Water Code §§ 10620, 10621 (2010).
9. A majority of the ordinances surveyed for this report can found on the Department of Water Resources website. Department of Water Resources, ftp://ftp.water.ca.gov/Model-Water-Efficient-Landscape-Ordinance/Local-Ordinances/ (last visited Sept. 15, 2014). For additional resources, including ordinances not listed in the previous source, contact council staff via the CUWCC's website, http://www.cuwcc.org/.
10. For convenience, this memo will consider both of these terms as within the scope of water "waste" ordinances, even if "wasteful" and "non-essential" uses may differ.
11. Cal. Code Regs. tit. 23, §§ 864, 865 (2014). On March 17, 2015, the SWRCB extended and added to its 2014 emergency regulations. The additional restrictions prohibit the application of potable water to outdoor landscapes during and up to 48 hours after measurable rainfall and the serving of drinking water other than upon request in eating or drinking establishments.
12. Not all jurisdictions have an ordinance that prohibits water waste. *See*, *e.g.*, City of Susanville, Municipal Code § 13.08.070 (2005) (although "[a]ny person who wastes, causes, permits or allows to be wasted any water …shall have all water service disconnected," there is not a separate definition of "waste" anywhere in the code). *See also*, *e.g.*, City of San Bernardino, Municipal Code § 17.06.010 et seq. (2009). In San Bernardino, homeowners can be fined for visible dead landscaping, even if it results from voluntary conservation. § 8.27.10 (1996). However, homes registered in the Water Wise program are given a temporary exemption from these provisions. § 17.06.010.
13. *See*, *e.g.*, City of Elk Grove, Municipal Code § 14.10.230 (2010) (an example of an ordinance that prevents runoff or overspray onto impermeable surfaces).
14. *See*, *e.g.*, City of Oxnard, Municipal Code § 22-136(B)(3) (2009).
15. *See*, *e.g.*, City of Industry, Municipal Code § 13.03.090(E) (2010) (providing technical requirements for outdoor irrigation equipment).
16. *See*, *e.g.*, City of Petaluma, Municipal Code § 15.17.070(2009) (requiring evaporative covers for all outdoor pools).
17. *See*, *e.g.*, City of Turlock, Municipal Code § 6-7-302(c) (1991) (the City of Turlock permits wading pools, but does not allow "slip-and-slides").
18. A.B. 1881 (Laird), adding Gov. Code §§ 65591 et seq. (2006). *See generally*, http://www.water.ca.gov/wateruseefficiency/landscapeordinance/ . *See also infra*, § 1.4.3 Planning Restrictions.
19. The plumbing fixtures typically addressed are toilets, faucets, and shower heads. *See*, *e.g.*, City of Beverly Hills, Municipal Code §§ 9-4-100 et seq. (2009). Examples of the efficiency standards for each type of these fixtures are: 1.6 gallons per flush for toilets, 2.2 gallons per minute for faucets, and 2.5 gallons per minute for shower heads.
    § 9-4-103.
20. *See*, *e.g.*, City of Beverly Hills, Municipal Code § 9-4-104.
21. *See*, *e.g.*, City of Beverly Hills, Municipal Code §§ 9-4-106, -107.
22. *See*, *e.g.*, City of Los Angeles, Municipal Code § 122.03 (1998).
23. *See*, *e.g.*, City of Santa Clarita, Municipal Code § 9.38.035(3)(a) (2005).

24. *See*, *e.g.*, City of Brea, Municipal Code §§ 13.20.060(H), (I) (2009).
25. *See*, *e.g.*, City of Fountain Valley, Municipal Code §§ 14.18.040(j), (k), (o), (r) (detailing strict permanent conservation requirements that apply to commercial water users). *See also*, *e.g.*, City of Newport Beach, Municipal Code §§ 14.16.040(N), (Q) (2009).
26. *See*, *e.g.*, City of Fountain Valley, Municipal Code § 14.18.100 (2009).
27. *See*, *e.g.*, City of Pasadena, Municipal Code §§ 13.10.065, .067 (2009) (fines are doubled for non-residential customers with water meters larger than one-and-a-half inches).
28. *See*, *e.g.*, City of Antioch, Municipal Code § 6-10.05 (2009). In addition to restrictions on water waste, if a customer uses more than 21 units, and has not achieved a 15% reduction from actual usage during the years of 2005 – 2007 (or from 20 units if their service began after 2007), then a surcharge of four times the quantity charge will be applied to water used in excess of their historical use. *See also*, *e.g.*, City of Gilroy, Municipal Code § 27.76 (creating a daily use allocation for each customer and a fine schedule for exceeding that allocation).
29. *See*, *e.g.*, City of Chino, Municipal Code § 13.05.105 (2009) (exempting single-family residential customers that use less than 224 gallons-per-day from water waste restrictions).
30. *See*, *e.g.*, City of Aliso Viejo, Municipal Code § 7.30.030(C)(5) (2009).
31. *See*, *e.g.*, City of Pasadena, Municipal Code § 13.22.020 (2010).
32. *See*, *e.g.*, City of Gilroy, Municipal Code § 27.98(a)(3) (2014); *see also*, *e.g.*, City of Menlo Park, Municipal Code § 14.44.020(F)(5) (2010).
33. *See*, *e.g.*, City of Anaheim, Municipal Code § 10.19.020.0204 (2009).
34. *See*, *e.g.*, City of Dinuba, Municipal Code § 13.05.050 (1989).
35. *See*, *e.g.*, City of Santa Monica, Municipal Code § 7.16.020(f) (2008).
36. *See*, *e.g.*, City of Sacramento, Municipal Code § 13.04.880 (2009).
37. *See*, *e.g.*, City of American Canyon, Municipal Code § 13.04.060 (2009).
38. *See*, *e.g.*, City of Buena Park, Municipal Code § 13.28.050(C) (2009).
39. *See*, *e.g.*, City of American Canyon, Municipal Code § 13.04.060 (2009).
40. For example, no ordinance was found that forbade people from taking long showers or running half-full loads of dishes or laundry. Aside from the challenges of enforcing such an ordinance, public resistance to such behavioral mandates would likely preclude their enactment in the first place. Instead of mandating such indoor restrictions, water service providers appeal to personal values and social norms to try to achieve the desired indoor reductions.
41. Town of Apple Valley, Municipal Code § 06.40.040(1) (1990).
42. City of Chino Hills, Municipal Code § 13.08.040(A)(3) (2008).
43. *See*, *e.g.*, City of Huntington Beach, Municipal Code § 14.18.110 (2014) (reserving the authority to apply several types penalties, in addition to the maximum fine allowed under state law, on a customer's first violation).
44. *See*, *e.g.*, City of Delano, Municipal Code § 13.04.180 (2008); *see also*, *e.g.*, City of Commerce, Municipal Code §§ 6.20.020 – 6.20.070 (2010) (reserving only the authority to issue a warning or to issue a $100 fine).
45. *See*, *e.g.*, City of Orange, Municipal Code §§ 13.04.160 – 13.04.170 (1996) (allowing the Water Manager to discontinue service to any customer that "wastefully or negligently use[s] water" within 5 days of notification).
46. *See*, *e.g.*, City of Pasadena, Municipal Code §§ 13.10.065, 13.10.067.
47. *See*, *e.g.*, City of Fullerton, Municipal Code § 12.06.120 (1991).
48. Cal. Code Regs. tit. 23, § 864.
49. Water Code § 377 (1983).
50. *See*, *e.g.*, City of Chino Hills, Municipal Code § 13.08.100 (2008) (an example of a typical fine schedule).
51. *See*, *e.g.*, City of Sacramento, Municipal Code § 13.04.890(D) (2009) (doubling fines during drought).
52. *See*, *e.g.*, City of Manhattan Beach, Municipal Code § 7.44.050 (2009); *see also*, *e.g.*, City of Monterey Park, Municipal Code §§ 14.08.100, 1.08.010(A) (2009).
53. *See*, *e.g.*, City of Signal Hill, Municipal Code § 10.03.100(E) (2009); *see also*, *e.g.*, City of San Juan Capistrano, Municipal Code § 6-12.08(a)(9) (2009).
54. *See*, *e.g.*, City of Manhattan Beach, Municipal Code § 7.44.050(B).
55. *See*, *e.g.*, City of Arcadia, Municipal Code § 7553.9.1 (1995).
56. *See*, *e.g.*, City of Santa Ana, Municipal Code § 39-112(2) (2009).

57. *See*, *e.g.*, City of Seal Beach, Municipal Code § 9.35.170(B)(2).
58. *See*, *e.g.*, *id.* at (B)(3).
59. *See*, *e.g.*, City of Fullerton, Municipal Code § 12.06.120(A)(3) (2008).
60. *See*, *e.g.*, City of Garden Grove, Municipal Code § 14.40.060 (2012).
61. *See*, *e.g.*, *id.*; *see also*, *e.g.*, City of Fullerton, Municipal Code § 12.06.120(A)(3).
62. *See*, *e.g.*, City of Garden Grove, Municipal Code § 14.40.060 (instituting a $50 flat fee).
63. *See*, *e.g.*, City of Folsom, Municipal Code § 13.26.170(B)(3)(a) (2009) (permitting installation of a meter on any flat rate service connection at the expense of the property owner following a violation during a drought stage); *see also*, *e.g.*, City of Hanford, Municipal Code § 13.04.150(B)(3) (1995) (mandating installation of a water meter on non-metered properties following a third violation).
64. *See*, *e.g.*, City of Los Angeles, Municipal Code § 121.10(A) (2008) (providing enforcement authority to the Los Angeles Department of Water and Power).
65. *See*, *e.g.*, City of Ione, Municipal Code § 18.16.250 (2010); *see also*, *e.g.*, City of Ukiah, Municipal Code § 3615 (1977); *see also*, *e.g.*, Rio Vista, Municipal Code 13.04.190 (1977).
66. City of Brea, Municipal Code § 13.20.120(C) (2009) (requiring the City of Brea to establish a reporting hotline that allows residents to report observed water waste).
67. City of Palo Alto, Municipal Code § 12.32.020 (1989).
68. *See*, *e.g.*, *Report Leaks/Water Waste*, City of Fresno, http://www.fresno.gov/Government/DepartmentDirectory/ PublicUtilities/Watermanagement/Conservation/reportwaterwaste.htm (last visited Sept. 18, 2014); *see also, e.g., Report Water Waste*, East Bay Municipal Utility District, https://ebmud.com/report-water-waste, (last visited Oct. 20, 2014).
69. *See*, *e.g.*, Estero Municipal Improvement District Code §§ 8.70.070, 8.80.050 (2010).
70. *See*, *e.g.*, City of Malibu, Municipal Code § 9.22.060(B) (2009).
71. *See*, *e.g.*, City of San Mateo, Municipal Code § 27.71.130 (1989) (requiring that 90% of plants used in newly installed landscaping be an approved drought-resistant variety).
72. *See*, *e.g.*, *id.* at § 27.71.120(c) (2009) (limiting turf to 25% of total area on landscapes greater than 1000 sq./ft.); *see also*, *e.g.*, City of Del Mar, Municipal Code § 21.060.040(E)(1) (1992) (limiting turf to 15% of lot area).
73. *See*, *e.g.*, Estero Municipal Improvement District Code § 8.70.070 (2010).
74. *See*, *e.g.*, City of Del Mar, Municipal Code § 21.060.050 (1992).
75. *See*, *e.g.*, City of Redding, Municipal Code § 16.070.040 – .60 (2010).
76. *See*, *e.g.*, City of Menlo Park, Municipal Code §§ 12.44.040 – .090 (2010).
77. *See* Denis Cuff & Jeremy Thomas, *Tri-Valley Hits High Water Marks: Cities Top Drought Conservation Lists*, Contra Costa Times (Sept. 24, 2014), www.contracostatimes.com/contra-costa-times/ci_26590102/tri-valley-hits-high-water-marks-cities-top.
78. City of Fountain Valley, Municipal Code § 14.18.040(q) (2009).
79. Town of Apple Valley, Municipal Code § 06.40.030(B)(18) (1990).
80. City of Turlock, Municipal Code § 6-7-201(a) (1991).
81. *See*, *e.g.*, City of Sacramento, Municipal Code § 13.04.890(A)(2) (2009); *see also*, *e.g.*, Robert Wilde, *Drought Update: Water Abusers Sent to 'Water School' in Santa Cruz*, Breitbart News (Aug. 10, 2014), http://www.breitbart.com/Breitbart-California/2014/08/10/Drought-Update-Water-Abusers-Sent-to-Water-School-in-Santa-Cruz.
82. *See*, *e.g.*, City of Covina, Municipal Code §§ 13.06.050 – 13.06.080 (2009); *see also*, *e.g.*, City of Cloverdale, Municipal Code § 13.05.050 (2014).
83. *See*, *e.g.*, City of El Monte, Municipal Code § 14.02.020 (2009).
84. *See*, *e.g.*, City of Covina, Municipal Code § 13.06.050.
85. *See*, *e.g.*, City of Bell Gardens, Municipal Code §§ 11.03.070 – 11.03.090 (2009).
86. *See*, *e.g.*, City of Calistoga, Municipal Code §§ 13.04.330 – 13.04.370 (1991).
87. *See*, *e.g.*, City of Bell Gardens, Municipal Code § 11.03.100 (2009).
88. *See*, *e.g.*, City of Santa Cruz, Municipal Code §§ 16.01.060 – 16.01.110 (2010).
89. For a no-exceptions ban on outdoor watering during a severe drought stage, see City of Burbank, Municipal Code § 8-2-304(F)(1) (2014).

90. *See*, *e.g.*, City of West Covina, Municipal Code § 23-325(b)(1) (1991).

91. *See*, *e.g.*, City of Chino Hills, Municipal Code § 13.08.090 (2008).

92. *See*, *e.g.*, City of Roseville, Municipal Code § 14.09.110(c)(2) (2014).

93. *See*, *e.g.*, City of Simi Valley, Municipal Code § 6-11.107 (b)(1)(v) (2009).

94. *See*, *e.g.*, City of San Diego, Municipal Code § 67.3808(b)(1)(2011).

95. *See*, *e.g.*, City of Hermosa Beach, Municipal Code § 8.56.100(1)(f) (2010).

96. *See*, *e.g.*, City of Dinuba, Municipal Code § 13.05.060(C)(5) (1989).

97. *See*, *e.g.*, City of Livermore, Municipal Code § 13.26.110(D) (2011).

98. *See*, *e.g.*, City of Riverside, Municipal Code § 14.22.070(B)(2) (2011).

99. *See infra* § 3.2.1.4.

100. *See*, *e.g.*, City of Santa Clarita, Municipal Code § 9.38.035(3)(a) (2005).

101. *See supra* § 3.1.1.2.

102. *Compare* City of Chino, Municipal Code § 13.05.070(A), 13.05.080(B) (2009) *with* City of Newport Beach, Municipal Code §§ 14.16.040(L), (Q) (2009).

103. *See*, *e.g.*, City of Turlock, Municipal Code § 6-7-405(f)(2) (1992).

104. *See*, *e.g.*, City of San Diego, Municipal Code § 67.3804(f) ("industrial manufacturing, processing, or research and development is exempt from the water use restrictions during Drought Response Levels 1 and 2 [out of 4], if . . . the business uses reclaimed water on its premises . . . and the business participates in all applicable City water conservation programs that are considered BMPs by the CUWCC.")

105. *See*, *e.g.*, City of Ukiah, Municipal Code § 3606(A) (1977) (limiting single family use to 50 gallons per day per permanent resident).

106. *See*, *e.g.*, City of Benicia, Municipal Code § 13.35.060 (2012).

107. The percentage of mandatory water use reductions called for from each customer under such ordinances may increase, for example, from 20% during a Stage I Drought to 40% during a Stage III Drought. *See*, *e.g.*, *id.*

108. *See*, *e.g.*, City of Del Mar, Municipal Code §§ 21.70.130, 21.70.140 (2009).

109. Irvine Ranch Water District, Water Regulations § 12.6 (2012).

110. *See*, *e.g.*, City of American Canyon, Municipal Code § 13.14.100 (2009).

111. Irvine Ranch Water District, Water Regulations § 15.5 (2012).

112. *See*, *e.g.*, City of Buena Park, Municipal Code § 13.28.060 (2009) (listing per se violations that constitute a violation of the ordinance); *see also*, *e.g.*, City of Camarillo, Municipal Code § 14.12.030 (2009).

113. *See*, *e.g.*, City of Rio Vista, Municipal Code § 13.04.190(A) (1977) ("[t]he city police department shall ascertain if waste is being committed"); *see also*, *e.g.*, City of Arcata, Municipal Code § 7741 (1979). ("[w]here water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the Public Works Department may discontinue the service . . .").

114. *See*, *e.g.*, City of Burbank, Municipal Code § 8-2-304 (2014); *see also*, *e.g.*, City of Santa Monica, Municipal Code § 7.16.020 (2008) (listing specific definitions of waste).

115. *See*, *e.g.*, City of Orange, Municipal Code § 13.04.160 (1996) ("[i]t is unlawful for a customer to wastefully or negligently use water or to otherwise detrimentally impact the service to other customers"); *see also*, *e.g.*, City of Belmont, Municipal Code § 25.5-19 (1981) ("[u]nreasonable use of water is prohibited").

116. *Compare* City of Wheatland, Municipal Code § 13.48.010(C) (1984) ("[t]he willful waste of water supplied by the city is prohibited") *with* City of Roseville, Municipal Code § 14.09.030 (2014) (listing several activities that qualify as a waste of water).

117. **portal.cityofsacramento.org/Utilities/Conservation/FAQs#q9** Last accessed April 3, 2015.

118. **http://www.acwd.org/DocumentCenter/View/631** Last accessed April 3, 2015.

119. **www.lbwater.org/conservation** Last accessed April 3, 2015.

