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2023 ANNUAL WATER SHORTAGE ASSESSMENT REPORT

APRIL 2023



City of
**Santa
Monica**

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List of Acronyms

AF	Acre-Feet
AFY	Acre-Feet Per Year
AMI	Advanced Metering Infrastructure
AWSDA	Annual Water Supply and Demand Assessment
BMP	Best Management Practice
CWC	California Water Code
DRINC	Drinking Water Information Clearinghouse
DWR	Department of Water Resources
GAC	Granular Activated Carbon
GSP	Groundwater Sustainability Plan
MCL	Maximum Contaminant Level
MG	Million Gallons
MGD	Million Gallons Per Day
MOU	Memorandum of Understanding
MTBE	Methyl Tert-Butyl Ether
MWD	Metropolitan Water District of Southern California
ND	Non Detect
NOV	Notice of Violation
PFAS	Per- and Polyfluoroalkyl Substances
SGMA	Sustainable Groundwater Management Act of 2014
SMB	Santa Monica Basin
SMBGSA	Santa Groundwater Basin Groundwater Sustainability Agency
SMURRF	Santa Monica Urban Runoff Recycling Facility
SWIP	Sustainable Water Infrastructure Project
SWMP	Sustainable Water Management Plan
SWRCB	State Water Resources Control Board
RO	Reverse Osmosis
TBA	Tert-Butyl Alcohol
WCU	Water Conservation Unit
WSCP	Water Shortage Contingency Plan
WSIP	Water Savings Incentive Program
WRD	Water Resources Division
WTP	Water Treatment Plant
WUA	Water Use Allowance

1 INTRODUCTION

This report summarizes findings from the City of Santa Monica (City) 2023 Annual Water Supply and Demand Assessment (AWSDA). The AWSDA is required by the California Water Code (§10632.1) to analyze current water supply and demand conditions as well as project water supply reliability each year. In doing so, AWSDA's serve as a tool to help identify potential water supply shortages and to implement water shortage response actions to mitigate possible supply gaps.

Beginning in 2022, the California Water Code (§10632.1) required urban water suppliers to conduct an AWSDA and submit an annual water shortage assessment report to the California Department of Water Resources (DWR) on or before July 1 of each year. The annual water shortage assessment report evaluates water supply reliability over the following year and provides an explanation of the process, data, and results of the assessment.

1.1 CALIFORNIA WATER CODE REQUIREMENTS

The City's 2023 AWSDA was performed in compliance with California Water Code (CWC) requirements. Guidelines for the AWSDA can be found in CWC Section 10632 and a brief summary is provided below.

CWC §10632.1 An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

CWC §10632(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

- (i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.
- (ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.
- (iii) Existing infrastructure capabilities and plausible constraints.
- (iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.
- (v) A description and quantification of each source of water supply.

The written decision-making process used to determine water supply reliability and key data inputs and assessment methodology used for the 2023 AWSDA are detailed in Section 2 of this report, Annual Water Supply and Demand Assessment.

1.2 WATER SYSTEM OVERVIEW

The City's current domestic water supply consists of local groundwater and purchased imported water (either from the State Water Project or the Colorado River) from the Metropolitan Water District of Southern California (MWD). The City extracts local groundwater from ten active groundwater wells located in the Santa Monica Groundwater Basin (SMB). Five of these wells are located in the Charnock subbasin, two are located in the Olympic subbasin, and three are located in the Arcadia subbasin. Three of the five wells located in the Charnock subbasin are pretreated at the Charnock Water Treatment Plant (Charnock WTP) to remove volatile organic carbon (VOC) compounds from historical industrial pollution and then blended with the two other Charnock wells prior to being pumped to the Arcadia Water Treatment Plant (Arcadia WTP) for further treatment. Groundwater pumped from the Olympic and Arcadia subbasins are also treated at the Arcadia WTP. The Arcadia WTP provides multi-barrier treatment to all of the City's groundwater wells to reduce hardness in the groundwater and meet all federal and state drinking water regulations. Only one groundwater well, SM-1, located in the Arcadia subbasin is distributed, after disinfection at the well head, directly into the water distribution system as it does not require any additional treatment to meet federal and state drinking water regulations. Final treated water from the Arcadia WTP is sent to the 5-million-gallon (MG) Arcadia Reservoir and distributed for potable water use throughout the City. In addition to the Arcadia Reservoir, the City also owns and operates three additional water storage reservoirs representing a total storage capacity of 40 MG: Riviera Reservoir, Mt. Olivette Reservoir, and San Vincente Reservoir.

The City supplements its local groundwater supply with imported water purchased from MWD. The City, along with 12 other local governments, formed the MWD in 1928. MWD was originally created to build the Colorado River Aqueduct to supplement the water supplies of the original founding members in Southern California. Water was first delivered to the City in 1941 via the Colorado River Aqueduct. In 1972, MWD augmented its supply sources to include deliveries from the State Water Project via the California Aqueduct. Today, MWD serves more than 145 cities and 94 unincorporated communities across Southern California.

An overview of the existing domestic potable water system is shown in Figure 1.

