

Water Shortage Contingency Plan

June 22, 2021



Lake Arrowhead Community Services District

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Water Shortage Contingency Plan

Figure 1 Lake Arrowhead Village



This Water Shortage Contingency Plan (WSCP) provides guidance for the Lake Arrowhead Community Services District (LACSD or District) when the available water supply is insufficient to meet normal demand. Having a plan in place improves preparedness for droughts and other impacts on water supplies, which may be interrupted or significantly reduced due to drought, earthquake, a power outage, or a toxic spill that affects water quality. Water supplies may also be constrained due to regulatory action, population growth, changes in residency, or climate change. This WSCP describes how the District plans to respond to short- or long-term reductions of water supplies so that needs can still be met and catastrophic service disruptions are prevented. Utilizing this plan, LACSD will be able to proactively implement these pre-determined steps to manage a water shortage.

This WSCP has been adopted separately from the Urban Water Management Plan (UWMP) so that it may be updated independently but is included as Chapter 8 in the 2020 UWMP. In accordance with California Water Code Section (CWC) 10632, this WSCP includes the following sections:

1. Water Supply Reliability Analysis
2. Annual Water Supply and Demand Assessment
3. Six Standard Water Shortage Levels
4. Shortage Response Actions
5. Communication Protocols
6. Compliance and Enforcement
7. Legal Authorities
8. Financial Consequences of the WSCP
9. Monitoring and reporting
10. WSCP Refinement Procedures

- 11. Special Water Feature Distinction
- 12. Plan Adoption, Submittal and Availability

1 Water Supply Reliability Analysis

This section summarizes the reliability of the District’s water service under varying conditions. In accordance with CWC section 10635, water agencies are required to provide a supply and demand assessment of the reliability of current and long-term water service during normal, dry and multiple dry years. This analysis relies on multiple data sets pursuant to CWC section 10631. Additional details regarding this information may be found in the 2020 UWMP including the Water Supply Analysis in Chapter 6 and the Water Service Reliability Assessment in Chapter 7.

The District relies on multiple sources of water. Depending on the water shortage cause, each source may be impacted in a different way. The reliability of each source is also described in this section.

Normal Year

In a future normal year, the District will have an excess supply of potable water at projected demand levels as seen in Table 1. The amount of supply shown is the maximum allowable but the actual production would be based on customer demand. Any excess potable water supply not used would remain in Lake Arrowhead to boost lake level in drier years. This excess will also enable the District to avoid purchasing imported water. Supplies are expected to grow as more groundwater is developed. A concern of the District is that demand could increase with a change in residential status. As seen in 2020, when more people take up residence in Lake Arrowhead, demand can surge very quickly so the District must plan to always have reserves in place.

Table 1 Normal Year Supply and Demand Comparison - Potable

Year	2025	2030	2035	2040	2045
Supply totals	1,901	1,931	1,991	2,021	2,051
Demand totals	1,507	1,336	1,360	1,387	1,406
Difference	394	595	631	634	645

Single Dry Year

In a single dry year, based on past efforts and responses in the District, it is assumed that demand will be reduced by 5% due to public awareness campaigns. This is based on the response from the community in 2014 which was a critically dry year. The District can rely on the full amount of surface water but would voluntarily ensure that lake draw is at least 5% lower than the full water right. Current demand estimates are low enough to remain within these parameters. As groundwater supplies are developed further, the excess supply increases and surface water withdrawals can decrease. This water will remain in Lake Arrowhead to keep lake levels as high as possible. It will also assist the District to purchase as little imported water as possible.

Table 2 Single Dry Year Supply and Demand Comparison - Potable

Year	2025	2030	2035	2040	2045
Supply totals	1,823	1,853	1,913	1,943	1,973
Demand totals	1,274	1,298	1,322	1,340	1,360
Difference	549	555	591	603	613

Multiple Year Drought in the Near-Term

The District conducted a Drought Risk Assessment which calculated the minimum potable water supply available during a continuous five-year drought event. This assumes a voluntary reduction in lake draw. Even though the total water right of 1,566 acre-feet per year (AFY) is legally available, the public will desire to preserve lake level as much as possible. This will in turn require a reduction in demand, especially if imported water cannot be relied upon. When comparing these supplies to the demand projections, LACSD has adequate supplies available to meet projected demands with demand management measures should a multiple-dry year period occur during the next five years. Table 3 shows the estimated potable supply and demand totals over a five-year drought beginning in 2021.

Table 3 Potable Supply and Demand During Multiple Year Drought in the Near-Term (Acre-Feet)

Year	Supply	Demand	Surplus/ (Shortfall)	DMM*	Revised Surplus/ (Shortfall)
2021	1,763	1,463	300	73	373
2022	1,505	1,436	70	72	142
2023	1,405	1,405	-	198	198
2024	1,304	1,374	(70)	198	128
2025	1,175	1,336	(161)	258	97

**Demand Management Measures*

The analysis above is specific to drought conditions. Other threats to supply could include catastrophic interruption to local or imported supplies from earthquake, wildfire, malicious attacks, contamination or emergency power outages. Depending on the situation, various shortage response actions will occur as described in Section 4.

Multiple Year Drought in the Long-Term

On a longer-term horizon, during multiple years of drought, shortages start to be seen in the fourth year if no demand management activities are put into place. This indicates that the District can weather three consecutive dry years but there would be no way to know if the drought was going to end in the fourth or fifth year so increased demand management measures would need to begin by at least year three.