The complete
Jumpstart Water Shortage Toolkit includes:

- #1 – Model Water Shortage Contingency Plans
- #2 – Water Waste Ordinances and Enforcement Primer
- #3 – Water Shortage Pricing Primer
- #4 – Water Loss and Supply Alternatives Primer
- #5 – Customer Programs and Communication/Outreach Primer
- #6 – Local Water Supply Fact Sheet
- #7 – Water Use and Loss Awareness Resources
- #8 – Water School Curriculum
- #9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

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Jumpstart Water Shortage Toolkit

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Tool #3:

Water Shortage Pricing Primer

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CONTENTS

During prolonged water shortages, water providers may face increasing costs and declining revenues. Water shortage pricing can help send a stronger signal to customers to meet a water use reduction target while providing the utility some revenue stability.

Pricing may be one of the most influential tools available to agencies to manage water and financial resources during a water shortage. Pricing is also one of the more challenging tools to implement. A change in water pricing can be politically sensitive among local ratepayers; these ratepayers will have a chance to vote both on the rates themselves and for the elected officials who set them. In addition, the substantive and procedural requirements of Proposition 218 (addressed on pages 6 – 8) complicate and lengthen rate setting efforts. This tool is meant to be a primer to help agencies better understand water rates surcharges and rates setting rules. It also identifies additional resources to help local agencies develop successful water shortage rates.

WATER SHORTAGE PRICING

Three common methods of adjusting pricing in response to a water shortage include surcharges, excess use charges, and integration of water shortage or drought rates into water shortage contingency plans.

Terminology: The use of the terms "drought rates," "surcharges" and "excess use charges" vary regionally and among publications. The varied use of these terms often reflects local preferences. This tool employs the terms in the following manner. "Surcharge" connotes a fee that is distinct from an agency's normal rates. Labeling a water shortage related fee a "surcharge" will help communicate that the fee is temporary, charged for a specific purpose or not charged to all customers. For instance, fees for customers receiving deliveries at a higher elevation or for specific capital financing purposes are often labeled "surcharges." In contrast, "excess use charge" is used by the Department of Water Resources (DWR) *Urban Drought Guidebook* to refer to fees that send increasingly higher price signals as a customer uses more water.[1] For its part, the American Water Works Association's *M1 Principles of Water Rates, Fees and Charges*, does not use "excess use charge." Rather, it includes a similar concept in its discussion of "class-based volumetric surcharges" as

one type of drought surcharge. Labeling a water shortage fee an "excess use charge" will help communicate to customers that the fee could be reduced if they reduce their consumption. Finally, "water shortage rates" or "drought rates" refer to the entire pricing structure in effect during the water shortage.

Considerations for Structuring Surcharges

Key implementation considerations include customer equity and matching conservation goals with revenue stability goals. Useful questions to ask about equity include *Which customers will be affected?* and *What level of water use will be affected?* Useful questions to ask pertaining to conservation and revenue stability include *What is the reduction goal?* and *How much additional revenue will be required at the projected level of water use?* The answers to these questions will not only affect public perception and acceptance of the charges, but also are critical to meeting any Propositions 218 and 26 challenges. The *Propositions 218 and 26* section on page 6 of this tool provide background on these issues.

Water shortage pricing can be enacted in several ways to meet various revenue and conservation needs. Revenue needs include increased costs potentially incurred for varied reasons, including supply augmentation, water restriction enforcement, customer outreach, conservation programs, or the increased cost for wholesale water. These increased costs may well come at the same time as revenue decreases. Conservation needs include demand management efforts designed either to better manage a limited supply of water, or to avoid pursuit of more expensive water sources.

Drought surcharges are typically designed to change a customer's water bill in one of three ways: a fixed fee added to the total bill, a percent increase to the entire bill, or an increase to the unit price of water. Table 1: Surcharge Options by Rate Structure below summarizes common drought surcharge options most readily available to agencies without substantially redesigning their rate structures. The table is not intended to suggest agencies are limited to their existing rate structure type when developing drought surcharges. For instance, see the Alameda County Water District (ACWD) drought surcharge tables on page 10 of this tool, for an example of an agency with uniform rates under normal conditions and tiered rates during water shortage situations. Surcharges can also target specific customer types and water uses, such as residential water use or dedicated irrigation accounts. In addition to the options below, agencies with allocation based rates may vary charges based not only on customer type, but on individual customer allocations. The examples of drought rates reviewed in this primer are all based on increases to the unit price of water.

Table 1: Surcharge Options by Rate Structure

Rate Structure[1]				
Surcharge Options	Flat	Uniform	Tiered	Allocation[2]
Fixed fee to bill	X	X	X	X
Percent increase to bill	X	X	X	X
Increase to all blocks[3]		X	X	X
Increase for use over benchmark		X	X	X
Progressive increase for volume used			X	X

[1] Rate structures and surcharge options can vary by customer type.

[2] In addition to the options above, agencies with allocation based rates may vary charges based not only on customer type, but on individual customer allocations.

[3] If uniform rates are used, this increase would be applied to all usage.

In addition to existing rate structures in use or in consideration per agency, surcharge options available to each agency will be limited to the capabilities of the utility billing system. As Table 1: Surcharge Options by Rate Structure illustrates, tiered and allocation rates provide more options for targeting specific types and levels of water use; however, uniform rates have a variety of options as well. The benefits of each surcharge strategy may include:

- **Fixed fee and percent increase to bills**: This surcharge structure can help agencies limit revenue shortfalls; however, these surcharges either send no effective price signal for customer to limit water use, or send only a blunt signal to reduce usage. The effectiveness of the price signal will vary with the rate structure to which the surcharge applies. Surcharges based on fixed fees, and percent increases to a customer's water bill, may be easier to implement and may seem to affect customers equally, but ultimately may be less acceptable to customers.[2]

- **Increase to all blocks**: This surcharge structure adds a fee or percent increase to each block. The fee does not target specific levels of water use with higher charges, and in that way does not provide as strong of a signal for customers to maintain water use below specific levels as the below options.

- **Increased price for use over a benchmark**: This surcharge applies an increase to the commodity charge for water use above a benchmark, such as a fixed quantity, for example, 12 units/month, or a percentage of normal use. The pricing effect will discourage total water use, or when applied to higher tiers, discourage outdoor or "excessive" water use.
  - The example from Bella Vista Water District (BVWD) on page 10 of this tool is based on a tiered rate structure, although this could potentially be applied to uniform rates as well. It could be applied to uniform rates as a flat fee for water use above a benchmark. If applied to uniform rates as an increase in cost per unit, it would have the effect of creating an additional tier(s). The ACWD example shows how drought rates can be used to transform a uniform rate structure into a three tier rate structure.

- **Progressive increase for volume used**: These surcharges apply no increase or a small increase to lower quantities of water used with progressively higher increases for larger quantities of water used. The pricing effect can discourage total water use, or when applied to just to higher quantities, these surcharges can discourage outdoor or "excessive" water use. Two methods of implementing this include:
  - **Reducing tier width for some or all tiers**. Reducing tier width by 100% will effectively eliminate the tier. See Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD) examples beginning on page 10 of this tool.
  - **Adding progressive increases to some or all blocks**. See examples from Dublin San Ramon Services District (DSRSD) and Olivenhain Municipal Water District (OMWD) beginning on page 11 of this tool.

Meeting Water Use Reduction Goals

Water use reduction goals identified in agency water shortage contingency plans (WSCP) may help inform the development of water shortage surcharges. Agencies that either do not have a WSCP, or plan to update their WSCP, may want to review the companion primer on *Water Shortage Contingency Plans* (Tool 1). Increasingly, agencies include water shortage surcharges within their non-shortage rates. Prior integration of such surcharges provides three benefits. First, it eliminates the time and expense otherwise needed to enact a drought surcharge when a shortage occurs. Second, it avoids the need to separately notice rate changes. Finally, it increases customer awareness and acceptance of drought surcharges before the shortage. The sample Water Shortage Contingency Plan in Table 2: Contra Costa Water Shortage Contingency Plan3, from the DWR *Urban Drought Guidebook*, shows how water use reduction goals can be coordinated with projected sales across customer classes.

Table 2: Contra Costa Water Shortage Contingency Plan[3]

Water Use Sectors	2004 Sales (AF)	% of Total Sales	Stage I 0-10%(a)		Stage II 10-20%(a)		Stage III(b) 20-35%(a)		Stage IV(b) 35-50%(a)		Maximum(b) 50%	
			Goal (%)	Sales (AF)	Goal (%)	Sales (AF)	Goal (%)	Sales (AF)	Goal (%)	Sales (AF)	Goal (%)	Sales (AF)
Raw Water Service Area												
Municipal	47,434	39%	5%	45,062	15%	40,319	25%	35,576	40%	28,460	50%	23,717
Industrial	33,255	27%	0%	33,255	5%	31,592	5%	31,592	10%	29,930	40%	19,953
Irrigation	1,612	1%	10%	1,451	30%	1,128	75%	403	90%	161,110	100%	0
Agricultur	184	0%	5%	175	15%	156	25%	138	40%	58,661	50%	92
Subtotal	82,485	68%		79,943		73,195		67,709				43,762
Treated Water Service Area												
SF Residential	22,054	18%	5%	20,951	20%	17,643	30%	15,438	45%	12,130	50%	11,027
MF Residential	6,325	5%	5%	6,009	15%	5,376	25%	4,744	40%	3,795	50%	3,163
Irrigation	4,443	4%	10%	3,999	30%	3,110	75%	1,111	90%	444	100%	0
Commercial	4,284	4%	5%	4,073	10%	3,858	20%	3,430	30%	3,001	50%	2,144
Industrial	247	0.2%	0%	247	5%	235	5%	235	10%	222	40%	148
Public Authority	985	1%	5%	936	10%	887	20%	788	30%	690	50%	493
Private Fire Protection	137	0.1%	0%	137	0%	137	0%	137	0%	137	0%	137
Temporary Service	76	0.1%	0%	76	0%	76	100%	0	100%	0	100%	0
Municipal	62	0.1%	5%	59	15%	53	25%	47	40%	37	50%	31
Subtotal	38,616	32%		36,487		31,375		25,930		20,456		17,143
Total	121,101	100%	4%	116,430	14%	104,570	23%	93,639	35%	791,179	50%	60,905

(a) Range in overall reduction goal to be achieved for a given supply reduction stage. A stage's overall reduction goal equals the water supply shortage remaining after supplemental supplies are obtained.

(b) The Urban Water Management Planning Act requires the Plan to consider the reductions necessary to achieve a maximum reduction of 50 percent. Stages III and IV are not expected to be experienced as a result of drought, but rather in response to an emergency situation and exceeds CCWD's estimate of the minimum public health and safety requirement.

Actual water use reduction will typically vary from the reduction goal. Table 3: Programs Adopted by Retail Water Suppliers during California Drought 1976-774 below from the 1976-77 drought shows overall reduction during water rationing was typically within plus or minus 5 percent of the rationing target set by each agency – but more frequently at or above the level than below the level requested by the agency.

Table 3: Programs Adopted by Retail Water Suppliers during California Drought 1976-77[4]

Supplier	Residential Rationing Program	Achievement Percent
Marin Municipal Water District	Mandatory 57% per capita	**65**
East Bay Municipal Utility District	Mandatory 35% per household	**40**
Contra Costa County Water District	Mandatory 30%	**25**
San Francisco Water Department	Mandatory 25%	**30**
Los Angeles DWP	Mandatory 10%	**16**
Sunnyvale Water Department	Voluntary 25%	**26**
Santa Clara Valley Water District	Voluntary 25%	**30**
City of Pleasanton	No program	**19**

Determining how reduction goals and drought surcharges will affect overall revenue is a daunting task. A new *Sales Forecasting and Rate Model* from the Alliance for Water Efficiency can help take some of the confusion and uncertainty out of designing drought surcharges. The spreadsheet-based model and user guide have specific sections dedicated to drought rate adjustments.

Fines and penalties for violating water waste ordinances can also be an effective way of reaching a water use reduction target. They are not; however, typically a substantial source of revenue. For limitations on the use of penalties, see the *Propositions 218 and 26* section below. For more information on penalties, refer to the *Water Waste and Enforcement Primer* (Tool 2).

For additional information on rate surcharges, the AWWA M1: *Principles of Water Rates, Fees, and Charges* is a key resource for water pricing, and provides a thoughtful summary of the benefits of various surcharge types.

PROPOSITIONS 218 AND 26

Overview of Propositions 218 and 26

A recent publication, cited below, describes the principal aspects of Proposition 218:

> As in most states, the price of water service in California is primarily based upon the water supplier's costs. Unlike other states; however, California has constitutionalized its requirement that government-owned water suppliers provide water at cost. In 1996, California voters approved Proposition 218. Known as the "Right to Vote on Taxes Act," Proposition 218 added Articles XIIIC and XIIID to the California Constitution. Article XIIIC requires voter approval before any government entity can impose any kind of tax. Article XIIID addresses a public agency's ability to impose "assessments, fees and charges." In combination, the two provisions address most of the fees that a public entity might impose for water delivery.
>
> Article XIIID lays out the two principal provisions affecting water [service] rates. Section 4 of that article addresses property assessments. Section 6 addresses a "fee" or "charge," "imposed either upon a parcel or upon a person as an incident of property ownership" for a "property-related" service. The courts have concluded that provision of water through an existing connection is a "property-related" service.
>
> Section 6 thus places both procedural and substantive limitations on an agency's ability to impose such charges. Procedurally, it allows a majority of property owners to block a proposed charge by submitting written protests. Substantively, it prohibits any such charge unless:
>
> - the revenues do not exceed the agency's costs of providing the service;
> - the revenues are only used for the purpose for which the agency imposed the charges; and
> - the amount of the charges do "not exceed the proportional cost of the service attributable to" an individual parcel.
>
> In addition, it precludes imposition of any charges based on "potential or future use of a service." It treats such "standby" charges as "assessments" governed by Article XIIID, section 4. That section imposes identical procedural and substantive requirements for "assessments."
>
> Proposition 218's application to the complex world of water rates has regularly prompted agencies to seek or offer guidance. It has also spawned a wide range of appellate decisions. The cases involving charges for water service have principally addressed whether the act applied at all to a particular charge in a particular context. For example, while Proposition 218 covers the delivery of water to existing connections, it does not cover a charge to a landowner for the property's initial connection to a water system. For charges that do fall within Proposition 218's ambit, there have been no appellate cases

> addressing what a water supplier can include as "costs." … There have been no cases that attempt to draw a line between a covered "fee or charge for a property-related service" and a "regulatory charge;" the latter would be beyond Proposition 218's mandate, [governed instead by the provisions of Proposition 26].[5]

There have been two cases that directly address the proportionality requirement and two recent appellate opinions have ruled on the use of customer classes to demonstrate proportionality. Both courts agreed that an agency can meet Proposition 218 by demonstrating that it has set rates for specific customer classes in proportion to the costs imposed on the agency by each customer class.

For its part, Proposition 26 also amended Article XIII of the California Constitution. In effect, it defines a "tax" to be any revenue-raising activity a public agency might undertake, with specified exceptions. If the activity does not fit within one of the exceptions, it is a "tax" and must be approved by a two-thirds vote.

Several of the Proposition 26 exceptions arguably apply to water rates, including the fees otherwise covered by Proposition 218. So, if an agency sets fees that meet the Proposition 218 requirements, the fees are not "taxes" within the meaning of Proposition 26. They do not need to be approved by a two-thirds vote. If, however, an agency's fees do not comply with Proposition 218, the agency will have to find another exception within the Proposition 26 list. Reasonable allocation of costs to run a regulatory program is one of these other exceptions. "Fines and penalties" is another. Again, failure to fit within one of the Proposition 26 exceptions means that the rate will be invalid as a tax unless it had been approved by two-thirds of the relevant voters.

Application to Drought Pricing[6]

1. How to save your agency from going through an unnecessary Proposition 218 procedure.

As noted above, Proposition 218 imposes several procedural requirements. In particular, it requires agencies to give affected property owners notice of proposed rate changes and an opportunity to file written protests. If a majority of the property owners within the agency file such protests, the rates cannot go into effect. The agency has to start over.

With this in mind, agencies are increasingly preparing themselves for revenue declines from drought-induced sales reductions by enacting the drought rate structures or drought surcharges described elsewhere in this tool. Agencies with foresight are adopting such drought rates ahead of time, before they are needed in a drought. Increasingly, they are doing so at the same time that they review and revise their overall structure.

Adoption of drought rates before they are needed has two principal benefits. First, it notifies ratepayers before a water shortage that the agency will have to recover its costs with a different formula than would otherwise apply in times of relative abundance. While never eager for a rate increase, rate payers are least accepting of rate increases that are sought after they have been cutting back on their water use in response to a drought. "You tell me to use less water, and then increase my rates?" is heard all too often by cash-strapped water agencies. Second, if the drought pricing mechanism is combined with the regular rate revisions, the agency only has to undertake one Proposition 218 procedure. This will not only save the agency the costs of an additional Proposition 218 notice and possible protest, but will mean that the rates are already in place when needed.

2. Your agency has three options that can comply with Propositions 218 and 26 when using rates to respond to drought.

If done with a proper administrative record, an agency may choose any one of three ways to use rates to respond to drought. These are: a) drought surcharges added onto existing rates; b) special drought rate structures that temporarily replace the regular rates; and c) fines and penalties. In theory, any of the three approaches

could comply with Propositions 218 and 26. The key to success in meeting a legal challenge; however, is the development of a proper record. The next item addresses this point.

3. Whatever your agency does, "Show Your Work."

How does an agency develop an adequate administrative record to support its choice of drought rates? Recent appellate cases give a short answer: "show your work." For starters, an agency needs to do an adequate cost-of-service study that properly allocates drought-related costs among different customer classes. Simply doing the study; however, will not guarantee that the resulting rate structure will survive a legal challenge. The formal record of the rate-setting proceedings must demonstrate to a judge, who probably knows nothing about water rates, how the agency used the rate study to allocate costs while meeting Proposition 218's proportional cost requirements. Ideally, an agency's rate consultant has described within the study itself how the proposed rates comply with Proposition 218. In addition, staff presentations during formal rate setting hearings should specifically address Proposition 218. This evidence needs to have been presented to the decision makers before the decision is made, not developed after a decision.