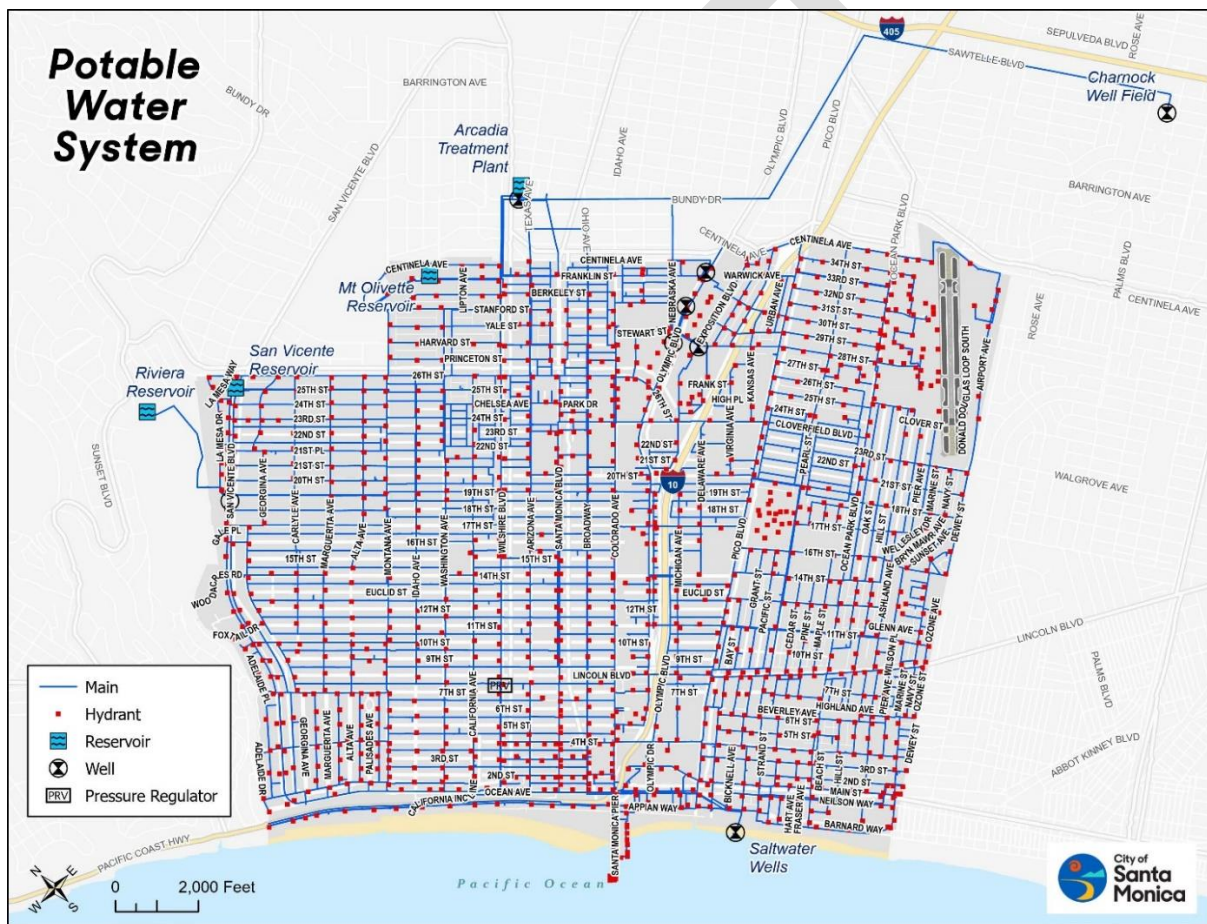


Figure 1. Potable Water System Overview

The City also has a dedicated recycled water system that provides service to 30 metered locations currently. The primary use of recycled water is for landscape irrigation but is also used for street sweeping, sewer jetting, and for lavatories at two facilities. Recycled water is distributed from the Santa Monica Urban Runoff Recycling Facility (SMURRF), which captures and treats urban runoff from the storm drain system. Prior to SMURRF

operations, the runoff discharged to Santa Monica Bay and adversely impacted water quality.

In November 2018, City Council adopted an updated Sustainable Water Master Plan (SWMP). The intent of the 2018 SWMP update was to refine the pathway for the City to reduce its reliance on imported water. The refined pathway also considered impacts of on-going drought conditions as well as new regulations that required additional treatment for restoring local groundwater supplies. The 2018 SWMP builds on the City's previous successes by continuing to develop projects and programs at the local level to enhance the reliability and resiliency of the City's water supply. The 2018 SWMP consisted of three key components and a brief summary on progress is listed below.

- **Component 1 – Increasing water conservation efforts to permanently reduce water demand.** The City is currently developing its first Water Conservation Master Plan that will be completed in 2023, aimed to increase water conservation efforts to permanently reduce water demand.
- **Component 2 – Developing sustainable and drought resilient alternative water supplies.** A ribbon cutting ceremony was held for the City's Sustainable Water Infrastructure Project (SWIP) in November 2022. The SWIP leverages stormwater, dry weather urban runoff, brackish groundwater, and municipal wastewater to provide up to 1,650 acre-feet per year of sustainable, drought resilient water supply to the City's water supply portfolio. The City is also making progress on enhancing the production efficiency at the Arcadia WTP through concentrate recovery by implementing the first municipal installation of Flow Reversal Reverse Osmosis that would provide an additional 1,200 acre-feet per year of drinking water for the City and set to be completed by the end of 2023.
- **Component 3 – Expanding local groundwater production within sustainable yield limits.** To maximize local groundwater supplies, the City is constructing a new well head treatment facility to remove industrial contaminants in the Olympic Well Field and restore it to full production capacity. The new Olympic Advanced Water Treatment Facility is scheduled for completion by the end of 2023.

When fully implemented, the projects outlined in the 2018 SWMP will provide a diversified, drought-resilient water supply portfolio that leverages all available water resources to the City. The key components of the SWMP are listed on the following page and shown in Figure 2.