As lake level declines, the District would implement demand management measures to reduce usage from 5% in the first years to 20% during a prolonged drought. Imported water can supplement local supplies if it is available. As more groundwater is developed, less imported water will be needed and the District will have more flexibility to determine what supply can be utilized under different conditions.

Table 4 Potable Supply and Demand During Multiple Year Drought in the Long-Term (Acre-Feet)

		2025	2030	2035	2040	2045
First year	Supply totals	1,823	1,853	1,913	1,943	1,973
	Demand totals	1,274	1,298	1,322	1,340	1,360
	Difference	549	555	591	603	612
Second year	Supply totals	1,559	1,586	1,640	1,667	1,694
	Demand totals	1,278	1,303	1,325	1,344	1,364
	Difference	281	284	315	323	330
Third year	Supply totals	1,453	1,477	1,525	1,549	1,573
	Demand totals	1,158	1,181	1,201	1,219	1,238
	Difference	295	296	324	329	334
Fourth year	Supply totals	1,346	1,367	1,409	1,430	1,451
	Demand totals	1,094	1,117	1,134	1,152	1,170
	Difference	252	250	274	278	281
Fifth year	Supply totals	1,161	1,179	1,215	1,233	1,251
	Demand totals	1,098	1,121	1,137	1,156	1,174
	Difference	62	57	77	77	77

1.1 Imported Water

The District supplements local supplies with purchases from the SWP via agreements with Crestline-Lake Arrowhead Water Agency (CLAWA) and San Bernardino Valley Municipal Water District. As a result of continued challenges to the State's water supplies, the availability is uncertain during drought since LACSD is not a SWP contractor. Efforts are ongoing to improve reliability of the SWP by developing new projects to increase capacity while encouraging its member agencies to develop local supply. Because LACSD's needs are small, reliability in most years is very good. Imported water is generally available to the District due to the small quantities requested but it is limited by CLAWA's capacity which hasn't been a problem up to this point. CLAWA prefers that LACSD takes the water during lower demand months.

During an outage that is more specific to LACSD's operations, the reliability of imported water can be relied upon. There have been occasions where District facilities were being rebuilt and supply was supplemented with imported water. If the District suffered a malicious attack or surface water contamination, the reliability of imported water in otherwise normal conditions is very good. In the event of an earthquake or wildfire, the reliability is less certain since it is possible that the conveyance system could be damaged. During a power outage, the District is prepared to be self-reliant and can draw upon its own local sources.

1.2 Groundwater

Groundwater supplies can diminish during long-term drought but the effect is delayed. The District's groundwater wells are recharged solely through precipitation and can sustain production in single dry years. District records show that losses to production don't occur until more than a year of dry weather and the wells recharge quickly in wet years. After three consecutive years of lower precipitation from

2011 to 2016, there was a reduction in production of approximately 30% but one normal year of precipitation brought production back up to prior levels. For purposes of a drought risk assessment, groundwater production assumptions are more conservative. The analysis includes normal production amounts in a single-dry water year and a decrease of 10% for every consecutive dry year.

Groundwater can be affected by natural disasters, power outages and contamination. Any unhealthful constituents can force a well to be kept offline and any failure in the infrastructure can interrupt operations. The District has a system of groundwater operations that can isolate an individual well if necessary.

1.3 Surface Water

LACSD obtains the majority of its supply from local surface water. Due to a specific water rights ruling, LACSD can withdraw up to 1,566 AFY regardless of hydrologic conditions. This makes this source highly reliable but, during drought, lake level is a public concern. When lake level is low, the community will expect lower draws, regardless of the water right.

Figure.2 Lake Arrowhead and MacKay Dam



Photo credit: Paul Bormann, bormannphoto.com

During the driest five years on record from 2011 to 2016, the District's service area received 61% of normal precipitation and the level of Lake Arrowhead dropped 11.5 feet. This source is very reliable since LACSD's withdrawal right is fixed every year, but the District will voluntarily reduce its draw on this resource during drought and will also rely on the public to conserve.

Other risks include earthquakes, contamination and power outages. This source can be at risk from earthquakes since the raw water line feeding the main water treatment plant is over a mile long and increases in elevation by more than 200 feet which requires significant pressure. Contamination to this source is possible but the volume in Lake Arrowhead and the depth of the intakes reduce this risk. The District has the necessary infrastructure to operate its surface water infrastructure during a power outage.

1.4 Recycled Water

Recycled water is drought resistant even when indoor water use declines because of the system currently has excess capacity. This source is vulnerable to earthquake because of the 2-mile transmission line. The Grass Valley Wastewater Treatment Plant, where recycled water is made, is equipped with both a fuel powered emergency generator as well as a battery storage facility. Malicious attacks and threats of contamination are low due to this being a non-potable source.

2 Annual Water Supply and Demand Assessment Procedures

Starting in 2022, every supplier is required to annually assess their supply and demand. District staff will prepare an Annual Water Supply and Demand Assessment (Annual Assessment) utilizing prior calendar year data to assess current conditions and estimate supplies one year in advance. The results will be presented to the Board of Directors (Board) for approval by the end of June. This Assessment Report will then be submitted to the California Department of Water Resources (DWR) by July 1st every year.

While the first Annual Assessment is not required to be submitted to DWR until July 1, 2022, suppliers are encouraged to use the procedures documented in the WSCP to prepare an Annual Assessment for 2021 and present the results in their UWMP as an example. This assessment is included as Appendix H in the 2020 UWMP.