To help ensure an adequate record, the agency should involve its attorneys well before rates are proposed or the cost-of-service study is completed.

4. Be especially careful with the Proposition 26 exception for "fines and penalties."

As noted above, "fines and penalties" are not subject to either Propositions 218 or 26. This exception may prove tempting to agencies that have not developed an adequate record to justify rates charged to highly inefficient or wasteful users. Generally, the purpose of "fines and penalties" is to sanction specified conduct, not to raise revenue. An administrative record that relies upon fines and penalties to fill revenue gaps is likely to be suspect when viewed by a judge.

5. Remember: Your agency bears the burden in court.

Traditionally, courts upheld an agency's rate-setting decisions unless the agency acted unreasonably. The burden of proof lay on challengers. The challengers had to demonstrate that the agency acted unreasonably. The agency did not have to prove that it acted reasonably. If the judge found the evidence to be of equal weight, the party with the burden of proof—i.e., the challenger—would lose. The court would uphold the rate structure.

Both Propositions 218 and 26 reverse this presumption. Now, the burden of proof lies on the agency to prove that its rates are reasonable. The challengers do not have to prove that the rates are unreasonable. If a judge finds the evidence to be of equal weight, the party with the burden of proof—i.e., the agency—loses. The court will strike down the rate structure.

Again, the best way to ensure that an agency has met its burden of demonstrating reasonableness is to involve its attorney as early in the process as possible, and well before specific rates are formally proposed.

6. Make sure your rate consultant and attorney keep up with new cases.

Finally, the law governing Propositions 218 and 26 is evolving rapidly. At a minimum, agency staff needs to know that its attorney and rate consultants are keeping up to date with the latest developments. Other agency staff may also benefit from keeping up with the case law, in order to more effectively interact with their technical and legal rate-setting experts.

EXAMPLES

See the appendix for example tables and language of water rate surcharges.

ADDITIONAL RESOURCES

Foundational resources for agencies looking to develop water shortage surcharges should include the AWWA M1, the DWR *Urban Drought Guidebook*, and the AWE *Sales forecasting and Rate Model Guide*. Below is an extended list of potential resources for this topic.

American Water Works Association, M1: ***Principles of Water Rates, Fees, and Charges***, Sixth Edition. 2012.

Alliance for Water Efficiency, ***Sales Forecasting and Rate Model User Guide.***

California Public Utilities Commission Drought Procedures Standard Practice U-40-W

Department of Water Resources, ***Urban Drought Guidebook***. 2008

Proposition 218 Webinar, May 12, 2015. **http://cuwcc.org/Calendar/Workshops**

Figure 1: Sample outreach tool that illustrates the value of water

Photo credit – Association of California Water Agencies

APPENDIX

Bella Vista Water District 2014 Water Shortage Rates

"The amount of water Residential and Rural customers are allowed at each block rate is determined by individual water allotments. Bimonthly allotments are the greater of: (a) Public Health and Safety Allocation of 24 HCF to each Customer, or (b) 85% of the prior 3 year Average bimonthly usage at the location. This first block is considered the base allotment. [...] Base Allotment (for usage up to 85% of the 3 yr. avg. bimonthly usage or 24 HCF (whichever is greater) = $.468 per HCF [...] Excess Use Penalty Charge for all usage exceeding the base Allotment = $2.50 per HCF"[7]

Alameda County Water District Drought Surcharges

Table 4: Alameda County Water District Drought Surcharges[8]

Drought Surcharge (Single-Family Residential Customers): Effective 7/21/14					
	Usage	Type	Base Rate Per 100 Cubic Feet (100 Cubic Feet Equals 748 Gallons)	Drought Surcharge	Total Cost Per Unit
SFR	Indoor	**Tier 1** (0 to 16 hcf)	$ 3.373	$ 0.000	$ 3.373
	Outdoor	**Tier 2** (>16 to 30 hcf)	$ 3.373	$ 1.480	$ 4.853
	>Average	**Tier 3** (>30 hcf)	$ 3.373	$ 2.000	$ 5.373

Drought Surcharge (Non-Single-Family Residential Customers): Effective 7/21/14					
	Usage	Type	Base Rate Per 100 Cubic Feet (100 Cubic Feet Equals 748 Gallons)	Drought Surcharge	Total Cost Per Unit
NON-SFR	All	Uniform	$ 3.373	$ 0.460	$ 3.833*

Examples: Multi-Family Residential, Commercial, Dedicated Landscape, Institutional, Industrial
*For Outside District Customers: $3.878 + $0.46 = $4.338

Dublin San Ramon Services District Water Rates, Normal and Water Shortage Conditions

Table 5: Consumption Charges for Potable Water Distribution[9]

Rate per Unit Effective Jan 1, 2015	Normal Conditions	Water Shortage Conditions			
		Stage 1	Stage 2	Stage 3	Stage 4
Target Reduction Goal	0%	10%	20%	35%	50%
Residential Customers					
Tier 1 (1-10 units)	$0.53	$0.59	$0.66	$0.92	$1.35
Tier 2 (11-34 units)	$1.11	$1.39	$1.72	$2.22	$3.60
Tier 3 (over 34 units)	$1.48	$1.92	$2.88	$4.14	$5.69
Commercial Customers (includes Industrial, Multi-Family and Institutional)					
Winter (Nov-Apr) – all units	$1.06	$1.15	$1.27	$1.60	$2.01
Summer (May-Oct) – all units	$1.27	$1.48	$1.77	$2.23	$3.17
Potable Irrigation Customers					
All units	$1.48	$1.92	$2.88	$4.14	$5.69
Recycled Water Customers (See Table A)					

http://www.dsrsd.com/your-account/rates-fees/water-rates

Eastern Municipal Water District WSCP Stages with Applicable Rate Changes

Table 6: EMWD WSCP Stages and Applicable Rate Changes[10]

Stage	Requirements	Enforcement
1 **Supply Watch**	Up to 10% Voluntary Demand Reduction	Allocation-Based Tiered Rates
2 **Supply Alert**	Up to 20% Voluntary Demand Reduction	Allocation-Based Tiered Rates
3 **Mandatory Waste Reduction**	Mandatory Waste Reduction	Limits on Variances and up to 100% reduction of Tier 3 Allocation
4 **Mandatory Outdoor Reduction**	Up to 100% Outdoor Water Use Reduction	Up to 100% reduction of Tier 2 Allocation
5 **Mandatory Indoor Reduction**	Up to 50% Indoor Water Use Reduction	Up to 50% reduction of Tier 1 Allocation and allocation for non-tiered customers

Olivenhain Municipal Water Rates – 2013

Table 7: Olivenhain Municipal Water Rates Table[11]

MONTHLY WATER RATES & CHARGES	Effective April 1, 2015 (1 Unit=748 Gallons)				
Water Rates Per Unit (1 unit = 748 gallons)	NON-SHORTAGE	WATER SUPPLY SHORTAGE RATES For updates, please visit: www.olivenhain.com			
Customer Type	**(Base) Rates**	**WATCH/LEVEL 1 Voluntary**	**ALERT/LEVEL 2 Mandatory**	**CRITICAL /LEVEL 3 Mandatory**	**EMERGENCY / LEVEL 4 Mandatory**
Domestic					
0-6 Units	$2.25	$2.25	$2.36	$2.48	$2.70
7-25 units	$3.74	$3.93	$4.11	$4.68	$5.42
26-80 Units	$4.23	$4.65	$5.29	$6.35	$7.40
Over 80 units	$4.73	$5.44	$5.91	$7.10	$9.46
Agricultural	$3.74	$3.93	$4.02	$4.49	$5.24
Combined Agricultural / Domestic	First 26 units per month: Follow Domestic Rate Structure. Over 25 units per month: Follow Agricultural Rate Structure.				
Commercial	$3.20	$3.36	$3.44	$3.84	$4.48
Irrigation					
Tier 1	$3.43	$3.60	$3.77	$4.29	$4.97
Tier 2	$4.24	$4.88	$5.30	$6.36	$8.48
Construction	$5.72	$6.58	$7.15	$8.58	$11.44
Recycled	$3.18	Shortage rates do not apply			

The rates include costs from San Diego County Water Authority (SDCWA) from which OMWD must purchase 100% of its potable water supply.

Western Municipal Water District Water Supply Allocation Plan

Table 8: Western Municipal Water District Water Supply Allocation Plan[12]

WMWD Riverside Retail Service Area											
Single-Family Residential Customers: Rates by Tier and Stage — Effective January 1, 2015											
Stage	**1**	**2**	**3a**	**3b**	**3c**	**4a**	**4b**	**4c**	**5a**	**5b**	**5c**
Tier 1	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978	$1,978
Tier 2	$2,306	$2,306	$2,306	$2,306	$2,306	$2,306	$2,306	$2,306	$5,314	$5,314	$5,314
Tier 3	$2,849	$2,849	$2,849	$2,849	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314
Tier 4	$4,424	$4,424	$4,424	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314
Tier 5	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314	$5,314

NOTES

1. The Guidebook cites an example where excess use fees increased to $25/1000 gal. for use above 3000 gal.
2. See M1: Principles of Water Rates, Fees, and Charges, Sixth Edition, Chapter 3 Drought and Surcharge Rates. Customer acceptance is mentioned on pages 182, 185.
3. DWR Urban Drought Guidebook: 2008 Update, page 75.
4. DWR Urban Drought Guidebook: 2008 Update, page 57.
5. Adapted from Gregory S. Weber, *A New Water Accounting*, 50 Ecology Law Quarterly 795, 803-805 (2013).
6. The matters set forth in this section are not intended to be, or to be acted upon as, legal advice. Rather, they are simply meant to ensure that busy agency staff members and managers are equipped to have a meaningful conversation with the agency's attorney. Do ensure that your agency has either employed or retained an attorney who keeps up-to-date with the ever-growing body of Proposition 218 law.
7. **http://www.bvwd.org/rates**. Last Accessed April 3, 2015.
8. **http://www.acwd.org/index.aspx?NID=115**. Last Accessed April 3, 2015.
9. **http://www.dsrsd.com/your-account/rates-fees/water-rates**. Last Accessed April 3, 2015.
10. **http://cuwcc.org/Portals/0/Document Library/Committees/Permanent Committees/Plenary/2014 Meetings/December 10, 2014/Presentations/Panel_Water Rate Adjustments During Drought_Lovsted.pdf**. Last Accessed April 3, 2015.
11. **https://www.olivenhain.com/files/docs/finance_billing/rates&rules.pdf**. Last Accessed April 3, 2015.
12. **http://cuwcc.org/Portals/0/Document%20Library/Workshops/Water%20Rates%202015/Presentations/Mascaro_ppp.pdf?timestamp=1428099864314**. Last Accessed April 3, 2015.

The complete
Jumpstart Water Shortage Toolkit includes:

- #1 – Model Water Shortage Contingency Plans
- #2 – Water Waste Ordinances and Enforcement Primer
- #3 – Water Shortage Pricing Primer
- #4 – Water Loss and Supply Alternatives Primer
- #5 – Customer Programs and Communication/Outreach Primer
- #6 – Local Water Supply Fact Sheet
- #7 – Water Use and Loss Awareness Resources
- #8 – Water School Curriculum
- #9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

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Jumpstart Water Shortage Toolkit

Photo credit – Water Systems Optimization, Inc.

Tool #4:

Water Loss and Supply Alternatives Primer

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – Dublin San Ramon Services District

CONTENTS

INTRODUCTION

This tool provides a primer on actions that agencies can take to mitigate the effects of drought by reducing real losses and augmenting supplies.

WATER LOSS REDUCTION

Real losses are the physical losses within a distribution system. While these losses vary by agency, real losses of 39 gallons per service connection per day and greater are not uncommon in California.[1] The savings potential inherent to implementing a water loss control program can be more than the savings achieved through other programs combined. These losses represent water that the agency has already paid to obtain, store, treat and distribute. A water loss control program can include leak detection, pressure management, and improved speed and quality of leak repair.

Photo credit Charlie Pike

This primer does not address two types of water losses: "Apparent" losses and customer-side losses. "Apparent" losses are losses only on paper; they result from faulty water accounting or meter errors. Customer-side losses take place on the customer side of the meter. Many agencies consider these losses to be a customer's responsibility. To help customers deal with leaks in their home, the Council sells the *Practical Plumbing Handbook*, in English and Spanish, to water providers for distribution to customers.

Leakage reduction substantially benefits the water service provider. These benefits can include:

- A "new" source of water at critical times;
- Reduced need for pumping;
- Reduction in the amount of water being treated and pressurized;
- Reduced public health hazards caused by contamination of water supply;

- Improved pressure to customers with no pumping increase; and
- Reduced potential liability due to property damage associated with leaks.

A robust leakage reduction program also sends a signal to agency customers and the wider community that the water provider is being proactive in reducing system losses.

The following sections describe fundamental tools and techniques to reduce real losses for agencies that do not already have an active water loss control program.

Water Audit

A distribution system water audit is the first step in assessing the amount of a system's real and apparent losses. The AWWA Water Loss Control Committee has developed the industry-standard "Free Water Audit Software." It is a spreadsheet-based tool available for download from AWWA's website.[2] Completing the AWWA water audit will allow agencies to understand the overall amount of real and apparent water losses. It also provides a series of financial and operational performance indicators to help track year-to-year progress. The AWWA manual, *M36 Water Audits and Loss Control Programs,* is a companion resource that can assist agencies both with completing a water audit and with developing a water loss control program.

The Council has developed a three-hour webinar to help agencies meet the training requirements of Best Management Practice (BMP) 1.2, the water loss control BMP. This webinar can also be very useful to non-members. To access the Council's Water Loss Webinar recording, send the completed **registration form to the Council**. The Council is also planning a series of hands-on water audit workshops for 2015-2016 – refer to the calendar at **cuwcc.org** for more information.

Component Analysis

After completing a water audit with reliable data (i.e., a data validity score of 60 or greater), agencies may want to conduct a component analysis. This will show which water loss control programs may be best to pursue, and at what level of investment.

This analysis helps agencies to better understand their physical or real losses by breaking them down into three components: background leakage, un-reported leakage, and reported leakage. Table 1: Categories of System Water Leaks – Adapted from AWWA M36 Manual below describes these three types of water loss and the tools commonly used to reduce these leaks.

Table 1: Categories of System Water Leaks – Adapted from AWWA M36 Manual

Leakage Type	Tools
Background Leakage Un-reported and un-detectable using traditional acoustic equipment	Pressure Reduction Main and service replacement Reduction in the number of joints and fittings
Un-Reported Leakage Often does not surface but is detectable using traditional acoustic equipment	Pressure Reduction Main and service replacement Reduction in the number of joints and fittings Proactive leak detection
Reported Leakage Often surfaces and is reported by the public or agency workers	Pressure Reduction Main and service replacement Optimized repair time

To help agencies design efficient and sustainable leakage control programs, the Water Research Foundation recently produced both the *Real Loss Component Analysis: A Tool for Economic Water Loss Control* and a companion report analyzing approximately 2,500 U.S. water audits. The tool, report and an introductory webinar are available at http://www.waterrf.org/Pages/Projects.aspx?PID=4372.

Pressure Management

Pressure reduction is one of the most cost-effective methods for reducing leaks within a distribution system. While many systems are often operated to maintain a minimum pressure, there are still many opportunities across the state to optimize water systems through pressure reduction. An analysis of 80 water audits reported to the Council for 2012 showed a mean system pressure of 74.3 psi, and a median system pressure of 74.5 psi. This shows that half of the water agencies whose data was analyzed are operating at nearly **double** the standard minimum operating pressure maintained for fire flow needs. A recent report, *Assessing Fire Flows in California's Urban Water Systems,* suggests that a 10% reduction in pressure will ordinarily reduce system water losses by 10%.[3] Estimates suggest that pressure reduction programs save water at 25% of the cost of rebating low-flow toilets at $100 per toilet.[4] Concerns over loss of pressure for fire suppression can be mitigated by using flow modulated pressure-reducing valves that allow pressure to increase on demand.

For additional water loss reduction strategies, the references in the Additional Resources section below may be helpful.

WATER SUPPLY ALTERNATIVES

Preparing for and responding to a drought requires a water supplier to identify, plan for and potentially obtain alternative water supplies. These alternatives can include local supplies, neighboring agency supplies, and prepackaged water distributed in various ways.[5] This section will introduce these options and provide additional resources for more information. Table 2: Alternative Water Supplies and Distribution Methods6 summarizes alternative supplies, distribution methods, and relevant considerations.

Drill New Wells or Recondition Existing Wells

Drilling a new well or reactivating an existing well may be a necessary step in ensuring an adequate water supply. Reactivating old wells may be cost effective; the Department of Water Resources' *Urban Drought Guidebook (2008)* estimates the cost of rehabilitating large capacity wells at up to $25,000 per well. Augmented water supplies, including new and rehabilitated wells; however, may present water quality concerns. In determining the cost effectiveness of such wells, an agency must consider the costs needed both to blend the water to maintain quality standards and to increase water quality monitoring.

Work with Neighboring Water Suppliers

Developing interconnections, also called interties, between water providers may allow water transfers between agency systems. During the 1976-77 drought, a five-mile pipeline was laid across the Richmond-San Rafael Bridge to provide water from the East Bay Municipal Utility District to parched Marin County. These projects typically require pre-planning and written agreements between the cooperating agencies. Another way to cooperate with neighboring agencies is to develop a mutual aid agreement. Refer to the Additional Resources section of this tool for information on a mutual aid action plan, including a sample mutual aid and assistance agreement, developed by AWWA.

