

# LAKE ARROWHEAD COMMUNITY SERVICES DISTRICT

## MEMORANDUM

**DATE:** April 27, 2021

**TO:** BOARD OF DIRECTORS  
Lake Arrowhead Community Services District

**FROM:** CATHERINE CERRI, General Manager

**SUBJECT:** Urban Water Management Plan and Water Shortage Contingency Plan Update

**A. RECOMMENDATION**

This is an information item only.

**B. REASON FOR RECOMMENDATION**

This is an information item only.

**C. BACKGROUND INFORMATION**

Every five years, the District is required to prepare an Urban Water Management Plan (UWMP). The District encourages participation from the public, customers and other interested parties. Attached is a summary of the UWMP and the assumptions used. This will provide the opportunity for comment and discussion in advance of its adoption. It is due to be submitted to regulatory agencies by July 1, 2021.

In response to the severe drought from 2011-2016, new legislation in 2018 mandated that water suppliers maintain a Water Shortage Contingency Plan (WSCP). It is included in the UWMP as Chapter 8 but is a standalone plan that must be adopted separately so it may be changed as needed without amending the UWMP.

**D. FISCAL IMPACT**

This is an information item only.

**E. ENVIRONMENTAL IMPACT**

This is an information item only.

**F. ATTACHMENTS**

- Summary of the 2020 Urban Water Management Plan

## 2020 Urban Water Management Plan Summary

Any water supplier in California that delivers more than 3,000 acre-feet per year (AFY) or has more than 3,000 customers is required to complete an Urban Water Management Plan (UWMP) every five years. The purpose of this plan is to document and communicate the District's water supply plan. This summary describes the contents of the District's 2020 UWMP.

### 2020 UWMP Table of Contents

**Chapter 1 – Introduction and Overview:** This chapter describes the fundamentals of the UWMP and provides an overview of the District's water supply reliability. Also described are the changes the District has made compared to the prior UWMP.

**Chapter 2 – Plan Preparation:** This chapter provides information on the process used for developing the UWMP, including efforts in coordination and outreach.

**Chapter 3 – System Description:** This chapter describes the District's water systems as well as the service area, climate, demographics and an overview of LACSD's organizational structure and history.

**Chapter 4 – Water Use Characterization:** This chapter describes and quantifies the current and projected water uses within LACSD's service area including potable and non-potable uses by the related sectors. A discussion of climate change considerations is also included.

**Chapter 5 – SB X7-7 Baseline and Targets and 2020 Compliance:** This chapter describes compliance with SB X7-7 which required a 20% reduction in water use by 2020. The target for 2020 was adopted in the 2015 UWMP and this chapter demonstrates compliance based upon actual 2020 customer water use. It also includes a description of the District's population estimates.

**Chapter 6 – Water Supply Characterization:** In this chapter, LACSD's current and projected potable and non-potable water supplies are described and quantified, including a narrative description of each supply source, the quantified supply availability and the quality of each supply.

**Chapter 7 – Water Service Reliability and Drought Risk Assessment:** This chapter describes LACSD's water system reliability through a 25-year planning horizon. This description includes projections for normal conditions, a single dry year, and five consecutive dry years. This chapter also includes a Drought Risk Assessment.

**Chapter 8 – Water Shortage Contingency Plan:** This chapter provides a structured, standalone plan for dealing with water shortages in standardized levels, along with actions the District may employ in the event of a catastrophic supply interruption. It also includes the procedures the District will follow to annually assess its water reliability.

**Chapter 9 – Demand Management Measures:** This chapter communicates the District's efforts to promote conservation and to reduce customer demands on water supplies. A narrative is included to describe the programs implemented and the effectiveness of the demand management measures.

**Chapter 10 – Plan Adoption, Submittal, and Implementation:** This chapter describes how the District has made its UWMP publicly available, as well as the steps taken to adopt and submit its UWMP in accordance with the Water Code.

