2025 Mojave Regional Urban Water Management Plan

TABLE OF CONTENTS

List of Tables

LIST OF FIGURES

APPENDICES

This 2025 Regional Urban Water Management Plan (RUWMP) was prepared by Zanjero in conjunction with Mojave Water Agency.

This 2025 RUWMP was prepared under the direction of a California licensed civil engineer

The Victorville Water District Retail Chapter contained within this RUWMP was prepared by:

The Golden State Water Company - Barstow System Retail Chapter contained within this RUWMP was prepared by:

EXECUTIVE SUMMARY
LAYPERSON'S DESCRIPTION

After the devasting drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands, and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).[1] The UWMPA requires urban water suppliers serving over 3,000 customer connections or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan (UWMP) every five years,[2] and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.[3] The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.[4] In addition, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature emphasizes that aggregating these legal requirements at the urban water supplier management level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the UWMP is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP provides elected officials, management, staff, customers, and the public with an understanding of past, current, and future water conditions. The UWMP integrates local and regional land use planning, water supply planning, infrastructure considerations, and demand management measures, while also addressing statewide challenges that may manifest through climate change, drought, and evolving regulations. Thoughtful urban water management planning provides an opportunity for water suppliers to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning

[1] California Water Code Section 10610 *et seq.* (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1) and its subsequent amendments
[2] California Water Code Section 10610 et seq.
[3] California Water Code Section 10631-10635
[4] California Water Code Section 10632
[5] California Water Code Section 10632.1

conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

ES-1 The Mojave Region

The 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP or Plan) has been prepared by Mojave Water Agency (MWA) and the ten participating urban water suppliers within the Mojave Region. The Mojave Region is concurrent with MWA's service area and encompasses approximately 4,900 square miles of eastern San Bernardino County. The Region includes a diverse mix of incorporated cities, unincorporated communities, rural domestic users, small water systems, industrial and recreational uses, agricultural uses, and urban retail water suppliers that depend primarily on local groundwater supplies supported by imported water management.

The 2025 RUWMP represents the first regional urban water management plan prepared for the Mojave Region. The regional planning approach allows MWA and the participating urban water suppliers to prepare a coordinated water management plan that evaluates shared regional water supplies, regional water demands, and long-term water service reliability using consistent assumptions and methodologies. This approach also reduces duplicative analyses, improves regional coordination, and provides a common technical foundation for local and regional decision-making.

The participating urban water suppliers include MWA, as the Region's wholesale water supplier, and the urban water retail suppliers located within MWA's service area. For adoption purposes, each participating urban water retail supplier will adopt Regional Chapters 1 through 5, MWA's wholesale supplier chapter (Chapter 6), its own retail-specific chapter, its Water Shortage Contingency Plan (WSCP), and all applicable appendices. MWA will adopt the entirety of the 2025 RUWMP, including Regional Chapters 1 through 5, its wholesale supplier chapter, all participating retail supplier chapters, its WSCP, and all applicable appendices.

Chapters 1 through 5 provide the shared regional planning framework, including the regional description, regional water supply characterization, regional water use characterization, and regional water service reliability analysis. Chapter 6 describes MWA's wholesale water supply, imported water management, managed groundwater storage, and other regional water management responsibilities. The retailer-specific chapters provide the additional information necessary to satisfy the UWMPA requirements for each participating urban water retail supplier.

The Mojave Region's fundamental water management challenge is that urban, rural, industrial, agricultural, and other water demands have historically exceeded the natural replenishment capacity of local groundwater basins. Groundwater is the foundation of the Region's water supply portfolio; however, that groundwater supply is actively managed through adjudications, stipulated agreements, imported State Water Project supplies,

recharge operations, return flows, recycled water, transfers, exchanges, and ongoing coordination among MWA, retail water suppliers, watermasters, land use agencies, and other regional partners. Together, these management actions support regional groundwater sustainability and long-term water service reliability.

For purposes of regional supply and demand evaluation, the 2025 RUWMP organizes the Mojave Region into three planning subregions. This subregional framework allows the Plan to recognize hydrologic, infrastructure, and demand differences across the Region while still evaluating overall regional reliability. The subregional framework also supports comparison of regional supplies and demands in a manner that is useful for both MWA's wholesale planning responsibilities and the participating urban water suppliers' retail planning responsibilities.

ES-2 Mojave Region Water Service Reliability

The 2025 RUWMP aggregates regional water supplies and demands through MWA's role as the Region's wholesale water supplier, State Water Project contractor, Watermaster for the Mojave Basin Area Adjudication, and administrator for the Warren Valley Basin Judgment. Because the Mojave Region depends primarily on groundwater, regional reliability is not evaluated solely by comparing annual imported water deliveries to annual demands. Instead, reliability is evaluated based on the coordinated management of groundwater, imported water, return flows, recycled water, stored water assets, transfers, exchanges, and the legal and institutional frameworks that govern water use across the Region.

The 2025 RUWMP extends the regional planning horizon through 2050. This planning horizon allows MWA and the participating urban water suppliers to evaluate long-term population growth, land use changes, water demand trends, imported water reliability, groundwater management conditions, recycled water opportunities, and infrastructure needs. These considerations help improve regional coordination and provide a common planning framework for local and regional water management decisions.

As described in *Chapter 3 – Regional Water Supply Characterization*, the Mojave Region's water supply portfolio includes native groundwater, imported State Water Project supplies, return flows, recycled water, and other managed water supplies. These supplies are not all used in the same manner or at the same time. Native groundwater and return flows help support recurring local supply conditions; imported water is used by MWA to support recharge, replacement water obligations, and regional groundwater management; recycled water helps offset potable demands at the retail water supplier level where available; and stored water assets provide an important management tool for addressing hydrologic variability, imported water fluctuations, and dry-year conditions.

Chapter 4 – Water Use Characterization, characterizes current and projected regional water demands, including demands associated with participating urban water retail suppliers and other regional water users. These demands are organized by subregion to support regional

supply and demand comparisons while recognizing that water use, groundwater conditions, infrastructure, and management needs vary across the Mojave Region. The regional demand forecast provides a common planning basis for evaluating long-term reliability and for coordinating wholesale and retail water management actions.

Chapter 5 – Regional Water Service Reliability, evaluates regional water service reliability under normal year, single dry year, and five consecutive dry year conditions through 2050, as well as the five-year Drought Risk Assessment for 2026 through 2030. The analysis demonstrates that the Mojave Region has sufficient managed water supplies to meet projected regional demands under the planning scenarios evaluated in this RUWMP. The analysis also recognizes that reliability depends on continued regional management, including MWA's importation and recharge of supplemental water supplies, implementation of adjudication requirements, use of stored water assets when needed, local retail supplier management, recycled water development where feasible, and continued demand management.

The Region's water assets are based understood as a regional reliability and management tool rather than a recurring annual supply that should be added directly to all other annual supplies. MWA stores water in wet and normal years to help manage dry-year risks, imported water variability, and groundwater basin conditions. These stored supplies provide operational flexibility and support long-term resilience, but their use is guided by hydrologic conditions, infrastructure capacity, basin management objectives, adjudication requirements, and regional water management priorities.

Each participating urban water retail supplier also evaluates water service reliability within its own chapter. Those chapters address local supply portfolios, demands, infrastructure, conservation measures, and WSCPs. Together, the regional analysis and retailer-specific analyses demonstrate that the 2025 RUWMP provides a coordinated and locally implementable framework for maintaining reliable water service throughout the Mojave Region.

In summary, the Mojave Region's coordinated management of groundwater, imported water, return flows, recycled water, transfers, exchanges, and stored water assets provides a reliable water supply portfolio to meet current and projected regional demands through 2050. The 2025 RUWMP demonstrates that the Region has reliable water supplies under normal, single dry, and five consecutive dry year conditions, while also providing the foundation for annual water supply and demand assessments and implementation of retailer-specific WSCPs.

Chapter 1.0 INTRODUCTION

The 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP, RUWMP, or Plan) establishes a long-term, coordinated framework for regional water resources planning and management through the year 2050 for the Mojave Region. The 2025 RUWMP applies to Mojave Water Agency (MWA or Agency) as the regional wholesale water supplier and to participating urban water suppliers within MWA's service area. This Plan represents the first RUWMP prepared for the Mojave Region and reflects a shared commitment to integrated, collaborative, and forward-looking water management.

The RUWMP provides a consistent assessment of long-term water supply reliability, supports groundwater sustainability, and addresses regional vulnerability to drought, climate change, and population growth. The RUWMP is intended to inform elected officials, water supplier staff, water users, interested community parties, and the State of California regarding current conditions, projected demands, and strategies to ensure reliable and sustainable water supplies.

Participating urban water suppliers include:

- City of Adelanto
- County Service Area 64
- County Service Area 70J
- Hesperia Water District
- Hi-Desert Water District
- Golden State Water Company – Barstow System
- Joshua Basin Water District
- Liberty Utilities – Apple Valley Water Company
- Mojave Water Agency (Wholesale)
- Phelan Piñon Hills Community Services District
- Victorville Water District

While this RUWMP provides regionally consistent planning assumptions and analyses, each urban water supplier will separately prepare and adopt a Water Shortage Contingency Plan (WSCP) customized for its specific service area. The RUWMP and associated WSCPs will be adopted in accordance with statutory deadlines.

1.1.1 Background and Purpose

The California Urban Water Management Planning Act (UWMPA) requires urban water suppliers serving at least 3,000 connections or delivering more than 3,000 acre-feet of water

annually to prepare an Urban Water Management Plan (UWMP) every five years. The UWMPA authorizes multiple urban water suppliers that share common water supplies to prepare a RUWMP in lieu of individual plans.

Recognizing the benefits of regional coordination, MWA and its urban water retail suppliers jointly elected to prepare this RUWMP. Compared with developing separate agency-specific UWMPs, a regional approach promotes consistent technical assumptions, reduces duplicative effort, improves cost efficiency, enhances data accuracy, and strengthens the region's ability to pursue state and federal funding opportunities.

1.1.2 Basis for Plan Preparation

The purpose of the 2025 RUWMP is to provide a coordinated evaluation of regional water supplies, demands, and management strategies shared among participating agencies. By developing a single regional planning document, participating agencies leverage collective data resources, technical expertise, and institutional knowledge to support consistent planning and informed long-term decision-making.

This 2025 RUWMP fulfills the reporting requirements established by the California Department of Water Resources (DWR) to implement the UWMPA and aligns with statewide water management objectives. The Plan satisfies statutory requirements for MWA as a wholesale urban water supplier and for each participating retail urban water supplier.

1.1.3 Coordination and Outreach

Development of the 2025 RUWMP included coordination with local governments, neighboring water agencies, and relevant regulatory entities, as required by the UWMPA. Coordination efforts were undertaken to ensure consistency with applicable city and county General Plans, Water Master Plans, groundwater adjudications and stipulations, and other related planning documents.

In accordance with California Water Code Section (CWC) 10621(b), MWA and the participating urban water suppliers conducted joint public outreach and provided required public notices prior to adoption of the RUWMP by each individual urban water supplier. A summary of coordination and public outreach activities is provided in **Table 1-1**.

TABLE 1-1: PUBLIC AND PUBLIC AGENCY COORDINATION

Coordinating Agencies	Coordinate Regarding Demands	Sent Copy of Draft RUWMP	Sent 60-Day Notice	Notice of Public Hearing
Cities, Counties, Customers, and Relevant Parties				
Liberty Utilities (Apple Valley Water Company)	X	X	X	X
Bighorn-Desert View Water Agency		X	X	X
City of Adelanto	X	X	X	X
County Service Area 64	X	X	X	X
County Service Area 70J	X	X	X	X
Golden State Water Company - Barstow System	X	X	X	X
Helendale CSD		X	X	X
Hesperia Water District	X	X	X	X
Hi-Desert Water District	X	X	X	X
Joshua Basin Water District	X	X	X	X
Mojave Water Agency	X	X	X	X
Phelan Piñon Hills CSD	X	X	X	X
Victorville Water District	X	X	X	X
San Bernardino County Planning Department			X	X
California Department of Water Resources			X	X
Local Agency Formation Commission (LAFCO) for San Bernardino County			X	X
General Public				X

1.1.3.1 Water Supplier Information Exchange

CWC Section 10631 requires wholesale and urban water suppliers to provide each other with information regarding water supply and demand. Since both MWA, as a wholesale supplier that receives water from the California State Water Project (SWP) on behalf of the Mojave Region, and each of the urban water suppliers are already coordinating on this RUWMP, information exchange was happening throughout the RUWMP development, and any separate noticing was unnecessary.

1.1.4 Statutory Requirements for Notice

In accordance with the UWMPA, notification of the RUWMP update was provided to cities and counties within the RUWMP Planning Area at least 60 days prior to the public hearing of the RUWMP as required by CWC Section 10621(b). Electronic copies of the final RUWMP will be provided to the County of San Bernardino no later than 30 days after its submission to DWR.

1.1.5 RUWMP Adoption

Each participating agency has reviewed, approved, and will implement the portions of this RUWMP that are specific and applicable to their service area. While the RUWMP was developed collaboratively to ensure consistency and coordination across the Mojave Region, not all elements of the RUWMP apply equally to every agency. The RUWMP is therefore organized in a modular format, where Chapters 1 through 5 are universal, and Chapters 6 through 16 are unique to each participating agency. This approach allows each agency to adopt Chapters 1 through 5 collectively with their agency-specific chapter and relevant WSCP. As such, the specific timing of adoption for each supplier is referenced within their unique chapter of the RUWMP.

Any future amendments or updates made by individual agencies to their respective chapter will not alter or affect the adopted portions of the RUWMP for other participating agencies. This structure preserves local autonomy while maintaining the benefits of regional coordination, ensuring that all agencies continue to contribute to a unified framework for sustainable water management within the Mojave Region and the MWA service area.

1.1.6 Document Organization

This RUWMP is organized to reflect the collaborative efforts of all participating agencies, while still allowing each agency to meet its respective statutory reporting requirements. As such, the 2025 RUWMP is organized as follows:

- Chapter 1 – Introduction
- Chapter 2 – The Mojave Region
- Chapter 3 – Regional Water Supply Characterization
- Chapter 4 –Regional Water Use
- Chapter 5 – Regional Water Service Reliability
- Chapter 6 – Mojave Water Agency (*Wholesale Water Supplier*)
- Chapter 7 – City of Adelanto (*Urban Water Supplier*)
- Chapter 8 – County Service Area 64 (*Urban Water Supplier*)
- Chapter 9 – County Service Area 70J (*Urban Water Supplier*)

- Chapter 10 – Golden State Water Company – Barstow (*Urban Water Supplier*)
- Chapter 11 – Hesperia Water District (*Urban Water Supplier*)
- Chapter 12 – Hi-Desert Water District (*Urban Water Supplier*)
- Chapter 13 – Joshua Basin Water District (*Urban Water Supplier*)
- Chapter 14 – Liberty Utilities – Apple Valley Water Company (*Urban Water Supplier*)
- Chapter 15 – Phelan Piñon Hills Community Service District (*Urban Water Supplier*)
- Chapter 16 – Victorville Water District (*Urban Water Supplier*)

Note to DWR:

The MWA and the urban water suppliers within its service area have written this RUWMP primarily as a water resource planning tool to effectively manage water supply, reliability, and demand. This RUWMP also satisfies all the requirements of the UWMPA for MWA (as a wholesale urban water supplier) and for each participating urban water supplier.

The body of the document provides narratives, analysis, and data that DWR requests in its 2025 UWMP Guidebook, including any changes to the CWC since 2020. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2025 UWMP Guidebook.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2025 UWMP Guidebook. These tables are separately uploaded to DWR's web portal for each of the participating urban water suppliers, along with this RUWMP. This RUWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F of the 2025 UWMP Guidebook.

Chapter 2.0 THE MOJAVE REGION

This chapter provides an overview of the Mojave Region (Region or RUWMP Planning Area) including its population characteristics, land use patterns, and climate conditions. It also introduces the various local entities and water purveyors that play key roles in managing and delivering water resources throughout the Region. As a foundational reason for preparation of this RUWMP, the Mojave Region is also concurrent with the MWA service boundary, which also fully encompasses all participating urban water suppliers that must also comply with the UWMPA. The Mojave Region, as a result, allows this RUWMP to capture the entirety of MWA's service area, as well as the service areas of each of the urban water suppliers that sit within MWA.

2.1.1 Regional Overview

The Mojave Region encompasses approximately 4,900 square miles of eastern San Bernardino County (**Figure 2-1**), corresponding to the MWA's service area. MWA serves as the Region's wholesale water supplier and as Watermaster for the Mojave Basin Area (MBA) adjudication. Located within the Mojave Desert of southeastern California, the Region includes several large, incorporated communities that collectively drive substantial and growing water demands despite extremely arid conditions.

The intermittent Mojave River is the Region's principal hydrologic feature. Its episodic flows provide the primary source of natural recharge to underlying groundwater basins and serve as a critical conveyance for imported SWP supplies used for managed groundwater recharge. Regional water management is shaped by a persistent structural water deficit, in which current primarily urban-driven demands exceed the natural replenishment capacity of local aquifers. Imported water is therefore essential to mitigating groundwater overdraft and supporting long-term regional sustainability.

Water management is organized across multiple geographic and administrative scales. At the regional level, MWA is responsible for managing and importing supplemental water supplies and coordinating their integration with local groundwater resources in cooperation with state, regional, and local partners. From a hydrogeographic perspective, the Region overlies all or portions of 36 groundwater basins and subbasins. For planning and management purposes, MWA groups these basins into eight subareas that cover the entire Region. Although the subareas are partially defined by faults and other geologic features, they generally remain hydrologically interconnected. Five subareas—Este, Oeste, Alto

(including the Alto Transition Zone), Centro, and Baja—are within the MBA adjudication and are named for their relative position along the Mojave River. The remaining three subareas lie outside the adjudicated basin and were part of MWA's original service area or incorporated through subsequent adjudication actions. All eight subareas are managed in a coordinated manner by MWA, the MBA Watermaster and the Warren Valley Basin Watermaster, and the numerous urban water suppliers (**Figure 2-2**).

At the local level, urban water retail suppliers—particularly those serving the cities of Victorville, Hesperia, Adelanto, and Barstow along the Interstate 15 corridor—are the primary contributors to regional growth and future water demand. Expansion of these service areas directly influences regional demand conditions and the management strategies applied within individual subareas, with the most pronounced effects occurring in incorporated cities.

Groundwater provides the foundation of the Region's water supply portfolio. Supplies consist of a managed combination of native groundwater and imported water, overseen by MWA on behalf of its constituent retail agencies, used to meet all demands within the Region. Recharge of native groundwater occurs through multiple mechanisms, including infiltration from the Mojave River and ephemeral streams, percolating rainwater, stormwater runoff, sublateral groundwater flow from surrounding mountains, treated wastewater and return flows, septic and irrigation seepage, and managed recharge of imported SWP supplies. As the SWP contractor for the Mojave Region, MWA manages the delivery and recharge of imported water using both the Mojave River and recharge sites located throughout its service area.

Effective water management in the Mojave Region relies on extensive coordination among MWA, retail water agencies, mutual water companies, adjudication watermasters, tribal entities, rural and self-supplied users, and land use and regulatory agencies. This collaboration supports coordinated infrastructure planning, groundwater monitoring, imported water operations, and drought response within a broader framework of regional and statewide water planning.

FIGURE 2-1: THE MOJAVE REGION

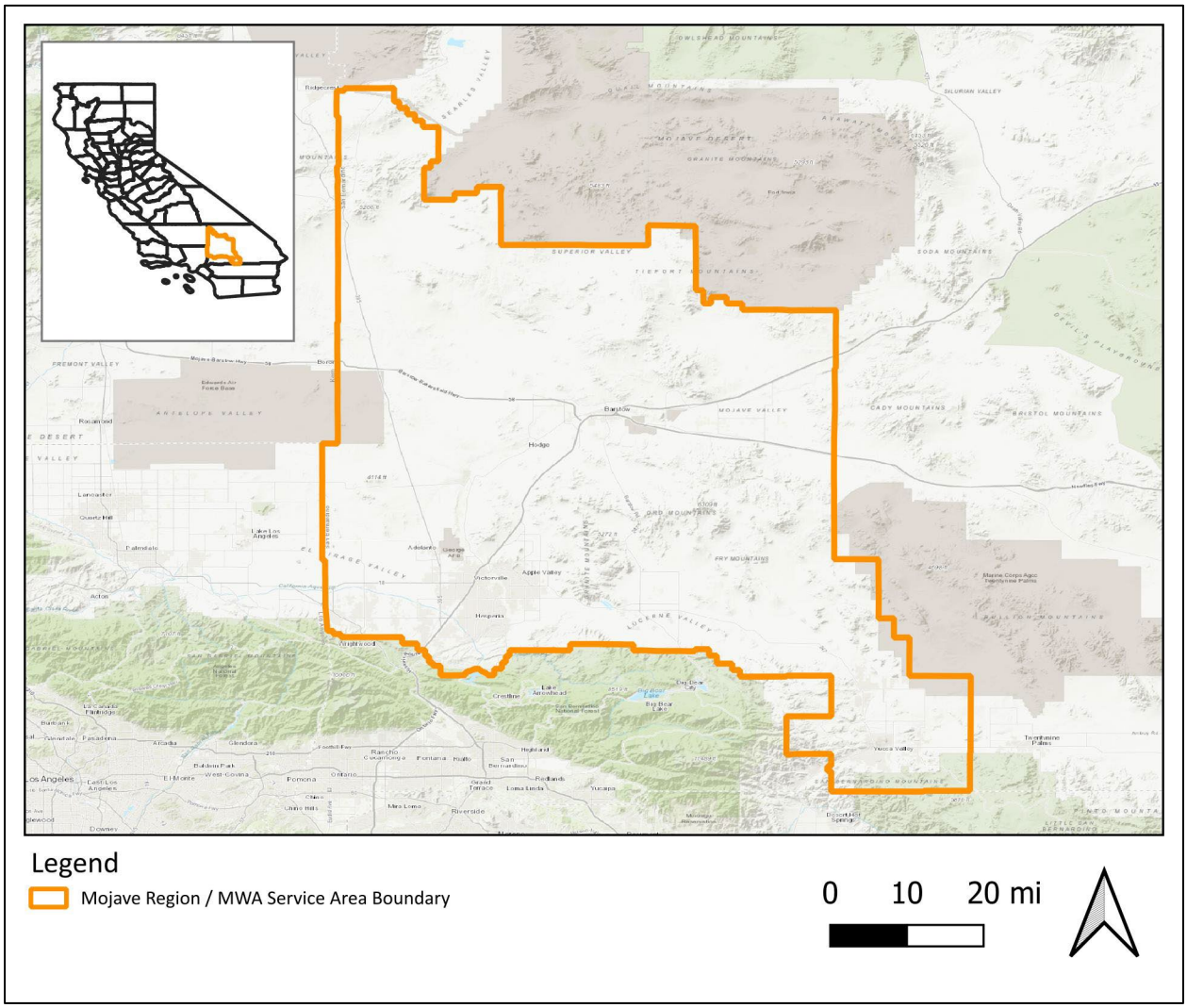
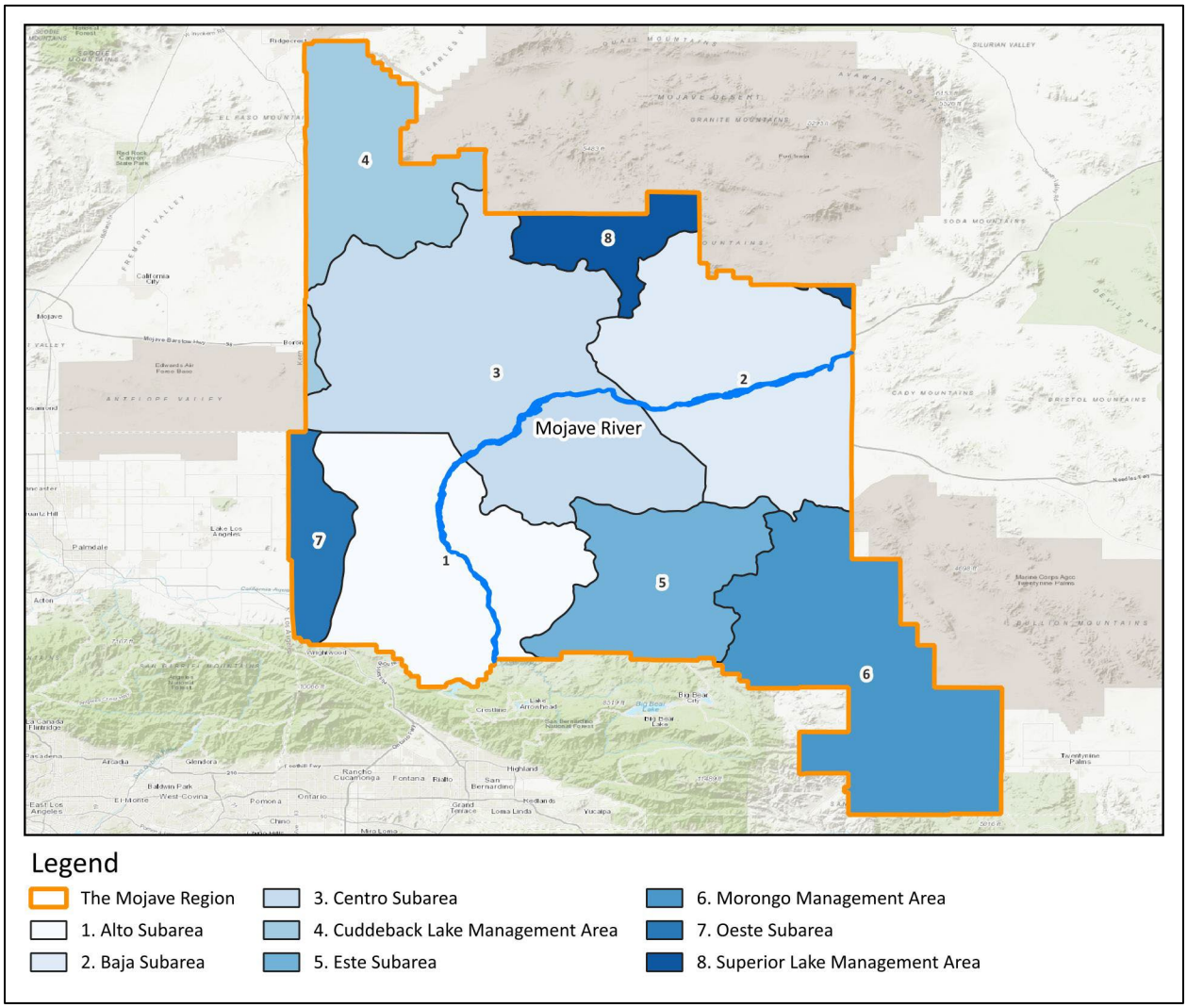


FIGURE 2-2: SUBAREAS AND MANAGEMENT AREAS WITHIN THE MOJAVE REGION

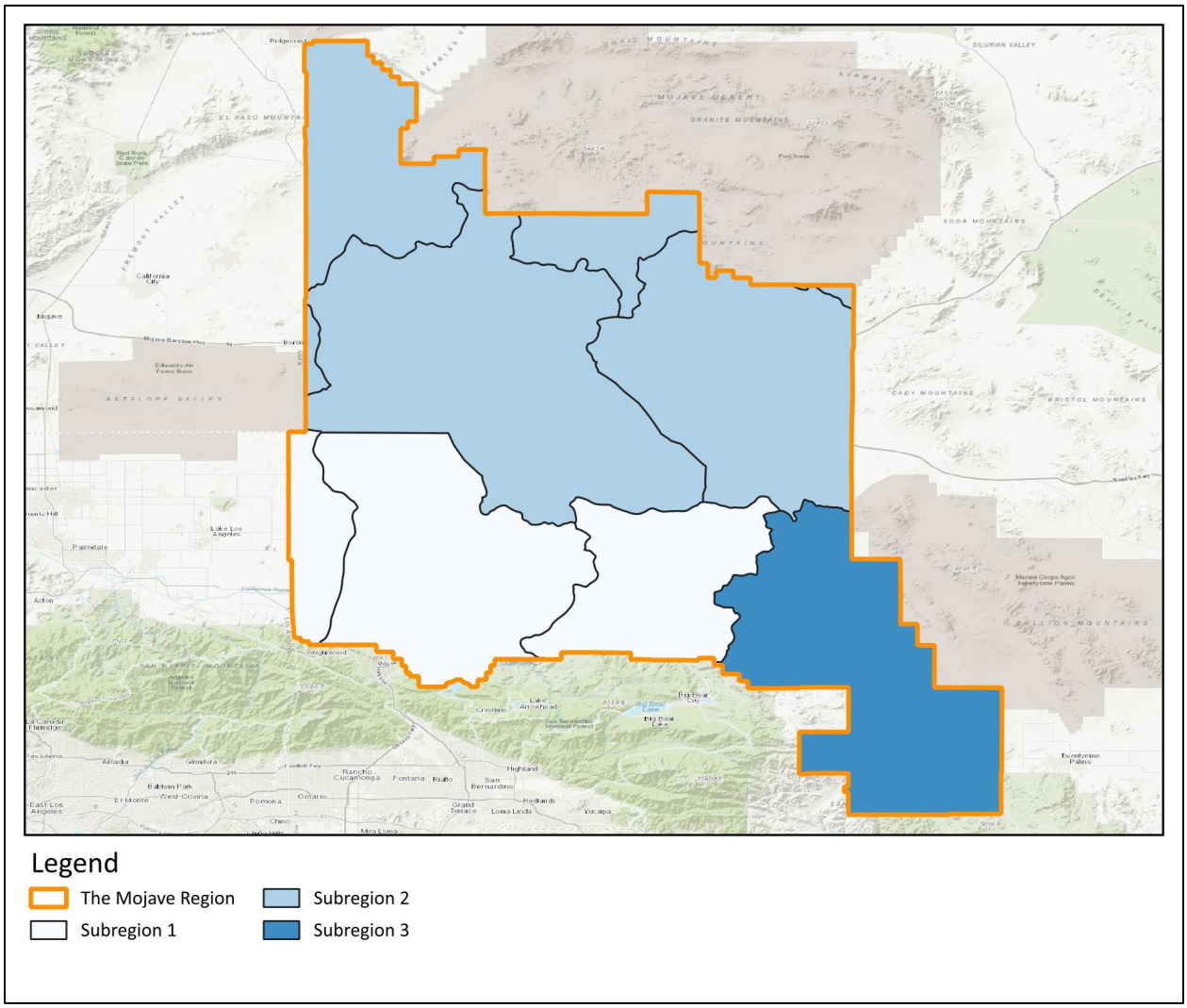


For the purposes of this RUWMP and evaluation of water supply reliability, the eight subareas are combined into the following three Subregions of the Mojave Region (**Figure 2-3**).