Table 2: Alternative Water Supplies and Distribution Methods[6]

Water Source[1]	Distribution Method		
	Through Existing Supply System	Bulk Water Delivered to Special Sites[2]	Considerations
Normal Local	Existing system redundancy that may require emergency equipment (generators, pipe), additional storage.	Sources potentially include hydrants or reservoirs.	See Tool 1 and 2 for demand side options such as water restrictions to extend available water supply.
Alternative Local	Local sources connected with emergency or pre-existing connections. Sources potentially include new and rehabilitated wells, recycled water.	Sources potentially include new and rehabilitated wells, recycled water.	May require additional treatment and water quality monitoring.
Neighboring Agency	Interconnections (interties) with neighboring agencies.	Sources potentially include hydrants or reservoirs from neighboring agencies.	May require a mutual aid agreement.
Pre-packaged Water	Not Applicable	Sources include third party bottled water providers.	Bottled water obtained through vendor contract or Federal assistance.

[1] Untreated supplies may require additional treatment by the agency or the household (e.g., boiling or chemical). See the Appendix for a list of some distributed treatment options. Recycled water may be an alternative to potable water sources for irrigation or industrial uses.
[2] Bulk Water is water transported to distribution points in un-serviceable areas for pickup. Delivery options for special sites include licensed tanker trucks, bladders, and small bags.

Provide Non-Potable Water for Non-Potable Uses

If an agency has a recycled water system in place, it might find new recycled water customers to offset potable water demand. Recycled water can also be provided for residential non-potable use. In 2014, Dublin San Ramon Services District developed a recycled water fill station. This station allowed residents to obtain recycled water to irrigate trees, gardens, and lawns at their homes or wash outdoor furniture and hard surfaces. In order to participate, customers had to first sign a residential recycled water use agreement, be trained in proper procedures, and receive an ID card and stickers for their water containers.[7]

Emergency Water Supply Options

Emergency water supplies may be necessary to respond to many situations beyond drought. These can include natural disasters, water supply interruptions, and drinking water contamination. Those water service providers who are required to submit an Urban Water Management Plan should have already detailed alternative supplies as part of both their water shortage contingency plans (WSCPs) and their catastrophic supply interruption plans. Agencies that have not prepared such plans may want to review the WSCPs of agencies in their region.

Three more resources deserve mention. First, both the EPA Emergency Incident Information website and the CalWARN website address catastrophic supply planning.[8] Second, the EPA **drought incident action checklist** is a useful resource for agencies planning for, responding to or recovering from a drought. Finally, refer to the Appendix, below, for a table of emergency water supply options.

PARTNERSHIP OPPORTUNITIES

For leak detection, inquire with other water suppliers to identify the leak detection programs that they have found most effective. Agencies can also contact leak detection equipment suppliers for training, to request an equipment loan, and for help with leak surveys. Training may also be available from the California Rural Water Association, the Cal-Nevada Section of AWWA, and the Council. Agencies may also ask their customers to report potential distribution system water leaks.

For water supply alternatives, consider working with neighboring agencies to develop a mutual aid agreement.

EXAMPLES

Water Loss

Hunting for Water Leaks in California's Drought (Gizmodo, 2015).

Pressure Management

The AWWA's M36, third edition, contains examples of pressure management techniques used at El Dorado Irrigation District, Halifax Regional Water Commission and Washington County (Virginia).

Interconnections:

Bay Area Regional Reliability Interties – EBMUD/ CCWD

Placer County Water Agency_Ophir Road Pipeline Extension Project

Photo credit – San Diego County Water Authority

ADDITIONAL RESOURCES

AWWA, *M36: Water Audits and Loss Control Programs*, Third Edition, American Water Works Association, **www.awwa.org**

Utilities Helping Utilities: an action plan for mutual aid and assistance networks for water and wastewater utilities. 2008. **Sample WARN Agreement http://www.awwa.org/Portals/0/files/resources/water%20knowledge/rc%20emergency%20prep/rc%20warn%20resources%20pdf/typingmanual.pdf**

AWWA Water Loss Control Committee, ***Water Audit Software & Compiler V5***.

CalWARN - **http://www.calwarn.org/**

CUWCC, ***Bmp Costs & Savings Study***, 2005. System Audits and Leak Detection, Section 2-112.

EPA Planning For Emergency Drinking Water Supply Report, June 2011.

http://water.epa.gov/infrastructure/watersecurity/emerplan/

http://www.wef.org/EPA_Planning_Emergency_DWSupply_June2011/

http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817f15001.pdf

Thornton, *Water Loss Control Manual 2nd Edition*, 2008. With Reinhard Sturm and George Kunkel.

Managing Leakage by Managing Pressure: a practical approach, 2003.

The Cal-Nevada Section of the American Water Works Association "Resources Guide" contains list of water loss control consultants. The Resources Guide is available at: **http://www.apogeepublications.com/emags/CANV_RG2014/**

The California Urban Water Conservation Council lists its business members. These include consultants and organizations with expertise in water loss and water supply planning. **http://cuwcc.org/Members/Member-Directories**

APPENDIX

Table 3: Emergency Alternative Water Supply Options[9]

Planning for Emergency Drinking Water Supply			
Option*	**Description**	**Implementation Requirements**	**Capacity/Scalability**
Bottled Water	Distribute bottled water at distribution sites.	Vendor contract or contract agreement with other utilities for aid	**Determined by vendor availability and local storage capacity (if storing bottles on-site)**
Reverse osmosis	Treat saline water sources, such as saline ground water and ocean water.	• Water source • Power source • Mode of transport to distribution sites	**0.5-1.0 MGD units**
Filtration	Treat untreated local water sources by ultrafiltration, microfiltration, GAC, or other filtration methods.	• Water source • Pumps/intake • Chemicals • Power source • Operators • Distribution points (into system or to packaging)	**0.5-1.0 MGD**
Point-of-Use Treatment	Use boil water notices for contamination that can be treated by boiling. Other options include household bleach disinfection, purification tablets or manual filters.	• Power in customer homes • Functioning distribution system	**Applicable over any scale demand**
Bottle In- house	Bulk water can be bottled at the source prior to transport and/or distribution.	• Bulk supply of water • Power source • Packaging material • Operators	**Up to 120 packages per minute (2.5 gal or less) (300 gpm ~ 0.4 mgd)**
Bag In-house	Bulk water can be bagged at the source prior to transport and/or distribution.	• Bulk supply of water • Power source • Two operators	**1-2.5 gal bags, 12-15 bags/min**
Stationary bladders	Distribution can take place at the water source from large (not transportable) bladders.	• Water source near an appropriate distribution site • Pipe and spigot apparatus • Individuals must bring containers • Staffing and operators	**10,000-100,000 gal**
Bladder transport to distribution sites	Small bladders that can be transported on a truck bed can be brought to distribution sites.	• Local water source • Pipe and spigot apparatus • Individuals must bring containers • Truck beds appropriate for transporting full bladders and forklifts, etc. • Functioning roadways	**Up to 6,000 gal**
Transport in tanker-trucks	Utilities can make agreements with companies in the area that have access to potable tanker trucks (e.g., dairy trucks) – or may have some on hand.	• Contract with company to use trucks in an emergency • Potable water source • Distribution method (e.g., packaging on-site) • Functioning roadways	**3,000-20,000 gal**

* Costs will depend on multiple factors including size, duration, site conditions, equipment availability, security considerations, and degree of infrastructure required.

NOTES

1. Using 2012 water audit data reported by 69 agencies to the Council, the median real losses per service connection per day was 39, while the average was 55. For agencies with a lower connection density, real losses per mile is a better metric.
2. http://www.awwa.org/resources-tools/water-knowledge/water-loss-control
3. Alex, Rucker A. – Assessing Fire Flows In California's Urban Water Systems: Opportunities For Reducing Greenhouse Gas Emissions, Water, And Energy Use. forthcoming, 2015.
4. Horvath, Stokes, Sturm – Water Loss Control Using Pressure Management: life-cycle energy and air emission effects.
5. EPA Planning for Emergency Drinking Water Supply Report
6. Adapted from Table 1 in the EPA Planning for Emergency Drinking Water Supply Report. June, 2011.
7. Dublin San Ramon Services District, **Recycled Water for Residential Use**
8. The mission of the California Water/Wastewater Agency Response Network (CalWARN) is to support and promote statewide emergency preparedness, disaster response, and mutual assistance processes for public and private water and wastewater utilities.
9. EPA Planning For Emergency Drinking Water Supply Report, June 2011. Page 21.

The complete
Jumpstart Water Shortage Toolkit includes:

- #1 – Model Water Shortage Contingency Plans
- #2 – Water Waste Ordinances and Enforcement Primer
- #3 – Water Shortage Pricing Primer
- #4 – Water Loss and Supply Alternatives Primer
- #5 – Customer Programs and Communication/Outreach Primer
- #6 – Local Water Supply Fact Sheet
- #7 – Water Use and Loss Awareness Resources
- #8 – Water School Curriculum
- #9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

The Council is grateful to the following individuals for helping Council staff to develop, edit and review the Jumpstart Water Shortage Toolkit: Russell Frink, Charlie Pike, Sharon Fraser, William Granger and Toby Goddard.

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Jumpstart Water Shortage Toolkit

Photo credit – Carmichael Water district

Tool #5:

Customer Programs and Communication/Outreach Primer

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – San Diego County Water Agency

CONTENTS

INTRODUCTION

This primer identifies popular and effective water efficiency and conservation programs, and communication and outreach strategies that have been used by California water utilities to educate customers, influence water use behaviors, and realize water savings.

This primer contains the following:

- An index of water efficiency programs;
- Strategies for how water providers can communicate with their customers;
- Strategies for how water providers can communicate with the media; and
- References linking examples of effective water efficiency programs and communication strategies.

PROGRAM BREAKDOWN

The effectiveness of individual programs depends on the service area. For example, communities built since 2000 will already have efficient toilets and clothes washers in new structures and would not benefit as much from a toilet and washer rebate program as would older communities.

In general, water efficiency programs can be categorized as mandatory, utility-provided, or incentivized and voluntary.

In terms of services provided to customers or incentive programs, most water efficiency programs can include:

Residential Customer Programs		Multi Family Programs	Commercial, Industrial and Institutional (CII) Customer Programs		Mandatory Actions
Outdoor Water Use / Landscape	**Indoor Water Use**	The residential programs listed may be implemented on a single-family or a multi-family scale; however, in some cases, specific techniques have been helpful in targeting multi-family complexes, such as:	**Outdoor Water Use**	**Indoor Water Use**	Most California water utilities have enacted regulations in response to the drought. These regulations are often tiered and based on water supply conditions and other factors. While these regulations are decided at a local level, state mandates such as the April 2015 mandatory water use reductions, will set targets and guide local regulations. For information on these regulations, visit the **State Board's drought portal**.
Irrigation Education and Incentives	Water Wise House Calls (agency-provided water audits)	Submeter programs	Landscape Surveys	Indoor Water Audit	
Sustainable Landscape Design, Installation, Education, and Incentives	Distribution of plumbing retrofits (e.g. faucet aerators and showerheads)	Indoor and Outdoor Water Audits	Water Budgets	Direct Install or Distribution of Efficient Fixtures	
Lawn Conversion or Landscape Modification Incentives	Rebates/ Incentives (e.g. for water efficient appliances)	Direct Install or Distribution of Efficient Fixtures	Rebates/ Incentives (e.g. conversion to drip or high-efficiency nozzles)		
Plant Choice Education	Leak Detection (usually at the customer's meter)	Efficient Pool Programs			
Alternative Water Sources for Outdoor Use Education and Incentives					

Water Efficiency Programs/Tools Index

The following table identifies water efficiency program topics, reference tools, and descriptions of their respective water savings actions.

Residential Efficiency	Description
Clothes Washer and Dishwasher Retrofits	Install high efficiency appliances as classified by the Consortium for Energy Efficiency that save water and energy; these appliances are often rebated by water and energy providers.
Home Water Use Calculator	Calculates water use from customer inputs and relays information to homeowners.
Leak Identification and Repair	Informs the property owner or the water provider of on-site water waste and stops wasteful leaks.
Toilet Retrofits	Install high efficiency toilets (HET).
Water Audits or 'Water Wise' or House Calls	Survey houses to identify opportunities to replace high water using appliances and to find leaks. Home survey kits are offered through schools to school children or surveys are performed by water provider employees.

Outdoor Efficiency	Description
Deficit Irrigation	Applies irrigation to plants in quantities less than the full ET requirement. Different plant species respond differently to deficit amounts.
Drip Irrigation	Applies targeted, low volume irrigation allowing water and nutrients to penetrate the soil to the root zone; reduces drift, spray evaporation, and runoff.
Graywater Capture and Use	Applies water that comes from bathroom sinks, showers, tubs, and clothes washing machines to plants as a substitute for potable water.
Irrigation Controller Efficiency and ET	Educates customers to adjust irrigation controllers, which can result in significant water savings. ET data is available from the California Irrigation Management Information System (CIMIS).
Irrigation Training for Landscape Professionals	Educates landscape professionals through multi-session classes about landscaping principles, soils, mulches, irrigation, pest management, pruning, fertilizers and turf care (e.g., Green Gardener Training and QWEL WaterSense training).
Large Landscape Surveys	Undertakes irrigation equipment inspections, sprinkler precipitation tests, written report listing suggestions for improving the efficiency of the irrigation system, site-specific irrigation schedule based on test data and local weather data, and can generate site-specific landscape water budgets designed to assist in managing landscape water use.
Lawn Conversions and Turf Removal	Removes and replaces turf lawns with more water efficient landscaping to reduce outdoor irrigation.
Low Water Using Plants and their ET Requirements	Minimizes water use through climate-appropriate landscaping. Reference WUCOLS (Water Use Classifications of Landscape Species) to identify low water intensity plants and to estimate their water needs.
Mulch	Covers soil surfaces to conserve moisture, improve fertility and health of soil, reduce weed growth, and enhance the visual appeal of the area.

Outdoor Efficiency	Description
Plant Tags	Identifies regionally-appropriate plants for consumers.
Pool Covers	Reduces evaporation from pools.
Rainwater Capture and Use	Captures rainwater from roofs, driveways, and other impervious surfaces. Applies rainwater to plants as substitute for potable water.
Recycled Waste Water	Substitutes treated wastewater for potable water on authorized uses such as landscape irrigation, street cleaning, dust control, and cooling towers.
Rotating Nozzles	Improve distribution uniformity, reduce runoff, reduce overspray, and improve application in windy conditions.
Soil Moisture Sensor	Measures soil moisture content in the active root zone and transmits signals to an irrigation controller to prevent overwatering.
Water Wise Gardening	Involves gardening practices that use limited supplemental irrigation.
Weather Based Irrigation Controller	Estimates or measures available plant moisture in order to operate an irrigation system in accordance with current weather conditions.

CII Efficiency	Description
Commercial Clothes Washers	Saves water used in the large family sized washers often found in coin-operated laundries.
Commercial Ice-Makers	Maintains ice machine temperatures through air flow in place of water flow.
Connectionless Food Steamers	Minimizes steam water waste in commercial kitchens.
Cooling Towers – Conductivity Controllers	Measures water quality and controls water additions to cooling water evaporation systems.
Dry Vacuum Pumps	Reduces water use by vacuum pumps common in dentistry and hospitals.
Laminar Flow Restrictors	Reduces flow in health care facility faucets where faucet aerators may be a repository for pathogens.
Modifications to Processes and Equipment	Updates industrial processes and equipment for water efficiency, water quality and/or energy efficiency improvements.
Plumbing Flow Control Valves	Maintains pressure while reducing flow for showers and faucets.
Pre-Rinse Dishwasher Sprayers	Minimizes commercial kitchen water used to pre-rinse dishes before loading them in a commercial dishwasher.
Surveys and Audits	Inspects on-site equipment and processes to identify opportunities for water and energy savings.
Toilet Retrofits	Installs high efficiency toilets (HET).
Urinal Retrofits	Installs waterless and high efficiency urinals.

COMMUNICATION AND OUTREACH

Water conservation programs that effect permanent market changes continue to yield water savings long after the program has ended. Public information campaigns are essential to the success of such programs. The American Water Works Association's (AWWA's) **Conservation Communications Guidebook** outlines key principles for communicating with customers. Two of these are: alignment of water provider actions with expected program outcomes; and preventing conservation backlash.

The California Urban Water Conservation Council has also developed resources to advise outreach strategies. Agencies interviewed by the Council's Residential Committee during the development of its *Residential BMP Guidebook* cited a range of the most effective strategies for public information campaigns including:

- Information on mandatory conservation regulations
- Home water surveys/audits
- Turf replacement programs
- Water agency events and workshops
- Irrigation efficiency retrofits
- Landscaping guides
- Online advertising
- Tours
- Websites

There is a growing body of work that documents the effectiveness of using social norms to cause long term behavior change.

Excellent examples of social marketing campaigns and general resources in the field are listed below.

- Salter Mitchell, **www.saltermitchell.com**.
- The blog, **Social Marketing Panorama**, has lots of good information on social marketing campaigns. Note the Blog Roll for other commentaries on social marketing.
- Doug McKenzie-Mohr, noted Canadian psychologist and social marketing expert, **www.cbsm.com**.

Basic programs for contacting the public

Information on bills and inserts

Following are some general tips for using customer bills for conservation outreach. Please also see *Tool # 7 – Consumption Awareness* for additional insights.

Capitalize on the customer's undivided attention. Utility branding expert John Ruetten says the water bill is the most important communication vehicle because the customer is paying attention and, in many cases, is motivated to find ways to pay less. (See Ruetten's **Utility Branding Network**).

Show year-to-year consumption comparisons. This will help customers understand how their water use has changed over time, and may inspire them to achieve previous low consumption levels. A graph showing historical consumption data can also alert a customer to a major leak or other source of water waste.

Use editable and static message spaces on the bill to point to conservation pages on your web site.

Keep inserts small and lightweight to prevent an increase in postage costs. Good topics for inserts include seasonal reminders on irrigation adjustments; workshops, public events, and meetings; rebates and other incentive programs; and conservation measures that are in force.

Wholesalers may offer bill insert templates or the opportunity to print jointly with other retailers in the area. This cuts design and printing costs and disseminates a consistent message on conservation throughout the region.

