

Livermore Municipal Water Water Shortage Contingency Plan

Introduction

The City of Livermore has developed this Water Shortage Contingency Plan for the Livermore Municipal Water System as required by California Water Code Section 10632(a). The Plan describes the following required elements:

- Water conservation stages of action in response to shortages up to 50%;
- Estimates of the minimum 3-year water supply available;
- Actions taken to prepare for and implement during catastrophic supply interruptions;
- Mandatory prohibitions and consumption reduction methods;
- Penalties and charges for excessive use;
- Analysis of potential revenue impacts from Shortage Plan implementation;
- Mechanisms for determining water use reductions.

Background

The City first adopted a Water Shortage Contingency Plan in 1991 and updated the plan in 1996 and 2005. The Water Shortage Contingency Plan has undergone a more comprehensive revision as part of the 2010 Urban Water Management Plan update to incorporate more consistent regional requirements. In March 2009, the Committee of Valley Water Retailers; comprised of Council Members, Board of Directors, or Management-level representatives from each of the four urban water retailers; approved a model Tri-Valley Retailers Water Shortage Contingency Plan to allow consistent implementation of requirements within the Zone 7 service area during water shortage events.

Also, the Livermore City Council adopted a Water Conservation Plan in 1991 which specified voluntary and mandatory conservation measures. The requirements in the 1991 Conservation Plan have been updated and incorporated into the Water Shortage Contingency Plan. Modifications to the Livermore Municipal Code updating the legal authority to implement expanded conservation measures will be made after adoption of the updated Shortage Plan. This updated Water Shortage Contingency Plan is intended to supersede the previous Water Shortage Contingency Plan and Water Conservation Plan.

The Water Shortage Contingency Plan will be reviewed and updated periodically as necessary to ensure conformance with California Water Code requirements; but at least every five years as part of the Urban Water Management Plan update process.

Activation

The Livermore City Council may enact any stage of the Water Shortage Contingency Plan by adopting a resolution in response to local or regional water supply conditions. The Plan may be enacted based on a number of conditions, including:

- A formal water supply shortage notification by the Zone 7 Water Agency;
- A collective recommendation of the Tri-Valley Water Retailers Group;
- An actual or potential local water supply restriction or emergency affecting the Livermore Municipal Water system;

The Livermore City Council may also enact Stage I or Stage II water restrictions and conservation rates as necessary to meet the requirements of the Water Conservation Bill of 2009, which requires a reduction in baseline per capita water usage of 20% by 2020.

The Conservation Stages will normally be implemented in a progressive manner; however it may be necessary for the City to skip Stages in the use reduction plan in response to catastrophic supply reductions. In general, conservation/use reduction levels will be set according to the anticipated reduction in available water supplies.

Stages of Action / Conservation Stages

Each Stage in the Plan is organized in the following manner:

- **Definition:** This is the condition of the water supply that would normally trigger this element of the Plan.
- **Message:** This is an example of the message that might be communicated to the public to describe the state of water availability.
- **Type:** This defines whether the stage is voluntary or mandatory on the part of the customer.
- **Expected Reduction:** This is an estimate of the range of reduction that may be required under each stage of the Plan. A specific goal will be defined when each stage of the Plan is activated.

Normal Supply

Inclusion of “Normal Supply” in the Plan is an important level. The Water Conservation Bill of 2009 requires urban water suppliers to reduce per-capita water consumption by 20 percent by 2020. Implementing conservation during “Normal Supply” periods will play an important role in reaching the required twenty percent reduction in per-capita consumption.

- **Definition:** Water supplies are adequate to meet all the water demands of customers.
- **Message:** We can deliver all the water our customers need, recognizing that customers should practice wise water use at all times.
- **Type:** Voluntary.
- **Expected Reduction:** None targeted
- **Conservation:** Basic water conservation measures and public information promoting wise water use and Best Management Practices when using water for residential, commercial or irrigation uses.