## Chapter 1: Introduction and Overview

This chapter is an overview of the UWMP. It includes a newly required “lay description” which describes how much water the District has on a reliable basis, how much it needs for the foreseeable future, what the agency’s strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency’s plan. The lay description is included below.

### Lay Description

In a normal year, the District currently has 1,841 acre-feet (AF) of reliable potable water available. This is a combination of surface water from Lake Arrowhead, groundwater from wells in Grass Valley and imported water from the Crestline-Lake Arrowhead Water Agency (CLAWA). LACSD has a very reliable source of surface water from Lake Arrowhead. The amount that the District can withdraw is limited to 1,566 AF per year (AFY) which has been sufficient in recent years to cover the District’s consumptive needs. One of the reasons the District has been able to stay within this limited supply is the use of recycled water for irrigation which has reduced potable water demand. LACSD also supplements its supply with groundwater which produces between 180 and 225 AFY. While these supplies are highly reliable, the District also has a connection for imported water from the State Water Project (SWP). See Chapter 6 for more information on water supply.

In recent years, District customers used an average of 1,366 AFY. This gives LACSD a surplus of 475 AFY but not every year is normal and supply and demand may vary, so LACSD must plan and prepare for uncertainty. On the supply side, drought, earthquake or regulatory changes may reduce water availability. During dry years, when lake level is a concern, the District may elect to not draw all of the water from Lake Arrowhead that is allowed. On the demand side, population shifts may have an effect on water usage. For example, in 2020, District customers used 10% more water than average due to an influx of people spending more time in Lake Arrowhead during the COVID-19 pandemic. See Chapter 4 for more information on water use.

To assess how much water may be needed in the foreseeable future, the District evaluates a variety of possibilities for changes in supply and demand. The area doesn’t have a lot of potential for future growth since it is mostly built out and surrounded by state and federal forest lands but increases to the full-time population, as seen in 2020, can increase demand in a short amount of time. For this reason, the District is planning for the possibility of needing 2,050 AFY of supply by 2045. In the short-term, the District can purchase limited amounts of imported water to fill any gaps in supply but imported water supplies are constrained. For the longer term, the District is developing more local groundwater supplies to increase local sources and reduce reliance on Lake Arrowhead.

A long-term, reliable supply of water is essential to protect the productivity of a community’s businesses and economic climate. Water use efficiency and water supply planning are critical for resilience to drought and climate change. This UWMP examines how the District will ensure that there is enough water for the Lake Arrowhead community in future years, and what mix of programs should be explored for making this water available. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. As part of LACSD’s past and current sustainability goals, LACSD is currently implementing all facets of this plan to achieve its water conservation and usage targets.

## Chapter 2: Plan Preparation

This chapter talks about the preparation of the UWMP. The District utilized a consultant to prepare the plan in the past due to the significant regulations that must be met. The 2020 UWMP was prepared by District staff.

This plan only covers the Arrowhead Woods service area. District staff have notified related agencies that the UWMP is being updated and will coordinate with CLAWA before finalizing the plan.

## Chapter 3: System Description

This chapter describes the District's water systems, service areas and history. There is also a discussion on the area's climate, population, demographics and land uses.

The Lake Arrowhead Census Data Place is used by the Census Bureau to count the number of full-time residents in the Lake Arrowhead area. Its borders are roughly equivalent to the District's sewer service area. Since the UWMP is only for the Arrowhead Woods water service area, we used a GIS tool to overlay a map of the water service area onto the Census Data Place to estimate the full-time population. This process estimated a full-time population of 7,008 people. The 2019 interim population estimates are showing a decline in population that is probably not accurate. Unfortunately, the 2020 census data will not be available in time for this UWMP.

The UWMP is required to provide population projections. To estimate future population, the District assumed a conservative increase of 2.51 people for every new connection based on the 2019 population estimate. Every new connection is assumed to be for a full-time resident, equivalent to growth of 1.44% per year in the first five years and 1.16% in subsequent years. This does not account for part-time residents. This data is used in the next chapter to estimate future water use.