Include links that enable electronic bill-payers to view the inserts, varying the message and links in the cover e-mail to capture customer's attention at each billing cycle.

Public service advertising

Public service advertising (PSA) is an option in some communities, but television and radio stations are no longer required to provide "free" air time to non-profits or for public service messages. If local media produce and/or air PSAs, it is generally as part of a partnership or sponsorship.

Some water agencies have built successful partnerships with private businesses and media outlets that have sustainability initiatives to air water conservation messages at no cost to the agency. Other times, PSAs are produced for free online distribution and used in combination with paid advertising.

Community bulletin boards that run on public access and government channels are another low- or no-cost alternative. Contact the cable provider or the city to determine how to provide information for this venue.

Water agencies may have a 30-minute video production suitable for airing on the government, public access or education channel. Contact the city or the cable provider to determine how to get it on the air. In some cities, the cable provider may operate these channels; in others, these channels are operated and controlled by the city or the county.

Paid advertising

Paid advertising can be expensive, but often it makes economic sense when an organization is truly serious about widely promoting its conservation message or if the agency has a very large service area with many customers. Advertising options include local newspapers and magazines, radio spots, movie theaters, billboards, bus shelters, cable TV spots, and online sites.

Because of the cost, water utilities must be vigilant in designing the structure of a campaign, developing effective messages, and tracking results. Often it can be cost effective to hire a public relations/advertising firm to aid in developing an advertising campaign. This is especially true if an agency requires specific expert knowledge about advertising techniques and practices that can't be sourced from internal staff. Additionally, if the campaign requires buying media from a large variety of outlets, an ad agency may be able to bundle media buys to reduce cost. For media that reach large geographic areas, consider working with regional partners to spread out media costs and cut the percentage of the budget devoted to producing the ads.

Consistency and frequency are crucial in water conservation advertising campaigns. Use frequent, consistent messages to achieve long-term results.

Examples of paid advertising:

- TV and Radio Campaigns
- Outdoor Ads
- Local Newspapers
- Online Ads
- Vehicle Wraps or Magnets for District Vehicles

Speakers

Chambers of Commerce, Rotary clubs and other community organizations frequently invite speakers to their meetings, providing many opportunities to talk about water-related topics. Having a speaker ready to go when the group has a time slot to fill enhances water utility's reach into the community. In addition, water agencies should include speakers as a part of any major outreach campaign. Identify groups that represent segments of the audience you need to reach and proactively seek opportunities to address them. A primary goal of both types of speaking engagements is to reach active and influential community leaders who will pass on information to others, lending their own credibility to the message in the process.

Photo credit – Carmichael Water District

Photo credit – Carmichael Water District

Events

Community and regional events can reach a large audience at a limited cost.

Community events, such as Earth Day celebrations, farmers' markets, Water Awareness Month events, home and garden shows, and green expos occur on an ongoing basis. They offer water utilities a varied audience – ready to walk by booths and take information – at a very low cost.

Regional events, such as county fairs, trade and industry expos, conferences, and regional symposiums happen less frequently, but they can provide excellent opportunities to reach a large, cross-sectional audience.

Tours and open houses are a relatively inexpensive way to get customers excited and informed about water agency operations and can generate positive media coverage. Most customers have never seen the inside of a water treatment plant or considered the power necessary to pump water to different elevations within the district. Sustainable garden tours can open eyes to efficient landscapes and turf alternatives.

CONTACTS WITH THE MEDIA

Phone calls, e-mails, face-to-face meetings, and fliers are all methods to make contact with the media, but press releases and media advisories are the most effective, time-honored methods.

A press release is a news story that you write. It's the starting place for a reporter, who usually changes it significantly. A media advisory makes reporters aware of an event that they may want to attend or cover.

Maintaining Relationships with Reporters

Particularly with journalists, the purpose of a contact is to establish a relationship in order to disseminate information to the public. The better the relationships, the easier it will be to inform your target audience of pertinent events and key messages. Journalists appreciate effective "sources" that make their job easier. Be accessible and provide a steady stream of accurate, newsworthy information.

In 2014 the Council presented a short media training session during its plenary meeting. The handout distributed during the meeting, **"Top Tips for Media Interviews,"** provides helpful information on dealing with media inquiries and developing relationships with reporters.

Actively Maintained Website & Internet Presence

More flexible and timely than printed materials, a comprehensive website should be the foundation of your public outreach program. Always include your online address in bill inserts, newsletters, social media posts, flyers, newspaper articles, and any other communication tool you produce. Then these other tools can work like headlines, capturing attention and leading interested readers to your website for the rest of the story.

- Be timely
- Be customer-centric
- Be prominent
- Be accurate
- Be found
- Measure results

Tools and topics to consider adding to your website

- How-to information on rebates and incentives, including forms, rules, deadlines and lists of eligible models
- Conservation kit request
- Information on ordinances, including how to comply, what is voluntary and what is mandatory
- Recommended irrigation schedules and other seasonal guidelines
- ACWA's free **Save Our Water widget** to display rotating tips
- Agency newsletters, with the option of signing up for an e-mail alert when a new edition is available
- Agency water sources (make sure it aligns with the information required in your annual Consumer Confidence Report)
- News releases on conservation programs and success stories with links
- Hydrant flushing schedule, explaining why it is necessary and doesn't waste water
- Water waste reporting form; determine in advance how your agency will use the information and respond to the person reporting the problem and to the suspected water waster.
- School education programs, including how to request materials and presentations
- Information for students doing research for school reports

Social Media

Social marketing should not be confused with social media, a term used to describe types of media that are based on online conversations and interactions. Social media can be effective tools in a social marketing campaign because they connect people who are interested in similar issues and help the group articulate its normative values. Out of 22 agencies interviewed by the Council Education Committee in 2010, there were 12 using social media, primarily Facebook, Twitter, and YouTube.

- Several agencies use "contact us" links or forms on their websites to generate dialog with customers, and consider this as a social media channel
- Other utilities are enthusiastic about using social media to reach out to customers that are both tech savvy and interested in conservation issues. They use a variety of platforms, but generally focus on generating content for Twitter and Facebook. These agencies link all of their social media accounts, so that when they update one site, the others update, too

RESOURCES FOR AND EXAMPLES OF PUBLIC INFORMATION PROGRAMS

The following section lists programmatic opportunities with customers and the media.

1. Newsletter articles on conservation:
   - Association of California Water Agencies Save Our Water **campaign**
2. Flyers and/or brochures, bill stuffers, messages printed on bill, information packets can be an excellent and inexpensive way to get your customers' attention. Below are some examples, and there is also more information on this in the **Council's Residential Guidebook**
   - AWWA's **Water Conservation for Small- and Medium-Sized Utilities** lays out a series of sample Public Information Materials in Appendix C
   - San Diego Water Authority: **bill insert distributed by wholesaler on behalf of retailers**
   - Monte Vista Water District bill **insert** on best practices and rebates
   - **Case study: Helix Water District Bookmarks**
3. Landscape water conservation media campaigns:
   - **Case study: RWA Blue Thumb Campaign**
   - **CLWA Residential Landscape Program**
   - **Case study: Anaheim orphaned parkways**
4. General water conservation information: this includes basic information on what water use efficiency is, how it applies to your region, and any programs offered by your agency. These can be distributed in any way that works for the agency: though mail, website, bill messaging, or other method.
5. Website:
   - Request the free booklet, *Secrets of Successful Government Websites*, from **Vision Internet**, a company that has designed more than 300 government websites, including those of **Lake Arrowhead Community Services District**, **Cucamonga Valley Water District**, and **Las Virgenes Municipal Water District**
   - Municipal Water District of Orange County launched its refreshed website **www.mwdoc.com** during the summer of 2010. The website features streaming video, integration with social media, RSS feeds, and a homepage with timely water-related news and announcements
   - Irvine Ranch Water District's website, **www.irwd.com**, won a 2010 "**Best in Industry" New Media Institute Award** for being customer-friendly and making it easy to connect with the district via social media tools
   - A micro-site developed by the Municipal Water District of Orange County and Orange County Water District, **www.ocwaterhero.com**, is part of a program: **Case study: OC Water Hero** that makes it fun for children to get involved in water conservation on a daily basis
6. E-mail messages: Contra Costa Water District allows customers to sign up for instant e-mail notification regarding when to reset their sprinkler timers:
   - **http://www.ccwater.com/conserve/sprinkleremail.asp**

7. Website links to qualified landscape professionals, associations and other helpful sites:
    - Qualified landscape professionals - **www.epa.gov/WaterSense, California Landscape Contractors Association, Irrigation Association**
    - Regional, statewide, national and international resources - your wholesaler's site, **www.aThirstyplanet.org**, DWR Water Use Efficiency, American Water Works Association
    - Resources on plants that thrive with little water in your climate: California Native Plant Society, **GardenSoft** (See also developing plant lists, below)
    - Water saving tips and consumption calculators. Use credible studies and sources such as **www.saveourh2o.org, www.h2ouse.org**, and **www.wecalc.org**
8. Direct mail - seasonal postcards noting irrigation requirement changes:
    - Zone 7 Water Agency: **Seasonal postcard sent to retailer's customers**
9. Direct mail or other notification to customers about high water use:
    - City of Santa Barbara uses door hangers: **http://www.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=34112**
    - Monte Vista Water District provides an online form for reporting water wasters: **http://www.mvwd.org/reportwaste.cfm**
    - Irvine Ranch Water District provides an excellent and informative letter offering an assistance visit to customers who may have a leak: **IRWD Outreach 2010**.
    - The City of Roseville has a customer contact program designed to change the behavior of customers who incur high-water-use over a series of months: **Roseville High Water User Contact**
    - Dublin San Ramon Services District's meter readers use this flyer to communicate with customers about water waste: **DSRSD overwatering flyer.pdf**
10. Customer notification when runoff is noticed or bill is at least 20% higher than same time last year: there is more information on this technique available in the **Residential Guidebook**.
11. Dedicated phone line or "on hold" messaging: this could be a phone line dedicated totally to water conservation messaging (similar to healthcare "flu lines" in the winter), or it could be recordings that customers hear when they are on hold or being transferred.
12. Fairs/events:
    - **Case study: Event Get Wet**
    - **Case study: OCWD Water Ed Festival**
    - **Case study: Water Do More with Less**
    - El Toro Water District open house celebrated its 50th anniversary: **http://www.ocregister.com/news/water-271839-county-district.html**

Photo credit – San Diego County Water Agency

13. Monthly water use reports: share progress in reaching conservation goals with your customers via website reports and/or a small section of their bill. This is also good information for your agency's newsletter.

14. Point of purchase pieces:

    - Dublin San Ramon Services District: Free "water on request" table tents for restaurants, mirror stickers for public building restrooms: **http://www.dsrsd.com/outreach/drought-watch-water-conservation/businesses-and-restaurants**
    - While East Bay Municipal Utility District (EBMUD) no longer employs this program, it formerly worked with local nurseries and landscaping supply stores to offer downloadable discount coupons on garden mulch. The agency established a relationship through a letter of agreement with the retail outlets: **EBMUD mulch coupon LETTER OF AGREEMENT**, and then advertised the program through its **newsletter** and **web site**.

15. Media outreach

    - **Case study: RWA Blue Thumb Campaign**
    - **Case study: Water Do More with Less**

16. Adult Education/Training Programs:

    - **Case study: Surfrider OFG**
    - **CLWA Residential Landscape Program**
    - **Case study: IWDWV xeriscape workshop**
    - **Case study: RWA Blue Thumb Campaign**
    - Metropolitan Water District of Southern California offers excellent online training classes that anyone can access through their website: **http://www.bewaterwise.com/knowledge01.html**

17. Water Conservation Gardens: involvement in a garden that promotes and educates the public about water-efficient landscaping and conservation techniques. May include "corporate" or "business" sponsorship or membership.

    - **Case study: Otay Garden**
    - **Case study: Surfrider OFG**
    - **Case study: RWA Blue Thumb Neighbors**
    - **Case study: Anaheim orphaned parkways**
    - **Sustainable Landscape Demonstration Garden** - Olivenhain Municipal Water District collaborates with the Surfrider Foundation and Mira Costa College

18. Sponsor or co-sponsor landscape workshops/ training for homeowners and/or homeowners associations.

    - Educating organizations like the **Greens Garden Group, EcoLandscape, Surfrider Foundation**, and the **Bay-Friendly Coalition** partner with water providers to provide region-specific educational landscaping materials and workshops for customers

19. Landscape watering calculator and watering index to assist with weekly irrigation scheduling

    - **Irvine Ranch Water District Irrigation Schedule**
    - Metropolitan Water District provides a Watering Index and Calculator that its member agencies can add to their websites see **www.bewaterwise.com**
    - City of Santa Barbara posts an up-to-date **Watering Index** on the home page of its web site. Customers can click through to get help in using the index

20. Other programs:

- Volunteers:

  1. The City of Sacramento employs a "water ambassador program," making use of neighborly connections. Training is offered through the city's website: www.sparesacwater.org

     or:

     http://www.cityofsacramento.org/utilities/water/CityofSacramentoDepartmentofUtilities-SolidWaste-h2oAmbassador**.cfm**

  2. Reach out to local master gardeners for landscape product community education; they are experts, typically well tied into their communities, and enjoy sharing their knowledge

- Advertise:

  1. Municipal Water District of Orange County's public service announcement featuring world champion surfer Rob Machado: **Case study: Water Do More with Less**

  2. Each year Santa Barbara water agencies host a video competition for Santa Barbara County High Schools. Schools from throughout the County submit 30 to 60 second commercial-style videos that promote water conservation in fun and innovative ways. The agencies use the best videos for a **summer media campaign**

- Develop and promote lists of plants/landscape options that will thrive locally:

  1. The Council's Water Saver Home website offers free climate appropriate sample landscape templates through its Smart From the Start project, as does EcoLandscape California as part of its New California Landscapes initiative.

  2. Zone 7 Water Agency sponsors a gardening site featuring water-efficient plants and landscape designs. GardenSoft produces the software, which is used by many other agencies, appropriately customized for each region's local climate and soils.

  3. The California Native Plant Society offers **native plant lists by region.**

The complete
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Special thanks go to the CUWCC Education Committee for development of the *Residential Guidebook*, which was particularly helpful in the creation of this tool.

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Jumpstart Water Shortage Toolkit

Photo credit – Department of Water Resources

Tool #6:

Local Water Supply Fact Sheet

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – Department of Water Resources

CONTENTS

INTRODUCTION

Customers who understand how their water supply gets from the source to their home or business are better able to understand water shortages and the need to reduce consumption. Surveys have shown that a majority of customers have little idea of where their water comes from, the steps necessary to make the water safe and reliable, or the limits of the supply. The water provider must repeatedly explain its supply and delivery system in clear, well illustrated messages, which can take several forms, such as: "snap shot" fact sheets, Frequently Asked Questions (FAQs), newsletter articles, and video presentations on YouTube.com.

WATER SUPPLY FACT SHEET TEMPLATE

The downloadable *Water Supply Bill Insert Template Kit* offers a customizable template for water providers to adapt to their own services areas and disseminate information to their customers. Simply complete the customization form and send files and links to a printer for publication. The customization form will allow you to add information about your agency's: water supply and use, water shortage specifics, customer actions, and assistance to customers. Additionally you may add images, charts and links as resources. While the template is designed for print, you may also adapt the content for your website.

DOWNLOAD THE TEMPLATE: **http://cuwcc.org/Portals/0/Document Library/Resources/Drought Resources/Tool Kit/Tool 6 Water Supply Bill Insert Template.zip**

The contents of the fact sheet should be tailored to the circumstances of the water shortage, the water provider, and the customers. Water shortages normally occur during drought conditions, but may also include emergency outages such as disruptions in a supply source or a transmission main break. Set out below are points that might be addressed, depending upon the shortage, along with some potential responses. In developing specific content, the water provider should compare how the "normal situation" differs from the particular water shortage at hand. When the appropriate points are fully developed, they will be the basis for press releases, newsletter articles, and other media communications.

The specific message to convey will vary from agency to agency, even in a drought year. This section summarizes the types of information you may want to include based on your agency's drought stage. Even if your agency is small and does not have formal drought stages, the following guidelines can help you focus your messaging to customers.

Water Supply and Use Information

Basics topics to consider including:

WHERE does our water come from?

WHAT percentage of system supply does each source provide?

WHAT is the average residential use in your service area? Or, what target reduction do you recommend for your customers? Consider using a gallons per day per person metric.

WHAT are "normal" water supplies and demands? Consider using a pre-drought baseline period for the normal comparison. To approximate a normal baseline, consider using historic averages or a multi-year period with precipitation and temperatures that are similar to long term averages.

Additional topics to consider including:

IS THE WATER from these sources available year round?

ARE DIFFERENT SOURCES used during different times of the year? Do some supply sources provide better quality water than others?

IS WATER PURCHASED from water wholesalers, including state and federal agencies? If so, are there restrictions on the wholesalers' supplies?

WHAT alternative water supplies are available? (interconnections with other water sources, new or reconditioned wells, recycled water for irrigation, and exchange agreements with other water suppliers)

WHEN and **HOW MUCH** can these alternative supplies contribute to your system?

DO THESE ALTERNATIVES include interconnections or exchanges with other agencies? If so, are there restrictions on these supplies?

WHAT percentages of the water supply are used for the different types of customers (commercial, agriculture, parks, or residential)? (Consider adding as a pie chart)

WHAT percentage of residential use is applied to landscape?

Water Shortage Specifics

Basics topics to consider including:

WHY is there a current or expected water shortage? Possible reasons for shortage include: drought, large water main bust, canal failure, water supply contaminated by a chemical spill or sewage, or legal constraints on deliveries.

WHAT State mandatory water reductions apply to your agency?

WHAT is the water provider doing to reduce the impact of the shortage?

WHAT is the current drought stage? Consider including the following:

Drought Stage 1:

- Explain the triggers for the current stage, demand reduction goals, and any use restrictions.
- Identify the decision makers involved in the declaration.
- Show pictures or graphics illustrating current storage or groundwater levels.
- Include brief descriptions of what might trigger a Stage 2 and any additional restrictions that would accompany it.