Stage 1- Minimal Reduction

- **Definition:** There is sufficient uncertainty concerning water supplies for this year or in the next few years that it would be prudent to conserve local water supplies so that these supplies may be used to meet water demands in the future.
- **Message:** We think we can deliver all the water our customers want, but request their help to conserve water to be sure local and imported supplies are adequate to meet future years' water demands – please conserve.
- **Type:** Voluntary.
- **Expected Reduction:** Up to 20%

Stage 2- Moderate Reduction

- **Definition:** There are definable events that lead to a reasonable conclusion that in the current and/or upcoming water years, water supplies may not be adequate to meet all customer water demands.
- **Message:** We may not be able to deliver all the water our customers want and we need customers' help to conserve water.
- **Type:** Voluntary or Mandatory.
- **Expected Reduction:** up to 20%

Stage 3- Severe Reduction

- **Definition:** There are definable events that lead to a firm conclusion that in the current water year, water supplies will not be adequate to meet customers' water demands.
- **Message:** We can not deliver all the water our customers need and we are requiring our customers to use less water.
- **Type:** Mandatory.
- **Expected Reduction:** 20 to 35%

Stage 4- Critical Reduction

- **Definition:** A Stage 3 shortage has been in effect and the reduction goal is not being met or new definable events require increasing the reduction goal.
- **Message:** We can not deliver all the water our customers need and we have not been able to achieve targeted reductions so we are now have to enforce the use of less water.
- **Type:** Mandatory.
- **Expected Reduction:** 35 to 50%

Water Emergency

A water emergency is when a specific event causes a disruption in the water supply. The disruption may affect all or part of the local Livermore Municipal Water system or the wider Zone 7, or statewide distribution system. In the event of emergency conditions affecting the water supply, the Livermore City Manager may declare a Water Emergency.

- **Definition:** There is a major failure of a supply, storage or distribution facility.
- **Message:** A very serious problem has occurred and we are unable to deliver sufficient water for human consumption, sanitation and/or fire protection.
- **Type:** Mandatory.
- **Expected Reduction:** Varies by area in response to specific situation

Table 1 below summarizes the Stages of Action that Livermore Municipal Water will use to address water supply shortages.

Table 1 – Livermore Municipal Water Stages of Action

Stage	Shortage Condition	Required Reduction	Voluntary or Mandatory
1	Up to 20%	10% to 20%	Voluntary
2	Up to 20%	20%	Voluntary or Mandatory
3	20% - 35%	35%	Mandatory
4	35% - 50%	50%	Mandatory

Actions required by each Stage of the Water Shortage Contingency Plan are cumulative; therefore if Stage 2 of the Plan is implemented, all of the reduction measures in both Stage 1 and Stage 2 shall be implemented.

The priorities for use of available water during shortages, based on Chapter 3 of the California Water Code, are as follows:

1. Health & Safety – interior residential (drinking & sanitation) and fire fighting;
2. Commercial, Industrial & Governmental – maintain jobs and economic base;
3. Annual Crops – protect jobs;
4. Existing Landscaping – especially trees and shrubs;
5. New Demands – projects without permits when shortage is declared

Table 2 below shows the types of actions or prohibitions that will be implemented by Livermore Municipal Water staff in response to each shortage Stage.

Table 2 – Stages of Actions and Consumption Reduction Methods

Stage	Expected Reduction	Consumption Reduction Methods
1	0 to 20%	<ul style="list-style-type: none"> • Public Education / Outreach; • Minimize distribution system flushing; • Voluntary Conservation Practices; <ul style="list-style-type: none"> ○ Use shut-off nozzles, no runoff, over-spray, or saturation of landscaping; ○ Sprinkler irrigation only between 9 p.m. and 6 a.m.; ○ Pools, fountains/spas must be leak-proof; ○ Use broom/bucket to wash pavement; ○ Recommend recycled water for construction uses if available.
2	0 to 20%	<ul style="list-style-type: none"> • Expanded Outreach / Voluntary cutback request; • Implement Stage 2 Conservation Rates; • Eliminate distribution system flushing; • Expanded Conservation Practices; <ul style="list-style-type: none"> ○ Stage 1 practices may become mandatory; ○ Odd / Even irrigation only, twice per week; ○ Cover pools/spas when not in use; ○ Use bucket to wash vehicles/boats/buildings, no more than monthly, encourage commercial wash services that recycle; ○ Require low-flow rinse nozzles at restaurants.