## Chapter 4: Water Use Characterization

This chapter describes and quantifies LACSD's past, current, and future water use projections for the Arrowhead Woods water service area. Uses are broken down by potable vs. non-potable water and by various sectors. In the last five years, 2020 had the highest usage.

The state is currently developing a standard for water loss from the distribution system and have added a new requirement to report on this in the UWMP. While the standards haven't been finalized, the District's current levels of water loss are considered to be low.

Future water use is estimated to ensure there will be enough water in the long-term. The analysis utilizes 2016 to 2019 as a baseline since water use during that time plateaued after the drought. The increase in water usage during 2020 is assumed to fade over the next five years. Limited growth assumptions are based on the average number of new connections plus some additional to account for the increase in new construction applications.

There is also a discussion about low income housing and a new requirement to consider how climate change might affect water supply.

### Water Demand by Sector

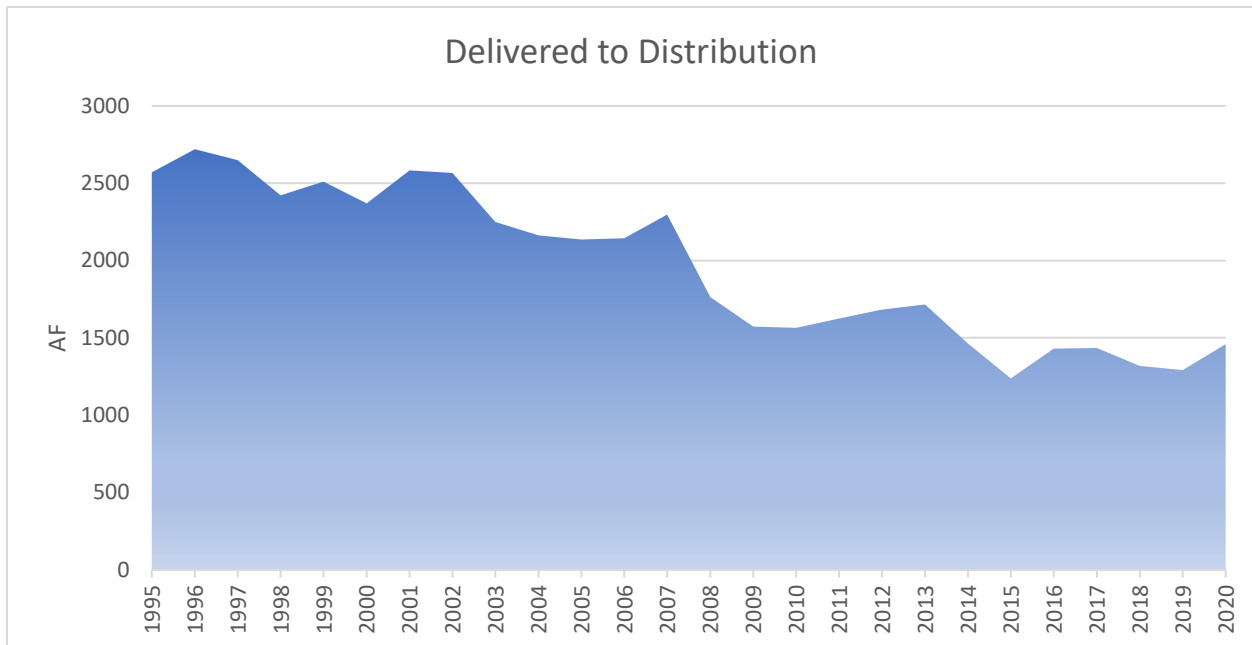
Sector	2016	2017	2018	2019	2020
Residential	996	992	1021	971	1,181
Commercial	102	105	91	87	86
Institutional	17	19	19	21	28
Irrigation	20	21	23	21	24
Hydrant	2	0	0	1	0
Fire Protection	0	0	0	0	0
<b>Total AW Water Sales</b>	<b>1,137</b>	<b>1,136</b>	<b>1,155</b>	<b>1,101</b>	<b>1,320</b>