- Subregion 1 – Includes the subareas of Oeste, Alto (and Alto Transition), and Este: This subregion includes seven of the 10 participating RUWMP urban water suppliers (City of Adelanto, County Service Area 64, County Service Area 70J, Hesperia Water District, Liberty Utilities – Apple Valley, Phelan-Piñon Hills Community Service District, and Victorville Water District), as well as other demands reliant on MWA including other small urban water suppliers, Helendale Community Services District, rural pumpers, agriculture, and industry.
- Subregion 2 – Includes the subareas of Centro, Baja, Cuddeback Lake, and Superior Lake: This subregion includes one of the participating RUWMP urban water suppliers (Golden State Water Company-Barstow), as well as other demands reliant on MWA including other small urban water suppliers, rural pumpers, agriculture, and industry.
- Subregion 3 – Includes the subarea of Morongo: This subregion includes two of the 10 RUWMP urban water suppliers (Joshua Basin Water District and Hi-Desert Water District), as well as other demands reliant on MWA including other small urban water suppliers, Bighorn-Desert View Water Agency, rural pumpers, agriculture, and industry.

These Subregions are used to summarize demand and supply conditions in areas with generally similar groundwater conditions and MWA imported water opportunities.

FIGURE 2-3: 2025 RUWMP SUBREGIONS



2.1.2 Water Suppliers of the Mojave Region

The Mojave Region is geographically diverse but generally characterized as the High Desert. Most of the region sits between 2,000 and 5,000 feet in elevation and extends across incorporated cities, unincorporated communities, tribal lands, and large expanses of undeveloped open space. Within this Region there are several water suppliers that must comply with the UWMPA, with MWA having responsibilities as a wholesale water supplier, and several others having responsibility as urban water retail suppliers.

2.1.2.1 Mojave Water Agency

MWA serves as the wholesale water supplier for the Mojave Region and manages water supply reliability across its approximately 4,900-square-mile service area. The Agency's core responsibility is to address the Region's structural water management challenges, including limited local runoff and chronic groundwater overdraft within underlying basins and subbasins.

To support long-term sustainability for its retail agency partners and other customers, MWA manages the importation of SWP supplies from the California Aqueduct. In addition, MWA serves as the court-appointed Watermaster for the MBA Adjudication Judgment (MBA Judgment) (see *Chapter 3 – Water Supply Characterization*), where it regulates groundwater production and coordinates water management activities across the adjudicated subareas.

Although MWA does not provide retail water service, it fulfills a central regional function by integrating imported supplies with local groundwater management to enhance supply reliability, facilitate groundwater recharge, and improve drought resilience. This role requires ongoing coordination with retail water purveyors, adjudication watermasters, and other regional stakeholders to align imported water operations with groundwater sustainability objectives and broader regional planning efforts.

2.1.2.2 Urban Water Retail Suppliers

There are a variety of small-to-large state-permitted Public Water Systems, also referred to as urban water suppliers, located in the Mojave Region. As noted above, MWA does not sell water directly to these retailers or to any consumers; rather, it supplies water to areas of the Region used to recharge local aquifers for specific retailers as needed to satisfy the MBA Judgment's replenishment requirements, as stipulated by the MBA Watermaster, as requested to meet needs in other adjudicated areas, and as needed to maintain overall groundwater basin health or requested to address local circumstances or retail requests. Of the twelve (12) large urban water suppliers within the Region, ten (10) are required to complete an UWMP pursuant to the UWMPA detailed in CWC Section 10610 et al. The 12 large urban water suppliers are shown in **Figure 2-4**.

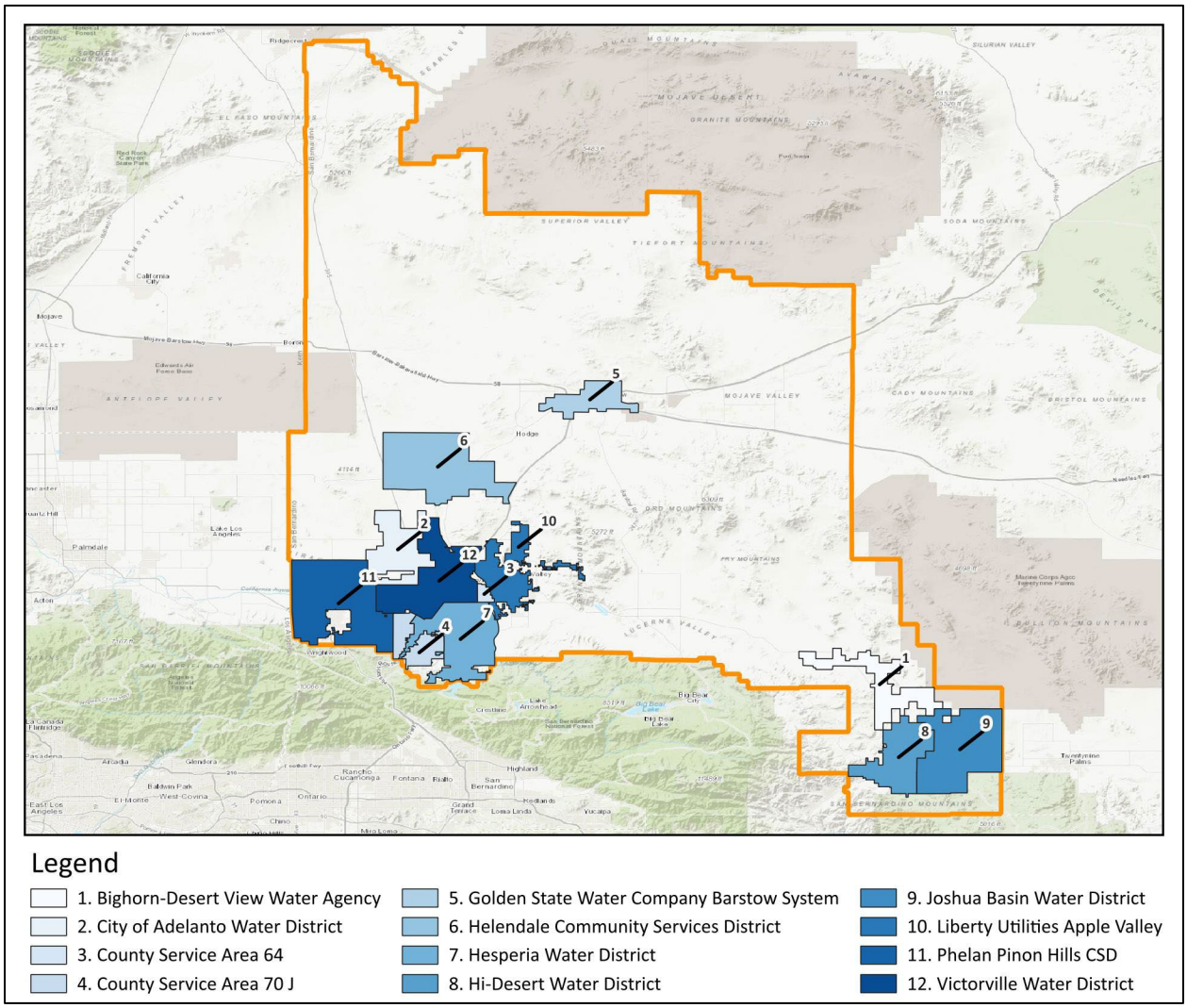
For the ten large suppliers required to prepare a UWMP, they collectively opted to pursue a coordinated RUWMP with MWA in lieu of ten individual UWMPs, hence this 2025 Regional UWMP document. **Table 2-1** lists the 10 suppliers that participated in this RUWMP, approximate service areas, and estimated total number of connections. Both Bighorn-Desert View Water Agency and Helendale Community Services District are incorporated into MWA's wholesale demand forecast presented in *Chapter 6 - Mojave Water Agency*, as they both have not reached the UWMPA compliance threshold of 3,000+ service connections and/or do not supply more than 3,000 acre-feet of water per year, but have significant demands and are active coordinators within the Region.

TABLE 2-1: URBAN WATER RETAIL SUPPLIERS WITHIN THE MOJAVE REGION

Urban Water Retail Supplier	Service Area (sq. miles)	Approximate Connections
City of Adelanto	53	8,300
Liberty Utilities - Apple Valley Water Company	51	21,000
County Service Area 64	4	4,000
County Service Area 70J	28	3,400
Golden State Water Company - Barstow System	33	9,000
Hesperia Water District	78	27,600
Hi-Desert Water District	57	11,000
Joshua Basin Water District	97	4,900
Phelan Piñon Hills Community Service District	118	7,200
Victorville Water District	85	38,000
Bighorn-Desert View Water Agency	52	< 2,000
Helendale Community Services District	116	< 3,000

Several additional urban water suppliers dependent on MWA's supplies and management are not specifically discussed within unique chapters of this RUWMP as their size does not yet require completion of a UWMP. However, these smaller suppliers, as well as numerous other water users dependent on groundwater throughout the Region such as agriculture, industry, and rural domestic pumpers, are reflected in MWA's Wholesale chapter (*Chapter 6 - Mojave Water Agency*) and are incorporated into the Region's overall water demand characterization.

FIGURE 2-4: URBAN WATER RETAIL SUPPLIERS WITHIN THE MOJAVE REGION



2.1.3 Mojave Region Groundwater Basins

The Mojave Region overlies all or a portion of 36 groundwater basins and subbasins as defined by DWR Bulletin 118. Collectively, these basins and subbasins are broadly grouped into two larger hydrogeologically distinct areas – the South Lahontan Hydrologic Region and the Colorado River Hydrologic Region. Groundwater basins along the Mojave River and adjacent areas are referred to as the Mojave River Groundwater Basin. Remaining basins and subbasins in the southeastern Mojave Region are generally referred to as the Morongo Basin/Johnson Valley Area or "Morongo Area," with the exception of the Lucerne Valley. The Lucerne Valley Subbasin is divided along the Helendale Fault with the southwest portion in the Mojave River Groundwater Basin and the northeast portion in the Morongo Area. Surface

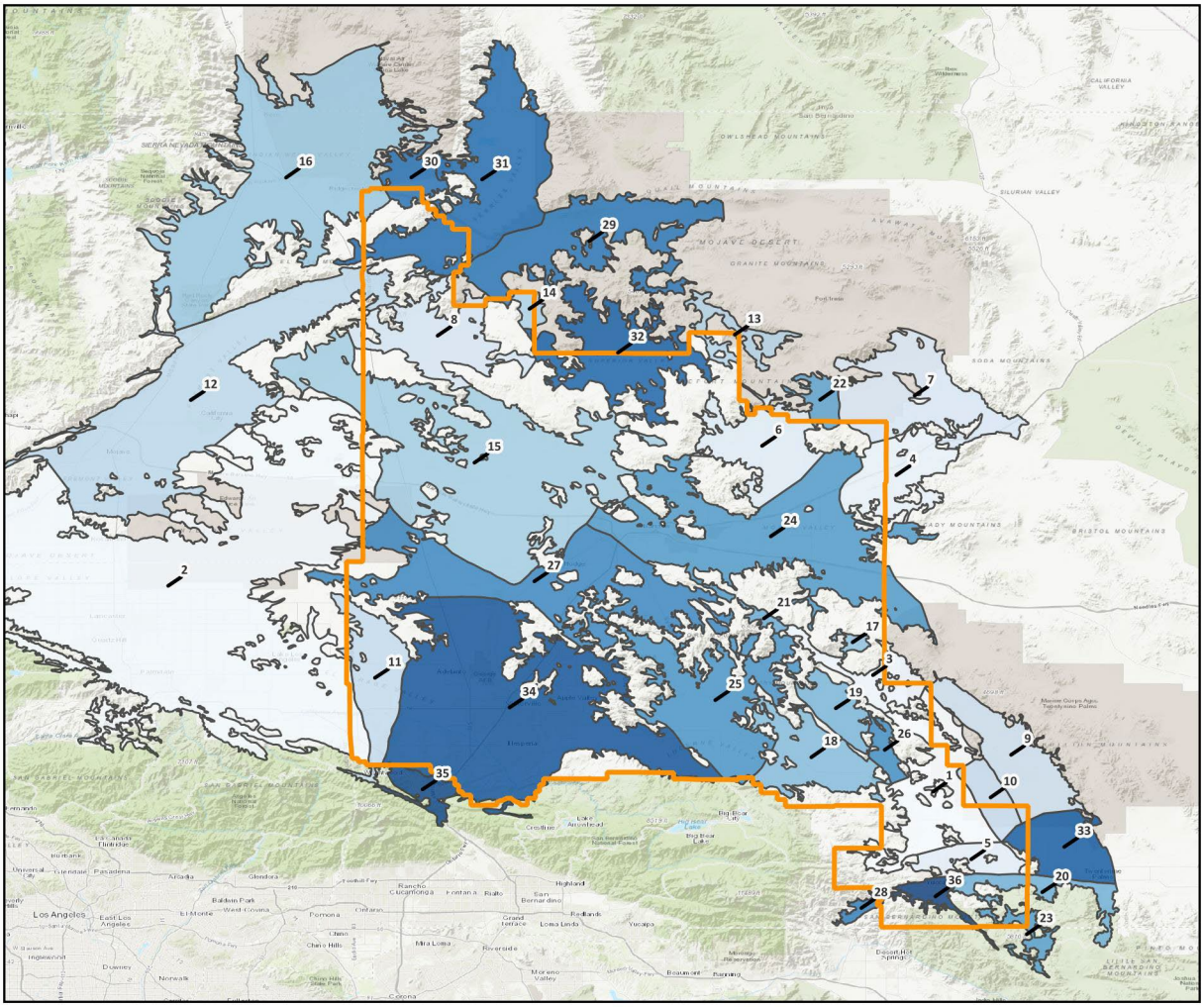
water drainage of Lucerne Valley is in the Colorado River Hydrologic Region but is not included in the Morongo Basin Area, isolating this area due to the hydrogeologic conditions.

Of the two main areas, the Mojave River Groundwater Basin is the largest. The 36 groundwater basins and subbasins are listed in **Table 2-2** and grouped by the South Lahontan (Region 6) and Colorado River (Region 7) Hydrologic Regions. The Mojave Region also overlaps a small portion of a DWR basin in the South Coast Hydrologic Region (Region 8) as shown by the last subbasin listed in **Table 2-2** – the Upper Santa Ana Valley. These basins are also shown in **Figure 2-5**.

TABLE 2-2: GROUNDWATER BASINS WITHIN THE MOJAVE REGION

DWR Basin	Groundwater Basin Name	DWR Basin	Groundwater Basin Name
South Lahontan Hydrologic Region		Colorado River Hydrologic Region	
6-35	Cronise Valley	7-10	Twentynine Palms Valley
6-36	Langford Valley	7-11	Copper Mountain Valley
6-37	Coyote Lake Valley	7-12	Warren Valley
6-38	Caves Canyon Valley	7-13	Deadman Valley
6-40	Lower Mojave River Valley	7-13	Deadman Valley
6-41	Middle Mojave River Valley	7-15	Bessemer Valley
6-42	Upper Mojave River Valley	7-16	Ames Valley
6-43	El Mirage Valley	7-17	Means Valley
6-44	Antelope Valley	7-18	Johnson Valley
6-46	Fremont Valley	7-18	Johnson Valley
6-47	Harper Valley	7-19	Lucerne Valley
6-48	Goldstone Valley	7-20	Morongo Valley
6-49	Superior Valley	7-50	Iron Ridge Area
6-50	Cuddeback Valley	7-51	Lost Horse Valley
6-51	Pilot Knob Valley	7-62	Joshua Tree
6-52	Searles Valley	8-2	Upper Santa Ana Valley
6-53	Salt Wells Valley		
6-54	Indian Wells Valley		
6-77	Grass Valley		
6-89	Kane Wash Area		

FIGURE 2-5: GROUNDWATER BASINS WITHIN THE MOJAVE REGION



Challenges in managing overdrafted groundwater resources along with the high cost of importing water drove the first adjudication efforts in the Region in the 1960s. In 1965, Morongo Basin was annexed into MWA's service area adding 35.5 square miles to MWA's boundary. The Morongo Basin was a sixth but separate area that added management and delivery obligations beyond the five other distinct hydrological subareas within the Mojave Basin Area: Este (East Basin), Oeste (West Basin), Alto (Upper Basin), Centro (Middle Basin) and Baja (Lower Basin).

2.1.3.1 Mojave River Basin

The Mojave River Basin (Mojave Basin Area or MBA) is the principal water management area of the Region. For management purposes, the MBA is separated into five distinct hydrologic divisions defined in previous studies (DWR, 1967), evolving over time based on a combination of hydrologic, geologic, engineering, and political considerations (**Figure 2-6**).

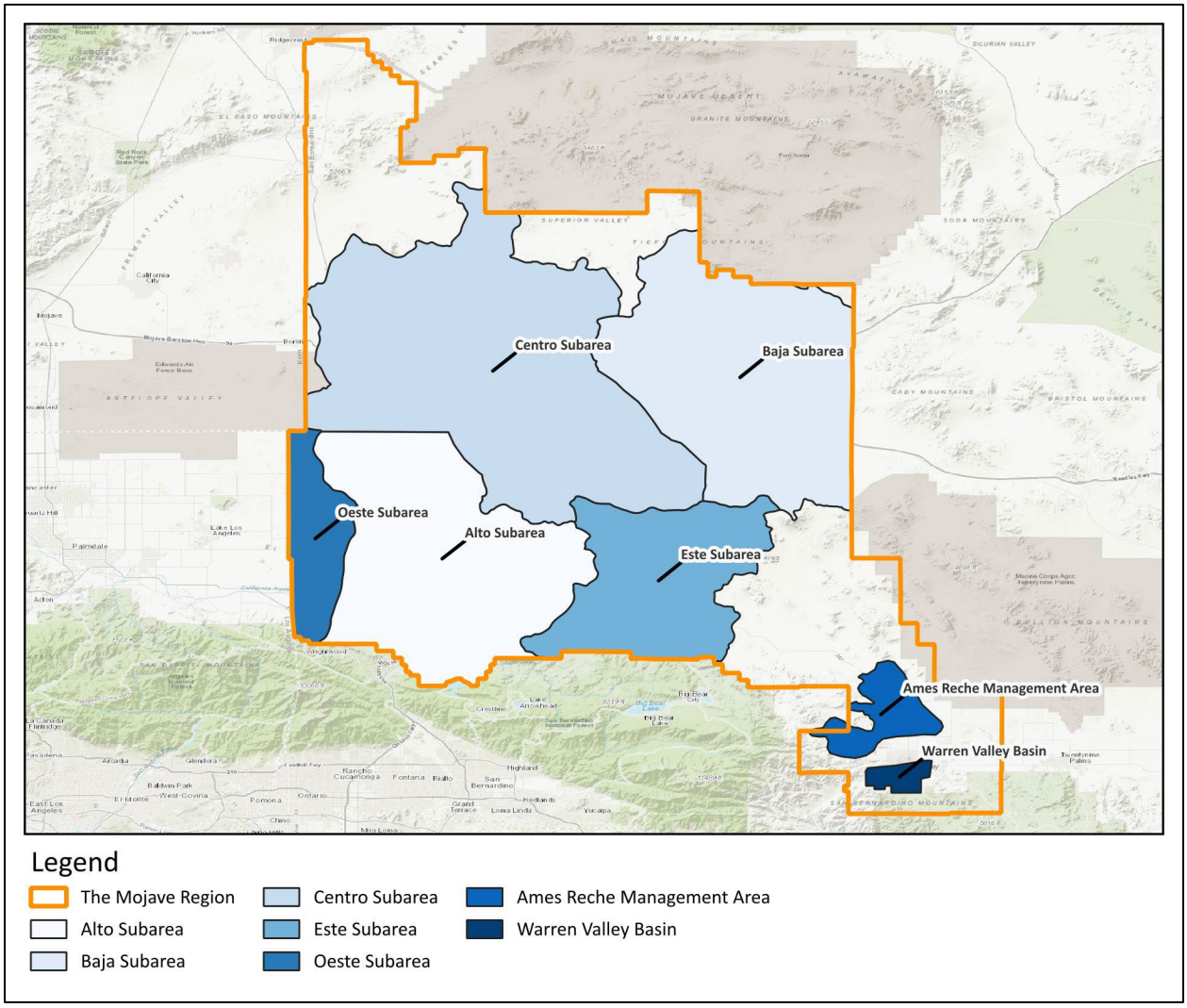
A second effort at adjudication within the MBA starting in 1990 proved more successful than attempts in the 1960s. The effort resulted in full adjudication of the MBA in 2002.[6] It began when the City of Barstow and the Southern California Water Company filed a complaint against upstream (and up-basin) water users claiming that lowering groundwater levels and water availability due to withdrawals reduced the amount of water available to downstream users. A year later, MWA filed a cross-complaint declaring that native waterflow of the Mojave River and basin area groundwater was not sufficient to meet current and future demands. The cross-complaint asked the court to determine surface and groundwater rights for the Mojave Basin Area. Negotiations over the next two years produced a Stipulated Judgment in January 1996 that formed a class of producers which used 10 acre-feet or less per year that were dismissed from litigation and offered an equitable solution for the remaining water producers that use over 10 acre-feet per year (aka Minimal Producers). The Riverside Superior Court appointed MWA as Watermaster for the area as part of the MBA Judgment. Appeals by non-stipulated parties continued over the next several years with the California Supreme Court finally ruling on the case in August 2000. Most of the appealing parties have stipulated to the MBA Judgment since the 1996 ruling.

The MBA Judgment helps maintain proper water balances between the Mojave Basin Area's five distinct, but interrelated, subareas (Este, Oeste, Alto, Centro, Baja). The Alto Transition Zone was also defined as a sub-management unit to better understand the water flow from Alto to Centro. Some subareas were also recognized to historically receive natural water flow from upstream subareas; to maintain that relationship, annual obligations are set according to average annual natural flow baselines defined in the MBA Judgment as Base Annual Production (BAP). The MBA Judgment established a Free Production Allowance (FPA) allocation to Producers based on each Producer's percentage share of the BAP which is set

[6] The MBA Judgment can be accessed at Mojave Water Agency's website: https://www.mojavewater.org/basin-management/watermaster/reports/

each year by the MBA Watermaster. FPA is reduced over time until it comes within 5% of the Production Safe Yield (PSY) defined by the MBA Judgment. All water produced in excess of any Producer's share of the FPA must be replaced by the Producer, either by payment to the Watermaster of funds sufficient to purchase Replacement Water, or by transfer of unused FPA from another Producer. The court can review and adjust the FPA for each Subarea on an annual basis as appropriate. The dynamics of the FPA and resulting forecasts of available native groundwater for the general subareas are discussed in more detail in *Chapter 3 - Water Supply Characterization*.

FIGURE 2-6: ADJUDICATED SUBAREAS AND DEFINED MANAGEMENT AREAS WITHIN THE MOJAVE REGION



2.1.3.2 Morongo Area

The Morongo Area includes 15 groundwater basins and subbasins that cover portions of the Morongo Area as defined in this RUWMP and shown in **Figure 2-5**. Several of these basins lie mostly outside of the Mojave Region, have low populations, and are essentially undeveloped

with respect to groundwater. The remaining basins have been grouped into six within the Morongo Area, with two of primary importance: the Warren Valley Basin and Ames Valley Basin.

2.1.3.3 Warren Valley Basin

The Warren Valley Basin covers an area of approximately 17,200 acres and consists of water-bearing sediments beneath the Town of Yucca Valley and surrounding area. The Warren Valley Basin (**Figure 2-6**) is geologically defined by the Pinto Mountain Fault to the north; a bedrock outcrop of the Little San Bernardino Mountains to the south; a bedrock constriction called the 'Yucca Barrier' to the east; and by a bedrock constriction and topographic divide to the west. Natural recharge to the Warren Valley Basin includes direct percolation of precipitation and percolation of ephemeral streamflow from Water Canyon and Covington Canyon.

After extractions began exceeding supplies in the 1950s, the area was adjudicated in 1977 in a decision known as the Warren Valley Judgment. Hi-Desert Water District (HDWD) was appointed Watermaster in the Judgment (the "Warren Valley Watermaster") and was ordered to help develop solutions to halting overdraft. A comprehensive approach was developed by the Warren Valley Watermaster Board which included adopting a Basin Management Plan that called for SWP water delivery from MWA through the Morongo Basin Pipeline (MBP) to address demand and replenish overdraft. Native groundwater supplies associated with the Warren Valley Judgment are described in more detail in *Chapter 3 - Water Supply Characterization*.

2.1.3.4 Ames Valley Basin

In 2014 the Ames/Reche Groundwater Storage and Recovery Program and Management Agreement replaced and superseded the original adjudication called Ames Valley Basin Water Agreement between HDWD and Bighorn-Desert View Water Agency (BDVWA) established in 1991. It was created for the construction and operation of the HDWD Mainstream Well located in the Ames Valley Basin (**Figure 2-6**). The 2014 Agreement was established by BDVWA, HDWD, and County of San Bernardino, with administrative support provided by MWA, and the Stipulation and Amended and Restated Judgment (Ames/Reche Judgment) was finalized by the Superior Court of California, County of Riverside in September 2014. The Ames/Reche Management Area includes 95 square miles encompassing the communities of Flamingo Heights, Landers, Pioneertown, and Yucca Mesa. Native groundwater supplies associated with the Ames/Reche Judgment are described in more detail in *Chapter 3 - Water Supply Characterization*.

2.1.4 Major Regional Infrastructure

This sub-chapter focuses specifically on MWA's water delivery infrastructure. Individual infrastructure assets, such as distribution pipelines, well locations or other attributes, associated with each urban water supplier are discussed in their corresponding chapter.

2.1.4.1 State Water Project

The SWP or California Aqueduct is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most facilities completed by 1973. Today, the SWP includes 28 dams and reservoirs, 26 pumping and generating plants, and approximately 660 miles of aqueducts.

The primary water source for the SWP is the Feather River, a tributary of the Sacramento River. The water flowing into the Feather River is captured by the SWP in Oroville Dam and Reservoir. Storage released from Oroville Dam flows down natural river channels to the Sacramento-San Joaquin River Delta (Delta). While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct or diverted by SWP contractors upstream, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to the Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains. From there the California Aqueduct divides into the East and West Branches. MWA takes its SWP deliveries from the East Branch, which was completed in 2003. MWA delivers its SWP supplies to recharge local groundwater basins through transmission pipelines, recharge facilities, and direct releases from Silverwood Lake – a SWP regulating reservoir. **Figure 2-7** depicts the SWP facilities that deliver water to MWA and details the sections of the Mojave Division Reaches of the California Aqueduct.