Stage	Expected Reduction	Consumption Reduction Methods
3	20 to 30%	<ul style="list-style-type: none"> • Expanded Outreach / Mandatory cutback request; • Implement Stage 3 Conservation Rates; • Eliminate sewer main flushing except in the case of back-ups or overflows; • Expanded Conservation Practices <ul style="list-style-type: none"> ○ Hand watering on Saturday or Sunday only; ○ Prohibit the use of potable water for street washing or flushing; ○ Only wash vehicles at commercial establishments that recycle water; ○ Prohibit potable water for construction uses; ○ Require low flow nozzles at restaurants
4	35 to 50%	<ul style="list-style-type: none"> • Aggressive Public Outreach via Livermore “communicator” system – Mandatory cutback request • Implementation of Stage 4 Conservation Rates • Mandatory use prohibitions <ul style="list-style-type: none"> ○ No turf irrigation; hand water only on Saturday or Sunday ○ Prohibit potable water use for ornamental fountains and ponds; refill only for public health or structural needs ○ Prohibit draining and filling of private pools; prohibit draining of public pool except for public health or structural needs • Excessive Use Penalties as appropriate

Minimum 3 Year Water Supply

Livermore Municipal Water purchases all of its potable water supplies from the Zone 7 Water Agency and has no other source of supply. While Livermore Municipal Water relies on Zone 7 as its primary water source, the Zone 7 system consists of a variety of different sources. A summary of Zone 7 supplies includes:

- Imported Surface Water
 - State Water Project
 - Byron Bethany Irrigation District
- Local Surface Water Runoff
 - Arroyo Las Positas
 - Arroyo Mocho
- Local Storage
 - Lake Del Valle
 - Chain of Lakes
- Non-Local Storage
 - Semitropic Water Storage District
 - Cawelo Water District

Therefore, Zone 7 is able to balance its supply between a variety of different sources to adapt to shortages or limitations in any one source due to legal, environmental, regulatory, or climatic factors. Chapters 7 and 16 of the 2010 Zone 7 Water Agency Urban Water Management Plan discuss the reliability of each of the Zone's water supply sources and the overall system reliability through 2030. Excerpts from page 16-1 of the Zone 7 Urban Water Management Plan regarding system reliability during normal, singly dry years, and multiple dry years are included below:

- *Under normal water years, Zone 7 does not anticipate any difficulty in meeting projected water demands, with or without additional conservation measures, assuming Zone 7 can successfully implement planned programs and projects (Table 16-1);*
- *Under single dry years, Zone 7 does not expect shortages through 2030 with the implementation of planned programs and projects (Table 16-2). The maximum potential shortage—based on the High Water Demand scenario—could be as high as 8,700 AF between 2020 and 2030 if Zone 7 cannot implement planned programs and projects.*
- *Under multiple dry years, planned programs and projects have similarly been designed to prevent any shortages. Zone 7's analysis indicates that, without such programs and projects, shortages of up to 36,000 AF can be expected under a multiple dry year scenario ending in 2030 based on the High Water Demand scenario.*

City staff will continue to work with Zone 7 staff directly and through the Tri Valley Water Retailers Group and the Committee of Valley Water Retailers to ensure that appropriate projects and programs are implemented to meet expected water demand at build-out of the adopted Livermore General Plan.

The 2010 Zone 7 Urban Water Management Plan includes projections for the minimum water supply available during the next three years based on the driest three-year historic sequence for Zone 7's water supplies. Table 13-1 from the 2010 Zone 7 UWMP is included below. The minimum supply years vary between imported surface water and local runoff sources due to hydrologic conditions, water supply infrastructure, and other conditions¹.