The WSCP is required to include the specific procedures that the District will take to complete the Annual Assessment (CWC 10632(a)(2)) so that it may be consistently prepared every year regardless of staff changes. This section will describe the following:

- A. The written decision-making process that LACSD will use each year to determine its water supply reliability.
- B. The key data inputs and assessment methodology that will be used to evaluate LACSD's water supply reliability for the current year and one dry year including:
 - I. Current year unconstrained demand considering weather, growth and other influencing factors to meet demand objectives in future years.
 - II. Current year available supply considering hydrological and regulatory conditions in the current year and one dry year. The supplier may also consider more than one dry year.
 - III. Existing infrastructure capabilities and plausible constraints.
 - IV. A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual assessment.
 - V. A description and quantification of each source of water supply.

2.1 Decision Making Process

The Annual Assessment will be prepared every year using a consistent process to ensure a standard result. The District uses calendar year for water supply planning so the Annual Assessment will also be prepared on a calendar year basis by June of every year. This is appropriate for the District since the local area will have received more than 80% of its annual precipitation by the end of March. The Annual Assessment will be prepared by staff for the following calendar year. It will be presented to the Board in June for their approval and submitted to DWR by July 1st. Below is the chronology of the assessment and decision-making process. The status will be reported to the Board on a monthly basis.

December
Monitor precipitation
Monitor water usage
Check SWP initial allocation
January
Continue to monitor precipitation
Continue to monitor water usage
Check for changes to the SWP allocation
Calculate water usage from the overlap area to calculate replacement water purchases for the CLAWA I contract.
Assess operational and hydrological conditions to estimate water purchases for the CLAWA II contract.
Submit an estimate of water to be purchased to CLAWA for the upcoming period between July 1 through June 30 for both CLAWA I and CLAWA II contracts.
February and March
Monitor potential for atmospheric rivers
Continue to monitor precipitation
Continue to monitor water usage
Check for changes to the SWP allocation
April and May
Assess lake level and hydrologic conditions
Assess groundwater production
Check for changes to the SWP allocation
Check American Community Survey for changes in full-time residency
Conduct residency assumptions against daily meter data
Discuss hydrologic conditions and groundwater production with Board
June
Assess operational concerns that may affect supply
Review upcoming capital projects
Prepare Annual Assessment
Review WSCP for potential updates
Present the Assessment to the Board
July
Submit the Annual Assessment to DWR by July 1st

2.2 Data and Methodologies

To prepare the Annual Assessment, the District will consider multiple sources of data, assess its own supply assuming dry conditions, and estimate future water demand. Using the applicable key data inputs, the District will estimate the planned water use for the current year while anticipating that the next year will be dry.

Key Data Inputs

The data used for the analysis includes lake level, groundwater production, precipitation, SWP allocations, and current unconstrained demand with no additional conservation measures to evaluate supply reliability for the coming year. The analysis will also consider any operational considerations or capital projects that may have an effect on distribution. All of this data is input into a combined spreadsheet that captures prior year, current year and estimates for the next year assuming it is dry.

Each month, the Water Operations Department prepares an analysis of all water supply uses. This data is distributed to staff and the Board and includes the following:

- Imported water purchases by contract and turnout
- Groundwater production by well
- Surface water withdrawals by intake
- Recycled Water deliveries
- Raw water transfers
- Production water reuse
- Distribution system water loss
- Amount delivered to the distribution system
- Emergency transfers to other water systems
- Metered water use
- Changes in storage volume

There are multiple precipitation gages used due to the many micro-climates in the Lake Arrowhead area. Data from large storm events are compared for all the precipitation gages and averaged.

- CIMIS maintained by LACSD
- USGS maintained by LACSD
- County gages
- Sewer monitors
- National Oceanographic and Atmospheric Administration (NOAA) website

Smaller rain events saturate the soil but atmospheric rivers provide the large quantities of water necessary to fill Lake Arrowhead. These events can also overload the wastewater treatment plants due to inflow and infiltration into the collection system. The District relies on the Center for Western Weather and Water Extremes for this information found here <https://cw3e.ucsd.edu/iwv-and-ivt-forecasts/>.

Demand is assessed through three data points: water delivered to distribution from the Water Operations Department, meter data provided by the Meter Technology Department and billing data from the Finance Department. All of these are assessed and compared to evaluate trends.

Operational considerations are provided by the Water Operations Department and capital projects are included in the 5-year Capital Plan which is included in the District's annual budget.

The Arrowhead Lake Association emails lake level data on a weekly basis and on a daily basis upon demand. This data is kept in a spreadsheet.

State Water Project Table A allocations are posted on the DWR website.¹

Assessment Methodology

The Key Data Inputs are entered into a standardized worksheet and the results are evaluated to determine water system reliability for the coming year with the assumption that the following year will be dry. Supply, demand and various hydrologic conditions are entered into the spreadsheet and considered as a whole.

The impact of dry conditions can vary year-to-year. One dry year at 50% of normal may not be as concerning as 50% of normal for the third year in a row. There have been dry years that provided the right conditions for the lake to maintain high levels. For this reason, the standardized worksheet considers multiple years as well as the current conditions to determine if a water shortage is imminent.

Precipitation that averages 30" per year or less is considered to be dry conditions in Lake Arrowhead. Each precipitation gage is analyzed separately due to the microclimates in the service area. When precipitation is less than 75% of normal over two or more consecutive years, a water shortage may occur in the following year. To estimate the severity of the potential water shortage level, precipitation data, lake level and groundwater production are all considered.