The initial SWP storage and conveyance facilities were designed to meet contractors' water demands with the construction of additional storage facilities planned as demand increased. However, few additional SWP storage facilities have been constructed since the early 1970's and a portion of the original conveyance design was never completed. SWP conveyance facilities were generally designed and have been constructed to deliver Table A amounts to all contractors. The maximum Table A Annual Amount of all SWP Contractors totals approximately 4.133 million acre-feet but full Table A Annual Amount deliveries rarely occur. Details regarding MWA's characterization of SWP reliability is discussed in MWA's wholesale *Chapter 6 – Mojave Water Agency*.

MWA diverts its SWP water from the East Branch of the California Aqueduct, which includes six turnout locations utilized by MWA (identified west to east): Sheep Creek Turnout, White Road Turnout, Highway 395 Turnout, Antelope Siphon Turnout, Unnamed Wash, and Cedar Springs Dam (Silverwood Lake). These turnouts are used to deliver water to recharge facilities located

throughout the MWA service area. **Figure 2-8** below depicts the MWA water turnout and delivery facilities.

FIGURE 2-7: SWP MOJAVE DIVISION AQUEDUCT REACH SECTIONS

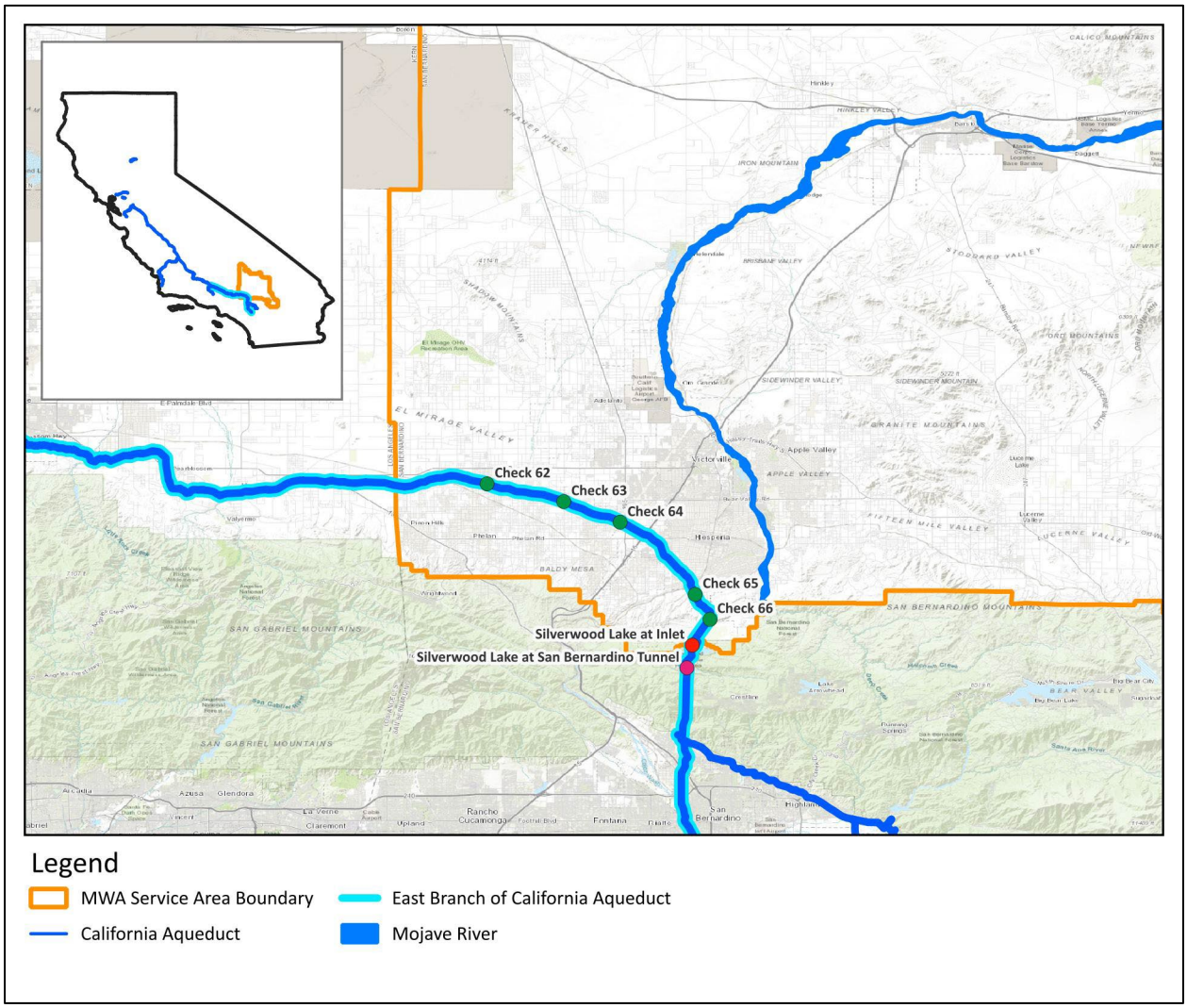
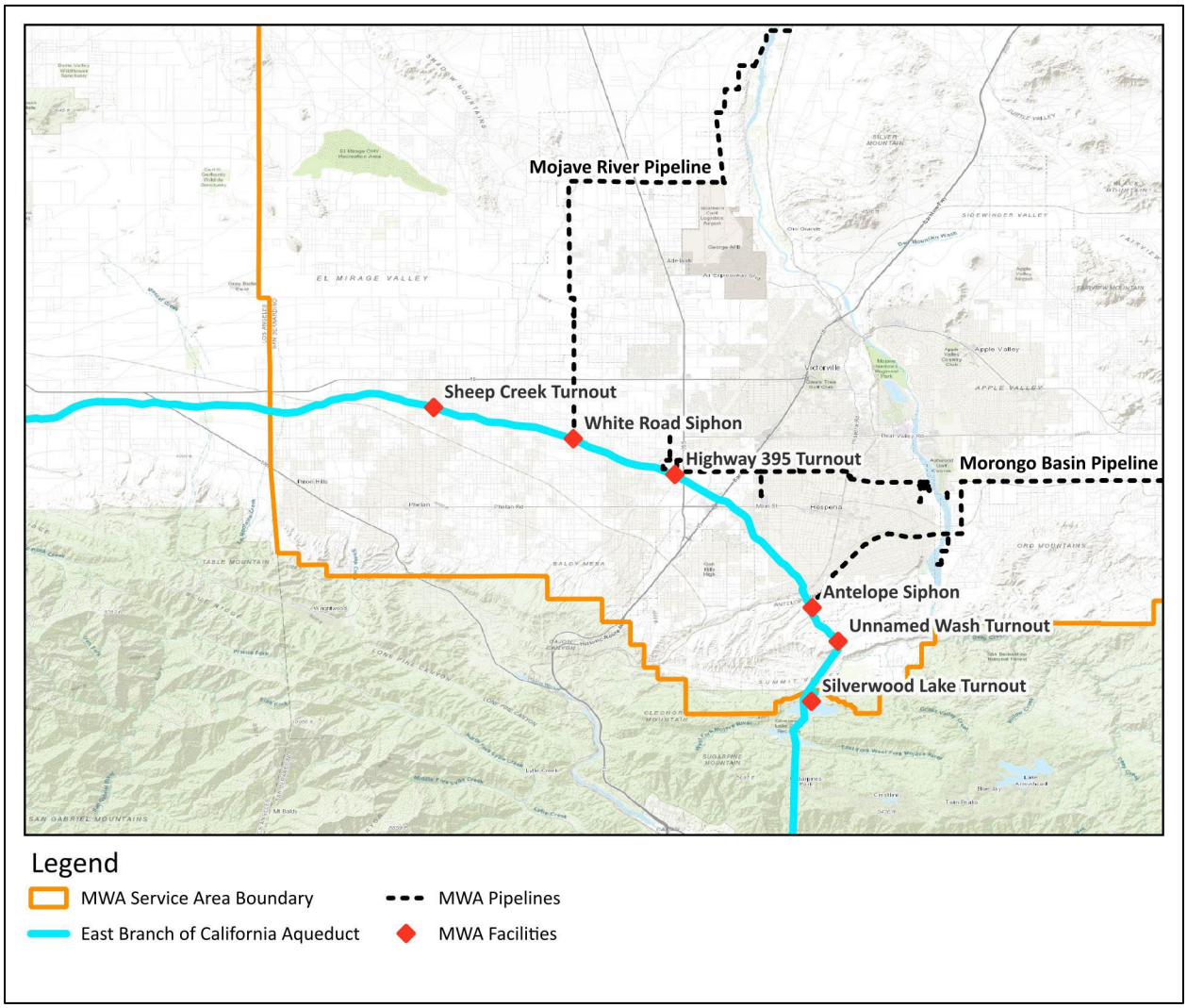


FIGURE 2-8: MWA TURNOUTS ALONG THE EAST BRANCH



2.1.4.2 Delivery System

MWA relies on the SWP contracted supplies to supplement local groundwater supplies throughout the Region using the Mojave River and two primary pipelines. The Mojave River Pipeline (MRP) is approximately 76 miles long, extending from the California Aqueduct in the Phelan area to four groundwater recharge basins along the Mojave River. These recharge basins are located in Hodge, Lenwood, Daggett/Yermo, and Newberry Springs. The MRP delivers up to 45,000 acre-feet of water per year to the Region. An additional pilot recharge basin is also currently under construction: the West Victorville Recharge Basin, located at the turnout of the MRP and adjacent to the California Aqueduct.

The second major pipeline linking the SWP to the subareas in the Region is the Morongo Basin Pipeline, which currently delivers water to groundwater recharge sites in Landers, Yucca Valley, and Joshua Tree to help address supplemental water needs for the Ames/Reche Judgment and the Warren Valley Judgment. The pipeline also allows MWA to deliver imported water into the Mojave River at the Deep Creek and Rock Springs discharge locations that serve the needs of the MBA Judgment. These two facilities are in areas of the River with high percolation rates, allowing water to recharge the aquifer directly upstream of the area with the highest groundwater pumping demand in MWA's service area (the Alto subarea). The facility includes a pipeline which extends south along the river from the MBP, a flow control facility and outlet. It can recharge a maximum of approximately 40,000 acre-feet per year.

The Amethyst Basin Facility, completed in 2019, delivers SWP water to recharge the Oro Grande Wash in Victorville just east of Sycamore Street and Amethyst Road in Victorville. It provides flood control and allows recharge through a series of dikes and recharge ponds. Water from the SWP is delivered to the recharge ponds through a pipeline that connects to the California Aqueduct at the Highway 395 turnout. Recharge capacity is about 8,000 acre-feet per year.

The Ames/Reche Recharge Facility delivers water from the SWP directly to the Pipes Wash in Landers, located north of Yucca Valley. The Ames/Reche facility consists of a pipeline extending west from the MBP at Winters Road to an outlet in Pipes Wash. Construction of the pipeline, flow control facility, and outlet was completed in 2014. The turnout is planned to flow up to a maximum capacity of five cubic feet per second, recharging a maximum of approximately 1,500 acre-feet per year.

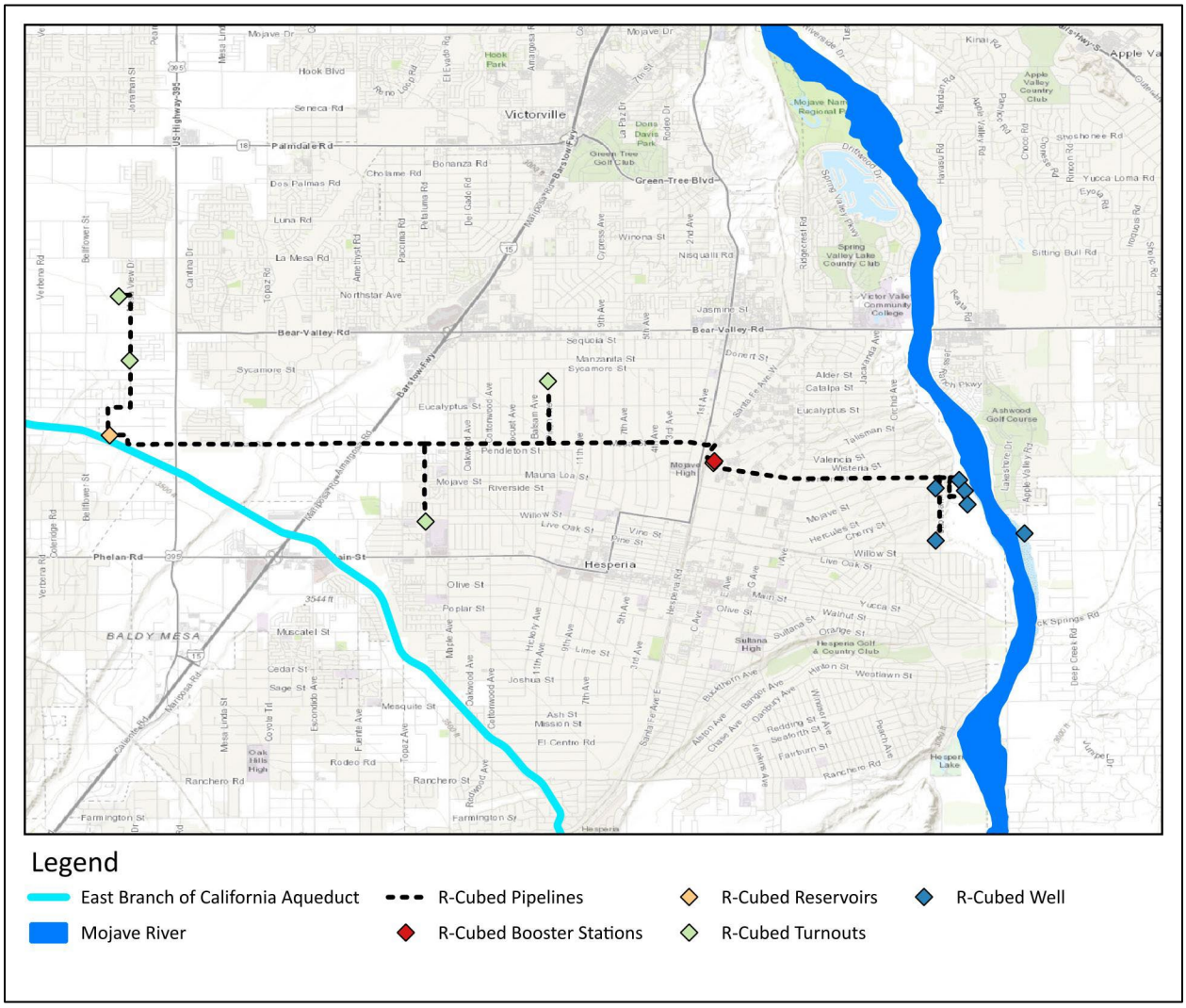
Silverwood Lake is a reservoir owned and operated by the State of California and DWR. At the California Aqueduct terminus in Hesperia, water is siphoned into the lake where it is stored for use in San Bernardino and Inland Empire areas. MWA takes deliveries of SWP from the lake via the Cedar Springs Dam which releases into the Mojave River.

Reflecting a more recent addition to the Region's infrastructure, MWA constructed and operates the Regional Recharge and Recover Project (R-Cubed). This conjunctive use project

stores SWP deliveries in recharge sites in the Floodplain Aquifer along the Mojave River near Hesperia and southern Apple Valley (**Figure 2-9**). When needed, MWA-owned production wells on both sides of the Mojave River, immediately downstream of the recharge area, can recover and deliver the stored water through pipelines directly to local urban water retail suppliers. Current beneficiaries of R-Cubed include Liberty Utilities (Apple Valley), City of Adelanto, City of Hesperia, and Victorville Water District.

Phase 1 of the R-Cubed Project was partially completed in 2013. It currently produces approximately 15,000 acre-feet per year, with expansion plans under consideration.

FIGURE 2-9: R-CUBED FACILITIES



2.1.5 Regional Climate

Located in the High Desert region of San Bernardino County, the climate in the Mojave Region is more extreme than the lowland areas of Southern California. As is typical of the Mojave Desert, the region is very arid because of the rain shadow effect of the surrounding mountains. The summers are extremely hot and dry with occasional monsoonal thunderstorms that can bring flash flooding and hail. Most of the precipitation happens in the winter, with snowfall possible, although much lighter than what occurs in the surrounding mountains and melting quickly.

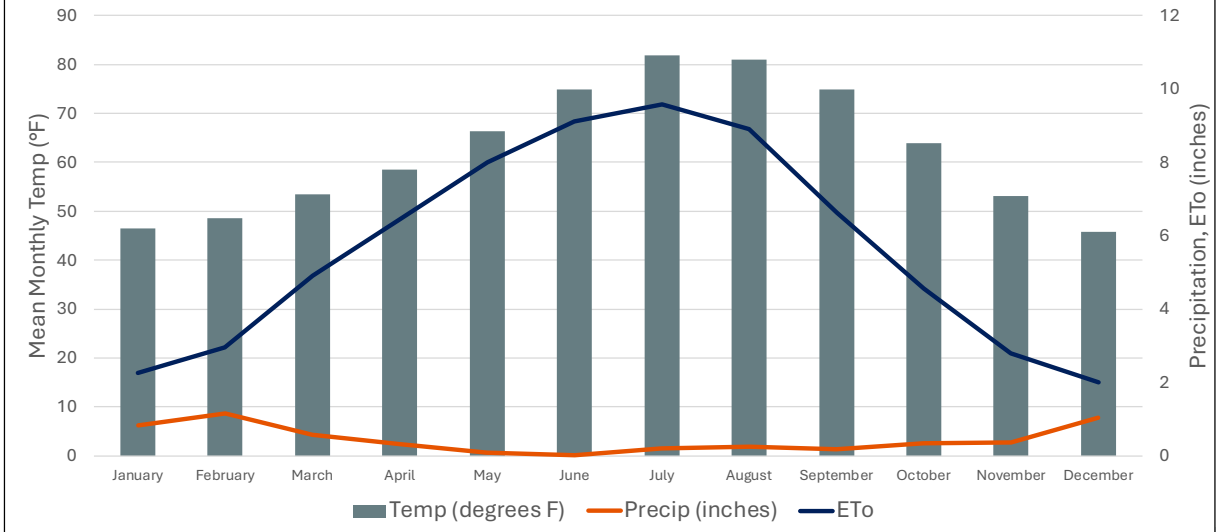
The major settlements in the Region are along the Highway 15 corridor which generally parallels the Mojave River, primarily within the southern end of the Region including cities and communities of Hesperia, Victorville, Adelanto, and Apple Valley. Thirty-two miles to the north, also along the Highway 15 corridor, is the City of Barstow. The elevation variance across the Region leads to slight differences in reported climate data for various areas, but not significantly different for purposes of this discussion. Therefore, the following figures report data representing the southern area of the Region (using Victorville), with some discussion of the minor climate differences via reference to conditions in Barstow.

Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from December to March with a 30-year annual average rainfall of 5.8 inches for Victorville and 5 inches for Barstow. The annual mean temperature is about 62 degrees, but the High Desert climate leads to extreme temperature ranges with highs during the summer months regularly hitting the upper 90s and lows in winter dropping to averages in the lower 30s.

Other climate characteristics of the Region include monsoonal moisture in the later summer, which can cause thunderstorms. These thunderstorms do not deliver nearly as much rainfall as desert regions further east and the region receives only a small fraction of the annual precipitation compared to the eastern areas. Snowfall in Victorville during the winter, if it occurs, is light and tends to melt before accumulating. Snow in Barstow is much rarer and occurs infrequently. Autumn averages very warm and dry conditions still and becomes cooler by November with rainfall beginning as California's traditional rainy season begins. Winter conditions usually appear by late November. Spring is usually warm during the days although low temperatures are still quite cool. Rainfall usually tapers off by May.

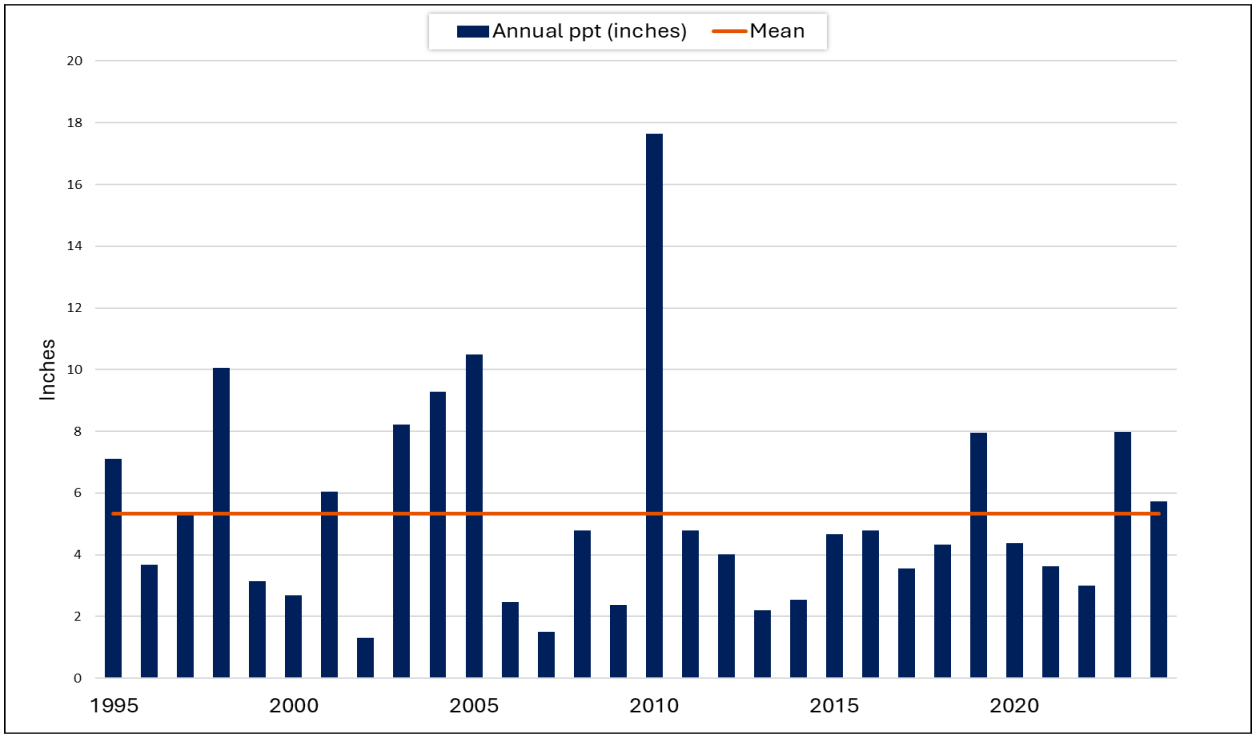
Figure 2-10 shows the average monthly temperature, rainfall, and evapotranspiration (ETo) for the service area. This figure reports data from Victorville. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in **Figure 2-11**. In most years, precipitation totals fall below the mean.

FIGURE 2-10: AVERAGE CLIMATE CONDITIONS



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	46.5	48.6	53.5	58.5	66.4	75.0	81.9	81.0	74.9	64.0	53.1	45.7
Precip	0.82	1.15	0.56	0.31	0.09	0.02	0.20	0.24	0.18	0.34	0.36	1.04
ETo	2.26	2.96	4.91	6.45	8.00	9.11	9.58	8.90	6.62	4.57	2.79	2.01

FIGURE 2-11: ANNUAL PRECIPITATION VARIABILITY (1996-2024)

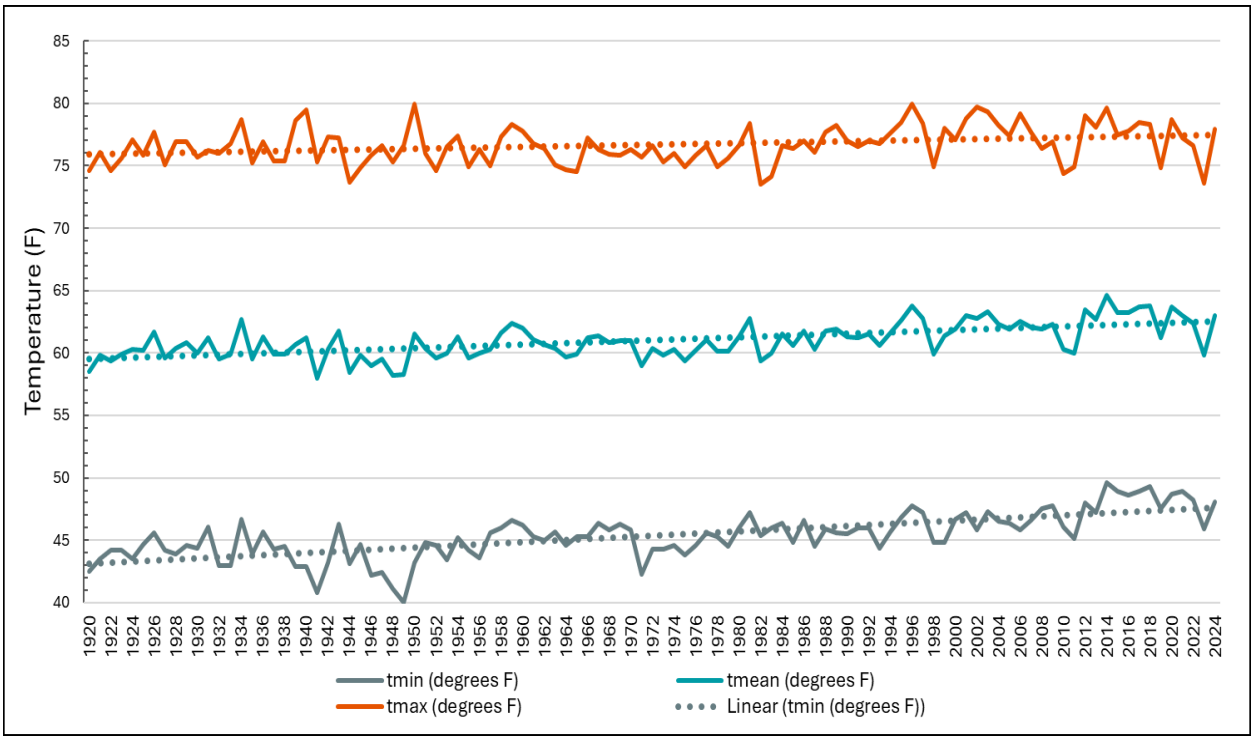


2.1.5.1 Climate Change

The CWC does not prescribe specific climate change planning and management measures for water suppliers; however, urban water suppliers should consider climate change when evaluating water supply availability and customer water use trends. For example, drier conditions or drought can lead to more residential irrigation and increased water use compared to wetter years.

Climate change will likely alter precipitation patterns, resulting in consequential externalities like reductions in Sierra Nevada snowpack. Given the region's reliance on imported water, particularly from the State Water Project, which relies on melting snowpack, any effect from climate change on Sierra Nevada snowpack levels and inflows to Northern California reservoirs and the Delta will have a serious impact on water availability. As shown by the trendlines in **Figure 2-12**, the region has experienced gradual warming in average temperatures over the last 100 years. Increasing temperatures locally within the Region can result in higher evapotranspiration, leading to additional water demand. Although annual median precipitation levels remain relatively consistent, projected changes in the frequency, magnitude, and volume of precipitation show large variability, which has implications for uncertainties in stormwater runoff and peak flow rates.

FIGURE 2-12: HISTORICAL ANNUAL TEMPERATURE AND TRENDS (YEARS)



2.1.6 Current and Projected Population

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use within the Mojave Region. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. The projections also provide the Region with the necessary data-driven means for assessing whether MWA is accomplishing its purpose of providing sufficient water to meet the Region's current and future needs.

Similarly, the Region's economic, social, and demographic trends provide valuable insight to water management and planning. This sub-chapter of the RUWMP addresses these factors to provide a supportable basis for forecasting future water use.

2.1.6.1 Current Population and Historical Trends

The Mojave Region has undergone a dramatic demographic transformation over the past century. In the early 20th century, the Region was sparsely populated, with an economy anchored by agriculture and the railroads, supporting only modest communities in Barstow and the Victor Valley. Following World War II, the Region began developing as Southern California's suburban boom began pushing development eastward from Los Angeles into the Inland Empire. However, it was the housing affordability crisis in coastal California during the 1980s and 1990s that truly ignited the region's expansion, as middle-class families sought more affordable housing opportunities. Relatively affordable housing continued to drive growth through the early 2000s, as the City of Victorville and neighboring communities in the Victor Valley entered a period of explosive residential growth, with tens of thousands of new residential homes constructed across former scrubland. This rapid expansion, however, came with significant challenges, including long commutes to employment centers, infrastructure strain, and acute vulnerability during the 2008 Housing Crisis.