Table 13-1. Three-Year Estimated Minimum Water Supply^(a) (Acre-Feet Annually)

Acre-Feet Annually		Year			
		2011	2012	2013	Normal
Imported Surface Water	SWP ^(b) – Table A	15,700	22,700	19,500	51,400
	SWP ^(b) – Yuba Accord	676	676	676	145
	BBID ^(c)	2,000	2,000	2,000	4,000
Local Runoff	Arroyo del Valle	350	520	150	3,440
<i>Total Water Supply</i>		18,726	25,896	22,326	58,985

^(a) Based on the driest three-year historic sequence applicable for each water supply.

^(b) State Water Project

^(c) Byron-Bethany Irrigation District

Based on water demand projections submitted by Livermore Municipal Water to Zone 7 during preparation of the 2010 Urban Water Management Plan, Zone 7 confirmed that it would meet all of the projected demands over the 20 year planning horizon provided that water supply projects could be implemented as planned.

Catastrophic Supply Interruptions

This section describes actions taken by Livermore Municipal Water to prepare for and to be implemented during a catastrophic interruption of water supplies. Potential catastrophic supply interruptions include but are not limited to a regional power outage, earthquake, or other disaster causing a water supply outage such as a failure of the San Joaquin Delta levee system.

Livermore Municipal Water has developed a comprehensive Emergency Response Plan (ERP) that addresses a variety of potential emergency situations directly affecting the LMW system. The goals of the ERP are to:

- Rapidly restore water service after an emergency;
- Ensure adequate water supply for fire suppression;
- Minimize water system damage;
- Minimize impacts and loss to customers;
- Minimize negative impacts on public health and employee safety;
- Provide emergency public information concerning customer service.

¹ 2010 Zone 7 Urban Water Management Plan, p 13-3

The ERP establishes “Action Plans” for different emergency conditions which outline the steps LMW staff will take to respond to, evaluate, and mitigate the emergency. Action Plans were developed for a variety of water supply interruptions, including: power outages; earthquakes; flooding; and terrorist events.

In addition to Action Plans, the LMW Emergency Response Plan includes an inventory of emergency supplies, mutual aid contacts, and lists of potential vendors of emergency supplies.

The LMW Emergency Response plan was developed to comply with Section 1433(b) of the Safe Drinking Water Act (SDWA) as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Due to the sensitive nature of the information contained in the Emergency Response Plan, the plan includes an Access Control section that limits distribution of the plan to “individuals directly involved in Livermore Municipal Water’s emergency planning and response activities. Therefore, excerpts from the LMW ERP are not included with the Urban Water Management Plan or Water Shortage Contingency Plan.

Mandatory Prohibitions

The Water Shortage Contingency Plan includes a variety of voluntary and mandatory management practices to conserve water. The majority of the mandatory conservation practices are triggered at the Stage 3 level; corresponding to an expected reduction of 20-35% below normal use as shown above in Table 2. Some of the mandatory prohibitions are described below:

- The use of potable water for municipal activities such as street cleaning and sewer main flushing will be suspended at the Stage 3 level. Recycled water will be used for these needs in Stage 3 water shortage events, with the exception of water used for sewer line flushing during emergency sanitary sewer blockages or overflows.
- Implementation of odd/even irrigation, with no watering on the 31st of each month for residential and commercial uses is included in Stage 2 and may be implemented as a voluntary or mandatory prohibition.
- The use of sprinkler irrigation will be prohibited and the requirement to irrigate by hand-watering only on Saturday or Sunday will become mandatory at the Stage 3 level.
- The use of potable water for compaction or dust control during construction activities will be prohibited at the Stage 3 level since recycled

water is available for these uses.

- The use of potable water for filling swimming pools will become a mandatory prohibition at the Stage 4 level.
- The use of potable water for washing buildings, vehicles or boats except at facilities which capture and recycle the water will become a mandatory prohibition at the Stage 4 level.