Because the District has multiple supply sources, there is some flexibility in how it is used. Depending on lake level and availability of the SWP, there may be a preferred supply mix that is different than the actual supply available. The District will analyze different scenarios to determine if there is an anticipated shortage of a particular supply or of total supply.

Evaluation Criteria

To prepare the Annual Assessment, supply sources and estimated demand will be analyzed and compared to each other for the upcoming 18 months. The preferred supply mix will be compared to actual availability. To estimate supply sufficiency for the following year, local conditions will be analyzed including precipitation and lake level. If dry conditions have been persistent and lake level is lower than desired, an analysis will conclude which water shortage level may be necessary.

By the end of April, hydrologic conditions can be predicted for the remainder of the year with a high degree of accuracy. The service area will have received approximately 90% of the total annual precipitation by this time. Lake level can also be predicted. The lake typically loses 4' of water level per year to evaporation and 1' for every 800 acre-feet (AF) of water withdrawn. Evaporation rates are higher in the summer. Using projected lake withdrawals, lake level can be estimated for the remainder of the year.

¹ <https://water.ca.gov/Programs/State-Water-Project/Management/SWP-Water-Contractors>

Water Supply

The Annual Assessment determines if near-term water supply will be sufficient to meet demand. Therefore, the quantification of each source of water supply is estimated based on current conditions.

State Water Project Table A allocations can provide an indication of how likely it will be that any requests for imported water from the District will be granted. If the allocations are restricted due to drought, LACSD’s request will be a lower priority.

Groundwater production is compared to prior years to determine how volume is being affected by hydrologic conditions. This is compared to current precipitation forecasts to project how much water might be extracted in the coming year. Groundwater production is analyzed by each well individually. Using this data, the next year’s production is estimated assuming a dry year. Assumptions of well production are made based on prior years with similar hydrologic conditions. Any planned projects or maintenance will also be considered.

While the District has the right to withdraw 1,566 AFY from Lake Arrowhead, lake level may be a concern so this it tracked carefully. If the lake isn’t full by May, it is not likely that it will fill that year. If that’s the case, the District may make plans for additional imported water if it’s available.

Table 5 Current Water Source Reliability Under Various Conditions

Supply	Normal	Single Dry	Multi-Dry 1	Multi-Dry 2	Multi-Dry 3	Multi-Dry 4	Multi-Dry 5
Surface	1,566	1,488	1,488	1,253	1,175	1,096	940
Ground	225	225	225	203	180	158	135
Imported	50	50	50	50	50	50	100
Potable	1,841	1,763	1,763	1,506	1,405	1,304	1,175
Recycled	1,102	1,102	1,102	1,102	992	950	900
Total	2,943	2,865	2,865	2,700	2,410	2,253	2,158

Unconstrained Customer Demand

Current year unconstrained demand is utilized to determine how much water might be used by customers in the period after the Annual Assessment is prepared. Unconstrained demand is customer water use before any shortage response actions are taken by the District. A determination is made for what is considered normal demand that is not affected by any other factors.

Water usage can fluctuate with a change in the percent of full-time vs. part-time residences. The American Community Survey or census data is referenced for indications of any changes in this ratio. Daily meter data is also used to determine the utilization of homes.

For the 2021 Annual Assessment, the usage from 2016 through 2019 has been averaged and is utilized as a baseline since hydrologic conditions were average and water conservation activities from the prior drought normalized. 2020 is not used due to an influx of population during the COVID-19 pandemic. This baseline is then adjusted based on hydrologic conditions, lake level and residency status. If it is a dry year and lake level is low, the community can be relied upon for a 2% voluntary reduction in water use but a

conservative assumption is that usage won't change. The area does not have a lot of growth, averaging only 11 new connections per year. It is conservatively assumed that new homes will have water efficient fixtures that won't exceed 55 gallons per person per day.

Infrastructure Considerations

Certain activities of the District may change the supply mix for the coming year. Capital improvement projects or other maintenance activities may require certain facilities to be inoperable for a time. Examples include reconstruction of conveyance facilities and tank recoating. The District's annual budget contains a five-year capital plan that should be referred to for projects that could interrupt specific supplies. Department managers should also be conferred with to understand any other maintenance activities that may occur or existing infrastructure problems that may need to be addressed.

3 Six Standard Water Shortage Levels

CWC section 10632(a)(3) requires suppliers to plan for six water shortage levels. The purpose of this is to standardize declarations between suppliers throughout the state. LACSD's Ordinance 79 identified three water shortage levels with criteria that were based on lake level, precipitation, groundwater production, SWP allocations and demand. This ordinance was superseded by Ordinance 83 which simplified the District's water use efficiency standards and revised the water shortage levels to six levels to be consistent with the state law. Table 7 (DWR Table 8-1) shows the District's water shortage levels required in the water code as stated in Ordinance 83.

Table 6 Water Shortage Level Actions

Level	Permanent Restrictions	Irrigation Days	Turf	Enforcement	Public Info	Drought Rates	Connection Moratorium	Reduction
1	X	3	No new	Maintain	Maintain			10%
2	X	3	Reduce	Maintain	Maintain			20%
3	X	3	Reduce	Increased	Increased			30%
4	X	2	Reduce	Increased	Increased			40%
5	X	1	Reduce	Strict	Persistent	X		50%
6	X	0	No Irrig	Strict	Persistent	X	X	50%+

The Board may declare a water shortage condition when the District determines that, due to drought, state regulations or other water supply conditions, a reduction in water use is necessary. Factors the Board will consider include but are not limited to, (1) the water level of Lake Arrowhead; (2) rainfall totals; (3) reliability of current and projected groundwater well production, (4) ability to meet demand; (5) State Water Project allocation; and (6) projected water allocations to the District from CLAWA. The District may not necessarily move progressively through the levels and, under certain circumstances such as emergencies, may skip to higher levels as necessary. During any declared water shortage level, all other permanent water use restrictions will remain in place.