Component 3 – New Local Groundwater
Expansion of Arcadia WTP

Component 2 – Alternative Water Supply
Production Efficiency Upgrade at Arcadia

Component 1 – Optimal Conservation Plan

**No More
Reliance on
Imported
Water**

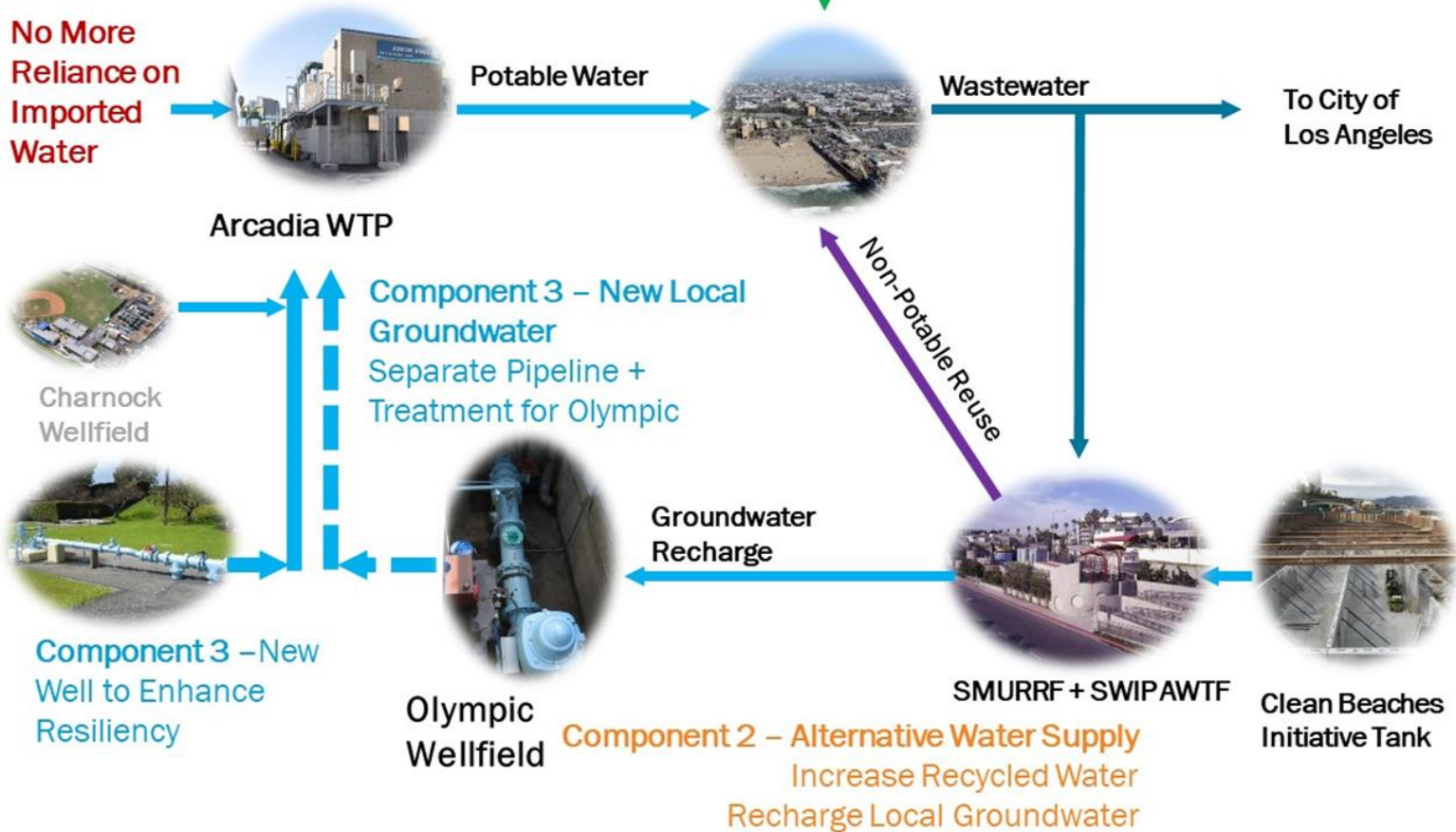


Figure 2. Components of the 2018 Sustainable Water Master Plan

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT

AWSDAs analyze current water demand and supply conditions and project water supply reliability over the next year. To analyze current water demand and supply, City staff compiled water use and water supply data over the previous calendar year (i.e., January 1, 2022 to December 31, 2022) to project the current year's trends for water demand and supply. This information, in combination with other considerations such as anticipated growth, weather patterns, State and local regulations and policies, and other plausible factors, were then used to project demand and supply over the next year. Because annual water shortage assessment reports are due by July 1st of each year, the projected water demand and supply is for the period from July 1, 2023, to June 30, 2024. Although California experienced one of the wettest winters on record, the CWC requires the projected assessment period to be a dry year. The following sections detail the decision-making process and data inputs used for the AWSDA and water shortage assessment report.

2.1 DECISION-MAKING PROCESS

CWC §10632 requires AWSDAs to be conducted according to a written decision-making process. The City's written decision-making process is outlined in the City's Water Shortage Contingency Plan (WSCP), which serves as the City's action plan during an actual or predicted drought or a catastrophic water supply shortage. The process includes:

- Presenting the findings to the City's Commission on Sustainability, Environmental Justice, and the Environment (formerly the Task Force on the Environment)
- Public notification regarding the proposed water supply shortage stage, water shortage response actions, and upcoming City Council meeting for the Public Hearing; and
- Formal adoption of the annual water shortage assessment report findings and proposed water supply shortage stage by City Council.

A timeline for the decision-making process is provided in Table 2-1.

Table 2-1. Annual Water Supply and Demand Assessment Process

Month	Activity
January	City of Santa Monica Water Resources Division's (WRD) commences the annual water supply and demand assessment
February	WRD presents annual assessment findings and proposed water supply shortage stage to the Commission on Sustainability, Environmental Justice, and the Environment
March	WRD prepares an annual water shortage assessment report and proposed water supply shortage stage, if any, to the Public Works Department Head for approval
April	Public notification regarding proposed water supply shortage stage, water shortage response actions, and upcoming City Council meeting
May/June	WRD presents annual water shortage assessment report findings and proposed water supply shortage stage to City Council for formal adoption by resolution
On or before July 1st	WRD submits a final water shortage assessment report to the State of California Department of Water Resources (DWR)

2.2 KEY DATA INPUTS

CWC §10632 requires the following data inputs and assessment methodology to be used to evaluate the urban water supplier's water supply reliability for the current year and one dry year:

- Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable. Unconstrained demand is defined by the CWC as "water demand absent any water supply and demand restrictions".
- Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.
- Existing infrastructure capabilities and plausible constraints (e.g., shutdown of the City's water treatment plant for extended durations or unforeseen extended outages of the City's groundwater production wells).
- A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.
- A description and quantification of each source of water supply.

The following sections describe these inputs in detail.

2.2.1 Water Demand

Water usage for the City is tracked by six customer categories: Single-Family Residential, Multi-Family Residential, Commercial/Industrial, Institutional, Landscape, and Fire Service. Predominate water use in the City is by residential users, which account for more than two-thirds of the City's total water consumption. Within the residential users, total water usage in the multi-family residential category (roughly 44% of total) is significantly higher than the total water usage of single family residential (roughly 25% total).

Commercial/industrial water consumption is approximately 25% of the total water usage within the City. The other three sectors (institutional, landscape, and fire service) combined account for approximately 6-7% of total water use in the City. Table 2-2 summarizes the constrained water demand in the City over the last five years in acre-feet (AF). An acre-foot is defined as the volume of water that would cover one acre of land to a depth of one foot. Constrained demand is calculated by subtracting the water demand reduction (e.g., the City's water conservation program) from the unconstrained demand. The City's water conservation efforts to date equates to approximately 20% of the unconstrained water demand.

Table 2-2. Constrained Water Demand by Sector in Acre-Feet (2018-2022)

	2018	2019	2020	2021	2022
Single Family Residential	2,773	2,556	2,756	2,845	2,577
Multi-Family Residential	4,917	4,752	4,944	4,752	4,613
Industrial/Commercial	3,028	2,914	2,100	2,131	2,458
Institutional	474	356	273	267	289
Landscape Irrigation	456	450	438	576	469
Fire Service	3	3	2	3	3
Water Loss	-	-	66	-	-1
Constrained Demand²	11,651	11,030	10,580	10,641	10,432

¹Water Loss Audit has yet to be completed for 2022.

²Demand summarized in this table are actual water demand (or constrained water demand as defined by DWR), which includes water demand reduction from water conservation efforts.

Compared to 2021, single family and multi-family residential water usage in 2022 decreased by 268 AF and 139 AF, respectively. The industrial/commercial sector saw an increase in usage of 327 AF, which can be attributed to businesses recovering after COVID-

19. Institutional usage also increased by 22 AF in 2022. Landscape usage decreased by 107 AF, while fire usage increased by 23 AF. Water conservation efforts by the community are a likely contributor to the decrease in water usage by residential and landscape users.