The Region slowly recovered following the 2008 housing crisis, fueled by a booming logistics and warehouse industry and a rebounding real estate market. Much of this growth has been concentrated along the Interstate 15 corridor as fulfillment centers and warehouse operations locate themselves near highways and the railroads. Another notable incident was the COVID-19 pandemic that brought an unexpected tailwind to the Planning Area as remote work flexibility and record low interest rates allowed more households to acquire affordable housing in the High Desert. Taken together, the Planning Area's growth has stabilized in recent years, with population and sprawl tempered by water conservation and growth limitations.

In terms of population, the estimated population of the Region in 2025 was 586,000. This accounts for 26% of the total population San Bernardino County and a 19.6% increase from MWA's 2020 UWMP population for the Region of just over 490,000.

This is a significant increase from the turn of the 21st Century when the Region only accounted for 16% of the County's entire population. There was a sizable migration into the

Region's incorporated cities between 2000 and 2010; their annual average growth rate outpacing the overall County rate of 1.9%. Between 2011 and 2019, that growth rate slowed to 1.1% for Adelanto and 1.0% for Victorville, still outpacing the 0.8% rate for the County. **Table 2-3** provides a representation of the Region's population over the past several decades.

TABLE 2-3: HISTORICAL POPULATION[7]

1990	2000	2010	2020	2025
266,232	321,264	453,649	507,000	586,000

2.1.6.2 Projected Population

As part of its 2020 Urban Water Management Plan (UWMP) development, MWA commissioned a population forecast by the Center for Economic Forecasting and Development at the University of California, Riverside, which was completed in 2020 (UCR Study or Beacon Economics Study). The population forecast provided population estimates for the entire Mojave Region, organized in multiple ways, as estimates for the large urban water retail suppliers, incorporated cities, and adjudicated subareas within the MWA service area. The following sections detail the population projections built from the UCR Study and subsequently used to estimate water use within the expansive Mojave Region.

Methodology

The UCR Study estimated that the Region's population would increase by 39% over the next 35 years, surpassing San Bernardino County's projected 21% increase as well as the State's 13% increase for the same period – resulting in a population increase of about 200,000 people by 2065.[8] Absent an updated UCR Study but given the release of 2020 Census data subsequent to the UCR Study's completion, a review and update to the UCR Study was warranted to allow updated forecasts for this RUWMP. An update to the UCR Study and comparison with Southern California Association of Governments (SCAG) data was undertaken as follows:

- **2020 Census Data Update** – The UCR Study's 2020 incorporated city population totals were compared to the subsequently available 2020 Census values, organized for the same incorporated city areas. This comparison allowed for differences between the two datasets to be captured and ultimately resulted in the derivation of refined population projections for the large urban water retail suppliers and the remaining

[7] The 2020 and 2025 population values for the Mojave Region reflects the refined UCR Study projections described in the later portions of this chapter.
[8] The UCR Study projected the Region's population to increase by approximately 205,284 people by 2065. Note: this estimation was derived prior to the release of 2020 Census population data.

portion of the Region to reflect actual 2020 populations. This update is referred to as the *Adjusted UCR Study*.

- **Alternative Data Comparison** – The original UCR Study values as well as Adjusted UCR Study values were compared with projections from the SCAG. This comparison focused on assessing whether the magnitude of projected population growth within the Region by the Adjusted UCR Study was adequately characterized.

2020 Census Data Comparison

As depicted in **Table 2-4**, the 2020 Census population totals for five of the six incorporated cities within the Mojave Region were greater than their respective UCR Study population totals, with differences ranging from 2% to 6%. These differences were used to adjust the UCR Study population projections of the six large urban water suppliers associated with these particular incorporated cities (**Table 2-5**). The remaining six large urban water suppliers that do not serve an incorporated city were not adjusted as part of this validation since Census data is not available at the water retailer service area boundary level. Furthermore, the six large urban water retail suppliers associated with this adjustment collectively represent 96% of the total projected growth between 2020 – 2065.[9]

Lastly, the refined population projections presented in Table 2-5 were used to adjust the UCR Study population projection of the entire Region, as depicted in **Table 2-6**.

TABLE 2-4: COMPARISON OF INCORPORATED CITY POPULATION DATA

Incorporated City	2020 UCR	2020 Census	Percent Difference
Adelanto	35,800	38,000	6%
Apple Valley	74,200	75,800	2%
Barstow	24,200	25,400	5%
Hesperia	97,800	99,800	2%
Victorville	127,700	134,800	6%
Yucca Valley	22,200	21,700	-2%

[9] The projected growth rate referenced is from the un-adjusted UCR Study population projections.

TABLE 2-5: URBAN WATER SUPPLIER POPULATION PROJECTIONS – UCR STUDY AND ADJUSTED UCR STUDY[10]

Large Urban Water Retail Supplier	UCR Study		Adjusted UCR Study	
	2020	2065	2020	2065
City of Adelanto	35,800	52,100	38,000	55,200
Liberty Utilities - Apple Valley Water Company	62,100	80,900	63,300	82,500
Golden State Water Company - Barstow System	32,200	35,100	33,800	36,900
Hesperia Water District	97,400	151,400	99,300	154,500
Victorville Water District	134,300	228,100	142,300	241,700
Hi-Desert Water District	25,700	31,000	25,100	30,300
Bighorn-Desert View Water Agency	4,100	4,600	N/A	N/A
County Service Area 64	11,200	13,700	N/A	N/A
County Service Area 70 J	10,200	11,500	N/A	N/A
Helendale CSD	6,600	7,300	N/A	N/A
Joshua Basin Water District	10,200	11,300	N/A	N/A
Phelan Piñon Hills CSD	20,800	23,000	N/A	N/A

TABLE 2-6: MOJAVE REGION POPULATION PROJECTIONS – UCR STUDY AND ADJUSTED UCR STUDY

UCR Study		Adjusted UCR Study	
2020	2065	2020	2065
492,000	698,000	507,000	722,000

[10] The following six water districts which do not supply an incorporated city did not have their population projections adjusted as part of the population validation: Bighorn-Desert View Water Agency, County Service Area 64, County Service Area 70 J, Helendale CSD, Joshua Basin Water District, and Phelan Piñon Hills CSD.

Comparison to SCAG

The Adjusted UCR Study population projections were compared to population projections found in the 2024 SCAG SoCal Connect Report.[11] The purpose of this comparison was to ensure that the magnitude of the Adjusted UCR Study projected population growth as used for this RWUMP was within a reasonable range of SCAG's projections, which used a different analysis and forecast method than the UCR Study. As depicted in **Table 2-7**, the SCAG provided a population projection specific to the Region through 2050.

TABLE 2-7: ADJUSTED UCR STUDY AND SCAG POPULATION PROJECTIONS

Mojave Region	2020	2050	2065
Adjusted UCR Study	507,000	673,000	722,000
SCAG	498,000	638,000	N/A

Results

The intent of the update and comparison was to provide confidence for a population projection critical to the water demand forecast method further described in *Chapter 4 – Water Use Characterization*. Population data is a key indicator used to understand per-capita demand and thus becomes the source for demand forecasts when more specific housing developments are less clear. For purposes of the RUWMP, the Adjusted UCR Study projections are used for each participating retail urban water supplier and for MWA, with the latter reflecting all the remaining small water suppliers and rural domestic users that are reliant on the water resources available to the Region. **Table 2-8** summarizes the population estimates for each participant.

[11] Link to the 2024 SoCal Connect Report: https://scag.ca.gov/connect-socal-2024-read-draft-plan. The SCAG SoCal Connect Report is updated every four years and utilizes 2020 Census data as an input for establishing its population projections.

TABLE 2-8: 2025 RUWMP POPULATION PROJECTIONS

Agency	2025	2030	2035	2040	2045	2050	2055	2060
City of Adelanto	44,588	45,913	47,239	48,565	49,890	51,216	52,542	53,867
County Service Area 64	11,691	12,099	12,390	12,646	12,884	13,103	13,304	13,490
County Service Area 70J	10,356	10,554	10,721	10,876	11,021	11,153	11,275	11,387
GSWC Barstow	35,947	37,744	39,542	43,137	46,731	54,209	57,861	61,513
Hesperia Water District	120,530	124,771	129,012	133,252	137,493	141,733	145,974	150,214
Hi-Desert Water Agency	27,139	27,538	27,938	28,338	28,737	29,137	29,537	29,937
Joshua Basin Water District	10,375	10,536	10,673	10,800	10,919	11,029	11,131	11,225
Liberty Utilities Apple Valley[12]	70,707	72,184	73,661	75,138	76,615	78,092	79,569	81,045
Phelon-Piñon Hills CSD	21,136	21,465	21,744	22,003	22,245	22,469	22,676	22,869
Victorville Water District	148,323	157,229	166,135	175,042	183,948	192,855	201,542	210,689
Mojave Water Agency[13]	85,602	84,485	83,152	79,907	76,230	68,100	64,002	59,422
Total Region	586,395	604,519	622,207	639,704	656,713	673,095	689,412	705,659

2.1.7 Land Use, Economy, and Demographics

Land use in the Mojave Region is undergoing a fundamental shift from its historical agricultural roots toward rapid urbanization and industrial expansion. The region's once thriving agricultural sector has declined as developmental pressures and geographic

[12] Projected population estimates for the City of Victorville presented in this table were further refined by the City using the methodology described in its retail-chapter.

[13] The Mojave Water Agency population shown in this table represents the portion of the Mojave Region located outside the service areas of the participating urban water retail suppliers. The projected decline reflects the assumption that future population growth will be increasingly served within the urban water retail supplier service area, rather than by areas represented under MWA's wholesale population category.

proximity to Southern California have transformed the High Desert into a major commuter community and logistics hub. Broad land use trends reflect a mix of continued suburban growth, logistics and industrial expansion, and large-scale renewable energy development.

Incorporated communities such as Hesperia, Victorville, Apple Valley, and Adelanto have seen ongoing residential development, particularly single-family residential housing, driven by relatively affordable housing. At the same time, the Interstate 15 corridor has attracted significant warehouse, distribution, and manufacturing projects due to regional freight movement between Southern California and the Inland Empire, reinforcing the High Desert's role as a logistics hub. In outlying areas, land use has increasingly shifted toward utility-scale solar energy and related infrastructure, supported by state renewable energy policies and the availability of large tracts of land. However, growth is occurring alongside planning efforts tied to groundwater sustainability in the Mojave River Basin, which are influencing development patterns, water supply planning, and the pace of new projects, particularly in communities that rely heavily on groundwater in overstressed portions of the Region's many groundwater subbasins.

This transition is fueled by the Region's relatively affordable housing and its strategic location along major interstate and rail corridors, leading to a projected 40% population increase over the next four decades that continues to transform the High Desert from rural to urban. Specific land use and demographic trends are discussed in each individual retailer's chapter. This sub-chapter provides a region-wide outlook on its land use and demographic trends over the last several decades to present-day.

2.1.7.1 Current and Projected Land Use

Anchored by the rapidly growing incorporated communities of Victorville, Hesperia, and Apple Valley, the region continues to attract large master-planned residential developments and millions of square feet in new industrial and logistics facilities, fueled by affordable land and strategic infrastructure access. Utility-scale solar energy projects are simultaneously converting vast stretches of desert land to solar farms. The planned high-speed Brightline West rail station in Apple Valley is expected to further accelerate transit-oriented growth in the region. Underlying all these planned growth trends is a critical constraint: the basin's groundwater supply.

Trends in future land use will be largely influenced by urbanization as more of the High Desert landscape is transformed into residential developments. Most residential development will be concentrated in the communities in the surrounding Victor Valley at the southern end of the Region, and in and around the City of Barstow. These two growth areas are also the region's largest economic engines, where the region's burgeoning logistics and transportation industries are expanding. In addition to these broader trends, several large-scale development projects have been identified that are expected to further accelerate growth within the Region. As shown in **Table 2-9**, these projects are anticipated to significantly

influence population growth, job creation, and land use patterns, and have been incorporated into the population and water demand projections that underpin this RUWMP.

TABLE 2-9: KNOWN LAND USE PLANS IN THE MOJAVE REGION

Existing or Planned Project	Project Area (acres)	Residential Housing Units
BNSF Barstow International Gateway	4,500	N/A
Brightline West Station	300	N/A
Rancho Lucerne Planned Development	1,376	4,257
Silverwood Specific Plan	9,336	15,663

2.1.7.2 Economic Trends and Other Social and Demographic Factors

California's High Desert region, anchored by the Cities of Victorville and Barstow, is one of the state's most consequential emerging growth corridors. Since the end of the Great Recession, it has seen some of the strongest employment growth in California, with the third largest workforce of the state's metropolitan areas. Straddling the convergence of Interstate 15 and Interstate 40, the region sits at a geographic crossroads between Greater Los Angeles, the Las Vegas metro, and the broader American Southwest. What was once characterized primarily as a pass-through zone, famous for Route 66, is now experiencing a structural economic transformation driven by a booming demand for logistics and warehouses, affordable housing, and multiple landmark infrastructure projects that stand to reshape the Region's role in the national supply chain and passenger mobility network.

The most consequential economic development in the region is the emergence of large-scale logistics and warehousing infrastructure, driven by the exhaustion of industrial land in the traditional Inland Empire to the south and the availability of vast, inexpensive parcels in the High Desert. Over the last four years, approximately 4.5 million square feet of new industrial construction has been completed in the High Desert. Major investors include Prologis, Clarion, and LINK, with significant leasing activity from Amazon and Home Depot. The City of Victorville recently welcomed a 1.3-million square foot Goodyear Tire distribution center and an Amazon Fulfillment Center at the Southern California Logistics Airport (SCLA), with additional industrial projects totaling over 1.35 million square feet planned along Mojave Drive. The SCLA is already home to Boeing and General Atomics, giving it a dual identity as both an aerospace hub and an e-commerce distribution node.

Railroads have long played a foundational role in the economic development of the High Desert. The Cities of Barstow and San Bernardino first emerged as railroad hubs for local farmers to ship agricultural goods to market and as stopovers for trains heading into the Los

Angeles Basin. Recently, railroads have re-emerged as a transformative force in the region's economy with the advent of the BNSF Barstow International Gateway (BIG) and the Brightline West high-speed rail line. BNSF Railway has announced plans to invest more than $1.5 billion in a master-planned rail facility designed to revolutionize cargo movement from Southern California ports. BIG will integrate a rail yard, intermodal facility, and warehouses to transfer containers directly from ships to rail for inland transit. It will directly connect the Ports of Los Angeles and Long Beach to Barstow via rail, allowing for faster transit of goods to the rest of the US. By moving containers by rail rather than trucks, BIG aims to reduce freeway traffic and cut emissions while creating 20,000+ jobs. Upon completion, BIG will be the largest intermodal transportation hub in North America – twice as large as any existing facility.

Passenger rail in the High Desert region anticipates a major tailwind from Brightline West. The privately financed 218-mile high-speed passenger rail line will connect Las Vegas to Rancho Cucamonga, with two planned railway station stops in Apple Valley and Hesperia. The project broke ground in 2024 and is projected to begin passenger service by 2028, with construction expected to generate more than 10,000 jobs and 1,000 permanent jobs. The Victor Valley station in Apple Valley is designed to accommodate commuter rail use, allowing High Desert residents to access employment in the Inland Empire and Los Angeles Basin at lower housing costs – a pattern that could accelerate population growth and transit-oriented development around the station.

Affordable housing is a critical driver of economic growth in the High Desert. As housing costs in coastal Southern California markets continue to rise, the High Desert has emerged as a population residential alternative for moderate household incomes. This popularity and proximity have spawned a large commuter population that works in nearby Los Angeles and Orange Counties. The number of residents commuting to jobs in neighboring counties is expected to increase in the near-term as housing prices continue to rise and supply remains constrained. Despite benefiting from population growth linked to affordable housing and commuters, the High Desert faces several structural economic and fiscal risks. With such a large proportion of the population commuting to coastal job centers in Los Angeles and Orange County, downturns in those economies can quickly ripple inland, reducing household income and housing stability. Moreover, dependence on commuters can distort land use and housing patterns. Effectively a "bedroom community," where housing growth outpaces job creation, this imbalance can make it harder to attract employers seeking proximity to locally available workforce. However, the rise in remote workers and multiple major infrastructure developments have the potential to disrupt the High Desert's legacy status as a bedroom community into a burgeoning employment hub.

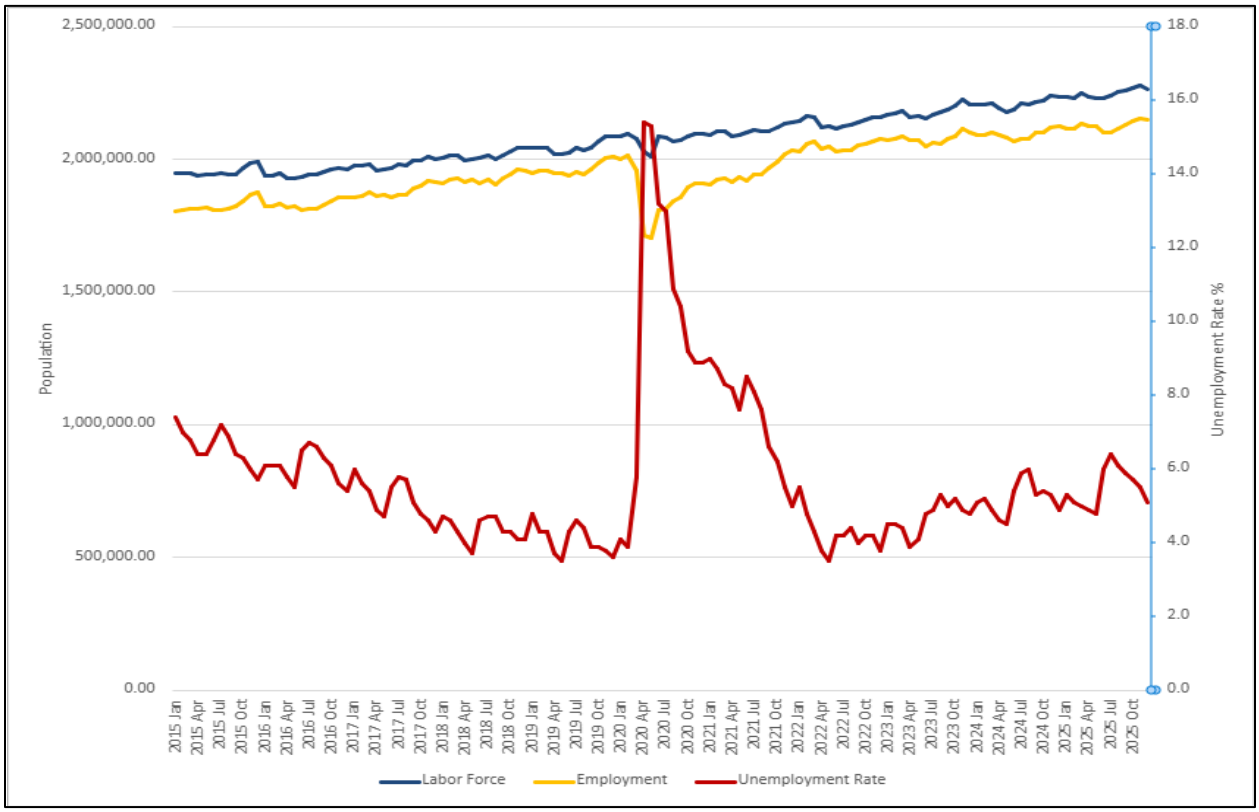
The High Desert is at an inflection point. Victorville has already become a significant logistics and population center, the fastest-growing large city in inland Southern California, though its economic gains are concentrated in lower-wage warehouse and distribution work rather than higher-value sectors that would diversify and deepen its tax base. Generally, the Region has experienced strong job growth and sectoral restructuring around the logistics industry, shaped by both regional dynamics in the High Desert and broader economic shocks such as

the COVID-19 pandemic. Over the past decade, the employment growth rate for non-farm labor in the San Bernardino County outpaced all other regions in Southern California and sustained less economic impact from the Covid-19 recession than Los Angeles, Orange, or San Diego Counties (**Figure 2-13**). Logistics, driven by the rise of e-commerce and the region's transportation infrastructure, has been the dominant sector, growing by approximately 80% over the decade, while healthcare and education have grown by roughly 30-40%, reflecting population growth and increasing service demand. These trends highlight a broader structural shift toward a service and distribution-oriented economy, with logistics serving as the region's primary economic engine.

At the same time, the labor market has shown improving stability compared to earlier decades. Unemployment rates, which were historically elevated in the Inland Empire, declined significantly following the post-Great Recession recovery and remained relatively moderate in the late 2010s. Although unemployment spiked sharply during the pandemic, reaching nearly 10% in 2020, the county experienced a strong recovery, with rates falling back to around 5% by 2024–2025, near statewide averages. This indicates a resilient labor market capable of rebounding from economic disruptions. However, more recent data suggest emerging signs of slowing growth and sectoral unevenness. Between 2022 and 2023, some key sectors, including logistics, manufacturing, and professional services, experienced modest employment declines, while healthcare and education continued to expand. This divergence reflects both post-pandemic normalization, particularly in goods movement, and broader economic headwinds affecting higher-wage industries.

Another defining feature of the past decade is the region's continued reliance on lower-wage and goods-moving sectors, even as wages have begun to rise across industries. While salary growth has been notable, especially in professional and healthcare fields, job concentration in logistics and warehousing has reinforced concerns about job quality and economic diversification. Overall, the High Desert has grown significantly and become more diversified over the past decade. Between the region's two largest cities, Victorville and Barstow, the High Desert is poised to leverage its emerging logistics industry and affordable housing stock to become a prosperous regional economy with its own identity.

FIGURE 2-13: SAN BERNARDINO COUNTY EMPLOYMENT DATA 2015-2025



2.1.8 Summary

The Mojave Region is one of the fastest growing regions in California. As discussed, relatively affordable housing and strategic infrastructure corridor access continue to accelerate population and economic growth. However, limited water supplies, further exacerbated by mounting hydrological and regulatory limitations, continue to adversely constrain the Region. Adequate water supplies and long-term resource management are paramount to the region's outlook. This 2025 RUWMP helps MWA and the large urban water retail suppliers coordinate and collectively plan to meet an optimistic future condition.

Chapter 3.0 Regional Water Supply Characterization

This chapter describes the Mojave Region's water supply sources, which include imported surface water supplies managed by the Mojave Water Agency, and local surface and native groundwater supplies managed collectively by MWA, retail water suppliers, and designated watermasters in the adjudicated areas of the Region.

The more specific characterization of water available for import is presented in *Chapter 6 - Mojave Water Agency*, while the detailed characterization of retailer-specific groundwater is discussed within each urban water retail specific chapter (*Chapters 7* through *16*).

The available regional supplies discussed in this chapter reflect a summary of the more specific MWA and retailer supply conditions and are organized into the three Subregions described in *Chapter 2 – The Mojave Region*. Organizing supplies for each specific subregion facilitates the integration with subregional demands (*Chapter 4 – Water Use Characterization*), providing for supply reliability analysis to be presented by subregion (*Chapter 5 – Regional Water Service Reliability*). This subregional approach allows the entire Mojave Region to be viewed in a more aggregated form, while still reflecting important geographic, hydrologic and management circumstances that are lost if the analysis were completed for just the entire Mojave Region. Each of the retailer-specific chapters (*Chapters 7* through *16*) reflect each retailer's reliance on the managed groundwater that results from two primary categories: (1) annually available sources including State Water Project (SWP) imports delivered through six turnouts on the East Branch of the California Aqueduct and subsequently recharged throughout the region, and (2) groundwater supplies comprised of natural recharge from the Mojave River and San Bernardino Mountains, return flows from water use, and imported wastewater from mountain communities. Recycled water is an important third component that is being deployed within the Mojave Region at the urban water retail supplier level and will continue to expand as an important supply source into the future.

3.1.1 Mojave Region Water Supply Sources

As described in *Chapter 2 – The Mojave Region,* the Mojave Region is situated in the High Desert of eastern San Bernardino County in a mostly closed topographic basin where water

supply is derived almost entirely from pumped groundwater from the various basins, subbasins and aquifers within its service area. Beyond the minimal precipitation in the Region, natural recharge of the aquifers occurs primarily from flows originating in the San Bernardino Mountains to the south that infiltrate into the basin-fill sediments along the mountain front. The Mojave River also contributes to groundwater recharge through streambed infiltration during wet periods and after significant mountain snowmelt that flows to the Mojave River and its tributaries. Augmentation of the native groundwater is dependent on State Water Project imports and transfers and exchanges conveyed to the Region. Additional local groundwater recharge occurs from irrigation return flows, wastewater imports, and recycled water.

The system is essentially a large underground reservoir where water moves slowly through interconnected aquifers creating the vital water supply for the region. For purposes of this RUWMP, water supplies available to the Region fall into the following major categories, each of which is described in detail throughout this chapter:

- Groundwater
- Imported Water
- Return Flows
- Treated Wastewater and Recycled Water
- Water Transfers and Exchanges
- Planned Water Suppliers

3.1.1.1 Groundwater

Groundwater is the principal source of municipal water supply in the Mojave Region. All retail water suppliers operating within the Region rely on managed groundwater – a blend of natural inflows and recharged imported water – to meet current and projected demand. As noted above, the MWA supports groundwater management in the Region by importing water supplies that are used to replenish groundwater extractions and help manage groundwater basin health.

Natural inflows into the groundwater aquifers are fed through direct percolated precipitation across the basin area and infiltration and storm runoff into stream systems during wet weather. The primary source of natural inflow is infiltration of stormflow runoff water from the San Bernardino Mountains into the Mojave River. The Mojave River is formed by the confluence of the West Fork Mojave River and Deep Creek, both originating in the northwestern San Bernardino Mountains. This mountain-front recharge provides the majority of natural groundwater replenishment to the basin and enters the system in the Alto subarea.

During Water Year 2024, natural water supplies exceeded historical averages, with total flow at the Mojave River Forks reaching 102,389 acre-feet. After accounting for 14,825 acre-feet of

SWP water that MWA imported to the West Fork Mojave River system, natural inflow was measured at 87,564 acre-feet compared to a Base Period average of 65,540 acre-feet. Despite this above-average year, the Region continues to experience long-term drought impacts, with native water supply conditions over the past 13 years averaging only 69.4% of the historical baseline (1931-1990).

As mentioned in *Chapter 2,* the Mojave Region overlies all or a portion of 36 groundwater basins and subbasins, as presented in **Figure 2-5**. Those situated along the Mojave River and adjacent areas are collectively referred to as the Mojave River Groundwater Basin, otherwise known as the Mojave Basin Area. The remaining basins in the southeastern portion of the Region are generally designated as the Morongo Basin/Johnson Valley Area (Morongo Area), with the exception of the Lucerne Valley, which is treated as a distinct management unit. MWA characterizes a long-term average of the natural supplies for the region, including both the Mojave Basin area and the Morongo Basin Area, as 57,349 acre-feet per year. This value is derived from previous assessments of natural supply available and groundwater basin conditions.