Table 7 (DWR Table 8-1) Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions <i>(Narrative description)</i>
1	Up to 10%	Outdoor irrigation is limited to 3 days per week. No new turf grass is allowed.
2	Up to 20%	Outdoor irrigation is limited to 3 days per week. Existing turf grass must be reduced by 50% when refurbished.
3	Up to 30%	Outdoor irrigation is limited to 3 days per week. Existing turf grass must be reduced by 50% when refurbished. Enhanced enforcement and increased Public Information campaigns will be initiated.
4	Up to 40%	Outdoor irrigation is limited to 2 days per week. Existing turf grass must be reduced by 50% when refurbished. Enhanced enforcement and increased Public Information campaigns will be initiated.
5	Up to 50%	Outdoor irrigation is limited to 1 day per week. Existing turf grass must be reduced by 50% when refurbished. Strict enforcement, water audits and persistent Public Information campaigns will be initiated. Drought rates will be considered.
6	>50%	No outdoor irrigation is allowed. Existing turf grass may not be watered by any method. Strict enforcement, water audits and persistent Public Information campaigns will be initiated. Drought rates and a moratorium on new connections will be considered.

4 Shortage Response Actions

CWC section 350 provides that the District may declare a water shortage emergency to prevail within the area it serves when it finds that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply. This section describes the actions the District will take when the potential for a shortage exists. These Shortage Response Actions align with the shortage levels described in the prior section. The actions described in this section include supply augmentation, demand reduction, operational changes, mandatory restrictions and an estimate of the water that would be saved from each action.

Some actions may be implemented differently depending on how quickly the reason for the shortage has occurred. A natural disaster may require a quicker move to a higher stage than a drought which can have more progressive degrees of demand management. Water uses are prioritized as follows:

1. Health and Safety: fire suppression, indoor residential use, Mountains Community Hospital
2. Commercial & Institutional: maintain economic base, education and community services
3. Landscaping: varying degrees

4.1 Demand Reduction

When the drought of 2011-2016 significantly depleted water supplies, the state mandated a temporary 25% reduction in water use which created public awareness and pressured agencies to enact or modify permanent contingency policies. The increased public awareness was helpful to LACSD. Prior to the drought, seasonal homeowners that were not accustomed to the strict water conservation ordinances already in place required significant education. During the drought, the District was able to realize the requested water savings of 25% and the District was encouraged by the voluntary actions of the community brought about by public awareness.

LACSD maintains a water efficiency ordinance to address droughts, emergencies, water conservation practices and limitations on the number of new connections. Permanent water conservation measures cover outdoor cleaning, hospitality, leaks, irrigation, and landscaping as well as water use efficiency audits. In the case of a water shortage, additional measures would be taken. Depending on the shortage level, the District will increase its public awareness campaigns and enforcement patrols as necessary. If the shortage continued into the higher stages, the District could restrict outdoor irrigation as needed to affect specific water savings. The District also has approved drought rates that can be activated to cover revenue shortfalls.

The District estimates that public education and outreach can reduce usage by 5% in the second level and 10% at higher shortage levels. The District utilizes advertising in the local newspaper and on social media. It also utilizes printed material with billings, email blasts and notifications through LACSD's water use app, DropCountr.

The District maintains irrigation restrictions every year, regardless of the amount of precipitation. Irrigation is permanently restricted to Mondays, Wednesdays and Fridays between May 1st and October 15th. By restricting the days that irrigation is allowable, the District can more easily monitor compliance. Irrigation is also restricted to the hours between 6pm and 8am. This is a more efficient use of water because the temperature and wind speeds are lower, causing less evaporative loss. During a supply shortage, the District can reduce irrigation days for the entire season or for a portion of it. Most residences in the District's service area do not have dedicated irrigation meters so it is not certain how much water can be saved, but it is estimated that irrigation accounts for 2.4 AF for every irrigation day.

Drought surcharge rates have been developed for the District to maintain sufficient revenues during mandatory conservation efforts or water shortage events. They can also discourage excessive water use. These surcharges may be implemented by the Board as drought levels are declared. Level 1 drought surcharges are designed to replace a 10% reduction in use. Level 2 surcharges replace revenue from a 25% reduction in use and Level 3 surcharges replace a 40% reduction. While drought surcharges can be implemented at any stage of shortage, Ordinance 83 requires the Board to review the financial implications of reduced demand in levels 5 and 6.

