

Appendix 6  
Proposed Draft Umbrella Water Shortage  
Contingency Plan Components

(Organized by Water Shortage Disaster Risk Management Phases  
and AWWA M60 Manual Suggested Steps)

*Prepared for*

County Drought Advisory Group process  
as partial fulfillment of Assembly Bill 1668

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## Proposed Draft Umbrella Water Shortage Contingency Plan Components

Tables 1 and 2 discuss the four-phase model of disaster risk management aimed at improving the drought preparedness of small water suppliers and rural communities. These tables detail a seven-step plan that addresses drought and water shortage vulnerability and risk reduction.

Table 1 presents phases 1 and 2 and explains pre-disaster strategies to employ before a drought and during a water shortage. Table 2 presents phases 3 and 4 and explains post-disaster strategies to aid in recovering from a drought or a water shortage.

**Figure 1 Disaster Risk Management Framework**



Table 1 presents phases 1 and 2 of the four phases in the disaster risk management framework. Both are pre-disaster phases. Phase 1 is a before-drought/water-shortage learning phase that includes risk assessment, risk reduction, improving coping capacity, and improving emergency and water shortage plans. Phase 2 is an ongoing phase that includes monitoring, forecasting, and tracking; improving science; and accounting for precipitation, water supply, or other changes.

**Table 1 Pre-Disaster Phases 1 and 2**

WSCP Component (AWWA M60, 2019)	Before Drought / Water Shortage  CDAG Requires (R) / Recommends (r)	Notes Phase 1: Preparation, Risk Reduction, and Capacity Building	Notes Phase 2: Forecasting and Monitoring
<b>Step 1: Form a Water Shortage Response Team</b>			
Select the Water Shortage Response Team	R	Team and lead in lead entity with support from other entities. AWWA M60 Step 1	Monitoring & Forecasting activities already in place for implementing WSCP
Set Priorities	r	Based on vulnerability & risk analysis, economic, environmental factors, water efficiency	Plan already in place and key staff are aware for Step
Establish Schedules and Maintain Momentum	r	Start planning in advance	Monitoring protocols already in place
Coordination, Cooperation, and Communication	R	Coordinate with water suppliers, community, and among local, regional, state and federal agencies	Reporting protocols already in place
<b>Step 2: Forecast Supply in Relation to Demand</b>			
Data Collection	R	Compile data related to water resources groundwater allocations and surface water rights, water purchase agreements, available water supply and storage capacity, treatment flexibility, recycled water availability, assets, customer characteristics, seasonal demand profiles. Identify early warning systems.	Early warning systems identified in planning stage. Continue to collect data.
Data Analysis	R	Analyze scenarios: supply data analysis, water quality data analysis, water demand data analysis	Continue to collect and use data to analyze for your region and review for potential adaptations needed due to climate change.
Is There a Predicted Shortage?	R	Plan regional communication. Can wholesale suppliers, retail suppliers carryover storage?	Communication planned already
Catastrophic Supply Interruptions		Short-term and long-term planning, Join regional entities (CALWARN). Emergency Response Plan recommended. Be ready to move directly to highest stage actions.	Early warning systems identified in planning stage. Continue to collect data.

WSCP Component (AWWA M60, 2019)	Before Drought / Water Shortage  CDAG Requires (R) / Recommends (r)	Notes Phase 1: Preparation, Risk Reduction, and Capacity Building	Notes Phase 2: Forecasting and Monitoring
<b>Step 3: Balance Supply and Demand and Assess Mitigation Options</b>			
Supply Augmentation Methods	R	AWWA M60 Table 3-1. (1) Leverage existing assets through existing system flexibility and infrastructure upgrades; (2) increase supplier water use efficiency; (3) expand water supply portfolio with new sources including recycled water; and (4) seek opportunities to collaborate with other agencies. Expand areas of use boundaries for emergency purposes, as needed.	Some are long term measures, these should be implemented prior to the drought and re-evaluated periodically to determine new information/projects that may be needed.
Demand-Reduction Methods	R	Plan demand reduction measures based on severity of the shortage and by stage.	Collect and analyze data related to demand reduction measures
<b>Step 4 Establish Triggering Levels</b>			
Trigger Mechanisms	R	Clearly define and document triggers-reservoir, groundwater levels, etc. See list AWWA M60 Pg 56. Use 3-5 stages. Plan exit strategy.	Monitoring & Forecasting already planned. Periodically, evaluate if adaptations to triggers are necessary based on new data.
<b>Step 5: Develop a Staged Demand-Reduction Program</b>			
Criteria for Demand Reduction During a Water Shortage		Criteria includes: timing (goals will be met?), magnitude of savings, season, costs	
Establish Stages	R	Based on triggers: 3-5	
Measures	r	Short and long term based on customer categories. See Table 5-3.	
Manage Customer Expectations		Implement system to answer community questions (call in phone line etc.)	