The water demand summarized in Table 2-2 also considered water loss in the water distribution system. Distribution system water loss, defined as the difference between water supplied to the system less authorized consumption, has declined linearly during this entire reporting period. The City meets the Water Loss Audit Standard through its participation in annual water audits. The audits are validated by an independent third-party according to American Water Works Association standards. In 2015, the total water loss was approximately 3.8%, and in 2016, it was 1.6%. However, subsequent years (2018, 2019, 2021, and 2022) yielded water consumption exceeding water supplied, and therefore it is assumed that water loss was 0% in 2018, 2019, 2021, and 2022.

The discrepancy for water consumption exceeding water supplied has been attributed to several factors. First, there is a timing issue with the manual meter reading where the City maintains a 60-day billing cycle so there is a lag in consumption data relative to source water entering the system. Second, the metering of the source water entering the City's distribution system are in multiple locations. The City's potable water supply has four sources entering the system: imported water from two MWD feeder services (SMN-01 and SMN-02) and local treated groundwater from Santa Monica Well 1 and the Arcadia WTP. MWD's two feeder service lines both have meters and are maintained by MWD. Santa Monica Well 1 has a dedicated magnetic flowmeter. The Arcadia WTP does not have a single flowmeter for the potable water produced. Rather, treated water flow from the Arcadia WTP is calculated using a composite of multiple internal flowmeters at the Arcadia WTP. These internal flows originate from internal bypass flows and reverse osmosis product flows, with each meter subject to its own margin of error. It is likely that the discrepancies in reporting are due to compounded inaccuracies from the various flow meters when tabulated.

The City is in the process of installing a single potable water flow meter at the Arcadia WTP, at the inlet of the Arcadia Reservoir, and upgrading water meters on the customer's end with Advanced Metering Infrastructure (AMI) throughout the distribution system. The new meter at the Arcadia WTP will allow for more accurate flow accounting while the AMI smart meters provide for real-time water demand monitoring in the distribution system as opposed to the current 60-day meter reading cycle.

2.2.1.1 Water Conservation

The City has a long history of promoting water conservation. In 2002, the City initiated its Water Efficiency Strategic Plan and in 2004 began implementing various conservation programs including the No Water Waste and Green Building Ordinances. On August 12, 2014, City Council adopted a resolution declaring a Stage 2 Water Supply Shortage thereby

requiring mandatory water conservation to achieve a 20% reduction in water use compared to 2013. Subsequently, on October 28, 2014, City Council also authorized the significant expansion of staffing and funding to augment the City's water conservation efforts to address the state-wide drought and help the City reduce its reliance on imported water supplies. The City has remained in a Stage 2 Water Shortage since 2014, which has contributed to a water demand reduction of approximately 20% or approximately 2,500 acre-feet per year (AFY). More recently, the City implemented outdoor watering restrictions, limiting outdoor watering to two days per week, on July 2022 in response to severe drought conditions across the State of California.

Water Demand Management is achieved through implementation of various water conservation and efficiency programs designed to permanently reduce residential and commercial potable water use. Continuation of existing and implementation of proposed conservation measures are essential for the City to reduce overall use in the face of increased demand pressures from new housing and from the commercial and institutional sectors of the local economy. Below is a list of some of the key conservation measures currently being implemented:

- **Water Neutrality Ordinance (SMMC 7.16.050):** On July 1, 2017, the City's Water Neutrality Ordinance went into effect, which caps water use for new developments to the average five-year historical water use for that individual parcel. If the projected annual water use for the development is greater than existing parcel's annual average over the past five years, the increased amount must be offset by funding water-efficient retrofits of existing buildings elsewhere in the City. Offset retrofits currently include low-flow indoor fixtures (toilets, urinals, showerheads, and aerators). The ordinance applies to pools, ponds, spas, and other water features as well. This ordinance was developed and is implemented by Water Conservation Unit (WCU) staff. Implementation includes performing over 500 development project plan checks each year along with determining fees and managing a full-scale Water Neutrality Direct Install program.
- **Recycled Water Ordinance (SMMC 7.12.170):** On January 1, 2023, the City's recycled water ordinance went into effect which requires all new development within the recycled water service area and with a total floor area of 7,500 square feet or more to utilize 100% recycled water for surface irrigation and/or dual-plumbing applications, as applicable, serving all non-potable water demands within the development. This includes applications using potable water that can be replaced with recycled water like landscaping, water features, toilet flushing, and cooling towers.
- **Water Use Allowances (WUAs):** The WUA is a component of the WSCP and is the mechanism to implement the mandatory reduction required by a Water Supply

Shortage. WUAs represent the amount of water that can be used by a water customer without risk of receiving an exceedance citation (see below). The WUA for the current Stage 2 Water Supply Shortage is 20% below the amount of water used in 2013. Every water customer in the City receives a WUA uniquely calculated for each billing period.

- **Water Use Allowance Exceedance Citations:** A water customer can receive an administrative citation for exceeding their WUA for any given billing period. Citation fees are \$250 for the first exceedance, \$500 for the second exceedance (within 12 months of the first) and \$1,000 for the third exceedance (within 12 months of the second). Since 2015, over 1,300 WUA Exceedance Citations have been issued.
- **Water Use Consultations:** WCU staff make onsite visits to customers to validate water meter readings and comprehensively audit indoor water use (measuring flush and flow fixtures, appliances, checking for leaks, behaviors) and outdoor water use (irrigation system, checking for leaks, behaviors). Recommendations for saving water are documented and sent to the customer. Consultations have resulted in the discovery and repair of major leaks, adjustment of irrigation system timers, installation of low-flow devices (aerators and showerheads [free]), toilets and urinals (rebates), and water-use behavior changes. This program is free of charge for any Santa Monica water customer. Since 2015, over 700 consultations have been provided to City customers.
- **Landscape Rebate Program:** The City's most successful rebate program provides rebates for customers that replace their turf grass and overhead spray irrigation with sustainable, drought tolerant, and low-water using landscapes with no or drip irrigation only. Santa Monica's unique landscape rebate requirements establish effective water conservation, provide successful and maintainable projects, and ensure an aesthetically pleasing landscape. Since 2015, over 750 rebate projects have been completed removing over 1.1 million square feet of turf at a program cost of \$2.5 million.
- **Landscape Consultants:** The WCU has partnered with professional landscape professionals who meet with potential landscape rebate customers at their property and provide expert advice on sustainable landscaping and completing a rebate. This service is \$50 for a two-hour consultation. Since 2015, over 620 Landscape Consultations have been completed. Note: This program was halted in 2020 due to COVID-19 budget cuts.
- **Water Waste Patrols:** WCU staff enforces SMMC 7.16.020, the "No Water Waste" ordinance. Responses to inbound water waste complaints are handled immediately, and proactive patrols in the community provide on-site detection of water waste. A Notice of Violation is issued to the water customer with Citations issued as needed if

the water waste continues. Since 2015, over 1,500 Notices of Violations have been issued.