Table 8 (DWR Table 8-2) Demand Reduction Actions

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	Reduction	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1-6	Landscape - Restrict or prohibit runoff from landscape irrigation	1%	Permanent Restriction	Yes
1-6	Landscape - Limit landscape irrigation to specific times	1%	Permanent Restriction	Yes
1-6	Landscape - Limit landscape irrigation to specific days	1%	Permanent Restriction	Yes
1-6	Landscape - Other landscape restriction or prohibition	1%	Permanent Restriction	Yes
1-6	CII - Lodging establishment must offer opt out of linen service	1%	Permanent Restriction	Yes
1-6	Offer Water Use Surveys	1%	Permanent	No
1-6	Provide Rebates on Plumbing Fixtures and Devices	1%	Permanent	No
1-6	Provide Rebates for Landscape Irrigation Efficiency	1%	Permanent	No
1-6	Reduce System Water Loss		Ongoing	No
1-6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	1%	Permanent Restriction	Yes
1-6	Other - Require automatic shut of hoses	1%	Permanent Restriction	Yes
1-6	Other - Prohibit use of potable water for washing hard surfaces	1%	Permanent Restriction	Yes
3-6	Expand Public Information Campaign	1% - 10%		No
3-6	Increase Water Waste Patrols	8% - 10%		No
5-6	Implement or Modify Drought Rate Structure or Surcharge	6% - 7%		No
6	Landscape - Prohibit all landscape irrigation	17%		Yes
6	Moratorium or Net Zero Demand Increase on New Connections	2%		Yes

4.2 Supply Augmentation

The District has two contracts for imported water supplies through CLAWA. One contract is to replace water that LACSD serves to an overlap area in CLAWA’s service area. This replacement water is drawn upon every year regardless of conditions. The second contract is for 7,600 AF that can be drawn upon if properly requested. The original contract had a minimum purchase of 550 AFY but the District was able to delay delivery until future years.

This water is included in the District’s planning during prolonged drought. This supply can only be delivered as long as it is within CLAWA’s maximum allowable flow rate. This exceedance has not been a problem in the past but it would most likely occur during the summer months. Because LACSD would not plan to take deliveries of this water until the third dry year of a drought, the District could plan for deliveries in the spring and fall to reduce lake draw. According to LACSD’s drought planning, the District would only need to augment supply by 50 AFY in the last years of a multiple-year drought. As the District continues to develop additional local groundwater supplies, this reliance during drought will diminish.

Table 9 (DWR Table 8-3) Supply Augmentation

Submittal Table 8-3: Supply Augmentation and Other Actions		
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?
6	Other Purchases	50 AFY

4.3 Operational Changes

Operational changes to help reduce demand include implementation of drought surcharges, increased water waste patrols and public information campaigns. The District may also increase its efforts in leak detection.

During a more catastrophic event such as an earthquake, existing water supplies in reservoirs will be protected and the District has the ability to adjust the zones and redirect where water is delivered. During a wildfire, the District may connect various zones in different ways. Also, an intertie to more remote areas has been installed between water systems to ensure fire flow as needed.

The District may also change from one supply to another depending on where the impact is. If imported supplies are available, interrupted or shortened local supplies may be augmented through the connection with CLAWA. As the District develops more local groundwater supplies, there will be greater flexibility on which sources to use at different times.

4.4 Additional Mandatory Restrictions

The District maintains very strict water efficiency measures on a permanent basis that are in addition to state-mandated actions. Additional mandatory restrictions will be considered as necessary. District ordinances prohibit the use of a hose to clean impervious surfaces or vehicles and prohibit non-

recirculating water features. Hospitality establishments are required to serve water and provide daily laundering only upon request. No water is allowed to flow from any property, no new turf grass is allowed and no new landscaping over 10,000 square feet is permitted.

4.5 Emergency Response Plan

The District maintains an Emergency Response Plan which is updated in compliance with the Environmental Protection Agency's America's Water Infrastructure Act. In addition to drought, LACSD plans for other threats to its water supplies such as regional power outages, wildfires and earthquakes.

The primary effect on LACSD during any of these events is a loss of power to the water treatment plants, water pumping stations and the wastewater collection and treatment systems. The District is also located in a heavily forested high fire risk area and Public Safety Power Shutoffs are a real possibility. At this time, nearly all of LACSD's water systems are equipped with emergency power generation that will supply power during a catastrophic event. The remaining facilities are equipped to be supported by portable power generation which would be acquired and connected to provide power and keep the water supply system in operation. The District has also installed a battery energy storage facility, which delivers additional power backup as well as energy cost savings.

The District conducts emergency response drills at least annually and coordinates with local emergency response agencies. The District's Disaster Preparedness Plan identifies the specific actions which will take place in the event of a catastrophic emergency. The District also has an Emergency Operations Plan that provides a detailed plan for the evaluation and mitigation of the water distribution system in the case of a major earthquake. This plan outlines the specific sequence of events to bring facilities back on-line as resources allow and includes detailed instructions for emergency operations of each facility.

A catastrophic water shortage would move the District to a higher shortage level very quickly compared to a shortage created by drought. The District's combined storage is approximately 9.4 million gallons of potable water in storage tanks which can be gravity fed to residences, even if there is a power outage. The public would be asked to reduce water use to minimum health and safety levels, extending the supply to seven days. This would provide sufficient time to restore surface water pumping and groundwater production. After the local water supply is restored, pumping capacity could meet the reduced demand until such time that imported water supplies were reestablished.

The area's water sources are generally of good quality, and no insurmountable problems resulting from industrial or agricultural contamination are foreseen. If contamination did result from a toxic spill or similar accident, the contamination would be isolated and should not significantly impact the total water supply.

4.6 Seismic Risk Assessment and Mitigation Plan

A major portion of the San Andreas Fault is located in near proximity to the LACSD service area where earthquakes are common.² It is possible that it could be several days after a major earthquake before outside help could get to the area. Extended supply shortages of both groundwater and imported water,

² <https://www.myplan.caloes.ca.gov/>

due to power outages and/or equipment damage, would be severe until the water supply could be restored.