WSCP Component (AWWA M60, 2019)	Before Drought / Water Shortage  CDAG Requires (R) / Recommends (r)	Notes Phase 1: Preparation, Risk Reduction, and Capacity Building	Notes Phase 2: Forecasting and Monitoring
<b>Step 6: Adopt the Plan</b>			
Involve the Community	r	Develop/Review and update the WSCP with public input	If adaptations are necessary, include community.
Prepare a Revenue Program		Plan for recovering expenses by considering raising water rates, imposing a water shortage surcharge (if legally allowable), include needed drought projects in hazard mitigation plans and seek funding sources from outside agencies, as appropriate.	Re-evaluate if modifications are needed based on new data.
Formalize cooperation with local agencies in the region		Prepare ordinances and interagency agreements for different levels of water shortage.	Re-evaluate if modifications are needed based on new data.
Review and finalize the plan		WSCP should go through formal public review process to minimize future objections when mandatory prohibitions are needed. Quickly adopt it formally.	Revise and reapprove if modifications are necessary.
<b>Step 7: Implement the Plan</b>			
Essential Elements of Implementing a Water Shortage Plan		<ol style="list-style-type: none"> <li>1. Staff levels</li> <li>2. Staff training and support</li> <li>3. Office space</li> <li>4. Equipment</li> <li>5. Budget</li> <li>6. Intra-office communication</li> <li>7. Coordination with other agencies</li> <li>8. Computer and billing format capabilities</li> <li>9. Customer assistance</li> <li>10. Customer appeals</li> <li>11. Special-needs customers</li> <li>12. Media contacts</li> <li>13. Monitoring of actual use</li> </ol>	Implement long-term projects

<b>WSCP Component (AWWA M60, 2019)</b>	<b>Before Drought / Water Shortage CDAG Requires (R) / Recommends (r)</b>	<b>Notes Phase 1: Preparation, Risk Reduction, and Capacity Building</b>	<b>Notes Phase 2: Forecasting and Monitoring</b>
Public Information and Media Program	r	Getting the public involved will require an expansion of an existing water conservation public education program. A vigorous public education program during a water shortage emergency is crucial for achieving substantial water-use reductions.	
Drought Recovery and Water Shortage Plan Termination			Monitoring indicates that a water system is capable of supporting unrestricted water demand for a sustained period of time.

Table 2 presents phases 3 and 4 of the four phases in the disaster risk management framework. Both are during-drought and post-disaster phases. Phase 3 an ongoing phase that includes monitoring, forecasting, and tracking; improving science; and accounting for precipitation, water supply, or other changes. Phase 4 a disaster response phase that includes communication, calling for assistance, and implementing emergency response procedures.

**Table 2 During-Drought and Post-Disaster Phases 3 and 4**

<b>WSCP Component (AWWA M60, 2019)</b>	<b>During-Drought/ Post-Disaster CDAG Requires (R) / Recommends (r)</b>	<b>Notes Phase 3: Response</b>	<b>Notes Phase 4: Drought / Water Shortage Recovery</b>
<b>Step 1: Form a Water Shortage Response Team</b>			
Select the Water Shortage Response Team	R	Same teams as planning stage implement WSCP	Team follows WSCP during implementation
Set Priorities	r	Plan already in place and public is familiar	Team reflects on actions taken and their effectiveness.
Establish Schedules and Maintain Momentum	r	Steps to implement WSCP already planned	
Coordination, Cooperation, and Communication	R	Essential staff roles laid out in WSCP, recent changes since last plan should be incorporated	