Drought Stages 2 and above:

Each time a new drought stage is declared, update the fact sheet to:

- Explain the triggers for the current stage.
- Identify again the decision makers involved in the declaration.
- Show pictures or graphics illustrating current storage or groundwater levels, including changes from the levels existing at the time of the prior stage declaration.
- Explain the differences in demand reduction targets, if any, from the prior stage so that customers can understand why they are being asked to further reduce their usage.
- Remind customers of the continuing restrictions imposed in the prior stage(s).
- Place this declaration in historical context, e.g., indicate the last time (if any) that the utility reached this stage.
- Include brief descriptions of what might trigger the next stage, if any, and any additional restrictions that would accompany it.

Additional topics to consider including:

If the shortage is not a drought, **HOW LONG** is this shortage expected to last?

Are there legal or institutional **RESTRICTIONS** limiting the quantity of water available or the timing of water delivery?

HOW SEVERE is the water shortage expected to be? (e.g. Give the acre-feet of supply reduction or the percent of demand reduction.)

Customer Actions and Assistance

Basics topics to consider including:

WHAT State mandatory water restrictions apply to your customers?

WHAT actions are the water service customers advised to take? Possible answers depend largely on the reason for the shortage. For instance, water contamination may require a boil water order. Severe drought may require a host of customer responses including suspension of landscape irrigation. See *Tool #1 Model Water Shortage Contingency Plans* and **"Save Our Water"**.

WHAT services are available from the water supplier to help customers cope with the shortage?

ARE OTHER SERVICES AVAILABLE that can help customers to reduce water demand? Possible services and products may be available from local irrigation, landscaping and plumbing business, UC Cooperative extension, Master Gardeners, as well as regional water programs.

Additional topics to consider including:

Are water rates and fees going to change, and why would they change during a water shortage?

Some customers are already conserving. Must all customers reduce consumption by the same percent? Consider providing target water use in terms of gallons per person per day. Explain how customers can determine how much water they are using on a weekly or monthly basis. (See *Tool # 7 Water Use Awareness Resources*.)

If reducing consumption by a percentage, what is that compared to? Specify a baseline time period, including year and month(s).

Will there be rationing or stricter conservation measures later? If you have water shortage contingency plan (see *Tool #1 Model Water Shortage Contingency Plans*), identify the first stage in which rationing would occur.

PARTNERSHIP OPPORTUNITIES

Water suppliers should take advantage of opportunities to include joint announcements with wholesalers or other water providers using the same water sources. Fact sheets and announcements may be distributed at local retail establishments and through landscape services. Language services can help translate fact sheets to inform non-English-speaking customers. Energy and wastewater utilities may provide space for long term water shortage announcements in their PSAs, websites, bill stuffers, and newsletters. Other media include: newspapers, TV, radio, movie theater advertisements, public transit, and billboards. (e.g. *Tool #5 Customer Programs and Communication*.)

ADDITIONAL RESOURCES

Customization Resources

Images:

DWR Image Collection includes many images available to the public for editorial, non-commercial, and educational purposes.

Water Conditions Data and Charts:

DWR Water conditions webpage has a wealth of information and can help produce custom charts showing precipitation, snowpack, and water reservoir storage levels.

Statewide and Regional Information:

There are many statewide and regional resources that can be used in print or on websites.

- **Save Our Water Tool Kit** includes many materials that can be printed or added to your website and linked to in your water supply fact sheet
- **Metropolitan Water District Public Use Widgets and Graphics**
- Visit our **Water Shortage Tool Kit Online** for updates to statewide and regional resources

State Water Resources Control Board GPCD Resources

"Instructions for Estimating Residential Gallons Per Capita Day (R-GPCD) in Completing Monthly Urban Water Supplier Report"

"Simplified California Urban Water Service Area Population Methodology"

EXAMPLE FACT SHEET WEBPAGES

Dublin San Ramon Services District

http://www.dsrsd.com/outreach/drought-watch-water-conservation

East Bay Municipal Utility District

https://www.ebmud.com/water-and-wastewater/latest-water-supply-update and, https://www.ebmud.com/water-and-wastewater/water-supply/drought-update

City of Santa Cruz

http://www.cityofsantacruz.com/home/showdocument?id=4299

City of Lindsay

http://www.lindsay.ca.us/Water2.htm

EXAMPLE GRAPHICS, IMAGES, AND WIDGETS

Metropolitan Water District of Southern California

Figure 1: MWD General Water Level Reserves Widget

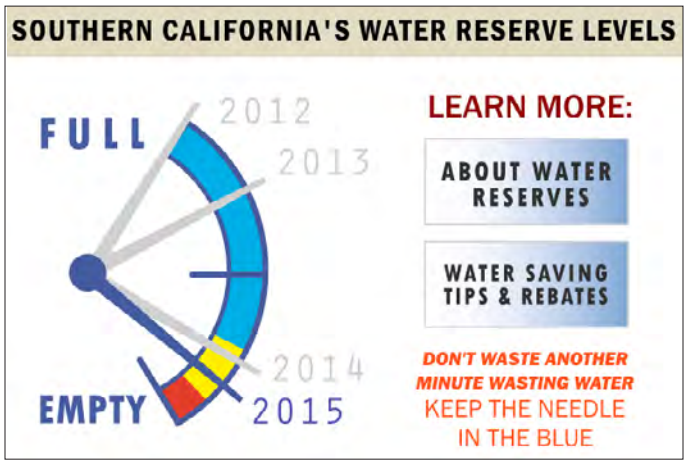
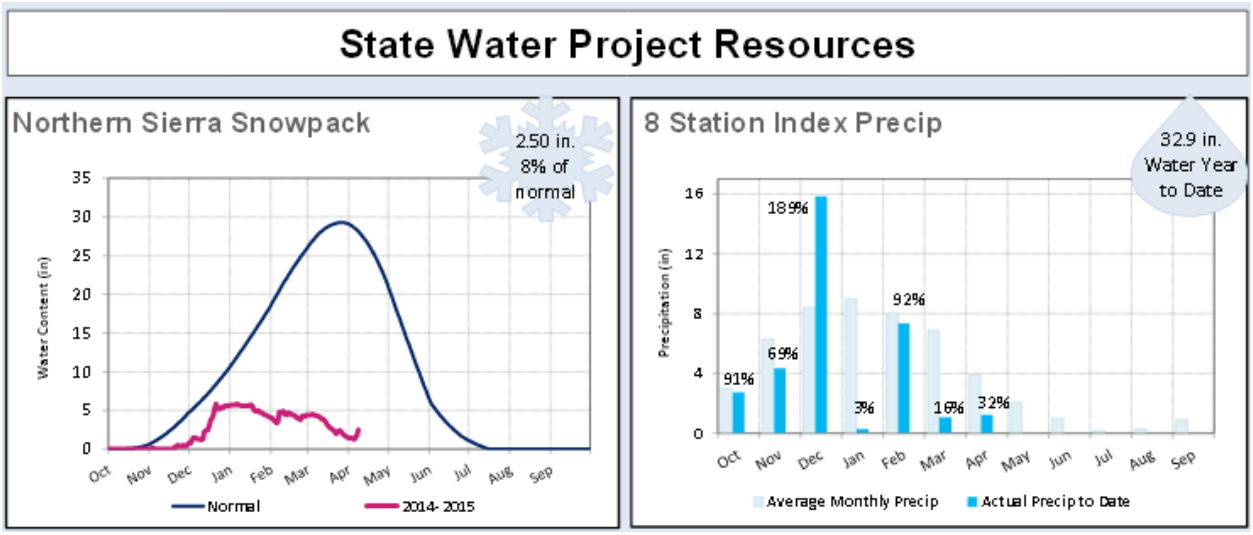


Figure 2: Watering Index Web Widget

Figure 3: MWD Water Level Illustration Details



East Bay Municipal Utility District

Figure 4: EBMUD's Camanche Reservoir - About one third full

Figure 5: Camanche Reservoir, EBMUD's Largest, is about one third full

Figure 6: Save Water and Drought Stage Indicator

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Jumpstart Water Shortage Toolkit

Tool #7:

Water Use and Waste Awareness

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – Water Systems Optimization, Inc.

CONTENTS

INTRODUCTION

Educating your customers to better understand their water use is key to many demand side conservation efforts. The earlier that customers can avoid waste and loss, the more water they will help save during a shortage. To avoid waste and loss as early as possible in a shortage, customers need to be made aware of their own water use, be alerted quickly to any undesirably high water use, and be provided with a specific water use target.

For example, if customers are told to limit indoor use to 50 gallons per person per day, how are they to know if they have met that target? If customers already consider themselves to be water efficient, how can they know if they truly are? If hidden leaks occur on a customer's property, how can the customer learn of the leaks quickly so they can make the repairs?

Answers to these questions can be provided by:

1) water meters; and

2) frequent water meter readings by the water provider or by the customer.

Different water providers collect metered water data at different intervals. Many read meters monthly or bi-monthly. Those with Advanced Metering Infrastructure (AMI) can read and report the volume of water use several times per day. Even those with Automatic Meter Reading (AMR) meters can read meters more frequently than once a month. In principal, all of these technologies and meter reading intervals can inform customers of their water use, but the greater the delay between use and awareness, the longer water waste or loss can occur.

This tool emphasizes customer water use awareness through frequent water provider meter reads or individual customer meter reads, the use of AMI/AMR web-based reporting portals, and through effective communication. See the **Bill-insert Template** section for a customizable messaging tool to increase customer water use awareness.

WATER PROVIDER METER READING

Water providers may need to change meter reading and billing practices to help improve water awareness during a water shortage. One way to accomplish this is to increase meter reading from bi-monthly to monthly meter reading. In addition to the staffing changes that may be required to accomplish this change, water providers may also need to modify the water bill to allow the customer to better understand if they are meeting reduction goals.

Advanced Meter Infrastructure and Customer Portals

In addition to manual and drive by meter reads, some agencies are reading meters using Advanced Metering Infrastructure technology. AMI has exponentially increased the opportunity for water providers to collect and share water use data with customers. Utilities with AMI can make customers aware of their daily or even hourly water use. When the AMI Data is made available via a website or mobile apps, the result is an AMI customer portal that allows customers to view their water use at higher levels of detail than traditional bills. Many of these portals also allow customers to set alerts for potential leaks or high usage.

Establishing an AMI portal requires substantial planning, effort, and investment.

When considering the creation of an AMI portal, utilities should evaluate:

- **WHY** the portal is being created and what the utility objectives are;
- **WHAT** data the customers will want to see;
- **HOW** the data will be organized and transferred from several sources to the portal;
- **WHAT** features, such as email billing and bill paying, will be included;
- **HOW** the data will be made available to customers; and
- **WHETHER** grant funding or low cost loans are available to help convert meters and meter reading systems.

Planners should also expect an extended period of time for their customers to achieve high subscription rates. See the additional resources section for a partial list of utilities using AMI with internet portals along with a partial list of AMI portal vendors.

A less capital intensive way to use AMI technology to increase customer awareness is to issue AMI meters to a small group of customers. A 2013 Survey of 29 agencies using AMI in California, shows that most agencies exploring AMI start with smaller investments - about 70% of agencies were studying, piloting or partially deploying the technology[1]

Targeting a small group of customers allows a water provider to target a group that may benefit most from increased water use awareness and leak detection. This list of users might include irrigation accounts, high water users or water waste prohibition violators. In 2015 the City of Long Beach started a program to provide smart water meters to interested customers. In addition to allowing customers to sign up for water meters, the city is temporarily installing a number of meters at the properties of water waste prohibition violators.[2] The City of Palo Alto has also piloted AMI technology on targeted customers.[3]

CUSTOMER METER READING

During a water shortage it may become necessary for water use information to be made more accessible to customers. Water providers may educate customers to read their own meters as an alternative to or in addition to changing water provider reading and billing practices. Short of using an AMI system to provide on demand access to water use information, water suppliers should consider instructing customers to read their own meter and learn how to reduce waste and leaks.

The California Urban Water Conservation Council Water Saver Home website provides meter reading instructions for the several units and displays. The printable PDF document is available at: **http://h2ouse.org/resources/meter/index.cfm.**

Some other samples of instructions to customers on how to read a water meter are:

- **Contra Costa Water District**
- **City of San Diego**
- **Irvine Ranch Water District**

Some videos showing customers how to read their meters are:

- **City of Los Angeles**
- **Coachella Valley Water District**
- **Contra Costa Water District**
- **Council Video Library, Water Meters**
- **Miami Dade TV**
- **Otay Water District**
- **Santa Barbara**
- **Scottsdale, Arizona**
- **Sonoma County Water Agency**

Meter Reading for Leak Detection

Water providers can take customer meter reading education one step further by teaching customers how to determine if they have a leak. The above list of videos include a handful of episodes that can help customers with leak detection. Customer-side leak detection can compliment water provider efforts to identify leaks such as site water audits or AMI data analysis. Leak detection can be harder or easier depending on the meter interface and the size of the leak. Some leaks are smaller than the resolution of a meter read. See appendix for customer instructions for detecting water leaks.

WATER USE AWARENESS

This section describes effective and innovative strategies for increasing customer water use awareness. Enlightening customers of their water use can be done with or without AMI systems in place. In light of the division between AMI and non-AMI communication capacities, not all of the following communication strategies will apply to all agencies.

- **SET AN ACHIEVABLE GOAL:** Challenge customers to track and record their own water use 3 times a month, or perhaps 12 times a year. Add in a water use reduction goal. Offer a graphically-engaging template for water use tracking for customers to monitor their progress.
- **USE CLEAR LANGUAGE AND MEASUREMENTS:** Many water utilities bill in hundred cubic feet (HCF), which can be confusing to customers. If at all possible, try to list water use in gallons, or in both HCF and gallons, this will help the customer better understand the volume of water they use.
- **INCENTIVIZE WATER USE AWARENESS:** Offer rewards for water aware customers. For example, ask customers to predict their own water use in advance of a bill. Present the customer closest to their exact water use with a prize or recognition.
- **ASK FOR A COMMITMENT:** Get customers to commit to a water-awareness action. Require customers to check a box on their online bill portal that pledges they will review their monthly and annual water use trends. Ask customers to sign a water conservation pledge with water use tracking components.
- **USE INNOVATIVE AND VISUAL LANGUAGE:** Employ lively language in all water-awareness messaging. Generate water volume visualizations that will stick with the customer. For example, when setting a water use reduction goal for the average 4-person single family residence, provide a visual equivalent of how much water they will save over a year if they achieve their goal (e.g., one Olympic pool; gallons of water stacked end on end for one mile, etc.).
- **PROMPT AND REMIND THE CUSTOMER:** Maximize customer water-awareness "touches" or interactions. Include water-awareness messaging in multiple outreach methods over an extended period of time to increase the odds of customer buy-in.
- **DEFINE A SOCIAL NORM:** Apply peer pressure to increase water use awareness. Within messaging efforts, emphasize the timeliness of water use awareness, suggest being water aware is "en vogue" with your language and graphics. Involve popular spokespersons and call out water wasters with water use comparisons (e.g., use normative facial expressions on water use reports).
- **USE FIELD-TESTED COMMUNICATION FORUMS:** Water providers tend to know which outreach methods generate the best customer response. Use the tried and true outreach methods that will reach customers and that have the highest odds of influencing behavior. A commonly used communication device for water providers, such as bill inserts, can be mailed out to educate customers of their own water use. A template for an insert is linked below. The insert provides customers a quick lesson on how to monitor their water use, and can provide information about local water use norms and reduction goals.

BILL-INSERT TEMPLATE

Download a template for improving customer awareness of water use. The tool allows utilities to quickly create a custom bill insert. The template includes:

- Ability to customize text and add utility logo
- Details for customers to find out their water use
- Regional water use context
- Water use reduction goal

DOWNLOAD THE TEMPLATE: **http://cuwcc.org/Portals/0/Document Library/Resources/Drought Resources/Tool Kit/Tool 7 Use Awareness Bill Insert Template.zip**

ADDITIONAL RESOURCES

CUWCC Video Library includes water meter reading and leak detection videos.

Water Utility AMI Portals (Partial List):

- **Dublin San Ramon Services District**
- **East Bay MUD**
- **Paradise Irrigation District**
- **City of Cotati**
- **Irvine Ranch**
- **City of Palo Alto**
- **Alameda County WD**

Eight Practices for Implementing a Water Utility Customer Portal, **Water Efficiency Magazine**.

Vendor AMI Software Platforms (Partial List):

- **AquaHawk Alerting Customer Portal**
- **Badger Meter Metering Analytics**
- **Dropcountr**
- **Itron Water Analytics**
- **MuniApp**
- **Sensus AMI**
- **WaterSmart Software**

APPENDIX

How to Read Your Meter

Below are two examples of instructions to customers on how to read their meters, and two examples about identifying water leaks.

1. H2OUSE.org[4]

There are several reasons why you'd want to be able to locate and read your water meter. First, you might be interested in just how much water you use in a day. By reading your meter at the beginning and the end of the day, you can compare the two totals to determine how much water you and your family used. The second reason is to check for leaks. If you turn off all the taps in your house, look at your meter and if it is still turning, chances are you have a leak somewhere. Here are some hints to help you find and read your water meter.

Important note: Some water utilities encourage customers to read their own meter while others prohibit opening the meter box and tampering with the meter in any way. It is a good idea to check with your utility before examining your water meter.

STEP 1: Locate Your Meter

Figure 1: Locate Your Meter

Your water meter is generally located near the curb in front of your home although in some areas (usually cold climates) it may be inside your home usually in the basement. Outside meters are typically housed in a concrete box usually marked "water" or in a meter pit with a cast iron lid. See Figure 1 for an example. Carefully remove the lid by using a tool such as a large screwdriver or pliers. Visually examine the area around the meter to make sure there are no harmful insects or other animals.