Recycled Water	230	212	258	211	269
Unbilled Metered	9	11	11	20	10
Non-Revenue Water	305	274	148	156	177
Transfers	0	0	0	0	0
<b>Total Other Water</b>	<b>544</b>	<b>497</b>	<b>417</b>	<b>387</b>	<b>456</b>

<b>Total Water Consumption</b>	<b>1,458</b>	<b>1,633</b>	<b>1,571</b>	<b>1,489</b>	<b>1,776</b>
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The graph below shows the history of the District’s water consumption and the tremendous progress we have made.

### Historic Water Delivered to Distribution



## Chapter 5: SB X7-7 Baseline and Targets and 2020 Compliance

In 2008, legislation was passed with a goal to reduce per capita water use twenty percent by 2020 (SB X7-7). In the 2010 UWMPs, suppliers were required to calculate a baseline to determine compliance to an interim target for 2015 and a final target for 2020. This chapter demonstrates that the District met its target and is in compliance with this legislation.

### LACSD Targets and Usage (Gallons Per Capita Per Day)

	Target	Actual
Baseline*		229
Interim (2015)	206	115
Final (2020)	183	<b>121</b>

*\*Average use from 1995 - 2004*

There has been some discussion between the District and the Department of Water Resources (DWR) over the last ten years regarding seasonal populations. Many of the water use efficiency regulations are based on a usage per person basis which essentially divides all the water use by the number of people counted in the census. When all of the water use is divided by the full-time population, the District's usage on a per-person basis is inflated. The DWR allowed the District to prepare a calculation to account for a portion of the part-time residents for the purposes of this legislation.

## Chapter 6: Water Supply Characterization

This chapter describes the District's various supply sources and estimates their future quantities. It includes a discussion about how the District has a right to withdraw 1,566 AFY but elects to use less than that to preserve lake level. The table below shows how much supply was available compared to how much was actually used on average over the last five years.

### Average Potable Water Deliveries and Supplies 2016-2020

Supply	Surface	Ground	Imported	Total
AFY	1,566	160	600	2,326
%	67%	7%	26%	100%

Delivered	Surface	Ground	Imported	Total
AFY	1,115	160	158	1,433
%	78%	11%	11%	100%
Surplus	451	-	442	893

The District is required to project supplies into the future. The analysis assumes that Well #2 will be back online and that the Blue Jay well will be operational starting in 2022 producing a conservative 30 AFY. Future years include one new well in three years and then one every five years. There is also an analysis of recycled water with capacity exceeding current demand. The last part of this chapter calculates energy use for the different supplies.

## Chapter 7: Water Service Reliability and Drought Risk Assessment

This chapter analyzes the reliability of the District’s various water supplies and conducts a Drought Risk Assessment (DRA). The constraints for each water supply are considered and supplies are assessed in a normal year, one dry year and multiple dry years. Supplies are compared to estimated demand to ensure water supplies are sufficient.

In a normal year, the District has an excess of supply because it maintains demand at less than the allowable lake level withdrawal of 1,566 AFY and supplements with groundwater and imported water. As groundwater supplies are developed, 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.

In a single dry year, it is assumed that demand will be reduced by 5% due to public awareness campaigns. 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.

During longer periods 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 additional 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.