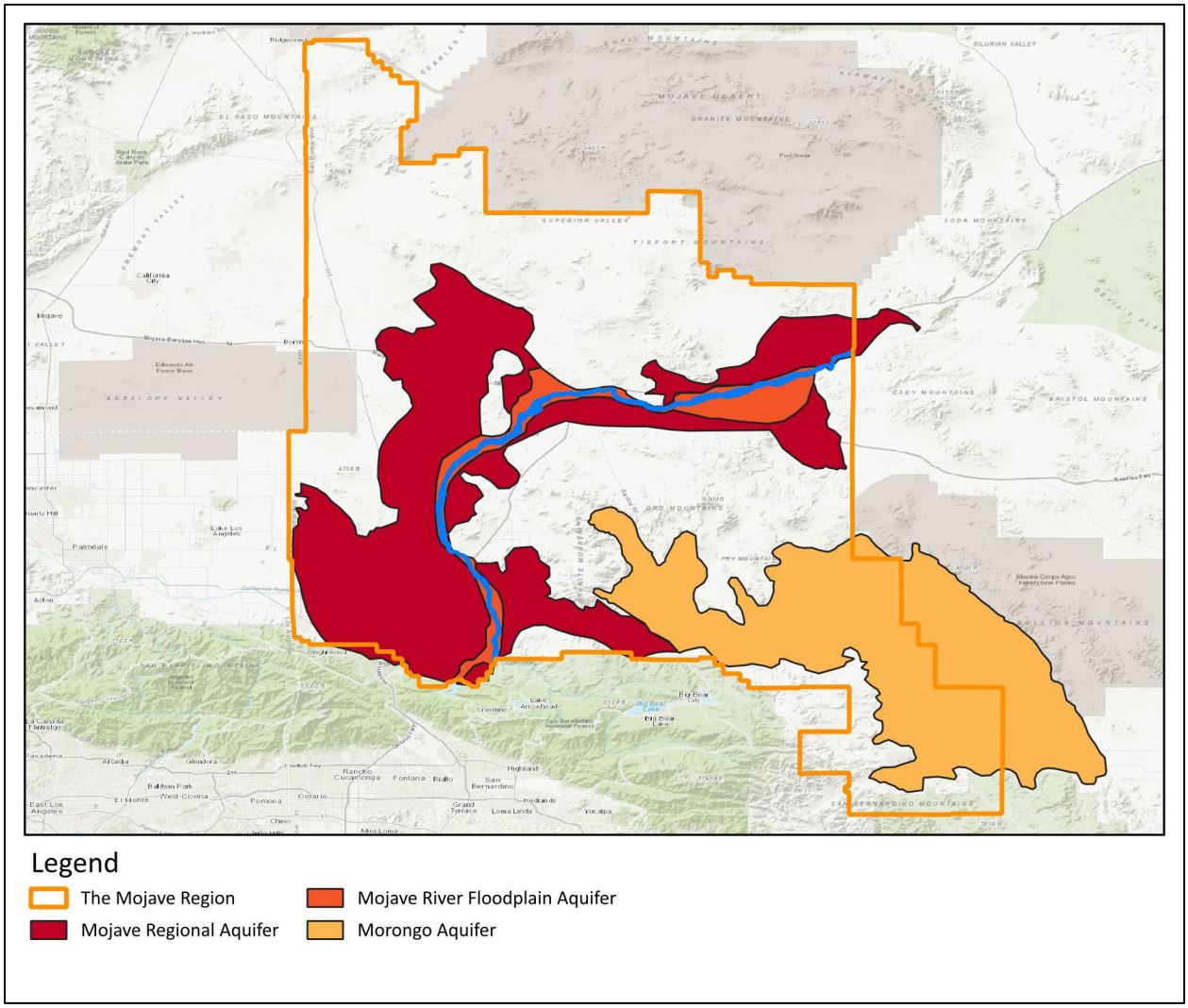
Most groundwater production in the Region relies on three primary aquifers: the Floodplain Aquifer, Regional Aquifer, and Morongo Aquifer (**Figure 3-1**). Each aquifer system has distinct hydrogeologic characteristics and recharge mechanisms. The Floodplain Aquifer is composed of sand and gravel weathered from metamorphic and granitic rocks of the San Gabriel and the San Bernardino Mountains, respectively, and deposited in a fluvial environment. Recharge occurs primarily through direct infiltration of Mojave River surface flows during the wet season, with the greatest recharge rates occurring near the mountain front where surface flows are most frequent and vigorous.

The Regional Aquifer underlies and surrounds the Floodplain Aquifer, comprising interconnected alluvial fan and basin fill deposits. Its primary recharge source is groundwater migrating laterally from the Floodplain Aquifer. Additional recharge is contributed by runoff from the higher elevations of the San Gabriel and San Bernardino Mountains, supplemented by smaller runoff volumes from local ephemeral streams and desert washes.

The Morongo Basin Area encompasses several interconnected basins in southern San Bernardino County. It is a vital water source, managed by the MWA and the local retail water suppliers, for the benefit of communities in the eastern portion of the Region. Groundwater supplies in the Morongo Area are supplemented by imported water conveyed through the 71-mile Morongo Basin Pipeline (MBP) that delivers water from the SWP's California Aqueduct to recharge basins in the Morongo Basin Area. The MBP serves a dual purpose: reducing overdraft in the Warren Valley Basin and Ames Valley Basin, and supporting groundwater

levels in the Joshua Tree Basin (see *Chapter 2 – The Mojave Region*).[14] Groundwater flow in the Morongo Area is complex but is generally from south to north in Johnson Valley and from west to east-northeast elsewhere in the area. Natural recharge originates primarily from the mountains on the southern and western boundaries of the Morongo Area, resulting in groundwater flow gradients to the north, east, and south adjacent to the boundaries, before turning to the east-northeast. Groundwater flow is complicated locally by pumping, faulting, shallow bedrock, and enhanced recharge basins. For example, in the vicinity of the developed area of Yucca Valley, groundwater flow is controlled to some extent by local recharge basins.

FIGURE 3-1: FLOODPLAIN AND OTHER REGIONAL AQUIFERS



[14] The following agencies jointly financed the MBP and currently rely on it for portions of their water supply: Hi-Desert Water District, Joshua Basin Water District, Bighorn-Desert View Water Agency, and CSA 70 W-4 Pioneer Town

3.1.1.2 Groundwater in the MBA Judgment Area

The MBA Judgment (see *Chapter 2 – The Mojave Region*) established a Production Safe Yield (PSY) system that defines sustainable groundwater pumping levels for each Subarea subject to the Judgment. Specifically, PSY is defined as the maximum production level that can be maintained over a sequence of years representative of long-term average natural water supply conditions, accounting for natural outflow, and under established patterns of water production, applied water, return flows, and consumptive use, while ensuring no long-term net reduction in groundwater storage. The MBA Judgment also assigned Base Annual Production (BAP) rights to each producer using 10 acre-feet or more, based on historical production during the period 1986-1990. Parties to the MBA Judgment are assigned a variable Free Production Allowance (FPA), which is a percentage of the BAP set annually by the Court for each Subarea based on the recommendation of the Watermaster. The BAP is reduced or "ramped-down" over time until FPA comes within 5% of the Judgment-defined PSY. The FPA changes over time as the MBA Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and PSY.

The FPA is set as follows for each Subarea for water year 2025-2026:[15]

- Alto Subarea – 50.4% of BAP
- Oeste Subarea – 45% of BAP
- Este Subarea – 45% of BAP
- Centro Subarea – 56% of BAP
- Baja Subarea – 19.5% of BAP

Any Producer that pumps more than their FPA must purchase Replacement Water from the Watermaster equal to the amount of production in excess of their total available FPA or transfer unused FPA from another party within their Subarea. Funds collected for Replacement Water are then used by MWA for purchase of SWP supplies and recharged into the Subarea they were produced from. In addition to purchasing water to offset the Replacement Water Obligations under the Judgment, MWA purchases and stores water in the Mojave Basin Area for future obligations (see *Chapter 6 – Mojave Water Agency*).

In *Chapters 7* through *16*, the projected FPA for each urban water retail supplier participating in the 2025 RUWMP, consistent with the UWMPA requirements, is provided.[16] Using the Subregions described in Chapter 2 – The Mojave Region, the summary of available native groundwater is presented in **Table 3-1**. These totals represent the native groundwater (i.e. FPA) in Subregions 1 and 2 and are inclusive of FPA available to the urban water retail

[15] Water Year 2024-2025 Mojave Basin Area Watermaster Annual Report, June 2026

[16] For instance, see values for Hesperia Water District in Table 11-8 and Table 11-9 in *Chapter 11 – Hesperia Water District*.

suppliers participating in the 2025 RUWMP as well as all other groundwater users within each subregion outside of a participating retailer's service area.

TABLE 3-1: PROJECTED NATIVE GROUNDWATER FOR EACH SUBREGION THROUGH 2050 (AFY)

Projected Native Groundwater For All Year Types	2030	2035	2040	2045	2050
Subregion 1	70,389	70,389	70,389	70,389	70,389
Subregion 2	39,602	39,602	39,602	39,602	39,602

3.1.1.3 Groundwater in the Morongo Subarea

As described in *Chapter 2 – The Mojave Region*, the Morongo Subarea encompasses both the Ames Valley Judgment and the Warren Valley Judgment. While these Judgments function differently than the MBA Judgment, they reflect conditions where native groundwater use exceeded natural recharge. Unlike the MBA Judgment Area, the Morongo Subarea does not have a single regional framework that establishes a quantified native groundwater production allowance appliable across all basins and users. The Morongo Subarea is composed of multiple groundwater basins with varying levels of development, monitoring, adjudication, and management. As a result, the amount of native groundwater reasonably available across the entire Morongo Subarea is not conclusively quantified for purposes of this RUWMP.

3.1.1.4 Imported Water

MWA relies on a diverse portfolio of imported surface water supplies. Imported water is delivered to the Mojave Region via the SWP California Aqueduct. As one of 29 SWP Contractors, MWA's primary imported supply source is its Annual Table A Allocation, followed by supplementary supplies obtained by various contractual agreements, transfers, and exchanges. Upon delivery of imported water, by the East Branch of the California Aqueduct, to the Agency's service area, MWA delivers this blend of imported water to various recharge sites throughout its service area. Fundamentally, MWA's mission is to provide the region with imported water to supplement local groundwater supplies and recharge local groundwater basins. A summary of the MWA's imported water supplies is provided in **Table 3-2**. Additional details on the SWP supplies and forecast reliability are detailed in *Chapter 6 – Mojave Water Agency*.

TABLE 3-2: MWA'S PROJECTED IMPORTED WATER SUPPLIES (AFY)

Total Supply		Percent Allocation	2030	2035	2040	2045	2050
Normal		54%	48,492	48,492	48,492	48,492	48,492
Single Dry Year		5%	4,490	4,490	4,490	4,490	4,490
Multi-Year Drought	Year 1	35%	31,430	31,430	31,430	31,430	31,430
	Year 2	5%	4,490	4,490	4,490	4,490	4,490
	Year 3	5%	4,490	4,490	4,490	4,490	4,490
	Year 4	20%	17,960	17,960	17,960	17,960	17,960
	Year 5	35%	31,430	31,430	31,430	31,430	31,430

3.1.1.5 Return Flows

When water supplies are extracted from the groundwater basins, a portion of the water pumped is consumed and another portion of the extracted water is returned to the groundwater aquifer and becomes part of the available water supply. This "return flow" is an important component of the Region's managed groundwater supply. For example, nearly all indoor water use is assumed to be returned to the basin either by percolation from septic tanks or treated wastewater effluent produced by municipal wastewater facilities. The MBA Watermaster Report calculates consumptive use for each producer in each Subarea of the MBA Judgment. The calculation is based on production amount, type of use, and an evaluation of processes that consume water.

Return flows shown in **Table 3-3** are calculated as a percentage of the previous years' water production for each water use category, as defined by the MBA Watermaster. Return flow factors, on a regional basis, average approximately 40% of the groundwater production, although this amount can vary significantly by Subarea and on an annual basis. Importantly, as water extractions increase in the Region, the return flows will also increase over time. However, as system efficiencies improve, return flows may begin to slowly decline. Nevertheless, for purposes of this 2025 RUWMP, return flows are assumed to be a percentage of the total Water Year Verified Production for each Subarea for the most recent reported Water Year.[17] This value is then held constant in all future year types and all years through 2050. A return flow is not calculated for the Morongo Subarea (Subregion 3).

[17] Water Year 2024-2025 Watermaster Report, June 2026, Verified Projection by Subarea, Appendix B, p.15 of 16. This methodology is consistent with the investigation of consumptive use by the MBA Watermaster.

While this is a recognized source of water affecting determinations of available FPA within the MBA Judgment Subareas, for purposes of this RUWMP, this supply source is ignored. This is a conservative assumption that allows this value to be refined while the interaction among FPA, Return Flows, and Managed Stored Groundwater continues to be evaluated to avoid inadvertently double-counting supplies in the Region's overall water reliability assessment.

TABLE 3-3: SUMMARY OF RETURN FLOW FOR SUBREGION 1 AND SUBREGION 2 THROUGH 2050 (AFY)

Subregion[18]	Verified Production	Estimated Return Flow
Subregion 1	78,278	31,300
Subregion 2	23,605	9,500

3.1.1.6 Treated Wastewater and Recycled Water

The Region's self-sufficiency includes development of recycled and reusable water supplies combined with a region-wide emphasis on water use efficiency. Additionally, the Region also accepts treated wastewater imported into certain subareas.

Treated wastewater effluent is imported from three wastewater entities outside the Region. Specifically, treated wastewater from the Lake Arrowhead Community Services District is imported into the Alto Subarea, while effluent from Big Bear Area Regional Wastewater Agency is imported to the Este Subarea. Wastewater from Crestline Sanitation District is also imported but already accounted for in the natural groundwater recharge. This water is considered indirect potable reuse. The MBA Watermaster recognizes these imports in its annual reporting, recognizing almost 3,400 acre-feet in the Water Year 2024-2025 Report. However, over half of this came from the Big Bear facility, which is currently implementing a local recycled water program that will result in this source rarely being available to the Region. For the purposes of this 2025 RUWMP, the recycled water is only assumed available to Region 1 and will be limited to approximately 1,200 acre-feet annually (continuing from Lake Arrowhead CSD and Crestline CSD).

The Region also relies upon and anticipates increasing the local recycled water portfolio to provide both direct use, direct recharge, and indirect aquifer replenishment within the Region, particularly in Subregion 1, where the Region's largest population base drives wastewater generation and, in turn, recycled water supply availability.

The primary recycled water source is the Victor Valley Wastewater Reclamation Authority (VVWRA) with recycled water production from its Regional Water Reclamation Plant (Regional

[18] As discussed in Chapter 2 – The Mojave Region, Subregion 1 includes the Alto, Este, and Oeste Subareas while Subregion 2 includes the Centro and Baja Subareas.

WRP) and two additional Subregional WRPs, one in Hesperia, and one in Apple Valley. There are currently five permitted recycled water users in the service area: American Organics, the City of Victorville, High Desert Power Plant, the City of Hesperia, and the Town of Apple Valley.[19]

The VVWRA also contributes recycled water through wastewater effluent discharges to the Mojave River to replenish the downstream aquifer and to support the riparian corridor that lies within the Alto Transition zone. In the Water Year 2024-2025 Watermaster Report, Victorville and VVWRA contributed approximately 14,000 acre-feet of recharge to the Mojave River. While only permitted to discharge 14 million gallons per day (MGD)[20], the main Victorville facility is designed to produce up to 22 MGD of water and is capable of discharging up to 18 MGD. The Apple Valley[21] and Hesperia[22] facilities are designed to be operational in phases, with Phase I having a capacity of 1 MGD, Phase II having a capacity of 2 MGD, and Phase III having a capacity of 4 MGD. Water from the main VVWRA facility is used to both provide flows in the Mojave River and recharge the aquifer as well as cooling in a nearby power plant. The Hesperia Subregional facility is used for irrigation at the Hesperia Golf Course and local area parks (see *Chapter 11 – Hesperia Water District*). The Apple Valley Subregional Facility at Brewster Park is expected to produce irrigation water for Brewster Park, the Civic Center and Apple Valley Golf Course among other locations.

Recycled water is subject to certain restrictions within the law, and localized use requires specific infrastructure investments. The recycled water facilities are governed by National Pollutant Discharge Elimination System (NPDES) permit restrictions. Additionally, the facilities are permitted only for the following beneficial uses: Municipal and Domestic Supply, Agricultural Supply, Industrial Service Supply, Freshwater Replenishment, and Aquaculture. Future recycled water projects will play a central role in enabling the Region to continue demonstrating reduced reliance on Delta imports.

For the purposes of this 2025 RUWMP, Subregion 1 will conservatively only represent the estimated recycled water volume that is available to Hesperia Water District and the City of Victorville, as further detailed in their individual retail chapters. **Table 3-4** presents projected recycled water supplies for Subregion 1 through 2050.

TABLE 3-4: RECYCLED WATER SUPPLIES FOR SUBREGION 1 THROUGH 2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	2,004	3,238	3,834	4,408	4,908

[19] VVWRA 2024 Annual Recycled Water Report, Table 2.
[20] https://www.vvwraca.gov/home/showpublisheddocument/194/637694937439730000
[21] https://www.vvwraca.gov/home/showpublisheddocument/200/637694940317370000
[22] https://www.vvwraca.gov/home/showpublisheddocument/204/637694942003170000

3.1.1.7 Water Transfers and Exchanges

As discussed in *Chapter 6 – Mojave Water Agency*, MWA engages in water transfers and exchanges involving its SWP assets and other SWP Contractors' SWP assets. Historically, MWA has both received and delivered water through these transfers and exchanges with various agencies throughout California. These transfers are essentially spot market transfers where short-term opportunities are identified and then actions taken for purchase and acquisition. These transfers help support management of MWA's and its retail agencies' water supply portfolios. Future MWA transfers and exchanges depend upon allocations available to MWA and other water purveyors and are not considered an available supply for purposes of this RUWMP.

3.1.1.8 Planned Water Supplies

Potential future water supply projects, supplementary to existing supplies, consist of the MWA's participation in Sites Reservoir, Delta Conveyance Project, and potential recharge projects. All of these focus on helping MWA improve the reliability and management of SWP supplies and are discussed in more detail in *Chapter 6 – Mojave Water Agency*.

3.1.2 Water Quality

Water quality is a critical consideration in the Mojave Region. Because local potable supplies are derived from blended groundwater sources, well locations, recharge activities associated with imported water, and other key system components are actively coordinated and managed among participating retailers and MWA.

3.1.2.1 Imported Water Quality

Generally, the imported surface water conveyed through the California Aqueduct and recharged throughout the Region is considered to be good quality. Many retailers rely on the imported supplies to help manage the quality of water delivered to customers, using the benefits of the imported water as a blending supply to the native groundwater. Water quality delivered to the Region is monitored by the DWR Division of Operations and Maintenance within the California Aqueduct. More details regarding the specific quality information are included in *Chapter 6 – Mojave Water Agency*.

3.1.2.2 Groundwater Quality

MWA has implemented a comprehensive groundwater monitoring program to improve understanding of both water quantity and quality across the Mojave Region's groundwater basins. In coordination with the United States Geological Survey (USGS), this program includes an 850-well monitoring network. Water levels from these wells are recorded on a regular basis and several of the wells are tested for water quality on a rotating sampling schedule.

Numerous studies dating back to the early 1900's have been conducted by various agencies to characterize groundwater quality in the Region and further the understanding of the Mojave River and Morongo Groundwater Basins. The most recent study was the Mojave Salt and Nutrient Management Plan completed in 2015.[23] Despite local groundwater quality degradation, these studies generally confirmed the suitability of groundwater for beneficial uses in the Region. Groundwater quality data, including intrinsic tracers, have been used to confirm sources of groundwater recharge and travel times along interpreted flow paths in the Floodplain and Regional aquifers. Investigations have also been conducted to identify the source and occurrence of key naturally occurring groundwater contaminants, including hexavalent chromium (Cr-VI) and arsenic, in the Mojave Desert region.

The impairment of groundwater from the perspective of its beneficial use as drinking water is determined by comparing concentrations of constituents of concern in the groundwater against drinking water maximum contaminant levels (MCLs) and agricultural water quality parameters needed for specific crops. Key groundwater constituents of concern in the Region include arsenic, nitrates, iron, manganese, Cr-VI, fluoride, and total dissolved solids (TDS). Some of these constituents are naturally occurring in desert environments while others are associated with human (anthropogenic) activities. Measurements exceeding drinking water standards have been found for some of these constituents within the Mojave River Basin and the Morongo Basin. If necessary, groundwater in these areas may require treatment prior to consumption.

MWA's Salt and Nutrient Management Plan (SNMP) provides an evaluation of potential groundwater quality issues that may result from sources of salts and nutrients. The SNMP addresses whether these constituents would unreasonably degrade groundwater quality and potentially decrease the beneficial uses of groundwater within the basin. For the MWA SNMP, TDS and nitrate were analyzed as appropriate indicator constituents of salts and nutrients.

Total salinity is commonly expressed in terms of TDS as milligrams per liter (mg/L). TDS concentrations in the groundwater are influenced by the chemistry of the aquifer and quality of water recharging the aquifer. TDS is not a health hazard at typical groundwater

[23] Relevant water quality studies are available at http://www.mojavewater.org/regional-studies.html. Hereafter "2015 Salt and Nutrient Plan").

concentrations but can be an aesthetic issue and can shorten the useful life of pipes and water-based appliances in homes and businesses. TDS monitoring data are widely available for source waters (both inflows and outflows) in the Region, and because TDS is a general indicator of total salinity, TDS is an appropriate indicator of salt loading. TDS concentrations generally increase in downgradient portions of the Mojave River Basin and along groundwater flow paths away from the primary recharge source in the basin, the Mojave River. Elevated TDS concentrations (greater than 1,000 mg/L) are generally associated with natural processes including mineralization and evaporation beneath dry lake beds. In the Morongo Basin, groundwater TDS concentrations generally increase along groundwater flow paths away from the southwestern margins of the basin where mountain-front recharge occurs.

Nitrate is a widespread contaminant in California groundwater. High levels of nitrate in groundwater are associated with agricultural activities, septic systems, confined animal facilities, landscape fertilization, and wastewater treatment facilities. Nitrate does occur naturally in groundwater – however, natural nitrate levels in groundwater are generally very low (typically less than about 10 mg/L as nitrate-NO3).

The volume-weighted average of existing TDS and nitrate-NO3 concentrations were calculated for each of the 22 analysis subregions. Results are summarized in **Table 3-5**. Average subregional TDS concentrations vary considerably, ranging from 153 mg/L to 1,716 mg/L across the Region. Average TDS concentrations are very low in the upgradient portions of the Mojave River Basin (less than 300 mg/L) and increase along the pathways along and away from the Mojave River due to natural processes (e.g., mineralization) and impacts from anthropogenic loading. Eight of the nine downgradient analysis subregions composing the Alto Transition Zone, Centro, and Baja Subareas have average TDS concentrations at or above 500 mg/L (Baja - Floodplain is the lone exception). In the Morongo Basin, average TDS concentrations are generally below the recommended secondary MCL for TDS of 500 mg/L. Exceptions include Lucerne Valley (north) (1,716 mg/L) and Johnson Valley (678 mg/L), where elevated TDS concentrations primarily reflect a high degree of mineralization and dry lakebed evaporation. Elevated TDS concentrations are naturally characteristic of dry lakes in arid desert environments.

Nitrate-NO3 concentrations are generally low across the Region. Average SNMP subregional concentrations are approximately 6.0 mg/L. Average nitrate-NO3 concentrations exceed 15 mg/L in Centro – Floodplain and Warren Valley. Additionally, nitrate-NO3 concentrations are slightly elevated (between 7.5 and 10 mg/L) in Centro – Regional (west), Alto Transition Zone – Floodplain (Helendale), and Alto – Right Regional. In the Centro Subarea, elevated nitrate concentrations are associated with historical and existing agricultural operations (crop field and dairies) and other naturally occurring processes. In the Alto subarea, septic tank return flows are likely the most significant contributing factor to slightly elevated groundwater nitrate concentrations. In the Warren Valley Basin, elevated nitrate concentrations are associated with historical entrainment of septage following managed aquifer recharge operations and a high density of septic tanks in the subarea.

The emerging water quality constituents of concern are per-and polyfluoroalkyl substances (PFAS) and perfluorooctanoic acid (PFOA). These chemical constituents are generally produced through chemical manufacturing of items like Teflon pans, stain resistant carpet, and fast-food packaging. Acceptable levels for PFAS and PFOA compounds are regulated by the State of California and have recently been lowered. As such, the regulatory actions may have some impact on the regional availability of groundwater supplies. MWA and the regional purveyors are addressing this emerging issue in the region-wide management of groundwater resources and imported supplies that augment the local sources.

TABLE 3-5: AVERAGE EXISTING TDS AND NITRATE CONCENTRATIONS BY SNMP SUBREGION

SNMP Analysis Subregion	Average Existing TDS Concentration (mg/L)	Average Existing Nitrate-NO3 Concentration (mg/L)
Mojave River Basin		
Baja - Floodplain	401	3.9
Baja - Regional	617	1.4
Centro - Floodplain	711	20.7
Centro - Regional (east)	618	3.2
Centro - Regional (west)	711	7.7
Centro - Regional (Harper Dry Lake)	1,028	4.0
Alto Transition Zone - Floodplain (Helendale)	915	10.0
Alto Transition Zone - Floodplain	500	3.4
Alto Transition Zone - Regional	529	3.9
Alto - Floodplain (Narrows)	205	4.3
Alto - Floodplain	177	3.3
Alto - Left Regional	310	0.9
Alto - Mid Regional	153	3.5
Alto - Right Regional	579	7.5
Oeste - Regional	781	2.5
Este - Regional	299	4.3
Morongo Basin		
Lucerne Valley (north)	1,716	5.6
Lucerne Valley (south)	472	5.7
Johnson Valley	678	6.2
Ames-Means Valley	330	5.7
Warren Valley	243	15.4
Copper Mountain-Giant Rock	247	7.5
Joshua Tree	202	14.7

3.1.2.3 Groundwater Monitoring and Protection

The general goal of groundwater protection activities is to maintain the groundwater and the aquifer to ensure a reliable high quality water supply. Activities to meet this goal include continued and increased monitoring, data sharing, education and coordination with other agencies that have local or regional authority or programs. The current MWA groundwater monitoring program includes groundwater quality data collected by MWA and the USGS through their cooperative water resources program and through the Drinking Water Program directed by the State Water Resources Control Board Department of Drinking Water (SWRCB DDW).

The SWRCB DDW enforces the monitoring requirements established in Title 22 of the CCRs for drinking water wells and all the data collected must be reported to the DDW (note: each participating retailer's specific Consumer Confidence Report is included within its respective Chapter). Title 22 also designates regulatory limits (e.g., MCLs) for various water contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters. Title 22 testing applies to potable public drinking water systems. MWA performs Title 22 testing only on water produced for the R-Cubed distribution system which supplies wholesale potable water to a few retail water suppliers in the Alto Subarea.[24] All retail water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the SWRCB DDW.

MWA has developed and actively maintains a Key Well program to support ongoing groundwater management activities, including monitoring of groundwater levels and water quality throughout the Region. Wells in the Key Well program include a combination of dedicated monitoring wells, scientific investigation wells, domestic water supply wells, and agricultural irrigation wells. Retailer's public water supply wells are not included in the Key Well program but data from these wells are tracked and included in the MWA database. Important wells identified or installed during scientific studies are continually added to the Key Well program.

There are a range of groundwater contamination sites across the region. These sites are regulated by the Lahontan and Colorado River Basin Regional Water Quality Control Boards. The potential detriments to water supply from these sites are being monitored by MWA and potentially effected retailers on a regional basis.

[24] Groundwater quality data are submitted electronically and are available for download online at the SWRCB water quality analyses data and download page: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/EDTlibrary.shtml

3.1.3 Desalination Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631(i)). In the past, MWA has evaluated potential options for developing desalination projects. However, none of the opportunities are currently practical or economically feasible for MWA or the Mojave Region, and MWA has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this RUWMP.

As discussed elsewhere in this document, the groundwater supplies in the Region are not considered brackish in nature, and desalination is not required. There are brackish supplies near the dry lakes, but it is not practical to pump, treat and potentially induce migration of better-quality water to the dry lake areas. However, MWA and the retail water purveyors could partner with other SWP contractors and provide financial assistance in construction of other regional groundwater desalination facilities in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to MWA from the SWP contractor for use in the Mojave Region. In addition, should an opportunity emerge with a local agency other than an SWP contractor, an exchange of SWP deliveries would most likely involve a third party, such as Metropolitan Water District. Most local groundwater desalination facilities would be projects implemented by retailers of SWP contractors and, if an exchange program were implemented, would involve coordination and wheeling of water through the contractor's facilities to MWA.

Because the MWA service area is not in a coastal area, it is neither practical nor economically feasible for MWA to implement a seawater desalination program.

3.1.4 Delta Reliance

The Mojave Region continues to demonstrate reduced reliance on water supplies derived from the Delta and regional self-sufficiency through the actions of the retail agencies and MWA. The reduced reliance and regional self-sufficiency are attributable to significant advances in developing recycled and reusable water supplies combined with a region-wide emphasis on water use efficiency among MWA and the retail agencies. **Table 3-6** presents the reduced reliance analysis for the Mojave Region. The Reduced Delta Reliance and improved regional self-sufficiency are detailed in **Appendix 2**.

TABLE 3-6: REDUCED DELTA RELIANCE

Year	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Water Supplies from the Delta Watershed	34.2%	34.2%	31.0%	26.1%	24.6%	23.5%	22.9%	22.3%	21.7%
Change in Water Supplies from the Delta Watershed		-0.1%	-3.3%	-8.2%	-9.6%	-10.7%	-11.4%	-12.0%	-12.5%

3.1.5 Climate Change

While the CWC does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply – both in an historical and future – projection context. The Region's primary climate change concern involves MWA's capability of providing imported SWP water for groundwater recharge and changes to the pattern and intensity of rainfall within the Region and snowfall in the mountains that feed the Mojave River and various local ephemeral streams.