Penalties for Excessive Use

Livermore Municipal Water utilizes several financial disincentives or penalties to discourage excessive use, both during normal water conditions and during shortage events.

The primary financial “penalty” for excessive use is the ascending tier water rates used by LMW, with increasing rates for higher levels of use. Ascending tier rates are in-place during normal and water shortage conditions. In addition, LMW also utilizes conservation rates that have an ascending rate structure to further discourage excessive use.

Livermore Municipal Water also has the authority to implement a penalty for excessive use by individual customers. Livermore Municipal Water staff will develop conservation usage targets based on average per-capita consumption or a percentage of historic consumption in response to specific shortage events. These usage targets will be used to evaluate customers for potential excessive use penalties. If customers uses more than the allotted usage targets for three consecutive billing periods, the City may increase the water rates to the highest conservation tier for a period of three months.

Customers will be provided with the ability to appeal excessive use penalties if they feel their use allocation was inappropriate due to factors such as:

- A higher than average number of people in residential units;
- Medical needs that demand water-consuming devices or uses;
- Water consumed in products or activities that cannot be reduced.

Customers will also have an opportunity to appeal excessive use penalties based on economic hardship or other factors. Excessive use penalties would be implemented at the Stage IV level.

In addition to additional charges for excessive use through ascending tier rates and penalties for excessive use, LMW may also issue penalties for violating mandatory prohibitions. Livermore Municipal Water staff will be able to issue administrative citations to customers violating mandatory prohibitions starting at the Stage IV conservation level. Administrative citations carry a fine of

approximately \$100 each.

Analysis of Revenue Impacts

Prolonged water shortage events and conservation practices that reduce water consumption will have impacts to water system revenues. To offset the impacts of water shortages on water system revenue, Livermore Municipal Water has developed an operating reserve and conservation rates that can be enacted in response to water shortages.

Conservation rates are updated and adopted by the Livermore City Council each time LMW water rates and service charges are adjusted. By having conservation rates previously adopted, LMW can avoid the delays associated with Proposition 218 notification and ballot procedures prior to implementing conservation rates in response to emergency water supply shortages. Conservation rates can then be implemented by Council resolution during water shortage events.

The Livermore City Council will typically implement the conservation rate corresponding to each Shortage Level; however Council may adopt conservation rates of a higher or lower Shortage Level at their discretion, based on the current status of water system revenues, progress towards compliance with water reduction targets, or other factors. Council can also declare a water shortage and implement the corresponding voluntary or mandatory use restrictions/prohibitions without implementing conservation rates.

Livermore Municipal Water has conservation rates that correspond to each Stage identified in the Water Shortage Contingency Plan, and are calculated to recover the necessary revenue based on the expected percentage reduction at each Stage. Since Livermore Municipal Water rates are comprised of both a fixed meter service charge and a variable water rate component, only a portion of the monthly charges are affected by reductions in water consumption.

Table 3 below presents a general overview of 2010 Livermore Municipal Water system revenues and expenses showing how the expected use reductions at each Stage might impact net water system revenue.

Table 3 – Impacts of Water Use Reductions on Net Water System Revenue²

	Normal	Stage 1 ³ 10%	Stage 2 20%	Stage 3 35%	Stage 4 50%
Operating Revenue					
Water Sales	\$7,879,000	\$7,091,100	\$6,303,200	\$5,121,350	\$3,939,500
Meter Service Chg	\$2,521,000	\$2,521,000	\$2,521,000	\$2,521,000	\$2,521,000
Total Revenue	\$10,400,000	\$9,612,100	\$8,824,200	\$7,642,350	\$6,460,500
Gross Revenue Loss					
	0	\$787,900	\$1,575,800	\$2,757,650	\$3,939,500
Operating Expenses					
Administration	\$1,289,150	\$1,289,150	\$1,289,150	\$1,289,150	\$1,289,150
Water Purchase	\$5,850,900	\$5,265,810	\$4,680,720	\$3,803,085	\$2,925,450
Pumping Expense	\$204,650	\$202,600	\$198,500	\$184,200	\$167,800
Transport/Distribution	\$1,688,600	\$1,688,600	\$1,688,600	\$1,688,600	\$1,688,600
Accounting/Billing	\$641,230	\$641,230	\$641,230	\$641,230	\$641,230
Conservation ⁴	0	\$20,000	\$50,000	\$150,000	\$250,000
Total Expenses	\$9,674,530	\$9,107,390	\$8,548,200	\$7,756,265	\$6,962,230
Expense Savings	0	\$567,140	\$1,126,330	\$1,918,265	\$2,712,300
Net Revenue Loss					
	0	\$220,760	\$449,470	\$839,385	\$1,227,200