WSCP Component (AWWA M60, 2019)	During-Drought/ Post-Disaster CDAG Requires (R) / Recommends (r)	Notes Phase 3: Response	Notes Phase 4: Drought / Water Shortage Recovery
<b>Step 2: Forecast Supply in Relation to Demand</b>			
Data Collection	R	Data collected essential to track triggers, if any data found to be missing based on evaluation of the specific drought then this should be immediately collected.	Additional data collection during recovery
Data Analysis	R	Data analysis to track needed change to triggers based on actual drought	Notify public when water shortage is over
Is There a Predicted Shortage?	R	Actions by wholesale suppliers and retail suppliers. Regularly collect up-to-date data and share with other agencies, as needed.	Document lessons learned
Catastrophic Supply Interruptions		Use ERP and contact Local OES. Additional steps as necessary to secure interim water supplies.	Document lessons learned to revise WSCP and ERP. Coordinate with other agencies (FEMA, CALWARN, etc.) on reimbursement needs/responsibilities.
<b>Step 3: Balance Supply and Demand and Assess Mitigation Options</b>			
Supply Augmentation Methods	R	Water purchases, transfers and interconnections already planned—determine if actual drought requires other non-planned changes.	Offer Incentives for increased water use efficiency, irrigation system audits. Re-evaluate alternatives for future based on lessons learned.
Demand-Reduction Methods	R	Public Information campaign, Restrictions, exemptions, rationing, enforcement, education, feedback – adapted to actual drought, as necessary	Continue informing Public, positive feedback until no longer necessary.
<b>Step 4 Establish Triggering Levels</b>			
Trigger Mechanisms	R	Communicate triggers in Step 7 adapted as necessary based on actual drought	Communicate exit strategy in Step 7.
<b>Step 5: Develop a Staged Demand-Reduction Program</b>			
Criteria for Demand Reduction During a Water Shortage			



WSCP Component (AWWA M60, 2019)	During-Drought/ Post-Disaster CDAG Requires (R) / Recommends (r)	Notes Phase 3: Response	Notes Phase 4: Drought / Water Shortage Recovery
Establish Stages	R	Communicate monitoring data and stage information	
Measures	r	Evaluate water saved by measures	
Manage Customer Expectations		Implement system to respond to community questions	Communicate exit strategy, anticipate that drought impacts will last longer in some communities than others
<b>Step 6: Adopt the Plan</b>			
Involve the Community	r	Hold public meetings/events as needed based on actual drought impacts.	Document what worked and challenges faced based on actual drought experience for future plan modifications.
Prepare a Revenue Program		Begin documenting additional staff costs and resources needed. Re-evaluate based on actual drought impacts.	Summarize financial impact of drought and challenges faced based on actual drought experience for future plan modifications. Coordinate with other agencies (FEMA, CALWARN, etc.) on reimbursement needs/responsibilities.
Formalize cooperation with local agencies in the region		Interagency agreements confirmed in advance of response-determine if any additional agreements are necessary based on actual drought impacts	Toward the end of the drought is a good time to formalize any informal partnerships that were developed as a result of the drought or begin searching for additional funding for future droughts while it is still a high priority.
Review and finalize the plan		Contacting industry representatives ahead of time may gain their support	Make adaptations as necessary based on actual experiences.
<b>Step 7: Implement the Plan</b>			
Essential Elements of Implementing a Water Shortage Plan		Re-evaluate based on current drought scenario.	Re-evaluate based on lessons learned in drought scenario.
Public Information and Media Program	r	The lead entity also assumes a central role in publicizing the extent of the water shortage problem as well as in helping consumers conserve. Even voluntary programs have achieved significant reductions in water use where the public was well-informed and understood the need to conserve.	Re-evaluate based on lessons learned in drought scenario.

<b>WSCP Component (AWWA M60, 2019)</b>	<b>During-Drought/ Post-Disaster CDAG Requires (R) / Recommends (r)</b>	<b>Notes Phase 3: Response</b>	<b>Notes Phase 4: Drought / Water Shortage Recovery</b>
Drought Recovery and Water Shortage Plan Termination			<p>Water shortage response team reflects on actions taken and their effectiveness.</p> <p>Track progress toward addressing vulnerabilities - Build on / update / improve DWR's list of vulnerable suppliers and communities within the umbrella area</p> <p>Publicize gratitude for the community's cooperation</p> <p>Restore water utility operations, organization, and services to pre-event levels</p> <p>Document the event and response, and compile records for future reference</p> <p>Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs</p> <p>Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future</p> <p>Complete a detailed evaluation of affected facilities and services to prepare an "after action" report, including lessons learned and recommended improvements</p> <p>Continue to maintain liaisons as needed with external agencies</p> <p>Plan to update the WSCP as needed.</p>