STEP 2: Read Your Water Meter

Water meters in the U.S. typically measure volume in gallons or cubic feet. One cubic foot = 7.48 gallons and 100 cubic feet = 748 gallons. Water charges are typically based on 100 cubic feet or on 1000 gallon units.

There are two basic types of water meters—the straight-reading meter which resembles the odometer in a car, and the round-reading meter which has several separate dials. The "straight-reading" meter is by far the most common.

Figure 2: Straight-Reading Meter

How to Read a Straight-Reading Meter

Figure 3: New Meter

In the meter shown in Figure 2, the reading is taken from the figures shown under the words CUBIC FEET. The meter reads 81710.03 which is the total number of cubic feet of water recorded since the meter was installed. If the utility bills in units of 100 cubic feet they would read this meter as simply 817.

The meter shown in Figure 3 is brand new, hence the reading for this meter is 0.00. The small blue triangle (just to the right of the "35") is the low flow indicator. That triangle will spin if any water is flowing through the meter. This indicator can be useful in leak detection.

Figure 4: Final Read

The meter in Figure 4, also cubic feet, is good example of a situation where the final number has already "turned over". The correct reading on this meter is: 2425.92 cubic feet. On most meters, the final digit will turn over once the big sweep hand has passed the 0.6 mark. Note that the size of the meter is usually printed on the dial. The meter in Figure 4 is a 5/8" meter as is shown on the dial.

How to Read a Round-Reading Meter

The meter in Figure 5 is an older style and is much less common; however, there are still some of these meters in service. This type of meter has several small dials and is a little more difficult to read than the straight-reading meter. The dials are marked off in divisions of 10, and are read much like a clock, except that the hand on every other dial turns counterclockwise.

To read this meter, begin with the 100,000 dial and read each dial around the meter to the one foot dial. If the hand is between numbers, use the lower number. Therefore, the dials below register 806323.

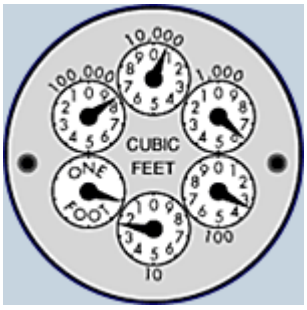


Figure 5: Round Meter

Determining the Size of your Water Meter

Occasionally, it may be necessary to determine the size of your water meter, for example, if you are designing a new irrigation system. Water meters typically come in the following sizes:

5/8", 3/4"
(these are the most common residential sizes)
1", 1.5", 2"

It is unusual to find anything larger than a 1.5 inch meter on a single-family home. The most common sizes are 5/8" and 3/4".

The size of the water meter is typically printed on the face of the meter. Sometimes the size is stamped into the case. For Badger Meters, model 25 = 5/8", model 35 = 3/4", and model 70 = 1.

2. Irvine Ranch Water District[5]

Your water meter is read monthly and regularly checked for maintenance and repairs. Please help us serve you by keeping the meter box free of plants, shrubs, dirt and cement. Don't risk contaminating your water supply by pouring paint, cleaning solutions or other chemicals into the meter box.

If you have any questions regarding meter reading, please call IRWD's Customer Service Department at **949-453-5300** or email **customerservice@irwd.com**.

Meter Locations	Opening Your Water Meter Box
Residential water meters are located in a cement box in the ground, usually near the end of a driveway or side walk. If the residence is in a condominium, town home, or an apartment, the meters for one building are typically located in a row or bank of meters in an area near the units.	While wearing gloves, you can use your fingers to lift the small, center portion of the meter lid. If you are unable to lift the lid with your fingers, use a stick or screwdriver to prop the lid open.
Reading Your Meter	**Who is Responsible?**
The meter is read like an automobile odometer. IRWD's meters record 100 cubic feet of water used. Each 100 cubic foot equals 748 gallons.	IRWD is responsible for maintenance and repairs to the water system from the street to the District side of the meter. The customer side of the meter begins at the customer valve located on the meter. The customer is responsible for any necessary repairs at and beyond the customer valve away from the street. IRWD is not able to check for or repair leaks on a customer's property.
Track Your Daily Usage	**Meter Reading Services**
Read and record the meter reading on at least two consecutive days. By subtracting the previous day's reading from the current reading, you will find out how many hundred cubic feet (ccf) of water you used in a specific period of time. By multiplying the number of ccfs by 748, you will determine how many gallons of water were used.	IRWD has contracted with Alexander's Contract Services (ACS) to perform meter reading services. ACS has considerable experience reading water meters and currently provides this service to several other cities and water companies. ACS uses an automated, hand-held meter reading system which is downloaded into a web interface and transferred electronically to IRWD's billing system. IRWD's mission is to provide services in an efficient, cost-effective manner. Though the District is a public agency, many operations have been privatized to take advantage of fast-changing technology and an up-to-date pool of resources and skills.

Mixed-Use Meters
Mixed-use meters on commercial properties measure both outdoor water usage such as landscaping, outdoor spigots, etc. and indoor water usage, such as toilet flushing, bathroom and kitchen fixtures, and production processes requiring water, etc. IRWD provides a mixed-use meter log sheet to help you keep track of your water usage on a weekly basis. For assistance using this log sheet and to determine your current indoor and outdoor allocations, please contact Amy McNulty in the Water Conservation Department at 949-453-5634 or mcnulty@irwd.com. Additionally, if your recent water bills have been in any of the following tiers: Inefficient, Excessive or Wasteful, we encourage you to schedule a free water use survey.

How To Identify Water Leak Examples

H2OUSE.ORG: Detecting Leaks with your Water Meter[6]

First it is important to understand **how to read your water meter**.

To check for leaks follow these steps:

Method 1

Turn off all water taps inside and outside your home. Record the meter reading and return in two to three hours to check for movement. If the meter reading has changed, you may have a leak.

Method 2

Many meters have a small red (or blue) triangle on the meter face, designed to detect even small leaks. If this red triangle is moving when you have all water off inside and outside your home, you may have a leak.

Common sources of leaks are a **toilet** that is running, a constant drip in a **sink or outdoor faucet**, a loose or dripping washer connection, a home water treatment unit, or a **irrigation system**.

Shutting off Water at Your Meter

Should you need to shut off the supply of water to your house (to repair a leak, etc.) there is usually a shutoff valve right at the water meter. The water meter shutoff valve typically looks like a brass bolt located on the pipe connected to the water meter. Often this bolt will have an arrow stamped into the top indicating the direction of flow. To shut off the water supply, use a large pair of pliers to turn the bolt 90 degrees. You can check to make sure that the water is off by operating a faucet or hose bib. To restore the water supply to your home, simply turn the bolt back to the position you found it.

San Diego: Water Meter Leaks[7]

To help prevent small leaks from becoming bigger problems and to reduce water loss in the system, we need your help. Saturated soil, standing water, and water flow from the water meter are signs of a possible leak. The following is provided to help you investigate small water leaks.

IS THE WATER LEAK CONSISTENT OR INTERMITTENT?

Consistent flow of water - It may be a water leak.

Intermittent - It may be due to some nearby irrigation run-off or a construction project. Check around the neighborhood.

FIND THE WATER METER.

Locate your water meter outside of your property. Your water meter is generally located near the curb in front of your home or place of business in a direct line with the main outside faucet/spigot. However, the meter may also be located in an alley way behind the property. The meter is housed in a **meter box** (PDF) usually marked "water." The box is covered with a removable lid.

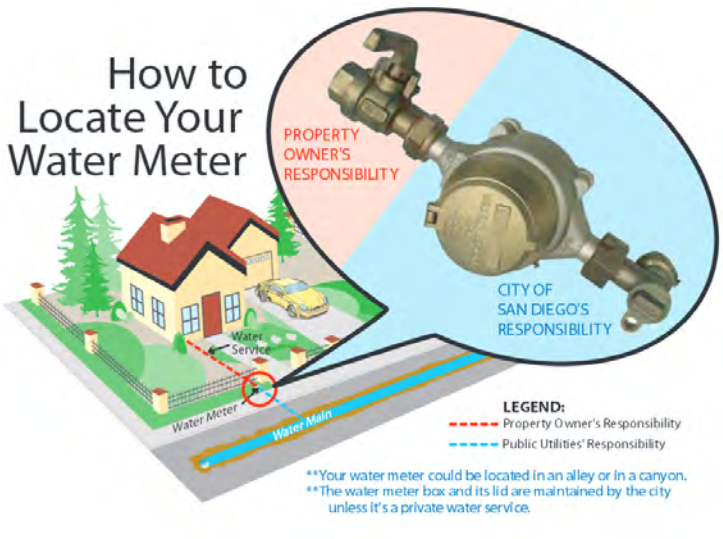
If possible, remove the box lid. Please exercise caution as you do so. Carefully remove the lid by using a tool such as a large screwdriver. Please, do not use your fingers. Insert the tool into one of the holes and pry the lid off. Visually examine the area around the meter to make sure there are no harmful insects or other animals.

If there is standing water inside the box, you may bail out the water to view the meter.

WHICH SIDE OF THE WATER METER IS THE LEAK COMING FROM?

View the **water meter box graphic** at the right.

- **Private property side -** If the leak is on the property owner's side of the meter, it is the property owner's responsibility to repair the leak. You may need to hire a certified plumber. (Public Utilities maintain the property side gasket/washer only).
- **City of San Diego side -** If the leak is on the City's side of the meter, a City Water Operations crew will repair the leak. You will not be charged for water that is leaking on the City side.



REPORT THE LEAK.

When you've completed your investigation of the meter, please be sure to put the lid back on the meter box.
To report a leak, a broken meter box lid or if you need assistance with determining the source of a leak, call the Water Emergency Hotline at (619) 515-3525. You may also call this phone number if you are experiencing difficulties with any of the items listed above.

NOTES

1. CUWCC AMI Symposium Subcommittee Member Survey, 2013
2. http://www.lbwater.org/smart-meter-program; http://www.lbwater.org/sites/default/files/documents/MEDIA%20RELEASE%20Smart%20Meter%20Announcement.pdf ; http://www.npr.org/2015/04/06/397774754/in-long-beach-calif-smart-meters-spot-wasteful-water-users .
3. https://www.watersmartinnovations.com/documents/pdf/2013/sessions/2013-T-1363.pdf
4. http://h2ouse.org/resources/meter/index.cfm
5. http://www.irwd.com/services/meter-information
6. http://www.h2ouse.org/action/details/action_element_contents.cfm?actionID=F56F50F2-34E3-4095-9A919C304D945B-5F&elementID=FCC1BED3-B2D1-4253-A3D07864BBA98629&parentPage=Take%20Action|/action/index.cfm
7. http://www.sandiego.gov/water/gen-info/emergencies/leaks/meterleaks.shtml

The complete
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- #7 – Water Use and Loss Awareness Resources
- #8 – Water School Curriculum
- #9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

The Council is grateful to the following individuals for helping Council staff to develop, edit and review the Jumpstart Water Shortage Toolkit: Russell Frink, Charlie Pike, Sharon Fraser, William Granger and Toby Goddard.

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Jumpstart Water Shortage Toolkit

Photo credit – City of Sacramento

Tool #8:

Water School Curriculum

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – City of Sacramento

CONTENTS

WATER SCHOOL INTRODUCTION

A 'Water School' is a program designed and implemented by a local or regional water agency to educate customers on water use regulations and restrictions. Water School classes can be open to any agency customer or community member, but the classes target local water wasters. A Water School course is often offered as a means to avoid fines for water use infractions. In the same way that drivers who are cited for moving violations must take driver's education courses, water wasters who exceed their water allotment or ignore water restrictions may be offered the opportunity to avoid a fine by attending Water School.

Benefits of Water School

Potentially, a Water School:

- **TARGETS** water education to customers who need it most.
- **INCREASES** community water education resources and water conservation awareness.
- **INCREASES** customer understanding of where their water comes from, the severity of the drought and the impacts of the drought on their water sources.
- **EDUCATES** customers on existing water use restrictions and regulations that they may not have been aware of previously.
- **PROVIDES** customers with a cost-free alternative to paying a significant water infraction fine, replacing customer anger and frustration with knowledge and action strategies.
- Creatively "penalizes" customers found in violation of water waste prohibitions while simultaneously **EDUCATING** them on the importance of water conservation and efficiency.
- **CAPITALIZES** on agency "face-time" with a captive audience to also get the word out about other water agency programs, such as rebates or online customer data portals.
- If offered as an alternative to a fine, a water school can dramatically **REDUCE** an agency's case load, time, energy and cost of lengthy appeals process.

Development Time

To realize the benefits listed above, a water provider must invest staff time. The following are key actions necessary to develop and implement a Water School:

- Curriculum Design/Revision
- Penalty Dismissal System Design and Approval
- Class-Scheduling and Site Logistics
- Material Preparation
- Instructor Training
- Customer Outreach

An initial upfront time investment in program development and implementation is estimated to range from 50-70 hours.

WATER SCHOOL PROGRAM DESIGN

Template Water School Curriculum

The following Water School curriculum template, modeled on the City of Santa Cruz's **Water School Curriculum**, outlines key concepts to be included in water classes. It leaves details that may vary by geography or by agency to be filled in by agency staff members.

1. Class Logistics
   - Explain how the course will be provided.
     - Class schedule
     - Attendance
     - Testing
     - Class structure
     - Fee removal
2. Course Objectives
   - Identify primary Water School objectives such as 'Convey the need for water regulations and restrictions;' or 'Repeal penalties;' or 'Provide students with relevant water conservation knowledge and tools'.
3. Course Topics
   - Identify primary Water School topics to cover during the course such as:
     - Agency water sources, and supply and distribution system (use maps when relevant)
     - Water service area description
     - Water supply/source review and current supply breakdown
     - Water treatment and distribution system descriptions
     - Water production/demand facts
   - Statewide and local climate conditions and predictions
     - Drought definition discussion
     - State drought status and 'Drought Monitor' system update
     - Local climate, drought, and water supply conditions
     - Water agency reduction target and achievement status
   - Utility services 101
     - Services provided
     - Customer breakdown
     - Water use by customer category
     - Metering/billing
   - Water use regulations and restrictions
     - History of local regulations/restrictions
     - Current federal, state, and local regulations and restrictions
     - Water shortage contingency plan/emergency drought stages and associated public requirements
     - Indoor vs. outdoor water use restrictions
     - Allotment calculations (if relevant)
     - Water waste hotline (or comparable phone-in tool)
     - Exemptions/exceptions

- Water conservation and efficiency strategies
  - Water meter
    - Check leaks
    - Track consumption
  - Indoor use (show usage category breakdown)
    - Change habits
    - Repair leaks
    - Install efficient devices
    - Device use: toilets, faucets, showers, dishwashers, clothes washers
  - Outdoor use (show usage category breakdown)
    - Reduce irrigation
    - Repair leaks
    - Capture and reuse water
    - Re-landscape/replant
    - Tools: mulch, trees, graywater, rainwater, lawn conversion

4. Review
   - Distribute, monitor, and review a course quiz

Class Tips

The following bullet points offer guidance on establishing and running water education classes:

- Maintain student accountability by treating the school as a "real class," e.g., through the promise of a test/quiz, the instructor's right to call on any student at any time, and group discussions with required participation.
- Make available voluntary feedback forms (paper form, electronic form, online survey form, etc.).
- Require a degree of student interaction and participation; avoid pure lecturing.
- Integrate powerful imagery and infographics into teaching materials.
- Minimize use of words on Power Point presentations.
- Design presentations and teachings to suit the technical/scientific understanding of an 8th grader.
- Segment the class into cohesive units or chapters with short breaks in between.
- When possible, engage students on a personal level; ask for introductions, reasons for attending, and/or brief student background.

Class Logistics

The following is a simplified list of class logistics to consider when constructing a Water School Program:

- **WHEN** – Day, time, duration, repetition?
- **WHERE** – Venue?
- **WHAT** – AV/IT equipment, student materials, instructor presentations, attendance records?
- **WHO** – Instructor, students, total numbers/ program capacity?
- **HOW** – How does penalty get revoked? How do you get students in the door?
- **WHY** – What is your agency's primary objective for hosting a Water School? Focus content on that central objective.

Each agency will need to develop its own policy about allowing an agent to attend (or not) on behalf of the customer who received the penalty. The customer of record may not be able to attend or is a property management firm, so there needs to be flexibility in who is allowed to attend.

Penalty Dismissal System

The following are options for designing a penalty dismissal system to integrate with the Water School program:

- **FLAT RATE** – One class of X hours, or a series of X consecutive classes of X hours wipes a customer's fine slate clean.
- **TIERED** – A customer can attend up to X hours of Water School or X consecutive classes; each hour or class reduces his/her fine incrementally by X%.
- **PARTIAL BREAK** – One class of X hours, or a series of X consecutive classes of X hours reduces a customer's fine by X%.
- **TEST CONTINGENT** – Passing a Water School quiz or test repeals a customer's fine, assuming OR regardless of class attendance.

Penalty dismissal needs to be closely coordinated with customer service and utility billing. Customer service representatives often first introduce customers to the concept of Water School and inform customers on the enrollment process. Customer service representatives or utility billing agents may also be responsible for actually adding and removing fines from customer bills. Agencies administer fine removal in two ways: 1) remove a customer's penalty immediately after the customer enrolls; or 2) keep the charge and all penalties on the bill until a customer attends a class, then remedy all the billing charges. In the case of the former, there needs to be a follow-up process to apply penalties back on the bill in the event of a no-show; however, this approach can create additional administrative burden for utility billing representatives.