### 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
<b>Potable</b>	<b>1,841</b>	<b>1,763</b>	<b>1,763</b>	<b>1,506</b>	<b>1,405</b>	<b>1,304</b>	<b>1,175</b>
Recycled	1,102	1,102	1,102	1,102	992	950	900
<b>Total</b>	<b>2,943</b>	<b>2,865</b>	<b>2,865</b>	<b>2,700</b>	<b>2,410</b>	<b>2,253</b>	<b>2,158</b>

During the five-year dry period of 2000-2004, the District’s service area received 66% of normal precipitation and the level of Lake Arrowhead dropped 21 feet. As a comparison, during the driest five-year period from 2011-2016, the District’s service area received 61% of normal precipitation but lake level only declined to 11.5 feet below full. While this was still of great concern, Lake Arrowhead maintained a higher level even though the drought was more pronounced. This is partly due to a reduction in withdrawals by the District. Since 2007, the District has left 3,713 AF of its withdrawal right in the lake which is equivalent to nearly five feet of lake level. The lake overflowed in 2019 and 2020.

## Chapter 8: Water Shortage Contingency Plan

This chapter will be a standalone Water Shortage Contingency Plan (WSCP) that will be adopted separately so that the District may make changes to it without needing to amend the UWMP. This WSCP provides a water supply reliability analysis similar to Chapter 7. It also discusses the new Annual Water Supply and Demand Assessment that must be prepared every year and submitted to DWR.

The WSCP must include the following elements:

- Water supply reliability analysis
- Six standard water shortage levels that are consistent with all water agencies
- Shortage response actions that are locally appropriate
- Procedures for an annual water supply and demand assessment
- Communication protocols
- Compliance monitoring and reporting procedures
- Reevaluation and improvement process

The WSCP also includes information regarding a seismic risk assessment and the District's emergency response plan. Additional information is provided for how any shortage will be communicated to the public and related agencies.

### Potable Supply and Demand During Multiple Year Drought

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

The WSCP is required to describe the District's water shortage levels. These levels are further described in the proposed 2021 Water Use Efficiency Ordinance.

### 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%+



## Chapter 9: Demand Management Measures

Demand Management Measures (DMMs) are actions taken by a water supplier to reduce water use and promote water conservation. Efficient water use is the foundation of LACSD's current and future water planning and operations policies. In fact, LACSD has been a leader utilizing DMMs to change water use behavior long before it was required. This was prompted by a SWRCB action which reduced the District's allowable surface water withdrawals. Since that time, water efficient behavior has been sustained due to the direct link between water use and the level of Lake Arrowhead which is the recreational heart of the community.

This chapter describes the District's efforts to promote an efficient use of water. Various topics include:

- Water Waste Prevention Ordinances
- Metering
- Conservation Pricing
- Public Education and Outreach
- Programs to Assess and Manage Distribution System Real Loss
- Water Conservation Program Coordination and Staffing Support
- Other Demand Management Measures that have a significant impact on water use

The District's Advanced Metering Infrastructure (AMI) allows staff to identify leaks and noncompliance quickly. In 2020, the District identified more than 2,225 violations and responded to 2,030 leaks. A small leak can run between 7 and 15 gallons per hour. Without the AMI system, this leak would go undetected for up to a month until the customer received a bill with higher usage. Assuming all of these leaks were small and ran for 15 days, LACSD saved between 15 and 33 AF of water in a year. This would have added 1.4 to 3 GPCD of water use assuming a population of 10,000 people.

Public Information is the primary focus of the District's conservation program. The District refreshes its water conservation awareness campaign every few years to keep it fresh. The 2020 campaign featured a picture of Lake Arrowhead with the tag line "Water Conservation, A Way of Life". This campaign helps to tie water usage to lake level which is an important priority in the community. The District communicates with its customers in a variety of ways including advertising, bill inserts, website, social media, Dropcountr, newsletters, special events and speaker bureau events.

The District has also seen a big improvement in water losses. Certain changes were made to more accurately identify the amount of water that was being input into the distribution system. Once these measures were put in place, the District's real water loss was reduced from 277 AFY to 180 AFY, a reduction of 35%. The revised input numbers are now corroborated with a new meter and the District has a high confidence in the number. Assuming a population of 10,000 people, this change equates to a savings of 8.7 GPCD.

## Chapter 10: Plan Adoption, Submittal and Implementation

The chapter describes how the District complied with the water code to adopt the UWMP and submit it to the required agencies.