- **MWD Water Conservation Rebates:** As a member-agency of the MWD, the City participates in the MWD's program to provide rebates for high efficiency toilets, urinals, clothes washers, restaurant appliances, irrigation devices and other devices. Since 2015, the WCU has increased the supplemental funding added to MWD's base rebate amounts to further incentivize installation of these water-conserving devices. Since 2015, over 7,500 devices have been rebated.
- **Free Water Saving Items:** WCU staff has distributed thousands of water saving items to Santa Monica water customers since 2015. These items include low-flow faucet aerators, low-flow showerheads, automatic shut-off hose nozzles, toilet leak-detection dye tabs, shower buckets, flow-rate bags, and reusable canvas bags. The WCU also provides free tent cards and door hangers for hotels/motels to encourage water conservation by guests through reusing towels and sheets. These free items are available in the City Hall and are also distributed at outreach events. Since 2015, over 17,000 water saving devices have been distributed.
- **Customer Support:** WCU staff provides excellent customer phone and email support every workday regarding any water conservation issue or program. Approximately 300 phone calls and emails from Santa Monica water customers are received and responded to each year.

Depending on funding, additional conservation measures that are planned for implementation over the next five years include:

- **Water Conservation Programs Master Plan:** An overall master plan is being developed to provide a more detailed water conservation framework and benefit/cost analysis of existing and proposed programs. An outside consultant is providing guidance and support for developing this plan.
- **Marketing/Messaging Program for "Conservation as a Way of Life":** A water conservation marketing campaign will be created with messaging aligned with the State's "Making Water Conservation a California Way of Life." Drought-related information will also become part of the messaging.
- **Targeted Commercial Sector Programs:** Restaurants, hotels, and medical facilities are the highest commercial users of water in the City. As such, outreach and support program will be developed for one-on-one audits, evaluations, process recommendations, and rebate incentives for fixtures/devices to provide meaningful water savings in these specific sectors. An outside contractor may be used to develop and implement these programs.

- Performance Pays:** This effort will leverage Metropolitan Water District’s Water Savings Incentive Program (WSIP) for unique, innovative water conservation programs. Potential projects include pump pods for fire department trainings and cooling tower retrofits with new technology.
- School District Retrofits via Water Neutrality Direct Install Program:** The scope of properties where the Water Neutrality Direct Install program retrofits fixtures will be expanded from residential and CII to include all City campuses of the Santa Monica-Malibu Unified School District.
- Irrigation System Audit and Repair:** Much of the outdoor water waste occurs due to incorrect watering schedules programmed in customer’s irrigation timers/controllers (i.e. overwatering). In addition, leaks and broken sprinklers heads go unnoticed as irrigation is typically run at night and not observed. This new program will utilize a contractor to provide extensive outdoor audits and make necessary timer adjustments and simple repairs to save water.

2.2.1.2 Non-potable Water Demand

The City has a dedicated recycled water system that provides service to 30 metered locations. The primary use of recycled water is for landscape irrigation, but it is also used for street sweeping, sewer jetting, and for lavatories at two facilities. With the implementation of the City’s recycled water ordinance, projected water demand is expected to increase over the coming year as new developments requiring recycled water come online. The City recently completed the SWIP on November 2023 that will increase recycled water production up to 1,650 acre-feet per year and also being groundwater recharge operations using advanced treated recycled water from SWIP by the end of 2023.

Table 2-3. Current Year and Projected Year Demands (Non-Potable)

	Current Year January - December 2022 (AF)	Projected Year July 2023 - June 2024 (AF)
Non-Potable Reuse	69	72
Aquifer Recharge (Direct Injection) ¹	0	242
Total Demand	69	314

¹200 GPM aquifer injection estimated to begin in October 2023.

2.2.1.3 Unconstrained Demand

The CWC requires water suppliers to estimate the current year’s unconstrained demand as part of the AWSDA. Unconstrained demand is water demand absent any water supply or demand restrictions (e.g., voluntary or mandatory conservation). Water suppliers then use

the current year unconstrained demand, while also considering other factors such as weather and population growth, to project demand for the twelve-month period following the July 1st AWSDA deadline (i.e., July 1 to June 30).

Table 2-4 summarizes the current year and projected year unconstrained demands as well as constrained demands, derived by subtracting an estimated 20% conservation savings. This 20% reduction is contributed to water conservation activities, which the City has consistently achieved or exceeded since 2014. Constrained demand for the current year is included from Table 2-2.

Table 2-4. Current Year and Projected Year Demands (Potable)

	Current Year Unconstrained January – December 2022 (AF)	Projected Year Unconstrained June 2023 – July 2024 (AF)	Current Year Constrained January – December 2022 (AF)	Projected Year Constrained June 2023 – July 2024 (AF)
Single Family Residential	3,221	3,389	2,577	2,711
Multi-Family Residential	5,766	5,854	4,613	4,683
Industrial/ Commercial	3,073	3,358	2,458	2,686
Institutional	361	404	289	323
Landscape Irrigation	586	654	469	523
Fire Service	33	3	26	3
Water Loss	-	-	-	-
Demand	13,040	13,661	10,432	10,929

The City used a conservative approach for the projected year demands, as the intent of the AWSDA and requirements of the CWC are to ensure urban water suppliers are able to maintain reliable water supplies for a projected dry year. Constrained demands for the projected year (July 1, 2023 through June 30, 2024) were calculated using averages of previous years’ constrained demand. This projection ensures the City is prepared for a

worst-case scenario (high demand coupled with a dry year). As temperatures continue to rise due to climate change, California is likely to experience warming by 2 degrees Fahrenheit or more by 2040. In Los Angeles County, the 12-month average temperature increased by 1.5 degrees Fahrenheit between May 2020 and April 2022. Higher temperatures are likely to result in increased water use from year to year. The projected year demands assumed that it would be hot and dry year (e.g., severe drought conditions). The projected year demand assumptions for each usage category are as follow:

- **Single Family Residential:** assumed usage was returning to pre-COVID-19 levels and continued drought conditions (e.g., hot and dry); used average of 2021 and 2022 actual demand (2021 had the highest usage of the past 5 years and 2022 usage is slightly greater than 2019 pre-COVID-19 usage and most accurately reflects recent usage).
- **Multi-Family Residential:** assumed usage was returning to pre-COVID-19 levels and continued drought conditions; used average of 2021 and 2022 actual demand (2021 usage was the same as 2019 pre-COVID-19 and 2022 usage most accurately reflects recent usage).
- **Industrial/Commercial:** assumed slight increase in demand due to economic recovery from COVID-19; used average of 2019 and 2022 actual demand (2019 usage reflects pre-COVID-19 and 2022 usage most accurately reflects recent usage).
- **Institutional:** assumed slight increase in demand due to economic recovery from COVID-19; used average of 2019 and 2022 demand (2019 usage reflects pre-COVID-19 and 2022 usage most accurately reflects recent usage).
- **Landscape Irrigation:** assumed slight increase in demand due to continued drought conditions; used average of 2021 and 2022 actual demand (2021 had the highest usage of the past 5 years and 2022 usage most accurately reflects recent usage).
- **Fire Service:** used historical average.
- **Water Loss:** used historical average.