As discussed in *Chapter 6 – Mojave Water Agency*, MWA uses DWR's 2025 Delivery Capability Report (DCR) to assess current and future reliability of SWP Contract Table A supplies. MWA's representation of supply availability during single dry and multiple dry years reflects its consideration of climate change impacts on its Table A water supplies.

3.1.6 Summary of Existing and Planned Water Supplies

Available wholesale water supplies in the RUWMP Planning Area consist of supplies managed exclusively by MWA and other supplies managed by constituent retail water agencies. MWA coordinates with its retailers to meet regional demands. Each retail water agency in the RUWMP Planning Area uses a unique mix of supplies and not all supply comes from MWA.

The projected total water supplies required to meet the demands of all of MWA's retail agencies and other water uses within the Mojave Region are summarized below in **Table 3-7** and **Table 3-8**. While MWA does not anticipate meeting all regional demands solely through collective water assets it directly manages, the Agency will work collaboratively with retail agencies and other stakeholders to manage available water supplies and ensure that projected regional demands can be met. The Region's overall water asset portfolio consists of same-year SWP Table A allocations, Article 56 Carryover (and Article 21 Interruptible Water), Stored SWP supplies as managed by MWA, Water Transfers and Exchanges, local native groundwater, local surface water, return flows, and recycled supplies.

TABLE 3-7: PROJECTED TOTAL WATER SUPPLY FOR THE MOJAVE REGION FOR THE NEXT 5-YEARS (AFY)

Year Type		All Sources (Native Groundwater, Recycled Water, SWP Table A)
Normal		162,812
Single Dry Year		118,810
Multi-Year Drought	2026 (1st Year)	145,759
	2027 (2nd Year)	118,810
	2028 (3rd Year)	118,810
	2029 (4th Year)	132,280
	2030 (5th Year)	145,759

TABLE 3-8: PROJECTED TOTAL WATER SUPPLY FOR THE MOJAVE REGION THROUGH 2050 (AFY)

Year Type All Sources		2030	2035	2040	2045	2050
Normal		162,812	164,046	164,642	165,216	165,716
Single Dry Year		118,810	120,044	120,640	121,214	121,714
Multi-Year Drought	Year 1	145,759	146,993	147,589	148,163	148,663
	Year 2	118,810	120,044	120,640	121,214	121,714
	Year 3	118,810	120,044	120,640	121,214	121,714
	Year 4	132,280	133,514	134,110	134,684	135,184
	Year 5	145,759	146,993	147,589	148,163	148,663

Chapter 4.0 Water Use Characterization

Understanding water use characteristics across the Mojave Region is fundamental to evaluating long-term water supply reliability and informing regional water management strategies. As described in Chapter 2, the Region encompasses a diverse range of communities with varying population densities, land use patterns, and economic drivers, all of which influence water use behavior and demand. This chapter characterizes current water use across the region and develops projections of future water demand over the planning horizon.

Consistent with the coordinated regional approach established for the 2025 RUWMP, population, land use, and economic assumptions described in Chapter 2 form the basis for demand projections presented herein. Retailer-specific demand characteristics, including customer class distributions and system water use profiles, are developed within their respective retailer chapters and incorporated into the regional demand projections presented in this chapter. Demands occurring outside the service area boundaries of participating urban water retail suppliers – including agricultural, industrial, and recreational uses, as well as demands from small water systems and rural domestic pumpers – are characterized within the Mojave Water Agency's wholesale planning framework as described in *Chapter 6 – Mojave Water Agency*.

Projected water demands developed in this chapter serve as the analytical framework for integrating regional water use with available supplies described in Chapter 3 – Water Supply Characterization. Together, these elements support the evaluation of system reliability under normal, single dry year, and multiple dry year conditions presented in Chapter 5 – Water System reliability and Drought Risk Assessment.

This chapter therefore provides a comprehensive and consistent framework for quantifying regional water use, supporting both near-term and long-term planning requirements and water resource management across the Mojave Region.

4.1.1 Current Regional Water Use

Water use within the Mojave Region reflects a diverse mix of urban, rural, industrial, recreational, and agricultural demands supported by a combination of managed

groundwater and supplemental supplies. Understanding how water is currently used across the Region provides critical context for evaluating demand trends, informing future projections, and assessing long-term water supply reliability.

Water use within the Mojave Basin Area is tracked and reported through Mojave Watermaster Verified Production reports, which document production across the five Subareas in accordance with the terms of the adjudication. In addition, urban water suppliers track and report their production to the State Water Resources Control Board (SWRCB) through monthly reporting requirements. For areas outside of the Mojave Basin Area, such as Subregion 3, water use data for Hi-Desert Water District and Joshua Basin Water District is derived from agency production records and State Water Resources Control Board reporting. Historic demand data for other uses within Subregion 3, including smaller systems and non-urban demands, are based on estimates developed as part of MWA's chapter, Chapter 6 – Mojave Water Agency.

Collectively, these data sources are synthesized to characterize recent and current water use across the Mojave Region. **Table 4-1** presents a summary of regional water use for the period 2021 through 2025 by major use categories, including (1) urban water retail suppliers, (2) small potable water systems and rural domestic users, (3) other uses such as industrial, commercial, and recreational demands, and (4) agricultural uses. To further illustrate spatial variability in water use **Table 4-2 through Table 4-4** provide a breakdown of these same categories by subregion.

This characterization of recent and current water use provides insight into regional demand patterns, the relative magnitude of different water use sectors, and the influence of long-term demand management measures and regulatory frameworks. These observed trends form the basis for developing and evaluating future water demand projections presented in the later portions of this chapter.

TABLE 4-1: REGIONAL WATER USE 2021-2025 (AFY)

Water Use Category		2021	2022	2023	2024	2025
Urban Water Retail Supplier	City of Adelanto	4,487	4,640	4,570	4,636	5,044
	County Service Area 64	2,793	2,677	2,561	2,597	2,666
	County Service Area 70 J	1,794	1,725	1,633	1,146	1,742
	Golden State Water Company - Barstow	6,004	5,604	5,421	5,591	5,437
	Hesperia Water District	14,253	13,645	12,604	13,724	13,852
	Hi-Desert Water Company	2,909	2,919	2,800	2,874	2,817
	Joshua Basin Water District	1,333	1,299	1,276	1,307	1,292
	Liberty Utilities - Apple Valley Water Company	10,014	9,538	9,399	9,698	9,642
	Phelan Piñon Hills CSD	3,094	2,863	2,555	2,674	2,717
	Victorville Water District	22,346	22,071	20,079	20,389	20,956
	Subtotal Urban Water Retailer	69,028	66,981	62,897	64,636	66,164
Other	Small Water Systems and Rural Domestic	17,836	15,869	15,215	16,699	17,050
	Industrial	10,435	10,135	9,035	9,235	7,335
	Golf Course	4,615	4,715	3,515	4,415	5,215
	Recreational	9,050	9,250	8,250	7,850	7,250
	Agricultural	21,700	16,200	15,300	15,100	14,500
	Subtotal Other	63,636	56,169	51,315	53,299	51,350
Total Water Use in Mojave Region		**132,664**	**123,150**	**114,212**	**117,934**	**117,514**

TABLE 4-2: SUBREGION 1 WATER USE 2021-2025 (AFY)

Water Use Category		2021	2022	2023	2024	2025
Urban Water Retail Supplier	City of Adelanto	4,487	4,640	4,570	4,636	5,044
	County Service Area 64	2,793	2,677	2,561	2,597	2,666
	County Service Area 70 J	1,794	1,725	1,633	1,146	1,742
	Hesperia Water District	14,253	13,645	12,604	13,724	13,852
	Liberty Utilities - Apple Valley Water Company	10,014	9,538	9,399	9,698	9,642
	Phelan Piñon Hills CSD	3,094	2,863	2,555	2,674	2,717
	Victorville Water District	22,346	22,071	20,079	20,389	20,956
	Subtotal Urban Water Retailer	58,781	57,159	53,400	54,864	56,619
Other	Small Water Systems and Rural Domestic	12,243	10,893	10,444	11,463	11,704
	Industrial	5,600	5,100	4,900	5,500	4,400
	Golf Course	4,400	4,500	3,300	4,200	5,000
	Recreational	7,000	7,400	6,400	6,000	5,400
	Agricultural	4,700	3,800	3,400	3,400	3,000
	Subtotal Other	33,943	31,693	28,444	30,563	29,504
Total Water Use in Subregion 1		**92,724**	**88,852**	**81,844**	**85,427**	**86,122**

TABLE 4-3: SUBREGION 2 WATER USE 2021-2025

Water Use Category		2021	2022	2023	2024	2025
Retailer	Golden State Water Company - Barstow	6,004	5,604	5,421	5,591	5,437
	Subtotal Urban Water Retailer	6,004	5,604	5,421	5,591	5,437
Other	Small Water Systems and Rural Domestic	2,971	2,644	2,535	2,782	2,840
	Industrial	4,500	4,700	3,800	3,400	2,600
	Golf Course	0	0	0	0	0
	Recreational	2,000	1,800	1,800	1,800	1,800
	Agricultural	17,000	12,400	11,900	11,700	11,500
	Subtotal Other	26,471	21,544	20,035	19,682	18,740
Total Water Use in Subregion 2		**32,476**	**27,148**	**25,456**	**25,273**	**24,178**

TABLE 4-4: SUBREGION 3 WATER USE 2021-2025[25]

Water Use Category		2021	2022	2023	2024	2025
Retailer	Hi-Desert Water Company	2,909	2,919	2,800	2,874	2,817
	Joshua Basin Water District	1,333	1,299	1,276	1,307	1,292
	Subtotal Urban Water Retailer	4,243	4,218	4,076	4,180	4,109
Other	Small Water Systems and Rural Domestic	2,621	2,332	2,236	2,454	2,506
	Industrial	335	335	335	335	335
	Golf Course	215	215	215	215	215
	Recreational	50	50	50	50	50
	Agricultural	0	0	0	0	0
	Subtotal Other	3,221	2,932	2,836	3,054	3,106
Total Water Use Subregion 3		**7,464**	**7,150**	**6,912**	**7,234**	**7,214**

[25] Subregion 3 "Other" water use categories were estimated by Zanjero using available spatial and water-use indicators as no single Watermaster or centralized reporting source tracks all non-urban retail water use throughout Subregion 3.

4.1.2 Forecasting Regional Water Use

Forecasting water use leverages the current understanding of prevailing regional water needs and trends while considering factors directly influencing more recent urban water use efficiency regulatory pressures and regional population trends. The following discusses the assumptions used to forecast water use at both the regional and subregional levels.

4.1.2.1 Forecasting Urban Water Retail Supplier Use

There are several factors significantly impacting the projection of future water use for the urban water retail suppliers ultimately informing the majority of the water use within the Mojave Region. These factors include State and local landscape regulations, building code requirements, and residential water-use mandates, as well as changes in types of housing products offered. These factors are incorporated into determining appropriate per-customer connection water demand values for use in forecasting future water needs. Relevant factors include:

- California Model Water Efficient Landscape Ordinance[26]
- Green Building Standards Code (hereafter the "CAL Green Code)[27]
- Per-capita Urban Water Conservation Objectives[28]

A significant portion of the projected growth in water demand includes a range of residential and non-residential uses within the urban water retail supplier's service areas, driven by the varied development proposals already approved (but not yet built) as well as future proposals, to meet regional population increases. Residential customers will include both single-family dwelling units, some with accessory dwelling units, built under a variety of densities, as well as multi-family residential dwelling units. Non-residential uses are expected to include a blend of commercial, institutional, industrial, and active landscapes such as parks, in ratios similar to current residential-to-non-residential connections. The forecasted future demands of the 10 RUWMP urban water retail suppliers will reflect the needs of existing customers and future new customers. The methodology repeats that used for the 2020 Mojave Water Agency UWMP, where existing customer use and forecasted new customer use are primarily based upon multiplying the population by a gallons-per-capita-per day water factor for residential and non-residential uses.

[26] Information regarding the California Model Water Efficient Landscape Ordinance (MWELO) can be accessed here.
[27] Information regarding the Green Building Standards Code (CAL Green Code) can be accessed here.
[28] Information regarding Per-capita Urban Water Conservation Objectives can be accessed here.

Forecasting Existing Customer Future Use

For each urban water retail supplier, data submitted to the SWRCB to satisfy monthly reporting requirements was obtained to establish the current water use characteristics, as presented in **Table 4-1**. The current total annual production values were then divided by each retailer's current population to generate gallons-per-capita-per-day (gpcd) values which are representative of each retailer's total gpcd when considering all residential and non-residential uses. The "current" gpcd values for these populations were then used to generate representative gpcd values for new customers as discussed below.

For existing customers' future use, the gpcd was either (1) held constant or (2) reduced slightly to reflect expected conservation through replacement of fixtures and appliances, continued adoption of a conservation ethic, and modifications of irrigated landscapes, as well as a function of continued implementation of the retailer's ongoing conservation programs.

Forecasting New Customer Future Use

One element of the information reported to SWRCB is the percentage each retailer serves to residential customers, a key value for the SWRCB's determination of the "residential gallons-per-capita-per-day" water use – or "r-gpcd." Using the total r-gpcd value as well as the wintertime r-gpcd values, which are often lower than during summer months, an estimate of the (1) residential versus non-residential per-capita use and (2) the residential indoor versus outdoor per-capita water use factor was derived for each retail supplier. The estimated gpcd values were then used to establish an anticipated gpcd value for each new customer using the following criteria:

- As stipulated by the CWC, each new residential user should have an indoor factor of 47 gpcd, dropping to 42 gpcd in the future.[29] For purposes of this forecast, 47 gpcd is used for all new customers until 2030 and 42 gpcd is used for growth beyond 2030.
- Using the residential indoor versus outdoor gpcd estimate from the existing customer data, an outdoor gpcd value was determined (as the difference between total r-gpcd and the estimated indoor r-gpcd). This outdoor value was added to the indoor value of 47 gpcd or 42 gpcd to generate a total residential gpcd value for future customers.
- The difference between the residential gpcd and the total gpcd created a representative non-residential gpcd value unique to each retailer. This non-residential

[29] CWC Section 10609.4(a)(2) establishes the indoor residential water use 'standard' to be 47 gpcd beginning in 2025 through January 1, 2030 while CWC Section 10609.4(a)(3) establishes the indoor residential water use 'standard' to be 42 gpcd beginning in 2030. These values represent average values across the entire customer base served by any urban water supplier.

gpcd was added to the residential gpcd to create an expected total gpcd for each new customer.

- The new gpcd value was multiplied by the incremental additional population anticipated during each five-year increment through 2050.
- The existing customer future demand and the new future customer demand were combined to represent the total demand for each large water retail supplier.

Projected water use for each participating urban water retail supplier is presented in the Water Use Characterization sub-chapter of each respective retailer chapter (Chapters 7 – 16). Each sub-chapter describes the retail-specific assumptions, customer use trends, existing and new customer demand forecasts, distribution system losses, and other factors used to develop each retailer's projected water use. The regional demand summaries presented in this chapter rely on those retail-specific forecasts and aggregate them, where appropriate, to support the broader regional water use characterization and reliability analysis.

4.1.2.2 Forecasting Non-Urban Water Retail Supplier Uses

In addition to the demands associated with participating urban water retail suppliers, the Mojave Region includes other water uses such as agricultural, industrial, golf, recreational, small systems, rural domestic, and other non-retailer demands. Historical use associated with these categories is summarized in this chapter to provide a more complete accounting of regional water use.

Future demands for non-urban water retail supplier uses were developed separately from the participating retailer demand projections. The methodology and assumptions used to forecast these demands are described in *Chapter 6 – Mojave Water Agency.* The regional demand projections presented later in this chapter aggregate these retailer and non-retailer forecasts to provide a total regional demand forecast for use in *Chapter 5 – Regional Water Service Reliability*.

4.1.3 Summary of Future Regional Water Use

The preceding sections identify the forecast sources used to develop future water use projections for the Mojave Region, including participating urban retail water supplier demands and non-urban/non-retailer demands. For regional planning purposes, these forecasts are aggregated in this section to present total projected water use for the Mojave Region.

Table 4-5 through Table 4-7 summarize projected water use from 2030 through 2050 by subregion. **Table 4-8** summarizes projected regional water use from 2030 through 2050 and provides the long-term regional demand forecast used to evaluate supply and demand conditions in *Chapter 5 – Regional Water Service Reliability*.

The projections presented in **Table 4-5 through Table 4-8** reflect baseline planning demands, do not include an additional adjustment for climate change, and are rounded to the nearest five acre-feet.

TABLE 4-5: PROJECTED SUBREGION 1 WATER DEMAND 2030-2050 (AFY)

Subregion 1	2030	2035	2040	2045	2050
Year 1	89,700	91,070	92,150	93,155	93,530
Year 2	89,975	91,290	92,355	93,220	93,560
Year 3	90,250	91,500	92,545	93,305	93,585
Year 4	90,525	91,715	92,750	93,375	93,610
Year 5	90,795	91,930	92,950	93,450	93,635

TABLE 4-6: PROJECTED SUBREGION 2 WATER DEMAND 2030-2050 (AFY)

Subregion 2	2030	2035	2040	2045	2050
Year 1	24,270	24,480	24,875	25,510	26,120
Year 2	24,315	24,560	25,000	25,630	26,270
Year 3	24,355	24,635	25,130	25,755	26,415
Year 4	24,395	24,715	25,255	25,875	26,565
Year 5	24,435	24,795	25,380	25,995	26,715

TABLE 4-7: PROJECTED SUBREGION 3 WATER DEMAND 2030-2050 (AFY)

Subregion 3	2030	2035	2040	2045	2050
Year 1	7,280	7,290	7,245	7,175	6,985
Year 2	7,285	7,275	7,225	7,140	6,965
Year 3	7,280	7,270	7,210	7,100	6,955
Year 4	7,285	7,260	7,205	7,060	6,935
Year 5	7,285	7,250	7,190	7,025	6,920

TABLE 4-8: PROJECTED REGIONAL WATER DEMAND 2030-2050 (AFY)

Mojave Region	2030	2035	2040	2045	2050
Year 1	121,250	122,840	124,270	125,840	126,635
Year 2	121,575	123,125	124,580	125,990	126,795
Year 3	121,885	123,405	124,885	126,160	126,955
Year 4	122,205	123,690	125,210	126,310	127,110
Year 5	122,515	123,975	125,520	126,470	127,270

Chapter 5.0 Regional Water Service Reliability

This chapter outlines the Mojave Region's general water system reliability findings as required under CWC §10635 and provides reliability information that the MWA and its constituent retail agencies may use in completing an annual supply and demand assessment under CWC §10632.1.

Assessing water service reliability is the fundamental purpose for MWA and the participating retail suppliers in preparing this 2025 RUWMP. Water service reliability reflects the Region's ability to demonstrate that the regional water needs may be satisfied under projected hydrological and regulatory conditions. The Region's 2025 RUWMP considers the reliability of meeting water demands by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the regional water supplies. The reliability assessment looks beyond past experiences and considers what could be reasonably foreseen in the future in order to reflect potential water supply planning scenarios. This chapter synthesizes the details imbedded in Chapters 3 and 4, which each on their own reflect synthesis of Chapters 6 through 16, and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents two regional water reliability findings:[30]

- Five Year Drought Risk Assessment: the 2026 through 2030 Drought Risk Assessment ("DRA") for the Mojave Region;
- Long-Term Service Reliability: the reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Dry Years in five-year increments through 2050;

In summary, regional water supplies are sufficient to meet regional water demands during normal, single dry, and five consecutive dry years through 2050.

[30] These findings are also used by Mojave Water Agency to represent reliability for their "wholesale water supplier" responsibilities under the UWMPA.

5.1.1 Mojave Region Five-Year Drought Risk Assessment

The Region is characterized by a unique portfolio of water supplies and infrastructure components. As noted in *Chapter 3 – Regional Water Supply Characterization* and *Chapter 6 – Mojave Water Agency*, the regional supplies that are available include MWA's SWP Table A Annual Amount, Native Groundwater, Imported Wastewater, Return Flows, Recycled Water and Stored and Carryover supplies (such as Article 56). These supplies are managed throughout each of the Subregions. For example, although MWA brings its annual SWP Table A allocation into its service area for delivery into the Subregions, it also may store some of its Table A allocation within the SWP system under the Carryover provisions in its SWP Contract or may store portions of the Table A allocation in regional groundwater basins for use in later years. As such, the annual management of the diverse water supply sources in the regional water supply portfolio forms the supply reliability assessment described in this Chapter.

The Region, as coordinated through MWA, the participating retailers and other users, manages its water supplies to address projected dry conditions. Specifically, MWA captures and stores surplus imported water in normal and wet years to use those water assets to meet regional demands in dry years. These strategic management actions stabilize annual fluctuations in supplies that may not meet regional demands under certain dry conditions. In other words, any surplus imported water supplies are captured and stored for future delivery to improve long-term supply reliability. As discussed in *Chapter 6 – Mojave Water Agency*, MWA has preemptively stored over 250,000 acre-feet of water to mitigate against dry conditions.

Table 5-1 below shows the Region's Five-Year Drought Risk Assessment (DRA) which integrates all of the regional water supplies for 2026 through 2030 as described in *Chapter 3 – Regional Water Supply Characterization* and reflects the water uses described in *Chapter 4 – Water Use Characterization*. As presented in the table, the Region maintains surplus water assets in the first, fourth, and fifth years of a projected five-year dry period but also indicates how stored water supplies are required to meet demands in the second and third years of the projected dry year period.

TABLE 5-1: MWA FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	145,759	118,810	118,810	132,280	145,759
Demand	119,390	119,856	120,351	120,832	121,252
Difference	26,369	-1,046	-1,541	11,448	24,507
Use of Managed Groundwater Storage	0	1,046	1,541	0	0
Revised Difference	0	0	0	0	0

The key takeaway is that MWA uses a portion of its stored water assets in the middle of a multi-year drought period to address deficits in the otherwise predictable water supplies (e.g. native groundwater, recycled water, and current-year SWP Table A). In shoulder years, where imported supplies in combination with other supplies exceed the demands, MWA has the option for excess water to be stored for future use as either carryover supply in the SWP system (e.g., San Luis Reservoir) or banked underground in local groundwater basins.

5.1.2 MWA Long-Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to 25 years to provide a guiding document for future land use and water supply planning through the next UWMP Cycle. The following sub-chapters describe the long-term water service reliability for the Region through 2050.

5.1.2.1 Normal and Single Dry Conditions 2030-2050

The Region's long term service reliability is characterized in normal, single dry, and five consecutive dry years through 2050. The future water supplies in normal and single dry conditions depicted in this section reflect the same hydrological, regulatory, and institutional criteria associated with each water asset as described in *Chapter 3 – Regional Water Supply Characterization*. In normal years, for example, SWP supplies are generally constrained only by the projected Table A allocations derived from DWR's DCR. Under the normal conditions, the same-year SWP Table A allocation, combined with other supplies, is adequate to fully meet demand without using any of the locally pre-stored Managed Groundwater. In dry years, additional hydrological, regulatory, and institutional issues may constrain the availability of water that reduce SWP supply availability based on reduced allocation percentages as noted in Chapter 3. In these years, Managed Groundwater Storage is available to address any shortfall forecast absent the stored groundwater. Additionally, other future water supplies, like return flow, tend to grow in annualized volumes as annualized

demands grow in parallel. However, as described in Chapter 3, many of these other supplies are not reflected as an annually available predictable supply to allow this RUWMP to make a conservative estimate of reliability. This information is described in detail in Chapter 3 and is incorporated into the supply and demand tables presented below.

The Region's future water demands in normal and single dry conditions through 2050 reflect the same considerations described in previous sections of this chapter. In both normal and dry conditions, demands tend to reflect anticipated uses based upon the climatological conditions in the Region. Future water demands are generally predicted to increase as land uses and populations grow within the Region. This information is detailed in *Chapter 4 – Water Use Characterization* and reflected in the values shown in the tables below. In normal years, the Region projects surplus water conditions, allowing MWA to recharge and store available supplies for future dry-year needs or coordinate with other SWP contractors to manage surplus supplies. The 2027 Master Plan, currently under development, is expected to reflect MWA's continued efforts to establish an imported water policy that helps provide further clarity regarding decisions during such circumstances.

Table 5-2 shows the normal year and single dry-year supplies and demands from 2030 through 2050. The single-dry conditions reflect the use of Managed Groundwater Storage to meet forecast shortfalls (shown as a negative difference), where the volume of Managed Groundwater Storage is set to resolve any shortfall to zero.[31]

[31] As described in Chapter 6, MWA currently has over 250,000 acre-feet of Managed Groundwater Storage throughout the three Subregions. This supply is also available to help retail suppliers meet demands during future periods where demands may exceed the supply shown in their retail chapters in interim years but fall within the total 2050 supply shown in this RUWMP.

TABLE 5-2: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	162,812	164,046	164,642	165,216	165,716
Demand	121,250	122,840	124,270	125,840	126,635
Difference	41,562	41,206	40,372	39,376	39,081

Single Dry Year	2030	2035	2040	2045	2050
Supply	118,810	120,044	120,640	121,214	121,714
Demand	121,250	122,840	124,270	125,840	126,635
Difference	-2,440	-2,796	-3,630	-4,626	-4,921
Use of Managed Groundwater Storage	2,440	2,796	3,630	4,626	4,921
Revised Difference	0	0	0	0	0

5.1.2.2 MWA Five Consecutive Dry Years through 2050

The Region defines a drought condition lasting five consecutive years as one that constrains MWA from obtaining some of the water supplies within its water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints that limit its Table A allocation but do not limit the availability of groundwater resources or wastewater imports. As more thoroughly described in *Chapter 6 – Mojave Water Agency*, the multiple dry years are assumed to use the following consecutive Table A allocations: 35%, 5%, 5%, 20%, 35%. These assumptions set forth the available same-year Table A supply that is added to the native groundwater and other local supplies, as summarized in *Chapter 3 – Regional Water Supply Characterization*.

The future dry year projections show the Region relying more on Managed Groundwater Storage as its population grows and water demands increase. Specifically, the Region continues to increase its use of MWA's Managed Groundwater Storage supplies in years two and three of a five consecutive year drought through the entire planning horizon. This gradual decrease in supply availability and eventual reduction in Managed Groundwater Storage in years one, four, and five would also impact MWA's ability to store surplus water in those years. Accordingly, although MWA will have adequate water supplies to meet the regional demands for five consecutive dry years in 2050, the Region will be using more of MWA's Managed Groundwater Storage supplies to handle those conditions. These issues are described in significant detail in *Chapter 3 – Regional Water Supply Characterization* and reflected in the

monthly reliability table below. **Table 5-3** presents the water supply and demand conditions for MWA's service area in five consecutive dry years from 2030 through 2050.

TABLE 5-3: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	145,759	146,993	147,589	148,163	148,663
	Demand	121,250	122,840	124,270	125,840	126,635
	Difference	24,509	24,153	23,319	22,323	22,028
Year 2	Supply	118,810	120,044	120,640	121,214	121,714
	Demand	121,575	123,125	124,580	125,990	126,795
	Difference	-2,765	-3,081	-3,940	-4,776	-5,081
	Use of Managed Groundwater Storage	2,765	3,081	3,940	4,776	5,081
	Revised Difference	0	0	0	0	0
Year 3	Supply	118,810	120,044	120,640	121,214	121,714
	Demand	121,885	123,405	124,885	126,160	126,955
	Difference	-3,075	-3,361	-4,245	-4,946	-5,241
	Use of Managed Groundwater Storage	3,075	3,361	4,245	4,946	5,241
	Revised Difference	0	0	0	0	0
Year 4	Supply	132,280	133,514	134,110	134,684	135,184
	Demand	122,205	123,690	125,210	126,310	127,110
	Difference	10,075	9,824	8,900	8,374	8,074
Year 5	Supply	145,759	146,993	147,589	148,163	148,663
	Demand	122,515	123,975	125,520	126,470	127,270
	Difference	23,244	23,018	22,069	21,693	21,393

5.1.3 Water Supply Reliability Summary

The Mojave Region's water supply portfolio is capable of meeting the water uses in Region in normal, single dry, and five consecutive dry years from 2025 through 2050.