For a major emergency such as an earthquake, Southern California Edison (SCE) has declared that in the event of an outage, power would be restored within a 24-hour period. For example, following the 1994 Northridge earthquake, SCE was able to restore power within 19 hours. SCE experienced extensive damage to several key power stations, yet was still able to recover within a 24-hour timeframe. Due to the remote location of the District, it is assumed that it will take much longer to restore power to the Lake Arrowhead area so the District is prepared for prolonged power outages.

The District prepared a seismic assessment of its water reservoirs which evaluated each tank for hydrostatic and seismic hydrodynamic conditions. Each of the tanks was rated and given a ranking based on the analysis. The study identified the top three tanks that had failure risks from seismic activity. The tank that was ranked with the highest risk of failure has since been replaced and the third highest risk will be replaced in 2021. Additional funding for tank replacements will be budgeted.

Portions of the District's distribution system are also at risk from earthquakes but these would most likely be localized. Nearly half of the water mains are made from polyvinyl chloride (PVC) which has been proven to be more resilient to ground movement than other materials. Much of the service lines are made of steel which would cause an outage to a specific home. These types of leaks can be identified and isolated. The greatest risk would be to the two raw water lines that draw surface water from the lake and transport it to the WTPs. Because there are two separate treatment plants, it is likely that at least one will remain operational.

The California Division of Mines and Geology has stated two of the aqueduct systems that import water to Southern California could be ruptured by displacement on the San Andreas Fault and supply may not be restored for a three to six-week period. The situation would be further complicated by physical damage to pumping equipment and local loss of electrical power. If a major earthquake were to damage a portion of the East Branch, deliveries could be interrupted and the District would need to rely on its own local sources. DWR has a contingency aqueduct outage plan for restoring the California Aqueduct to service should a major break occur, which it estimates would take approximately four months to repair.

4.7 Shortage Response Action Effectiveness

This section quantifies the effectiveness of the shortage response actions described above. Some actions can be quantified by the amount of water that is expected to be saved. Other actions can be difficult to quantify but support other activities. The estimated amount of water provided by each shortage response action is included in the table below as a percentage of the District's surface water right of 1,566 AFY. A combination of shortage response actions can be expected to deliver the outcomes that would be necessary during a water shortage.

Before the District implemented permanent water conservation measures, the service area was using 33% more water. While much of those savings have been incorporated into the normal demand, new customers are educated every year which saves the District an estimated 4% per year. As enforcement is increased during a drought or shortage, the savings increase slightly.

The effectiveness of reducing the number of allowable irrigation days is based on assumed demand for residential irrigation. The District has analyzed changes in deliveries on irrigation days as well as meter data to estimate how much water is used per irrigation day. As the District enforces higher shortage levels, the amount of water saved also increases.

The District’s permanent water conservation ordinance does not allow for any new turf grass to be installed. It is estimated that this action saves approximately 1% during normal conditions. In higher shortage levels, customers will be required to reduce their turf grass by 50% when it’s rehabilitated. In the higher levels, customers will not be allowed to irrigate existing grass.

The prior drought provided information regarding the effectiveness of public information and enforcement. In 2015, the District removed an irrigation day which was easier to quantify. The remainder of the savings were due to the public’s compliance with strict water use efficiency practices. These savings have been utilized as estimates. In addition, these activities boost the effectiveness of the other actions.

Drought rates are approved and can be implemented as needed. Although the Board may implement drought rates at any level, Ordinance 83 requires the District to consider the financial impacts of implementing the various stages starting in Level 5.

Ordinance 83 includes a consideration of a moratorium on new connections in Level 6. The amount of water savings might not be large but it will send a clearly alarming message.

Table 10 Shortage Response Action Effectiveness

Level	Permanent Restrictions	Irrigation Days	Turf	Enforcement	Public Info	Drought Rates	Connection Moratorium	Total Reduction
1	4%	3%	1%	1%	1%	0%	0%	10%
2	5%	3%	4%	3%	5%	0%	0%	20%
3	5%	5%	4%	8%	8%	0%	0%	30%
4	6%	9%	5%	10%	10%	0%	0%	40%
5	6%	13%	5%	10%	10%	6%	0%	50%
6	6%	17%	8%	10%	10%	7%	2%	50%+

5 Communication Protocols

The District utilizes multiple communication platforms. The protocols and procedures to inform customers, the public, and other governments about current or predicted shortages and any response actions that may be triggered are described in this section.

The service area has two local weekly newspapers that are widely read by residents. These publications are used for slower shortage conditions such as during drought. Bill stuffers are also used. To release critical information that is more time sensitive, the District uses its website and social media as well as email blasts and notifications through its water use app, Dropcountr. Any emergency response or regulatory agency will be notified with a phone call.

6 Compliance and Enforcement

During a water shortage, the District will increase its enforcement activities depending on the shortage level. During normal years, enforcement is in place but there are many more courtesy notifications without fines. During a water shortage, enforcement patrols would be increased and fines would be more likely to be imposed. The District would also increase its water use efficiency audits for higher volume water users.

Generally, for the first violation of LACSD's water use restrictions, the customer will receive a written notice and a phone call. For the second violation, the District will impose a penalty equivalent to 25% of their water use charges. For the third violation, the penalty is 50%, and the fourth violation carries a 100% penalty. After that, the District may install a water flow restricting device of one gallon per minute.

Customers have the right to appeal these penalties in writing to the General Manager within ten days of the issuance of a violation. The appeal will be heard within 30 days. A notice of determination is mailed to the appellant within ten days of the decision. The customer has the right to appeal the General Manager's decision to the Board. Further notices for the same violation will be withheld while the appeal is pending.