2.2.2 Water Supply

The City currently purchases imported water from MWD to supplement its local water supplies. The City is one of 26 retail agencies served by MWD and receives imported water at two locations: the Arcadia WTP and the Charnock WTP. Both connections are 24 inches in size and are capable of serving 100% of the City's water needs. The City's Tier 1 imported water supply limit from MWD has been 7,406 AFY since 2016, and the City has been well under this limit in the past 10 years since the Charnock Well Field Restoration Project was completed in 2010 that restored local groundwater supplies. Additional MWD supply beyond the Tier 1 limit is also available to the City at a higher Tier 2 water supply rate.

The California Water Code requires AWSDAs to evaluate water supply reliability for the current year and one dry year. Relative to previous years, the local groundwater supply in 2022 was lower than average. The lower local production was a result of two factors. First, Santa Monica 4 (SM-4), the highest producing well in the City's second largest producing groundwater aquifer (the Olympic Well Field) was taken offline due to operational issues. The other factor that contributed to lower groundwater supply in 2022 and 2023 was the Arcadia WTP temporarily being taken offline during construction of the Arcadia WTP expansion project. The Arcadia WTP is the City's primary drinking water treatment facility that treats local groundwater supplies. The expansion project will upgrade the Arcadia WTP to improve production efficiency from 82% to 90% or more and increase the treatment capacity from 11 million gallons per day (MGD) to a maximum 13 MGD. This project is scheduled to be completed by March 2024.

To assess supplies under a single dry year (drought year), the City used the available water supply estimate from the drought risk assessment performed as part of the 2020 Urban Water Management Plan. The drought risk assessment projected that under a single, worst-case dry year, the City's local groundwater supply was approximately 6,755 AF, which equates to the lowest five-year running average for the City's water supply from 2010 to 2020. The 2010-2020 time period was chosen because it is after the City completed the Charnock Well Field Restoration Project in 2010 and is more representative of current operating conditions (e.g., available groundwater supply and annual MWD imported water use).

2.2.2.1 Existing Infrastructure Capabilities and Plausible Constraints

In addition to evaluating water supply reliability for the current year and one dry year, the California Water Code also requires suppliers to consider existing infrastructure capabilities and plausible constraints. As previously mentioned, construction will be occurring at the City's Arcadia WTP through March 2024. It is estimated that this could result in a decrease in the local groundwater supply of approximately 552 AF for the Projected Year due to plant shutdowns during construction.

2.2.2.2 Regulatory Considerations

Over 20 years ago, Methyl tert-Butyl Ether (MTBE) and Tert-Butyl Alcohol (TBA), compounds once used as gasoline additives, were detected in three of the Charnock Sub-basin wells. These contaminants shutdown production from the Charnock Sub-basin, the City's largest groundwater supply, until the completion of the Charnock Well Field Restoration Project. The treatment from this project uses Granular Activated Carbon (GAC) filtration, from coconut shells, to successfully treat MTBE and TBA concentrations to levels well below the Maximum Contaminant Level (MCL) of 5 ppb. As a part of the Charnock Well Field Restoration Project, additional treatment processes were also added at the Arcadia WTP including reverse osmosis (RO) and aeration to provide multi-barrier treatment for the local groundwater.

More recently in April 2019, the State Water Resources Control Board (SWRCB) investigated source water wells in California most vulnerable to Per- and polyfluoroalkyl substances (PFAS) contamination. This included those near airports and landfills, and later those near secondary sources of PFAS activities. The SWRCB did not require Santa Monica to sample its sources. However, the City proactively sampled the City's Drinking Water sources, and PFOA was detected in the Olympic Well Field. This compound was in addition to 14 other synthetic organic constituents of potential concern, including trichloroethylene, tetrachloroethylene, 1,4-dioxane, and 1,2,3-Trichloropropane, identified in the Olympic subbasin as a result of historical industrial contamination. The City is required to demonstrate compliance with the Division of Drinking Water (DDW) Process Memo 97-005-R2020 - *Revised Guidance for Direct Domestic Use of Extremely Impaired Sources* to utilize the Olympic subbasin as a drinking water source. As part of maintaining compliance, the Arcadia WTP expansion will also include the new Olympic Wellfield Restoration Project to remove these constituents through ultraviolet-advanced oxidation processes and two-stage GAC in order to amend the City's drinking water permit to perform continuous wellfield monitoring for these substances, including PFOA.

In May 2017, the Cities of Santa Monica, Los Angeles, Beverly Hills, Culver City, and Los Angeles County signed a Memorandum of Understanding (MOU) to form the Santa Monica Basin Groundwater Sustainability Agency (SMBGSA). The SMBGSA is tasked with implementing an ongoing sustainable groundwater management program for the SMB in conformance with California's Sustainable Groundwater Management Act (SGMA) of 2014. A key piece of this program is the development of a Groundwater Sustainability Plan (GSP), which was approved by the SMBGSA in January 2022.

The GSP is the first comprehensive groundwater assessment and management plan specific to the SMB, which has been identified as a medium-priority groundwater basin by the California DWR. The SMBGSA is required to provide a description of the sustainable management criteria that will be used for the basin. As part of the GSP, sustainable management criteria (e.g., sustainable yield) and interfaces with neighboring groundwater basins (e.g., West Coast Basin and Central Basin) for the SMB was assessed. Projected groundwater levels calculated using a calibrated groundwater model indicate that at a production rate of 9,000 AFY, groundwater elevations will decline and recover based on the volume of recharge available in the SMB. The City has already begun implementing projects to aid in maintaining sustainability of the SMB, including groundwater recharge with advanced treated recycled water from SWIP, advancing monitoring wells to eliminate data gaps and refine groundwater modeling efforts, and expanding water conservation programs to permanently reduce water demand.

2.2.2.3 Projected Available Water Supply

Current year and projected year supply used for the AWSDA are provided in Table 2-5. The projected year water supply includes existing infrastructure capabilities, plausible constraints, and regulatory considerations described above. The projected year local groundwater supply was calculated by subtracting construction-related Arcadia WTP outages (552 AF) from the water supply from the drought risk assessment (6,755 AF). The water supply from the drought risk assessment is the lowest five-year running average for water supply from 2010 to 2020. As a conservative approach, the projected supply assumes that only MWD’s Tier 1 supply is available.