Chapter 6.0 MOJAVE WATER AGENCY

TABLE OF CONTENTS

LIST OF TABLES

LISTS OF FIGURES

Sub-Chapter 6.1 – Introduction

The Mojave Water Agency (MWA or Agency) was formed in 1960 as a special act district codified in Chapter 97 of the California Water Code (CWC) Appendix as the Mojave Water Agency Law (MWA Law).[32] The MWA Law states that MWA was created, in part, "to do any and every act necessary to be done so that sufficient water may be available for any present or future beneficial use of the lands and inhabitants of the agency…."[33] That statutory charge has long been shaped by the region's fundamental water management challenge: groundwater use in excess of natural replenishment. The aquifers in MWA's service area have been in overdraft since the early 1950s, as residents and other water users have historically used more water than is naturally replaced by limited rainfall and surface flows from the Mojave River and its tributaries originating in the San Bernardino mountains to the south. The Mojave Basin Area (MBA) Adjudication further reaffirmed MWA's role in managing local water supplies and tasked MWA with seeking and securing supplemental water supplies to help address groundwater overdraft and support the quality of life within its boundaries.

The MWA service area encompasses approximately 4,900 square miles of eastern San Bernardino County (County) and is concurrent with the Mojave Region (Region or RUWMP Planning Area) boundary as that is used for purposes of this 2025 RUWMP. Its service area is divided into eight Subareas, each one affiliated with a hydrological groundwater basin or boundary defined through adjudications or resulting from other practical basis (see **Figure 2-1**).

As discussed in *Chapter 3 – Regional Water Supply Characterization*, water supply for the Region is sourced almost entirely from pumped groundwater. As a State Water Project (SWP) contractor and MBA Watermaster, MWA acts as a wholesale supplier to large and small retail water agencies as well as many other individual users and uses throughout its service area by importing water supplies and placing them into the various groundwater basins to support on-going groundwater basin health needs – whether stipulated by judgments or based upon pre-emptive and anticipatory actions – to support the Region's reliance on pumped groundwater.

[32] California Water Code Appendix, Mojave Water Agency Law, Section 97-1 *et seq.*, 1960.
[33] MWA Law Section 97-1.5, July 21, 1960

6.1.1 Background and Purpose

The Agency has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this wholesale-specific chapter.[34] The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter, in conjunction with critical Regional summary tables presented in Chapter 3, Chapter 4, and Chapter 5, presents MWA's evaluation of these requirements and demonstrates its ability to meet anticipated water demands under near-term and long-term normal and drought conditions.

The 2025 RUWMP, together with this wholesale-specific chapter, updates MWA's 2020 Wholesale Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the CWC. In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional approach also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

6.1.2 Basis for Plan Preparation

With one exception, MWA does not operate as a Public Water System (PWS) as described in California Health and Safety Code Section 116275. Rather, it is solely classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for wholesale water supplies for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually through the management of imported water supplies on behalf of the Region. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the MWA and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively.

The one exception of a PWS is MWA's Regional Recharge and Recover Project (R-Cubed) which is a conjunctive use project that pumps a combination of participating retailers' MBA Judgement FPA and MWA's Managed Groundwater Storage within the Floodplain Aquifer along the Mojave River in Hesperia and southern Apple Valley (see **Figure 2-9** and **Figure 3-1**). When needed, MWA-owned production wells on both sides of the Mojave River, immediately

[34] California Water Code Sections 10610 through 10657

downstream of the recharge areas, can recover and deliver the FPA or stored water through pipelines directly to local retail suppliers. Details of the MWA's PWS are provided in **Table 6-1**.

TABLE 6-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610129	Mojave Water Agency (R-Cubed)	5

6.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and MWA. This coordination ensured consistency in assumptions, methodologies and regional analyses. MWA actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing regional conditions as well as MWA- and retailer-specific operations,

As required by the UWMPA, MWA coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, MWA encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

6.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

6.1.4 RUWMP Adoption

The Agency held a public hearing regarding the 2025 RUWMP on June 11, 2026. Before the hearing, the Agency made a draft of the 2025 RUWMP available for public inspection at 13846 Conference Center Drive Apple Valley, CA 92307, and posted on MWA's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The Agency's elected body adopted this 2025 RUWMP on June 11, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto MWA's website.

MWA plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

"FINAL Submittal 2025 UWMP Tables – MWA – 06.01.2026.xls"

"Appendix F 2025 Checklist – MWA – 06.01.2026.xls"

6.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 6.2 Water Service and System Description
- Sub-Chapter 6.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 6.4 Imported Water Supply and Reliability Characterization
- Sub-Chapter 6.5 Managed Groundwater Storage
- Sub-Chapter 6.6 Water Use Characterization
- Sub-Chapter 6.7 Water Conservation and Shortage Response
- Sub-Chapter 6.8 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 6.9 Energy Intensity Analysis

Sub-Chapter 6.2 – Water Service and System Description

The Agency manages water supplies from the urban, rural, industrial, recreational, and agricultural users throughout its expansive service area, depicted in **Figure 2-1**, which covers large portions of eastern San Bernardino County and the California side of the Mojave Desert.

The Mojave River is central to MWA history and settlement in the region. The river is more of an ephemeral stream which derives its flow from drainage of 217 square miles of the northern slope of the San Bernardino Mountains. Early farmers aggressively planted the Victor Valley with fruit trees and crops, which by the 1950s created serious water overdraft. This overdraft led to a halt in development in the area. Legislation for the SWP passed in 1959 to begin work on the California Aqueduct, along with the Davis-Grunsky Act, which afforded regions the opportunity to form local water agencies. Soon after, in 1960, the Mojave Water Agency was formed.

MWA's service area is divided into seven divisions, each one represented by a publicly elected board member who serves a four-year term. The MWA Board uses a committee format to inform decisions and receive recommendations for voting matters with each committee member serving a one-year term (or until a successor is appointed). These committees generally meet once a month and include: Legislative and Community Partners Committee; Planning, Resources, Engineering and Operations Committee; Personnel, Finance, Security and Technology Committee; Morongo Basin Pipeline Commission; Technical Advisory Committee; and Watermaster.

MWA's Sphere of Influence (SOI) is generally contiguous with its service area; however, there are two areas within the SOI that are currently not in its service area. Golden State Water Company serves the Wrightwood community's 2,700 customers on the southern boundary of the MWA SOI. The other area is near Grass Valley Creek, which is a tributary to the Mojave River. These two areas are at the base of the San Bernardino Mountains and are part of the headwaters that connect the drainage to the groundwater basins that are part of the MBA Adjudication. MWA, serving as the court appointed MBA Watermaster according to the MBA Judgment, coordinates with these entities within the SOI to ensure established water supplies into the subbasins are maintained. An overview of the MBA Judgment is described in *Chapter 3 – Regional Water Supply Characterization*.

As also described more thoroughly in Chapter 3, water supply for MWA's service area is sourced almost entirely from pumped groundwater from the various basins, subbasins, and aquifers in the area. MWA's role is to help manage the groundwater basins by importing and

managing delivery of imported supplies. To help with this, two primary water delivery projects were developed to deliver much-needed supply to additional locations in MWA's service area from the SWP. The Morongo Basin Pipeline (MBP), completed in 1995, provides imported water to the upper portions of Mojave River Basin and to the Morongo subarea. The Mojave River Pipeline, completed in 2006, provides critical recharge to lower portions of Mojave River Basin (e.g. Centro and Baja subareas) and, more recently, will provide supplies to the Regional Aquifer west of Victorville.

6.2.1 Service Area Climate

A thorough description of the Mojave Region's climate and considerations of climate change are included in *Chapter 2 – The Mojave Region*. Since MWA's service area is concurrent with the Region's boundary, details in Chapter 2 sufficiently address this UWMPA requirement and no additional details are provided in this sub-chapter.

Sub-Chapter 6.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use in the Mojave Region. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Because MWA's service area is concurrent with the Mojave Region as defined for this 2025 RUWMP, the regional population, land use, economic, and demographic conditions applicable to MWA are described in *Chapter 2 – The Mojave Region*.

Accordingly, this sub-chapter does not repeat the full regional population and land use discussion provided in Chapter 2. Instead, it identifies the subset of the regional population that is directly relevant to MWA's wholesale demand forecast: the small water system and rural domestic user population located outside the service area boundaries of the participating urban water retail suppliers. This population is summarized at the regional level in **Table 2-8** and is further organized by RUWMP Subregion in **Table 6-2** to support the water demand forecast presented in *Sub-Chapter 6.6 – Water Use Characterization*.

6.3.1 Small Water System and Rural Domestic User Population

The MWA population presented in **Table 2-8** represents the portion of the Mojave Region associated with small water systems and rural domestic users outside the service area boundaries of the participating urban water retail suppliers. While **Table 2-8** summarizes this population at the regional level, the water demand forecast presented in *Sub-Chapter 6.6* requires this population to be organized by RUWMP Subregion.

To support this subregional breakout, residential lands outside the service area boundaries of the participating urban water retail suppliers were identified using the SCAG HELPR 2.0 land use shapefile.[35] Lands designated as Mixed Use Residential, Commercial and Mixed Use Residential, Mobile Home and Trailer Parks, Multi-Family Residential, Rural Residential, and Single-Family Residential were classified as residential for purposes of this analysis. These residential lands were then assigned to the appropriate RUWMP Subregion.

[35] SCAG HELPR 2.0 shapefile accessed at: https://rdp.scag.ca.gov/helpr/?page=Main-Page

The number of residential parcels within each Subregion was used to determine the proportional share of the total small water system and rural domestic user population presented in **Table 2-8**. This method allowed the regional population total to be distributed among Subregions in a manner that reflects the relative location of residential land uses outside the participating retailer service areas. The resulting population projections are presented in **Table 6-2** and provide basis for the small water system and rural domestic demand forecast presented in *Sub-Chapter 6.6*.

TABLE 6-2: PROJECTED SMALL WATER SYSTEM AND RURAL DOMESTIC USER POPULATION 2030-2050

Subregion	2030	2035	2040	2045	2050
Subregion 1	57,994	57,080	54,852	52,328	46,747
Subregion 2	14,075	13,853	13,313	12,700	11,345
Subregion 3	12,415	12,220	11,743	11,202	10,007

Sub-Chapter 6.4 – Imported Water Supply and Reliability Characterization

This sub-chapter describes MWA's water supply sources. The description includes the historical sources available to MWA as well as projected water supply sources through 2050.[36] MWA delivers imported surface water to recharge facilities and groundwater systems throughout its service area, where the water contributes to local aquifer replenishment and can subsequently be extracted by retail agencies and other water users.

MWA categorizes its supply sources in essentially two groupings. The first grouping includes supply sources that are generally available on an annual basis. These sources include MWA's SWP supplies that are made available each year. Other sources may occasionally fall into this category but are not incorporated into this RUWMP. The second set of supply sources are those that MWA could make available in any given year but are generally not renewable in MWA's supply portfolio once they are used. In other words, although they can be replaced, like a water savings account, they are not guaranteed to be replaced on an annual basis. MWA's long-term water supply management actions focus on optimal utilization of its annually available supply sources and protection of its pre-stored supply sources to guard against extended drought conditions and catastrophic outage impacting water users in the Region. This sub-chapter describes MWA's water supply portfolio and develops a supply matrix that integrates the supply sources to reflect MWA's operational objectives.

6.4.1 State Water Project

The SWP provides a primary water supply for MWA. The water supply is derived from a series of water rights and water contracts as well as pumping and conveyance structures that connect the SWP supplies to MWA's delivery system as described in *Chapter 2 – The Mojave Region*. MWA became a State Water Project contractor in June 1963, entering into a water service contract with the California Department of Water Resources (DWR).

[36] The UWMP Act mandates a 20-year planning horizon and the 2025 UWMP Guidebook recommends a 25 year planning horizon.

6.4.1.1 SWP Table A Contract Amount

MWA's SWP Contract amount (Table A) has gradually increased since the Agency started taking deliveries in 1972. Initially the maximum Table A amount was 8,400 acre-feet per year (AFY) escalating to 50,800 AFY by 1990. MWA participated in two notable Table A permanent transfers, one in 1997 with Kern County Water Agency that augmented MWA's Table A by 25,000 AFY, and one in 2009 with Dudley Ridge Water District for 14,000 AFY that stepped up the Table A amount in three increments (7,000 AF in 2010, 3,000 AF in 2015, and the final 4,000 AF in 2020). MWA's current maximum SWP Contract Table A is 89,800 AFY.

MWA's SWP Contract has numerous components that allow MWA to administer and control the annually available SWP water supplies. MWA's SWP Contract has six important provisions that characterize the available supplies and the water delivery activities. The key aspects are: (1) Annual Table A Amount, (2) Annual Table A Allocation, (3) Article 56 Carryover, (4) Article 21 Surplus Supplies, (5) Article 12(f) on SWP conveyance priorities, and (6) water transfer and exchanges supported by Amendment No. 17, the "Water Management Tools".

As mentioned previously, MWA's Annual Table A Amount is 89,800 AFY, representing the maximum Table A amount available to the Agency under its SWP Contract. Although MWA's SWP Contract provides for the Annual Table A Amount, that total volume of water supply is subject to reduction each year based on actual water supply availability in the SWP system as determined by DWR. The last 100% allocation year occurred in 2023. However, actual deliveries vary widely with significantly reduced percentages of maximum contract amount being available during drought years. The long-term average annual Table A Allocation provided by DWR's 2025 Delivery Capability Report (DCR) is 54%.[37] Since 2005 the DCR's estimated average of total annual Table A water deliveries has decreased from 2,828 thousand acre-feet (TAF) to 2,234 TAF. This is based on several factors of note, including hydrology,[38] infrastructure issues through the system, Delta regulations which constrained exports, and updates to the CalSim3 model. As such, the estimated long-term average annual Table A deliveries were adjusted down from 57% of maximum in 2021, to the Final DCR 2025 long-term average estimate of 54% under existing climate conditions.

[37] The DWR 2025 Delivery Capability Report uses a hydrological modeling simulation to determine estimated deliveries under existing conditions using a historical time period from 1922-2021. Future delivery capability conditions are also modeled using these simulations along with CalSim3 and multiple climate change scenarios and future SWP system performance "levels of concern". Projections of future delivery capability are not part of this analysis.

[38] The 2025 DCR adjusted its hydrological baseline that incorporates statistically significant changes rim inflow from the rim watersheds into California's Central Valley in which standard deviations of precipitation and runoff during the early periods of the past 100 years are significantly different from the recent 30 years due to climate change.

As a point of reference, from 2010-2025, the average Table A Allocation for MWA was 39,218 AF (46% of max) in which allocations during that 15-year span ranged from 5% - 100%, as presented in **Table 6-3**. Average Table A Allocations over this period closely align with the 2025 DCR model projections for future conditions that incorporate climate change.[39] It is important to note that extreme hydrologic variability may become more commonplace in future climate scenarios, and MWA could experience drastic variations in Table A Allocation and deliveries in the future.

TABLE 6-3: MWA'S HISTORIC SWP TABLE A ALLOCATIONS AND DELIVERIES

Year	MWA Contract Amount (AF)	Table A Allocation	Annual Allocation Amount (AF)
2010	82,800	50%	41,400
2011	82,800	80%	66,240
2012	82,800	65%	53,820
2013	82,800	35%	28,980
2014	82,800	5%	4,140
2015	82,800	20%	16,560
2016	85,800	60%	51,480
2017	85,800	85%	72,930
2018	85,800	35%	30,030
2019	85,800	75%	64,350
2020	89,800	20%	17,960
2021	89,800	5%	4,490
2022	89,800	5%	4,490
2023	89,800	100%	89,800
2024	89,800	40%	35,920
2025	89,800	50%	44,900
Average Allocation and Deliveries:		46%	39,218

[39] Climate change effects modeled into the DCR delivery capability estimates include changes to monthly patterns of flows, more extreme hydrologic and drought events, and lower reservoir storage levels. Long-term average Table A delivery projections are estimated between 43-48% of maximum. (2025 DCR at Section 6, Table 6-2.)

MWA's annual Table A allocation has specific utility to provide replacement water for the adjudicated basins and support sustainable groundwater management. The Morongo Basin Pipeline and Mojave River Pipeline, along with the Mojave River itself, deliver this imported water directly to dedicated recharge facilities throughout the various adjudicated subareas. MWA utilizes SWP water primarily for groundwater recharge at these facilities, while maintaining over 250,000 acre-feet of stored water supplies both within local groundwater basins and as carryover storage in the SWP system to provide reliability during drought conditions and ensure long-term water security for the numerous retail water suppliers and end users within its service area.

6.4.1.2 Article 21

Article 21 of MWA's SWP contract outlines the rules for "interruptible water service." Interruptible water service means allocation of water that is essentially surplus in the SWP system and is in addition to the Table A Allocation in any given year. In other words, DWR may determine at a later date that there is additional water that could be delivered to requesting contractors that is in excess to that system-wide Table A Allocation. Article 21 was recently amended (Contract Amendment 17), and outlines the provisions for allocation, notice, and process for obtaining, rates, and transfers of Article 21 interruptible water. Notably, Amendment 17 allows for transfers of Article 21 water from certain SWP contractors to others if the contractor can demonstrate a special need for the transfer.

As a SWP Contractor, the Agency has access to Article 21 water when "excess" water is made available. Article 21 water is identified as non–Table A water that becomes available on an intermittent, interruptible basis. Allocations of Article 21 water are made based on the available supply in proportion to each contractor's annual entitlement as set forth in its Table A for that year.

When available, Article 21 water delivery is typically made in the wettest months of the year, December through May. As such, Article 21 water is sometimes called "wet weather water". It is offered to contractors when there is ample water in the system, and the State publishes a notice to contractors when it is made available. Article 21 water is not available for carryover storage in SWP facilities; however, a change in point of delivery is possible with a separate agreement with DWR in order to store Article 21 water outside of the service area. Notifications of Article 21 water availability come based on forecasting and existing hydrology, and the Article provides for the timely processing of requests by contractors for delivery. Demands are typically submitted for Article 21 water on a weekly basis.

The ability to take advantage of Article 21 water for MWA requires access to conveyance capacity in the aqueduct and available storage outside of San Luis Reservoir. Importantly, that priority for conveyance within the SWP goes to Table A water, and Article 21 water delivery may be interrupted if it is impacting a contractor's Table A water delivery through a shared reach of the aqueduct. The Agency's location on the East Branch of the aqueduct factors into the inherent conveyance priority limitations associated with Article 21 water.

The 2025 SWP Delivery Capability Report indicates that Article 21 availability will be more frequent, especially in very wet years. Between 2000–2020, Article 21 water was available in all but two years; however, during multi-dry year stretches such as 2008-2010 and 2014–2016 the amount of Article 21 water available was orders of magnitude smaller than in normal to wet years. In summary, Article 21 water requires opportunistic operational flexibility for storage and conveyance capacity in the aqueduct to maximize its intermittent availability. Because of this uncertainty, this RUWMP does not include Article 21 as a quantifiable part of MWA's water supply. Rather, MWA will continue to be opportunistic and access this supply as may best serve longer-term imported water policy objectives and groundwater basin needs.

6.4.1.3 Article 56 Carryover

Article 56 of MWA's SWP Contract outlines the rules for storing unused Table A Allocation in any year for use in a subsequent year. The Article 56 Carryover water is stored in San Luis Reservoir. There are limitations to the total carryover amounts, subject to a percentage of the Annual Table A Amount, dependent on the final allocation percentage for that year. For example, if the final Table A Allocation was 50% (44,900 AF), MWA could store (carryover) 25% of its Table A Amount (22,450 AF). If storage requests exceed capacity in San Luis Reservoir, the available capacity will be allocated among contractors in proportion to their Table A entitlement. Reallocation can also result in "displacement" of stored water, sometimes known as "spill" that results in stored amounts being released.

Storing water in San Luis Reservoir for multiple years is allowed but comes with risk because of the potential of losing the stored water due to capacity restraints. Nevertheless, storage of SWP water in San Luis Reservoir under Article 56 is a critical component of MWA's water asset management portfolio because it is a south of Delta storage option that allows carryover in multiple years. As an example of how this supply is managed, MWA had about 20,400 acre-feet of Article 56 supply available coming into the 2025 delivery year.

Due to the circumstances and water management choices made by MWA in 2025, a small amount of the available Table A supply was added to the carryover, resulting in the end-of-year 2025 Article 56 total being slightly over 21,000 acre-feet. Due to hydrologic and operational conditions in early 2026, a portion of this carryover supply was at risk of spilling. MWA anticipates that carryover storage by the end of 2026 will be slightly more than 12,500 acre-feet. The difference is expected to be used as part of MWA's broader imported water management strategy, including meeting regional needs in 2026, potentially increasing storage in local subareas, and supporting transfers to other SWP contractors.

Although MWA may use its carryover supplies under normal year conditions, it generally preserves these supplies to manage shortage conditions derived from extended drought or catastrophic water outages.

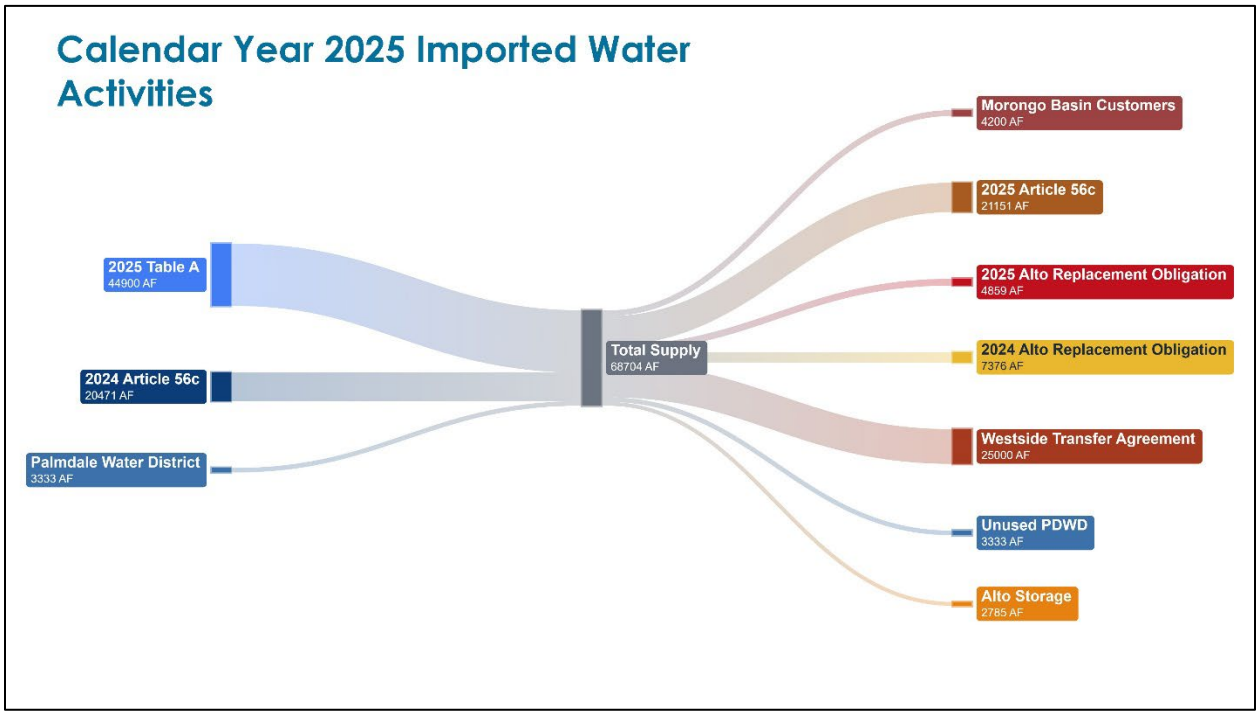
6.4.1.4 Summary of Historic SWP Deliveries

Collectively, MWA manages its SWP water supplies based on a variety of conditions, with each year reflecting a slight variance in both allocations, deliveries into the Region, and storage or sales to other parties. **Table 6-4** shows this variance between 2010 and 2025 while **Figure 6-1** provides a useful representation of how MWA evaluates and tracks its available SWP supplies year-over-year.

TABLE 6-4: SWP ALLOCATION COMPARED TO ACTUAL DELIVERIES INTO MWA SERVICE AREA

Year	Allocation	Table A Amount (AF)	Actual Deliveries (AF)
2010	50%	44,900	35,566
2011	80%	71,840	48,775
2012	65%	58,370	26,175
2013	35%	31,430	7,398
2014	5%	4,490	3,595
2015	20%	17,960	8,909
2016	60%	53,880	23,574
2017	85%	76,330	34,750
2018	35%	31,430	5,869
2019	75%	67,350	21,824
2020	20%	17,960	3,379
2021	5%	4,490	2,306
2022	5%	4,490	4,536
2023	100%	89,800	99,471*
2024	40%	35,920	2,618
2025	50%	44,900	19,220

FIGURE 6-1: EXAMPLE REPRESENTATION OF MWA'S ANNUAL MANAGEMENT OF SWP SUPPLIES



6.4.2 SWP Restrictions

Neither DWR nor the SWP guarantees delivery of 100% of water allocations every year. Under the historic lowest 5% of allocations, SWP deliveries to MWA were 4,490 AF for the year. This, in conjunction with the expected decrease in reliability of the SWP over time, places a significant constraint on the reliability of SWP supplies as a source of imported water for recharge of the Region's managed groundwater supplies. In addition to SWP system conveyance capacity limitations, MWA's SWP supplies are also subject to notable policy and regulatory constraints.

6.4.2.1 The Delta Reform Act

The Delta Reform Act (DRA) of 2009 established the Delta Plan and the Delta Stewardship Council.[40] Ultimately, the DRA requires water purveyors to reduce reliance on water supplies derived from the Sacramento-San Joaquin Delta and improve reliance on locally developed water sources (see this RUWMP's representation of compliance in *Chapter 3 – Regional Water Supply Characterization*). The Delta Plan is the governing document that guides the Delta's future and spawned the DRA regional self-reliance policies. The Delta Plan has two "co-equal goals:" (1) providing a more reliable water supply for California; and (2) protecting, restoring, and enhancing the Delta ecosystem.

[40] California Water Code Section 85225

Specifically, urban water purveyors should demonstrate consistency with Delta Plan Policy WR P1 – Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[41] WR P1 subsection (a) states that:

Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:

1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);

2) That failure has significantly caused the need for the export, transfer, or use; and

3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

The DRA is relevant to MWA's water asset portfolio and the water asset portfolios of its retailers because the DRA's rules require reduced reliance on water supplies derived from the Delta in favor of locally developed water supplies. The methodology needed to comply with DRA's regulatory requirement as noted in the policy is a reduction in "the percentage of water used from the Delta watershed."

6.4.2.2 Healthy Rivers and Landscapes

The Bay Delta Plan's Healthy Rivers and Landscapes program, implemented through Voluntary Agreements (VAs), establishes specific "forgone export" requirements that would directly restrict SWP deliveries to south-of-delta contractors. Under these agreements, DWR and the Bureau of Reclamation must reduce exports from key Delta pumping facilities (Jones Pumping Plant and Clifton Court Forebay) based on water year types. The required export reductions range from zero in critical and wet years to 125,000 acre-feet in dry and below normal years, and up to 175,000 acre-feet in above normal years. These forgone exports are designed to ensure that additional upstream flows provided under the VAs actually reach the Delta as outflow rather than being captured by the export facilities.

The restriction mechanism works by establishing "reference conditions" representing pre-VA baseline operations, then requiring that SWP and Central Valley Project operations avoid exporting both these reference flows and the new additive VA flows. This creates a complex accounting system where south-of-delta water contractors would experience reduced deliveries not only from the direct export limitations, but also from the operational constraints needed to ensure VA tributary flows bypass the pumps and contribute to Delta outflow. The

[41] Cal. Code Regs., tit. 23 Section 5003.

program includes detailed daily and monthly tracking requirements to verify that the projects are indeed forgoing exports rather than simply capturing the additional upstream flows, effectively prioritizing ecosystem benefits over south-of-delta water supply reliability.

6.4.3 Delta Conveyance Project

The Delta Conveyance Project (DCP) is a proposed project by DWR to mitigate lost supply to the SWP associated with transporting water through the Sacramento-San Joaquin Delta (Delta). SWP contractors situated south of the Delta are exposed to multiple risk scenarios for long-term SWP supplies, including previously discussed regulatory compliance statutes. Additional mitigation against other water supply risks driven by rising sea levels, earthquakes, progressive risk of levee failures, and extreme drought and flood are also identified as DCP benefits. Continuation of existing operation of the Delta is expected to increasingly expose water users that depend on water exported from the Delta to risks of interrupted water supply and decreasing water supply reliability over time. In short, the DCP is a significant risk mitigation component to help overcome uncertainties associated with conveying SWP water through the Delta.