7 Legal Authorities

The District has the legal authority to implement and enforce its WSCP. California Constitution Article X, Section 2 and CWC 100 declare that water resources must be put to beneficial use to the fullest extent of which they are capable and that the waste or unreasonable use of water must be prevented. Sections of Water Code Chapter 3, commencing with Section 350 of Division 1, provide the authority for the governing body of a water agency to declare a water shortage and to adopt and enforce water conservation restrictions. (CWC §§ 350-359, 375-378.0.) CWC section 350 states that the governing body of a distributor of a public water supply shall declare a water shortage emergency condition whenever it finds that the demands of water consumers cannot be satisfied without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation and fire protection. This gives the District the legal authority to implement and enforce this WSCP. If necessary, the District shall declare a water shortage emergency in accordance with CWC section 350.

Pursuant to these authorities, the District adopted Ordinance 83 in 2021, which updated and superseded existing water efficiency and emergency water supply shortage regulations. This ordinance imposes water conservation requirements on customers and contains six stages of water shortage conditions with escalating water conservation requirements at each stage. These stages are consistent with the requirements of CWC section 10632(a)(3) and include the declaration of a water shortage emergency by the Board depending on conditions at the appropriate stages. Such declarations will be made in accordance with CWC section 350. This ordinance also provides for the enforcement of all requirements and restrictions and has a process for appeals.

In the case of a water shortage, the District will coordinate with the County of San Bernardino for the possible proclamation of a local emergency under California Government Code section 8558. Upon proclamation by the Governor of a state of emergency under the California Emergency Services Act

(Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the state will defer to implementation of locally adopted WSCPs to the extent practicable.

8 Financial Consequences of the WSCP

CWC section 10632(a)(8)(C) requires suppliers to provide a description of the cost of compliance with Division 1, Chapter 3.3 which includes mandatory water use reductions during a period of drought for which the Governor has issued a proclamation of a state of emergency. During those times, suppliers will be moving into the various stages of their WSCPs.

For LACSD, implementing the WSCP will produce financial consequences that can be anticipated, including potential reductions in revenue and increased expenses associated with implementation of shortage response actions. Likewise, the District can implement actions to mitigate these financial impacts.

The District's water rate structure includes increasing tiers when customers use higher volumes of water, satisfying the requirements in CWC section 366. This structure encourages conservation and each tier is tied to the cost of providing greater amounts of supply. When implementing demand management measures, it is clear that the highest priced uses will be reduced first. The District has cash reserves, including a Rate Stabilization Fund, to maintain operations when revenues may be lower. If continued revenue losses become untenable, the District has drought surcharges in place that can be implemented in the worst-case scenario.

If the District is relying on imported water during a water shortage, operating costs will be higher due to the purchase of this supplemental supply. LACSD has pre-purchased for a large majority of this supply and has a reserve account with CLAWA for this water.

Other increased costs may be incurred for public outreach but these costs are minimal. The District does not anticipate any other significantly higher operating costs associated with a water shortage but certain operating costs or capital projects may be delayed until the emergency conditions subside.

9 Monitoring and reporting

Water supply volumes from all supply sources and customer billing records are generated monthly but are monitored on a daily basis. If the monthly goals of balancing supply and demand under shortage conditions are not being met, LACSD can implement shortage response actions, including both supply augmentation and demand response. The District's Automated Metering Infrastructure (AMI) system enables staff to identify leaks and ensure compliance with water use ordinances. All of the District's accounts are connected to the AMI system.

10 WSCP Refinement Procedures

The CWC requires the WSCP to be separately adopted from the UWMP so that it may be updated as necessary. The WSCP will be reviewed every year as part of the procedures associated with the Annual Assessment described in Section 2. At that time, any changes deemed necessary will be completed and

brought to the Board for adoption. The District will also review the WSCP after any event that may cause a shortage.

11 Special Water Feature Distinction

Water Code section 10632(b) requires suppliers to analyze and define water features that are artificially supplied with water including ponds, lakes, waterfalls, and fountains separately from swimming pools and spas to determine if they may be able to use recycled water. There are no large water features in the District's service area. A few residences have recirculating ponds but they are very small and not suitable for recycled water.

12 Plan Adoption, Submittal and Availability

On May 25, 2021, the Board of Directors considered public comment and took action to introduce and waive the first reading of Ordinance 83 and directed staff to publish the pre-adoption publication summary. This ordinance contains the Water Shortage Levels contained in this WSCP. On June 3, 2021, a certified copy of the full text of the proposed ordinance was made available to the public upon request by the clerk and posted to the District's website. On June 10, 2021, the pre-adoption summary was published in the Mountain News. It was adopted by the Board of Directors on June 22, 2021. A summary of the ordinance was published with the names of the Board members voting for and against the ordinance within 15 days of adoption. The District clerk posted in the office of the clerk a certified copy of the full text of the adopted ordinance with the names of the Board members voting for and against.

On June 3, 2021 and June 10, 2021, the District published a notice in the Mountain News regarding the date, time, and place of the public hearing to consider the WSCP. On June 22, 2021, the Board of Directors conducted a public hearing, considered public comment and took action to adopt Resolution 2021-07, Adopting a Water Shortage Contingency Plan. This resolution enacted the Water Shortage Contingency Plan. A copy of the WSCP was made available to the public in advance of the meeting on the District's website. The WSCP was also made available to District customers and the County of San Bernardino within 30 days after adoption on the District's website.

If the WSCP needs to be amended in the future, the same process will be followed and Resolution 2021-07 will be superseded.