Table 2-5. Current Year and Projected Year Potable Supply

	Current Year January – December 2022 (AF)	Projected Year July 2023 – June 2024 (AF)
Local Groundwater	4,082	6,203 ¹
MWD Tier 1	7,406	7,406
Total Supply	11,488	13,609

¹Derived from subtracting the 552 AF decrease in groundwater supply from the 6,755 AF water supply used in the drought risk assessment during the Projected Year due to Arcadia WTP construction.

2.2.2.4 Projected Available Non-Potable Supply

In 2001, the City began operating the SMURRF to treat dry-weather urban runoff that was previously discharged into Santa Monica Bay from the Pier and Pico-Kenter storm drains. The SMURRF is operated by Santa Monica, though operating costs and revenues are shared jointly with the City of Los Angeles, as a Best Management Practice (BMP) facility. Treated water from SMURRF is sent through a City-wide non-potable water distribution system that serves parks, medians, Woodlawn Cemetery, and dual-plumbed buildings for toilet flushing. The non-potable water is also used by City operations for street sweeping, sewer jetting, and pressure washing. Due to upgrades being made at SMURRF, the facility was offline during the entire current year (2022). As a result, supplemental potable water was used to meet recycled water customer demand during this period. The upgraded SMURRF is expected to be complete and back online Summer 2023.

In addition to SMURRF, the City will be using the SWIP Advanced Water Treatment Facility (AWTF) to supply non-potable customers Summer 2023. The SWIP AWTF will be the City’s first wastewater treatment facility and will be able to produce up to 1 MGD, on average, of advanced treated recycled water (approximately 10% of the City’s water supply). Initially, advanced treated recycled water would be used to meet non-potable reuse demands.

Ultimately, the advanced treated recycled water will also be used to augment the groundwater aquifer at the Olympic Well Field via direct aquifer injection. The City is also exploring the potential for direct potable reuse in the future when regulatory guidelines are available in December 2023. Table 2-6 summarizes the current year and projected year non-potable supplies available to the City.

Table 2-6. Current Year and Projected Year Non-Potable Supply

	Current Year January – December 2022 (AF)	Projected Year July 2023 – June 2024 (AF)
SMURRF	69	Up to 560
SWIP	0	Up to 1,120
Total Non-Potable Supply	69	Up to 1,680

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3 Supply and Demand Assessment Results and Recommendations

Results of the AWSDA comparing anticipated unconstrained demand and total water supply for the projected year are summarized in Table 3-1. A shortage is indicated by a negative number/percentage, while a surplus is indicated by a positive number/percentage.

Table 3-1. Assessment Results without Water Shortage Response Actions

	Total (AF)
Anticipated Unconstrained Demand	13,661
Anticipated Total Water Supply	13,609
Surplus/Shortage w/out Water Shortage Response Actions ¹	-52
% Surplus/Shortage w/out Water Shortage Response Actions	-0.4%
State Standard Shortage Level without Water Shortage Response Actions	Level 1 (≤10%shortage)

¹ Shortage is indicated by a negative number/percentage; surplus is indicated by a positive number/percentage.

Results indicate that without water shortage response actions, a -0.4% water supply shortage is projected for the next year. A -0.4% water supply shortage indicates a State’s Standard Shortage Level 1 (≤10%shortage) per the WSCP where necessary actions (e.g., water conservation) are not required to be taken to enhance the reliability and resiliency of the available water supply. However, the City recommends staying in a Stage 2 shortage, where conservation is required to meet the City’s goal of reducing its reliance on imported water supplies and is discussed further below.

3.1 RECOMMENDED WATER SHORTAGE RESPONSE STAGE

The City’s WSCP utilizes the same water shortage levels as the State and includes water shortage response actions for each stage. The City’s water shortage stages and associated water use reduction targets from the City’s WSCP are provided in

Table 3-2 on the following page **Error! Reference source not found.**

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Table 3-2. Water Shortage Stages and Reduction Targets

Water Shortage Stage	Shortage Level	Water Shortage Condition	Water Use Restrictions	City-wide Use Reduction Goal
Stage 1	≤10%	Minimal	Voluntary	10%
Stage 2 ¹	10-20%	Moderate	Mandatory	20%
Stage 3	20-30%	Significant	Mandatory	30%
Stage 4	30-40%	Severe	Mandatory	40%
Stage 5	40-50%	Critical	Mandatory	50%
Stage 6	>50%	Catastrophic	Mandatory	>50%

¹Recommended Water Shortage Stage

The recommended Stage 2 Water Shortage Stage includes mandatory water use restrictions with a City-wide use reduction goal of 20% compared to the 2013 water use baseline. Water shortage conditions and actions implemented as part of a Stage 2 Water Shortage Stage are provided in Table 3-3 and Table 3-4.

Table 3-3. Summary of Water Shortage Stages and Conditions

Water Shortage Stage	Water Shortage Level	Water Shortage Condition
Stage 1	Up to 10%	Using more than 50% of MWD Tier 1 allowance for imported/purchased water and/or MINIMAL decrease in local ground water supply
Stage 2	Up to 20%	Using more than 50% of MWD Tier 1 allowance for imported/purchased water and/or MINIMAL decrease in local ground water supply
Stage 3	Up to 30%	Using more than 70% of MWD Tier 1 allowance for imported/purchased water and/or SIGNIFICANT decrease in local ground water supply.
Stage 4	Up to 40%	Using more than 80% of MWD Tier 1 allowance for imported/purchased water and/or ADVANCED decrease in local ground water supply.
Stage 5	Up to 50%	Using more than 90% of MWD Tier 1 allowance for imported/purchased water and/or SEVERE decrease in local ground water supply.
Stage 6	> 50%	Exceeding MWD Tier 1 allowance for imported/purchased water and/or CATASTROPHIC decrease in local ground water supply.

Table 3-4. Summary of Stage 1 and Stage 2 Water Shortage Response Actions

Water Shortage Stage	Action	Estimated Reduction
Stage 1	Offer Water Use Surveys	1% - 2%
Stage 1	Provide Rebates on Plumbing Fixtures and Devices	1% - 2%
Stage 1	Provide Rebates for Landscape Irrigation Efficiency	1% - 2%
Stage 1	Provide Rebates for Turf Replacement	1% - 2%
Stage 1	Landscape - Restrict or prohibit runoff from landscape irrigation	1% - 2%
Stage 1	Landscape - Limit landscape irrigation to specific times	1% - 2%
Stage 1	CII - Restaurants may only serve water upon request	1% - 2%
Stage 1	Water Features - Restrict water use for decorative water features, such as fountains	1% - 2%
Stage 1	Pools and Spas - Require covers for pools and spas	1% - 2%
Stage 1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	1% - 2%
Stage 1	Other - additional conservation measures by City staff	1% - 2%
Stage 1	Other - Irrigation Association's Best Management Practices for all City landscaped areas	1% - 2%
Stage 1	Other - immediate notification by City staff of any leaks seen on City property or private property	1% - 2%
Stage 1	Other - immediate notification by City staff of any leaks seen on City property or private property	1% - 2%
Stage 2	Other - continued implementation of Stage 1 actions	10% - 20%
Stage 2	Other - Implement Water Use Allowances (WUAs) for a 20% reduction from the amount of water used in 2013.	10% - 20%
Stage 2	Expand Public Information Campaign	1% - 10%
Stage 2	Increase Water Waste Patrols	1% - 10%

The goal of water shortage response actions is to reduce demand and enhance the reliability of the City's water supply. For a Stage 2 Shortage, the City's WSCP identifies a list of actions that aim to reduce water demand in the City by 20%. The City has been in a Stage 2 water shortage stage since 2014 and has consistently achieved 20% reductions in water demand. The estimated reduction in water demand resulting from Stage 2 actions for the projected year is approximately 2,732 AF.