EXAMPLES

City of Santa Cruz

The City of Santa Cruz is among the few agencies to have designed and implemented a Water School for water abusers. Their Water School website and curriculum can be found at the following links along with relevant press on the release of their Water School:

Santa Cruz Water School

http://www.cityofsantacruz.com/departments/water/2014-drought/water-school

Santa Cruz Water School Curriculum

http://www.cityofsantacruz.com/home/showdocument?id=40732

Santa Cruz Water School Press

http://www.breitbart.com/california/2014/07/17/water-school-opens-in-santa-cruz-erases-fines-for-overuse/

http://www.huffingtonpost.com/2014/08/09/california-water-wasters-school_n_5664429.html

http://www.scpr.org/programs/take-two/2014/07/18/38441/water-school-santa-cruz-offers-classes-to-waive-fi/

City of Sacramento

The City of Sacramento also offers educational programs as an alternative to customer fines. Their program is based on attending a 'Water Conservation Workshop.' Workshops are offered roughly once a month, and participants can sign up through the City of Sacramento's website: **http://portal.cityofsacramento.org/Utilities/Conservation/Conservation-Calendar**.

ADDITIONAL RESOURCES

The following are additional water education resources and tools that may be presented in a Water School course as class material or that may be provided to the customer for additional educational opportunities:

- **DWR Water Education Materials for Educators**
- **Water Education Foundation – Conservation**
- **Be Water Smart**
- **Be Water Wise (SoCal)**
- **California Urban Water Conservation Council**
- **Water Footprint Calculator**
- **Water Saver Home**
- **Save Our Water**
- **Water Use it Wisely**

PARTNERSHIP OPPORTUNITIES

Consider reaching out to local water and community partners for opportunities to share Water School hosting responsibilities and to leverage existing programs' efforts instead of duplicating work.

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Jumpstart Water Shortage Toolkit

Photo credit – Department of Water Resources

Tool #9:

Water Resource Funding Primer

www.cuwcc.org | 916.552.5885

California Urban Water Conservation Council

Photo credit – Department of Water Resources

CONTENTS

INTRODUCTION

Federal and state agencies have a long history of cost sharing with local water agencies for a wide variety of public benefit projects. Some of this funding is directly related to water resources planning, water efficiency implementation, water shortage emergencies, and water project development. Other sources of funding may indirectly relate to these categories. The funding assistance may be in the form of loans or grants. Almost all funding requires some degree of matching resources for project/program eligibility.

The following tool describes approaches to seeking and applying for water agency funding. It offers a basic action plan for procuring needed funds, a list of common funding sources that can be used as starting points to aid in the search of available funds, and a series of additional resources to guide funding proposals. Not all resources that may be used for drought-related or drought-necessitated agency actions will be identified as drought-specific funding. Consequently, the following tool outlines a funding approach and funding resources that apply to both drought times and non-drought times.

DEVELOPMENT TIME

The time required to identify, apply to, and secure funding varies widely. Among other things, it depends on the funding source/funding cycles, application requirements, the amount of funding being sought, internal agency review, and the degree of the funder's familiarity with the applicant.

FINDING AND PROCURING FUNDING

The following outline details the process and considerations necessary to procure funding for a water agency:

1. **Planning ahead** – Internal and external funding proposal review can take anywhere from weeks to over a year. If you foresee a financial need, ensure that the timeline needed to obtain funding from your target source aligns with the timeline for your financial needs.
    - Identify funding cycles and deadlines; some proposals are accepted on a rolling basis, others are only accepted by a specific deadline.
    - Consult with internal management and decision makers to identify the necessary steps to get internal grant application approval (e.g., municipal approval to submit a grant application on the city's behalf).
    - Consult with internal project leads and financial staff to determine when funding, or the promise of funding, must be received to undertake a project.
    - If you are unclear on a funding cycle, contact the primary point of contact (see "*Communicating with funder and submitting applications*" on page 5).
    - Consider and allow time for the known and unknown parameters that will affect the application submission timeline as well as the funded project and deliverable timeline. These parameters include but are not limited to: project type (e.g., construction projects generally require more bureaucratic approval time than do research projects), approval processes, competitive bid requirements, seasonal factors, staff time and availability, partnership dynamics, data and information constraints, and shifting organizational political will.
2. **Identifying the need** – Not all financial asks are the same. Be conscious of the specifics of your need.
    - **Grant or loan** – Ask yourself, which do you need, a grant or a loan? Would a loan suffice if a grant is not available? These questions are the first steps to refining your funding search.
    - **Area of need** – Most grants or loans are provided for a specific area of need such as capital improvements, water conservation and efficiency, and water resource planning. Which category of funding best captures your need? If there is limited funding available for your specific need, identify a number of other categories that could include or involve your need if looked at from a different perspective. For example, perhaps there is funding available for utility energy efficiency, but you seek funding for immediate water efficiency upgrades. Use the embedded energy costs in water loss to justify your grant application for agency efficiency upgrades. Categories of funding include but are not limited to:
        - Drought Emergency Funding
        - Energy Efficiency
        - Infrastructure Upgrades
        - Pilot Projects / Multiple Benefit Projects
        - Reclaimed/Recycled Water
        - Water Conservation & Efficiency
        - Water Planning/Management
        - Water Quality & Treatment
        - Water Supply Reliability
        - Water Use Enforcement
    - **Quantity of funding** – A holistic and realistic calculation of funding need is important to identifying potential funders and to completing proposals properly. To determine the quantity of funding to request:
        - Understand what utility managers want to accomplish and what they want to spend; understand what the utility accountants say that the utility can spend; determine what staff time is available to devote to

the proposed project; determine what can be done internally and what requires consultant/contractor labor; understand the "match requirements" on the loan or grant for which the utility is applying.

- Perform a complete, conservative cost projection considering all of the above factors.
- If the cost projection does not meet the designated grant availability or internal 'match' spending threshold, re-evaluate the proposal finances accordingly.

3. **Identifying matching funding sources** – When identifying potential funding sources, consider the grant topic, the total funding ask, the project geography, the project timeline, the agency's standing, the existing relationship with the funder, and the application requirements. Peruse the list of "*Existing Funding Sources*" in the "*Additional Resources*" section on page 6 to identify Federal and State water utility funding and to determine which available pools of money align with agency financial need.

4. **Selecting and preparing grant-writers** – Typically internal grant writers have more institutional and project-related knowledge, but external grant-writers have more experience applying for and obtaining funding.

   - Internal writer
     - Select a writer intimately familiar with the proposed project and with the necessary institutional knowledge.
     - Plan for several phases of internal review by project team members including managers and financial officers.
     - Engage in an iterative editing process over several rounds of revisions.
   - External writer
     - Choose a professional grant writer familiar with public water agencies and/or familiar with the application process for the agency from which you are soliciting funds; if a competitive bid is necessary, issue a Request for Proposals (RFP) or a Request for Quotation (RFQ) to attract grant-writing candidates and to gauge market costs.
     - Plan for the cost; grant writers normally bill between $50-$125 per hour, plus service agreement fees; some agencies have contract-spending thresholds.
     - Take the time to brief the writer thoroughly on the project.
     - Prepare all the relevant written documents/materials to share with the writer.
     - Set firm deadlines.

5. **Composing funding applications** – Close attention to detail and a thorough preparation of materials will improve the quality of funding applications.

   - Review requirements and grant templates in fine detail
     - Ensure your agency is eligible to apply for the specific funding.
     - Ensure your project meets all of the funding requirements.
     - Ensure your agency can meet funding match expectations.
     - Read all available information on the funding application – all links, all forms, all fine print.
     - Review the entire application before filling it out to gather the appropriate materials and information.
     - Follow all directions unless granted exemptions.
     - Identify the funder's tone and replicate the tone in the funding application.
     - Reference grant-writing resources (see "*Additional Resources*" on page 6).

- Stick to deadlines
  - Draft an internal timeline to keep the application process moving that aligns with the funding timeline.
  - Anticipate time for internal review and editing.

6. **Communicating with funder and submitting applications** – Communication with funding agencies can form the foundation of a water utility relationship with a funder even before an application has been submitted.

   - Communicate with the correct point of contact as indicated on the grant application
     - Ask clarifying or qualifying questions directly and early on in the process; ensure the answers to your questions are not available on the funder's website.
     - Reach out to any funding agency staff with which you have a pre-existing relationship only as appropriate. It generally cannot hurt your chances if you simply make your contacts aware of your application for funding. Asking them to intervene on your agency's behalf may be completely inappropriate and impermissible; in particular, your application for a competitive grant could be disqualified.
   - Seek no special treatment:
     - Use the funder's preferred process of submission; avoid asking for extensions, exceptions to formatting, or other special treatment.
   - Be patient:
     - Anticipate a long wait; minimize communication during waiting period to essential need-to-know requests.

7. **Receiving funds** – See the funding process through to the end.
   - Follow up:
     - Upon receiving funds, understand that the obligations to the funder continue.
     - Maintain a detailed project history to comply with interim and final grant/ funding reports due to the funding agency.
     - Track and record expenditures closely for budget reports and reimbursement purposes.
   - If you need to make changes:
     - Consult with the funder regarding significant changes to the project.

Examples

The following links contain examples of successfully funded projects or proposals for reference:

- **DWR Desalination Final Funding Awards**
- **DWR Final Grant Awards for the Prop 50 2008 Urban Drought Assistance Grant Program**
- **Proposition 84 Funding Archive: Applications & Awards**
- **USBR Title XVI – Water Reclamation & Reuse Program**

PARTNERSHIP OPPORTUNITIES

Below find three collaborative strategies to leverage financial resources and to maximize funding impact.

1. **Partner with funding offices of California agencies** and join their distribution lists to receive updates on their respective funding opportunities (e.g. join the State Water Resources Control Board **region specific email list**, or the Department of Water Resources Integrated Regional Water Management Grants **mailing list**, etc.). State and Federal funding varies widely over time and may be available one year and not the next. Rules and guidelines for managing the programs may change between funding cycles. When possible, develop a personal acquaintanceship within the funding program management team. These team members know when new funding programs become available, the statutes authorizing the program, and the types of funding uses permitted in the legislation.

2. **Partner with non-profits** to leverage a different pool of funding for water agency conservation projects (e.g., private foundations with freshwater **interests**). Identify overlapping interests with non-profits (e.g., Natural Resources Defense Council **water program**) and partner on collaborative projects that yield multiple benefits for both parties. For example, leverage funds for a new conservation program that targets outdoor water use efficiency. This project will increase outdoor water conservation, benefiting the water agency, and decrease contaminated dry season runoff, benefitting the environmentally concerned non-profit.

3. **Partner with local, municipal governments** to coordinate on grant proposals and maximize potential benefits, increasing the reach of existing funding and the likelihood of being selected for new funding. For example, when implementing a turf rebate program that cuts down on outdoor water use, include a stormwater retention requirement on customers applying for the rebate, helping the city attain its stormwater reduction goals.

ADDITIONAL RESOURCES

Existing Funding Sources

1. FEDERAL

- *Environmental Protection Agency* (EPA)
  - **Federal Funding for Utilities - Water/ Wastewater - in National Disasters** – a tool for finding water disaster funding
  - **Climate Ready Water Utilities Toolbox** – funding resources containing climate-related information relevant to the water sector
  - **Sustainable Water Infrastructure** - list of funding opportunities for utilities in California
- *United States Bureau of Reclamation* (Reclamation)
  - **Title XVI – Water Reclamation & Reuse Program** – cost-share funding to plan, design, or construct reclaimed /reused water projects
  - **WaterSMART Grants** – cost-share funding for Water and Energy Efficiency grants, System Optimization Review grants, Advanced Water Treatment and Pilot and Demonstration Project grants, and Climate Analysis Tool grants
- *United States Department of Agriculture* (USDA) (primarily for rural areas)
  - **Water & Waste Disposal Loan & Grant Program** – funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas
  - Rural Development Program
    - **Emergency Community Water Assistance Grants** – funding for new water source, intake and/or treatment facility or waterline extensions, repairs to breaks or leaks in existing water distribution lines, and related maintenance

- **Community Facilities Direct Loan & Grant Program** – funding to develop essential community facilities in rural areas

2. STATE

- *Department of Water Resources* (DWR)
  - **All Funding Topics** – a central index of all DWR funding postings and announcements
  - **Integrated Regional Water Management (IRWM)** – a description of IRWM and links to current funding opportunities and funding status
    - **Proposition 84 Planning Grants** – funding for IRWM planning; all Proposition 84 IRWM planning grants have been awarded
    - **Proposition 84 Implementation Grants** – funding for IRWM Implementation Grants; designed for projects that are past the planning stages and are ready or nearly ready to proceed to implementation
    - **Groundwater Sustainability Plans and Projects Grant Program** – forthcoming grant funding to develop and implement groundwater plans and projects to promote sustainable groundwater management
  - Water Supply/Management
    - **Desalination** – funding to develop new local water supplies through the construction of brackish water and ocean water desalination projects and help advance water desalination technology and its use; all desalination funding has been awarded
  - Water Use Efficiency
    - **Water-Energy Grant Program** – funding to implement residential and commercial/institutional water efficiency programs or projects that reduce greenhouse gas emissions, and reduce water and energy use
- *California Environmental Protection Agency* (CalEPA)
  - **CalEPA Loans and Grants** – a central index of all CalEPA, Air Resources Control Board, Department of Toxic Substances Control, and Water Resources Control Board funding postings and announcements
  - **Environmental Enforcement and Training Grants** – financial assistance for environmental enforcement, education and training to enhance statewide enforcement of environmental laws
- *California Financing Coordinating Committee* (CFCC) [1]
  - **CFCC Funding Fairs** – event to make agencies aware of financial and technical resources available for water utility infrastructure upgrade projects
- *California Infrastructure and Economic Development Bank* (I-Bank)
  - **Infrastructure State Revolving Fund Program** – funding for public agencies and non-profit corporations for a wide variety of infrastructure and economic development projects
- *State Water Resources Control Board* (SWRCB)
  - **Financial Assistance Funding – Grants and Loans** – a central index of all SWRCB funding postings and announcements
  - **Clean Water State Revolving Fund** – low-interest loans for wastewater treatment facilities and nonpoint source pollution control projects
  - **Interim Emergency Drinking Water** – emergency drought funding for interim replacement drinking water supply for economically disadvantaged communities with contaminated water supplies
  - **Drinking Water State Revolving Fund** – low-interest loans for drinking water infrastructure **upgrades**)
  - **Public Water System Drought Emergency Response** – funding for public water systems to address drought-related drinking water emergencies

- **Proposition 84 Funding Section 75021** – funding for emergency clean drinking water for disadvantaged communities through the **California Department of Public Health**
- **Proposition 50 Funding** – limited funding remaining from initial Proposition 50 funds; designated for pilot and demonstration projects for treatment or removal of the specific contaminants and for drinking water disinfecting projects using ultraviolet technology and ozone treatment
    - **Proposition 1 Funding** – forthcoming funding, pending public and agency approval, for the following project categories:
        - **Water Recycling**
        - **Small Community Wastewater**
        - **Drinking Water**
        - Stormwater
        - Groundwater Sustainability

GRANT WRITING TIPS

Below, find a list of linked advice on composing funding requests (referenced from **GuideStar):**

1. **EPA Grant-Writing Tutorial**
   Software program produced by Purdue University under a cooperative agreement with the U.S. Environmental Protection Agency.
2. **Grant Proposal Writing Tips**
   Resource published by the Corporation for Public Broadcasting that provides guideposts for the grant-writing process.
3. **Grant Writing Tips**
   Grant-planning questions, basic elements of good proposals, and links to grant resources from an experienced grant writer.
4. **Grant Writing Tip Sheets**
   General grant-writing tutorials as well as specific information about applying for National Institutes of Health grants.
5. **Non-profit Guides**
   Grant-writing tools for non-profits, including tips, sample proposals, and links.
6. **Successful Grant Writing**
   A grant-writing consultant's outline of the basic steps necessary for planning the grant-writing process.
7. **Writing a Successful Grant Proposal**
   The Minnesota Council on Foundations' detailed outline of a grant proposal, which is particularly oriented to project proposals.

GRANT WRITING ORGANIZATIONS

Below, find a non-exhaustive sampling of grant writing organizations for agencies that choose to outsource their grant-writing:

1. **American Grant Writers Association**
2. **Association of Fundraising Professionals**
3. **Grant Writer Team**
4. **Professional Grant Writer**
5. **Resource Associates**

FUNDING FOR POPULATIONS & COMMUNITIES IMPACTED BY DROUGHT

Below, find a list of resources for water agencies to advertise to residents and communities particularly impacted by drought:

1. California Department of Community Services & Development (CDCSD) – CDCSD's **Drought Water Assistance Program Pilot Project** provides water utility assistance to low-income, drought impacted households; only applicable to ten specific counties

2. California Department of Housing an Community Development (CDHCD) – CDHCD's **Drought Housing Rental Subsidies Program** provides "rental subsidies for the purposes of disaster relief to persons rendered homeless or at risk of becoming homeless due to unemployment, underemployment, or other economic hardship or losses resulting from the [drought] state of emergency"

3. SWRCB – **Drought Response Outreach Program for Schools (DROPS)** provides funding for education agency projects that focus on reducing stormwater pollution and providing multiple benefits including water conservation, water supply augmentation, energy savings, increased awareness of water resource sustainability, and reduced dry weather runoff

4. USDA Natural Resources Conservation Service (NRCS) –

    - **Environmental Quality Incentives Program** provides financial and technical assistance to agricultural producers in order to address natural resource concerns such as conserving ground and surface water

    - **Conservation Technical Assistance** provides help to land users to address opportunities, concerns, and problems related to the use of natural resources

NOTES

1. The CFCC is made up of the following agencies: **State Water Resources Control Board, United States Department of Agriculture, California Department of Housing and Community Development, California Department of Water Resources, California Infrastructure and Economic Development Bank (I-Bank),** and **Bureau of Reclamation.**

The complete
Jumpstart Water Shortage Toolkit includes:

#1 – Model Water Shortage Contingency Plans
#2 – Water Waste Ordinances and Enforcement Primer
#3 – Water Shortage Pricing Primer
#4 – Water Loss and Supply Alternatives Primer
#5 – Customer Programs and Communication/Outreach Primer
#6 – Local Water Supply Fact Sheet
#7 – Water Use and Loss Awareness Resources
#8 – Water School Curriculum
#9 – Water Resource Funding Primer

Tools are available to view or download at www.cuwcc.org

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