Livermore Municipal Water's conservation rates are designed to recover the revenue necessary to fund water system operations as well as prudent operating and renewal/replacement reserves at each Stage of Action.

Based on the estimated 2010 revenue and expense information shown in Table 3, water conservation rates would need to recover between approximately \$220,000 and \$1.2 million in net revenue lost per year, depending on the Conservation Stage implemented. This estimate of lost revenue takes into account the reduced water purchase and pumping expenses as well as increased conservation program expenses. With an estimated 2010 water sales revenue of approximately \$7.88 million from "normal" water rates, an additional \$220,000 to \$1.2 million represents an increase of between 2.8% and 15.6% in revenue, and therefore in conservation rates. However, the actual increase in conservation rates would be greater than these percentages, since the lost revenue would have to be recovered from a smaller *volume* of water sold. Also, the calculation of conservation rates is more complicated due to the ascending tier rate structure used by Livermore Municipal Water to encourage conservation during Normal supply conditions. The general water rate impacts discussed above are for example purposes only.

² Based on projected Fiscal Year 2010/2011 expenses and revenue.

³ Stage 1 use reduction assumed at 10% (Stage 1 range is 0 to 20%).

⁴ Estimated additional expenses to implement expanded public outreach, billing, monitoring and other procedures and activities to achieve use reductions associated with each Stage.

An evaluation of the potential loss in water system revenue is conducted each time normal water rates are adjusted to calculate and adopt updated conservation rates as noted above. Normal water rates and conservation rates were last adjusted in July 2009.

Mechanism for Determining Use Reductions

Livermore Municipal Water has developed monitoring procedures to determine if water use reductions are being met during Stage 1-4 water shortages, as well as during critical water emergency or disaster events.

Normal Monitoring Procedure:

In normal water supply conditions, purchase and sales data is checked monthly by water staff and compiled by the Water Supervisor. These totals are reported to the Water Resources Manager or the Public Works Director as requested. The totals are also logged into the annual report to the Department of Water Resources.

Stage 1 or Stage 2 Water Shortage:

During a Stage 1 or Stage 2 water shortage, weekly turnout readings are reported to the Water Supervisor. The Supervisor compares the weekly purchase records to the weekly target to verify that the reduction goal is being met. Weekly reports are forwarded to the Water Resources Manager and the Public Works Director. Monthly summary reports are also sent to the Public Works Director. If reduction goals are not met, the Water Supervisor will propose additional activities or conservation measures and advise the Water Resources Manager. The Manager will notify the Public Works Director that additional corrective actions or use-reduction measures will be implemented.

Stage 3 and 4 Water Shortages:

During a Stage 3 or 4 water shortage, the procedure listed above will be followed, with the addition of a daily water purchase report being submitted to the Water Resources Manager.

Emergency Shortage:

During an Emergency Shortage, a major focus will be on monitoring LMW storage tanks to ensure adequate fire protection and emergency storage. Water staff will review tank levels via the Supervisor Control and Data Acquisition (SCADA) system on an hourly or continuous basis to ensure tank levels are maintained at safe levels for as long as possible. Also, meter readings of the volume of water purchased by LMW can be reported to the Water Supervisor, Water Resources Manager or Public Works Director hourly, if needed.