In addition to water demand reduction, water supply augmentation may also be used as a water shortage response action. The City plans to use Tier 2 imported water supply from MWD as a supply augmentation action during prolonged, planned local groundwater supply outages (e.g., shutdown of the Arcadia WTP or the Charnock Well Field for over 2 months). As previously discussed, the Arcadia WTP is temporarily offline for construction and during these outages, additional water from MWD, beyond the City's Tier 1 allocation will need to be purchased to supplement the City's supply. The proposed supply augmentation budget allowed from the MWD Tier 2 is 5,600 AF, which is equivalent to the current year's highest six consecutive month total supply and coincides with how long planned outages in local water supplies may last (e.g., construction at the Arcadia WTP or replacement of groundwater wells). Tier 2 water is not listed as a water shortage response action in Table 3-4 because it would only be used in certain circumstances (e.g. planned construction), and is not tied to customer water usage. The WSCP will be revised to reflect the addition of supply augmentation as a water shortage response.

The City recommends staying in a Stage 2 Shortage for a variety of reasons:

- First, the Water Conservation Act of 2009 (Senate Bill X7-7) required water suppliers in California to decrease urban per capita water use by 20% by the year 2020. The City met this goal, and by staying in a Stage 2 Shortage, the City would be able to continue meeting this requirement.
- Second, if the Stage 2 Shortage was lifted, water demand could increase due to the public's perception of relaxed conservation requirements, thus increasing the purchase of imported water. This could impact water rates and potentially lead to a heavier burden on the City's rate payers.
- Third, while California has seen heavy rain thus far in 2023, this does not completely alleviate the long-term impacts of the current drought or the state's chronic water supply challenges. The rain events have been beneficial for the State Water Project (imported water from Northern California); however, Southern California's other major imported water supply from the Colorado River has yet to recover from over 20 years of drought conditions, and studies suggest the Colorado River may not recover in our lifetime

Staying in a Stage 2 Water Shortage is prudent for the City in order to maintain demand reduction so that we are prepared for the next inevitable, extended dry period.

The severe drought California has faced since 2020, paired with the heavy rains of 2023, showcase that climate change results in greater variability and volatility of weather patterns. Investments in the City's water supply resiliency are necessary to mitigate against these extreme weather events. The SWIP and Arcadia WTP Expansion are examples of the City's efforts in adapting the City's water portfolio to climate change impacts. The SWIP leverages stormwater, when it is available during wet weather events, and municipal wastewater to produce purified water to recharge local groundwater aquifers. The Arcadia WTP will improve production efficiencies to produce additional drinking water without increasing local groundwater pumping through first-of-its-kind, high-efficiency Flow Reversal Reverse Osmosis technology. Both projects are expected to be online within the projected year. Coupled with water conservation activities, these components represent the culmination of the 2018 SWMP to improve water resiliency, self-sufficiency, and sustainability.

The long-term vision of the City is to center on water conservation, per CA Executive Order B-37-16: Making Water Conservation a California Way of Life. Local conservation goals are detailed in the City's Water Conservation Master Plan. Implementing cutting edge projects, along with great water conservation efforts from the public, the City is able to prepare for future. Table 3-5 highlights the benefits of remaining in a Stage 2 Shortage. The City is able to jump from a -0.4% shortage to a 20% surplus in water supply using Stage 2 Shortage response actions.

Table 3-5. Assessment Results with Stage 2 Water Shortage Response Actions

	Total (AF)
Projected Year Supply (Local Groundwater and MWD Tier 1 Supply)	13,609
Total Supply	13,609
Projected Unconstrained Demand	13,661
Benefit from Stage 2 Water Demand Reduction Actions	(2,732)
Constrained Demand	10,929
Revised Surplus w/ Water Shortage Response Actions (Total Supply – Constrained Demand)	2,680
Revised % Surplus w/ Water Shortage Response Actions	20%

3.2 ONGOING REASSESSMENTS

The City has been providing monthly water production and conservation reports to the SWRCB since July 2014 to comply with the statewide drought emergency water conservation regulation. While the emergency regulation expired in November 2017, the City continues to report voluntarily. Monthly reports became mandatory again in October 2020 after the SWRCB adopted a new regulation on Monthly Urban Water Conservation Reporting. The new reporting regulation requires monthly reporting of key elements and additional information during water shortages. The reports, compiled by the City, include information on residential water use, total potable water production, measures implemented to conserve water and improve efficiency, and local enforcement actions. The reports are submitted to the SWRCB's Drinking Water Information Clearinghouse online portal.

Over the next few years, the City will also be upgrading its water meters with AMI, which will allow real-time water demand monitoring as opposed to the current 60-day meter reading cycle. Past studies have shown AMI to reduce water demand by as much as 5-7% of the total water supply. The City is also working on three master planning documents: a Water Master Plan, a Water Conservation Master Plan, and a Recycled Water Master Plan. These master plans will help identify water system improvements over the next ten years, refine the implementation of water conservation measures to further reduce water demand, and plan for the expansion of the recycled water system.

On the water supply side, the City's WRD provides monthly water production reports to interested parties within the City. The reports include information on well production, finished local water production and imported water purchased. Staff will continue monthly monitoring of water supplies to assess water shortage conditions.

On the non-potable water supply side, the future non-potable water supply capability far exceeds projected demand. It is anticipated that the SMURRF and SWIP AWTF will operate to meet non-potable demand and aquifer recharge demand at one injection well. To maximize the use of advanced treated recycled water, the City is analyzing potential sites for up to two additional injection wells and exploring the potential for direct potable reuse in the future to further enhance the reliability and resiliency of the City's water supply portfolio.

As an adaptive management plan, the WSCP will be refined as needed to ensure it continues to effectively address potential water shortage conditions. On an ongoing basis, using the reports and compliance tracking process described above, any necessary changes to the WSCP will be identified. In addition, as a part of annual demand and supply assessments, the WSCP will be reviewed with refinements incorporated as needed.