MWA is an investor and participant in the DCP. The investment costs associated with MWA's role are to fund the work plan and reserve capacity space in the project. The DCP does not increase water rights associated with the SWP but rather would restore losses caused by current physical and regulatory issues and mitigate against future changed conditions affecting SWP exports by adding a new point of diversion in the northern Delta. The Final Environmental Impact Report for the DCP was certified by DWR in December 2023 and a Change in Point of Diversion Petition was filed with State Water Resources Control Board (SWRCB) February 22, 2024. MWA's participation in the DCP is safeguard for long-term supply reliability for the Region and its critical imported water supply.

6.4.4 Evaluating and Managing Supply Reliability Risks

MWA's water supply reliability is anchored by a diverse portfolio that includes SWP allocations, natural and managed groundwater, imported wastewater, return flows, and strategically stored water supplies totaling over 250,000 acre-feet. This diversity provides crucial flexibility in responding to varying hydrological and regulatory conditions, though it also introduces complex interdependencies that require sophisticated risk management approaches.

As both SWP contractor and MBA Watermaster, MWA must navigate the intersection of imported water reliability—in which average delivery projections have declined an estimated 22% over the last 20 years—with local groundwater management obligations under multiple court judgments. The Agency's stored SWP water assets serve as a critical buffer, enabling the system to maintain reliability even during extended drought periods when imported supplies may be curtailed.

Still, MWA's water supply portfolio faces a range of threats that require comprehensive risk assessment and mitigation planning, including SWP operational and regulatory constraints, local infrastructure vulnerabilities, climate change-driven hydrological variability, extended drought scenarios, seismic risk, and other emerging challenges that could impact the Agency's ability to reliably meet regional water demands through the planning horizon.

6.4.5 Evaluating Future Risk Scenarios

MWA's reliability risk management operates within an increasingly complex regulatory environment, requiring coordination with Groundwater Sustainability Plans under the Sustainable Groundwater Management Act (SGMA), compliance with updated Urban Water Management Planning Act requirements, integration with local hazard mitigation planning, and compliance with statutes and authorities protecting federally endangered and threatened species under the Endangered Species Act (ESA), D-1641 Bay Delta Water Quality Control Plan, and California Endangered Species Act (CESA), among others.

Climate change introduces additional layers of complexity to traditional reliability planning. Regional temperature data shows gradual warming trends over the past century, potentially increasing evapotranspiration rates and water demand pressures. While the high desert climate already experiences extreme conditions that limit the impact of incremental change, MWA recognizes the need to incorporate climate vulnerability assessment into long-term planning frameworks.

The significant risks to MWA's water supplies mainly relate to sustained reductions in SWP deliveries. The SWP's own climate adaptation planning, addressing more intense flood and drought cycles and rising sea levels in the Delta, directly impacts MWA's imported supply reliability. The DWR Delivery Capability Report, as discussed previously, indicates the expectation that the long-term average of the SWP deliveries will decrease. This trend of predicted long term average reductions has occurred in previous Delivery Capability Reports as well, and it is clear DWR plans to manage the SWP along these expectations. Even as projects like the Delta Conveyance Project are proposed to alleviate some of this supply reduction, it is only expected to mitigate reductions in supply rather than eliminate or even just stabilize the trend.

The most significant risk in the immediate future would be a sustained drought. If a multi-year severe drought were to impact SWP supplies and the MWA service area simultaneously, MWA would face a period with minimal capacity to recharge groundwater coupled with significant demand from within the service area that would strain basin health. Additionally, groundwater overdraft has led to ground subsidence along certain parts of SWP infrastructure, and while SMGA aims to mitigate subsidence and its impacts to the infrastructure, several groundwater basins across the State are still not in compliance and place the infrastructure at continued risk.

Seismic risks must also be considered in water supply reliability planning. Earthquakes put SWP infrastructure at risk, including dams, pumping plants, aqueducts, tunnels, and pipelines, many of which are located in seismically active parts of the state. Cascading risk such as fire from broken gas or electrical lines and flood risk from damaged dams or levees are also of concern. For instance, a major earthquake in the Bay Area that caused levee failure in the Delta could cause a catastrophic outage of water deliveries that could last for months or longer while repairs were made and salinity levels were restored. Seismic risks to critical infrastructure and potential supply disruptions require seismic monitoring and preparedness, infrastructure improvements, and comprehensive emergency response planning and system hardening strategies.

Water supply infrastructure within the MWA service area also poses potential risks to water deliveries. Significant portions of MWA's pipelines face corrosion challenges, and repairs or replacement could reduce service capacities and the ability to take SWP water deliveries for groundwater recharge. Capital improvement projects must also be aligned to prevent artificial constraints on MWA supplies. Additionally, certain assets face other technical or biological constraints, such as water imports that could impact the Arroyo Toad or debris in the California Aqueduct limiting the ability to take water. These are systemic issues that impact the reliability of MWA's water supplies but are manageable with foresight and prioritized action.

Sub-Chapter 6.5 – Managed Groundwater Storage

As previously indicated, managed groundwater storage represents a critical component of water supply reliability across the Mojave Region, encompassing both the five MBA Judgment subareas and the Morongo Basin. MWA directly stores imported water in the MBA subareas, accounted for as "Managed Groundwater Storage," and in the Morongo Basin under two separate agreements in the Ames Valley Basin and Warren Valley Basin.

Based on the most recent reporting, MWA maintains approximately 256,000 acre-feet of stored groundwater within the Mojave Basin Adjudication subareas, with an additional 173 acre-feet stored in the Morongo Basin under separate agreements.[42]

6.5.1 Alto Subarea

The Alto Subarea storage account balance is approximately 194,000 acre-feet. The Alto Subarea above the Lower Narrows continues to serve as the largest repository of MWA's stored groundwater. Operating parameters have been established with a minimum operating level based on 2016 storage conditions and a maximum level representing eight years of average annual consumptive use (approximately 55,000 acre-feet). Since 1996, the subarea has experienced significant storage depletion, with a cumulative change of -510,826 acre-feet through 2024, though recent years showed recovery with a positive change of 35,963 acre-feet in Water Year 2023-2024. Water levels exhibit seasonal variation near the Mojave River, with declining trends in heavily pumped areas, particularly in the western portion of the Regional Aquifer.

6.5.2 Centro Subarea

The Centro Subarea storage account balance is approximately 35,000 acre-feet. The Centro Subarea operates under defined parameters established since 1997. The minimum operating range reflects the lowest storage since establishment of the Judgment when the basin was considered healthy, with maximum levels representing five years of average annual consumptive use (approximately 18,000 acre-feet). The subarea demonstrated positive storage recovery in Water Year 2023-2024 with a net gain of 29,794 acre-feet.

[42] Planning, Resources, Engineering, and Operations Committee presentation, March 31, 2026.

6.5.3 Baja Subarea

The Baja Subarea storage account balance is approximately 25,000 acre-feet. The Baja Subarea faces ongoing challenges, having lost approximately over 500,000 acre-feet of groundwater storage since 1996. However, recent trends suggest potential stabilization, with indications that continued pumping at current or lower levels due to reduced agricultural operations may halt continuous depletion. Optimal operating parameters remain under development.

6.5.4 Este Subarea

The Este Subarea storage account balance is approximately 1,300 acre-feet. The Este Subarea appears to maintain natural balance, with water supply and use remaining balanced over the past 20 years based on water level data. The subarea achieved equilibrium in Water Year 2023-2024 with no net change in storage. While optimal operating parameters have not been formally established, the long-term stability suggests sustainable management under current conditions. MWA has developed demonstration groundwater recharge facilities in the subarea and is continuing geotechnical investigations to support future recharge basin development.

6.5.5 Oeste Subarea

The Oeste Subarea currently maintains no MWA stored water accounts but demonstrates natural balance between water production, supply, and outflow. Water level data indicates short-term stability, leading to a "no change in storage" designation for planning purposes. MWA has installed monitoring wells and approved design of a pilot recharge basin on a 10-acre Agency-owned parcel.[43] Geotechnical investigations are also ongoing to identify optimal locations for future off-Mojave River recharge facilities.

6.5.6 Morongo Basin

Beyond the MBA subareas, MWA maintains strategic storage in the Morongo Basin through two separate agreements. Storage includes 173 acre-feet in the Ames-Reche Management Area but zero acre-feet in Joshua Basin. The Ames-Reche Agreement covers 95 square miles and involves multiple agencies including Bighorn Desert View Water Agency and Hi-Desert Water District. Since 2012, water levels across the Ames-Reche Management Area have remained relatively stable, with annual pumping around 1,200 acre-feet compared to the established baseline of 1,646 acre-feet per year. The Warren Valley Basin within the Morongo area benefits from imported water deliveries through the Morongo Basin Pipeline, supporting

[43] MWA Watermaster 2023-2024 Supply Conditions Report at p. 16.

both the Warren Valley Basin Judgment requirements and enhanced storage management. Water levels have generally increased since implementation of recharge and management actions.

6.5.7 Summary of Managed Groundwater Storage by Subregion

When organized into the three Subregions discussed in *Chapter 2 – The Mojave Region*, the Managed (Stored) Groundwater Storage is:

Subregion 1: 194,000 AF *(Alto)* + 1,300 AF *(Este)* + 0 AF *(Oeste)* = 195,300 AF

Subregion 2: 35,000 AF *(Centro)* + 25,000 AF *(Baja)* = 60,000 AF

Subregion 3: 173 AF *(Ames)* = 173 AF

While no formal minimum storage target has been set by MWA, this supply is viewed as a vital contingency source for potential repeating instances of very low SWP Table A Allocations in consecutive years – or for other drivers impacting the current year's SWP Table A availability. As such, this source is recognized as available to meet Subregional demands whenever native groundwater (e.g. FPA for parties subject to the MBA Judgment), local recycled supplies, and anticipated Table A supplies are insufficient.

This supply is also available to help retail suppliers meet demands during future periods where demand may exceed the supply shown in their retail chapters in interim years but fall within the total 2050 supply shown in this RUWMP. Overall, use of this supply is represented within this RUWMP by making these supplies available in forecast supply tables for multiple dry year supply reliability in any event where a shortfall in Table A, native groundwater, or recycled water is projected prior to the use of the managed storage (see *Chapter 5 – Regional Water Service Reliability*).

6.5.8 Water Quality

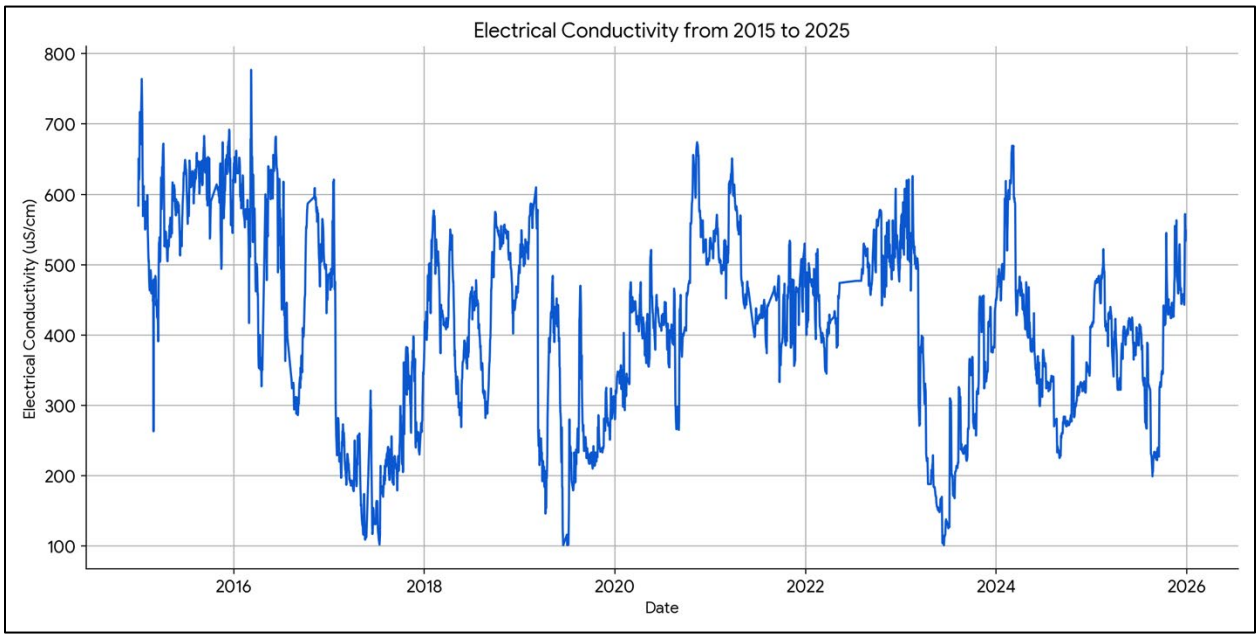
This subsection focuses on the quality of State Water Project supplies imported into the region and recharged into the various portions of the groundwater basins and adjudicated areas throughout the Mojave Region. A discussion of groundwater quality is included in *Chapter 3 – Regional Water Supply Characterization.*

The quality of imported surface water conveyed through the California Aqueduct is monitored by the DWR Division of Operations and Maintenance. DWR maintains 16 continuous water quality monitoring stations located throughout the SWP and data collected from these stations is regularly updated to the California Data Exchange Center (CDEC). The parameters for monitoring SWP water quality include electrical conductivity, water temperature, turbidity, pH, and fluorescence. SWP water quality changes as the water moves from precipitation and snowmelt runoff in Northern California to its termination points in Southern California. As such,

the water quality measurements at each station are important for purposes of tracking water quality constituents in the SWP system.

Of the 16 water quality monitoring stations, Check 66 is located closest to MWA's turnouts and Check 41 is examined to align operational decisions and data monitoring. Check 66 is located at an elevation of 3,448 feet in San Bernardino County near the City of Hesperia in the South Lahontan Hydrologic Region (see **Figure 2-7**). **Figures 6-2** through **6-4** show the measured publicly available electrical conductivity, temperature, and turbidity at Check 66 since 2015 through 2025. **Figure 6-5** shows pH at the Check 41 Kern measurement location and **Figure 6-6** shows fluorescence at the Pacheco Pumping Plant.[44]

FIGURE 6-2: CHECK 66 ELECTRICAL CONDUCTIVITY 2015-2025



[44] These varying water quality monitoring station locations were chosen because Check 66 does not collect these water quality parameters and the Kern location (Check 41) and Pacheco Pumping Plant monitoring stations were the nearest to Check 66.

FIGURE 6-3: CHECK 66 WATER TEMPERATURE 2015-2025

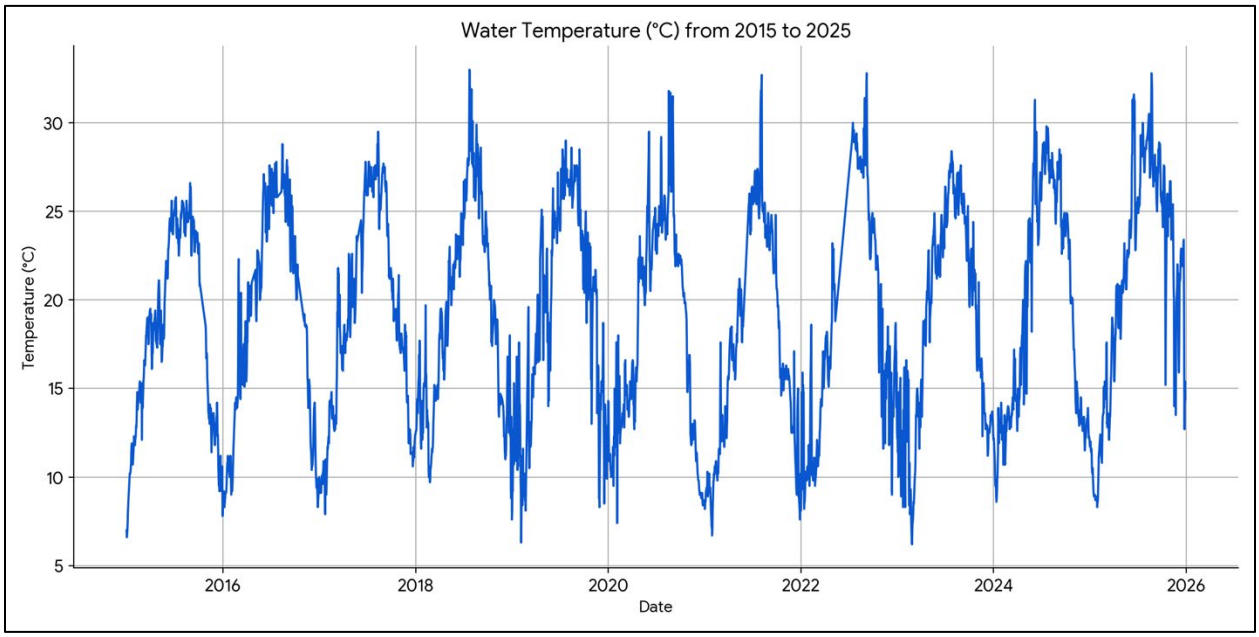


FIGURE 6-4: CHECK 66 WATER TURBIDITY 2015-2025

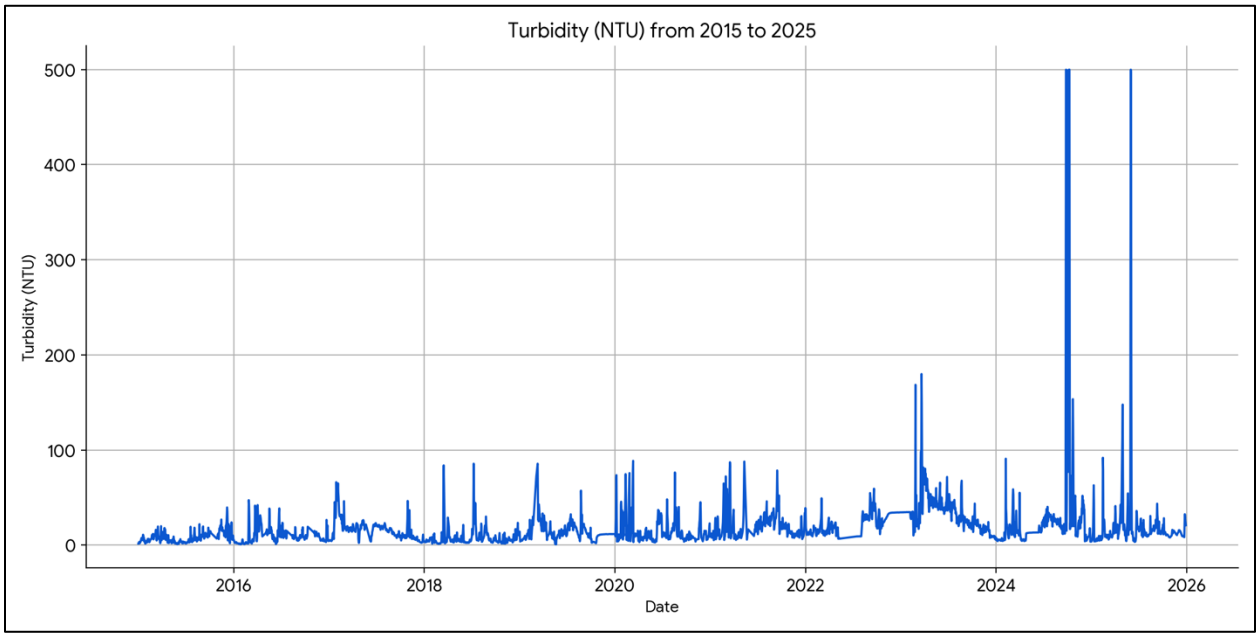


FIGURE 6-5: CHECK 41 (KERN) PH VALUE (2015-2025)

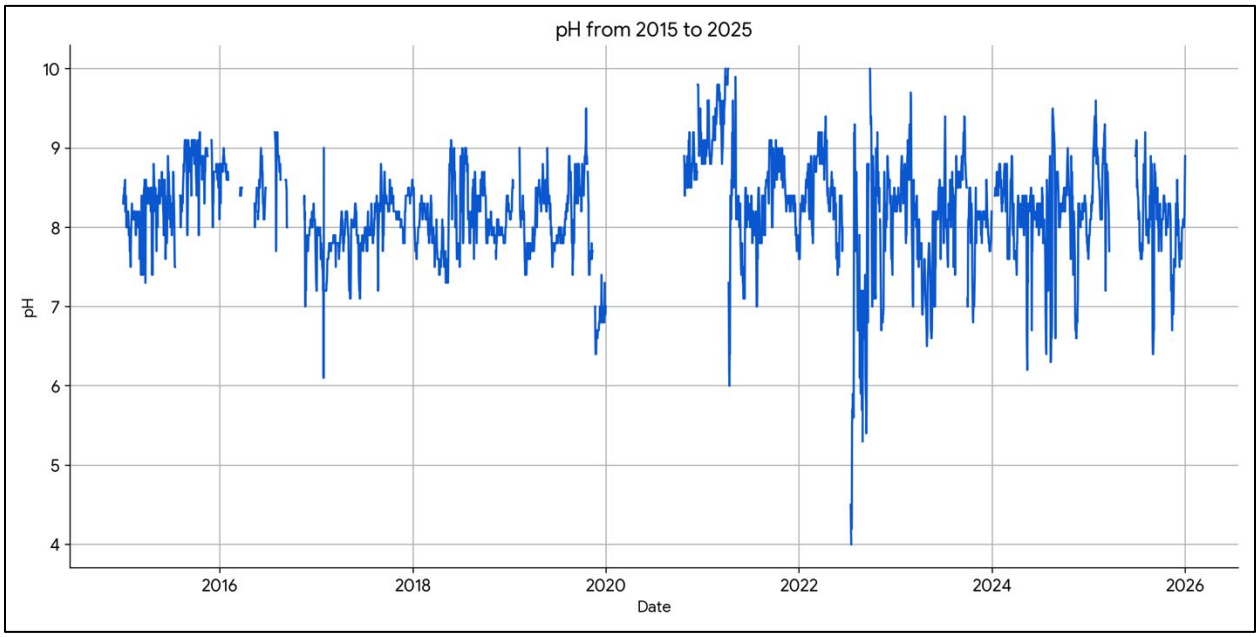
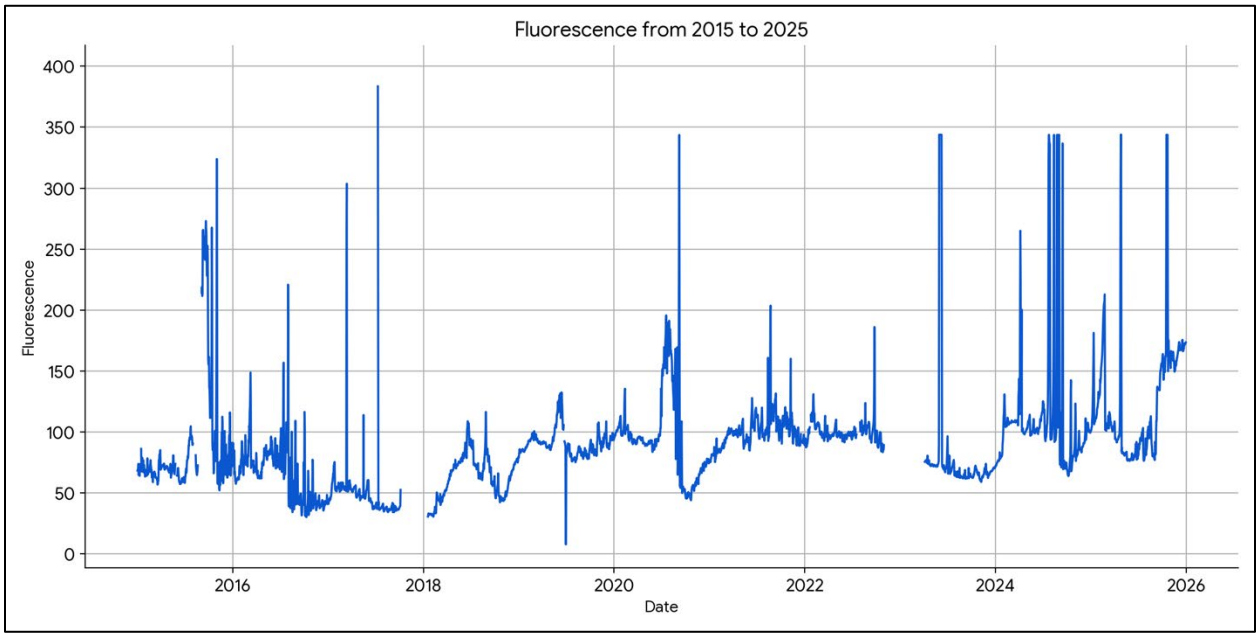


FIGURE 6-6: PACHECO PUMPING PLANT FLUORESCENCE 2015-2025



6.5.9 Recycled Water Supplies

MWA is not directly involved with the creation or distribution of recycled water supplies. This activity does occur within a few of the retailer's service areas, notably Hesperia Water District and the City of Victorville. MWA has zero recycled water supplies nor forecasts for such supplies.

6.5.10 Desalination Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). This discussion takes place in *Section 3.1.3 of Chapter 3 – Regional Water Supply Characterization.*

6.5.11 Water Transfers and Exchanges

MWA engages in water transfers and exchanges involving its SWP assets and other SWP Contractors' SWP assets. Historically, MWA has both received and delivered water through these transfers and exchanges with various agencies throughout California. These transfers are essentially spot market transfers where short-term opportunities are identified and then actions taken for purchase and acquisition. These transfers help support management of MWA's and its retail agencies' water supply portfolios. Future MWA transfers and exchanges depend upon allocations available to MWA and other water purveyors and are not considered an available supply for purposes of this RUWMP.

6.5.12 Supply Summary

Mojave Water Agency operates a diverse and strategically managed water supply portfolio that serves over 500,000 residents across a 4,900-square-mile service area. As both a SWP contractor and MBA Watermaster, MWA's water supply strategy centers on importing surface water for groundwater recharge to support sustainable management of local groundwater basins.

MWA's water supply portfolio consists of four primary components that work together to provide reliable water service through varying hydrological conditions. SWP imports form the foundation of MWA's supply strategy, with a maximum annual Table A contract amount of 89,800 acre-feet delivered through six turnout locations on the East Branch of the California Aqueduct. These imported supplies are primarily used for groundwater recharge rather than direct service delivery, supporting the adjudicated basin management framework that governs regional water use.

This integrated portfolio enables MWA to maintain water supply reliability across normal, single dry year, and multiple dry year conditions. The Agency's water supply diversification includes annual imported water deliveries combined with strategically managed locally

stored groundwater as well as SWP carryover supplies. A summary of MWA's water supply portfolio is shown in **Table 6-5**.

TABLE 6-5: MWA WATER SUPPLY PORTFOLIO SUMMARY

Source	Annual Amount	Description
State Water Project – Table A	89,800	Maximum Table A contract amount; actual deliveries vary (46% average 2010-2025)
SWP – Article 21	Variable	Intermittent SWP surplus water when available
SWP – Article 56 Carryover	Variable	Stored SWP allocation in San Luis Reservoir
Managed Groundwater Storage	256,000[45]	Storage across Mojave Basin subareas and Morongo Basin

For purposes of this RUWMP, the forecast of MWA's SWP supplies are presented in **Table 6-6** and **Table 6-7**.

TABLE 6-6: MWA'S PROJECTED SWP SUPPLY FOR 2026 – 2030 (AFY)

Year		SWP Contract Table A	Percent Allocation	Allocation Amount
Normal		89,800	54%	48,492
Single Dry		89,800	5%	4,490
Multi-Year Drought	2026 (1st year)	89,800	35%	31,430
	2027 (2nd year)	89,800	5%	4,490
	2028 (3rd year)	89,800	5%	4,490
	2029 (4th year)	89,800	20%	17,960
	2030 (5th year)	89,800	35%	31,430

[45] March 2026 State Water Project Allocation and Imported Water Operations Plan Update, Presentation on March 31, 2026 to the Planning, Resources, Engineering, and Operations Committee.

TABLE 6-7: MWA'S PROJECTED SWP SUPPLY THROUGH 2050 (AFY)

Total Supply		Percent Allocation	2030	2035	2040	2045	2050
Normal		54%	48,492	48,492	48,492	48,492	48,492
Single Dry Year		5%	4,490	4,490	4,490	4,490	4,490
Multi-Year Drought	Year 1	35%	31,430	31,430	31,430	31,430	31,430
	Year 2	5%	4,490	4,490	4,490	4,490	4,490
	Year 3	5%	4,490	4,490	4,490	4,490	4,490
	Year 4	20%	17,960	17,960	17,960	17,960	17,960
	Year 5	35%	31,430	31,430	31,430	31,430	31,430

The characterizations of MWA's SWP Table A Allocation long-term reliability reflect numerous hydrological and regulatory issues that inform the State's DCR modeling, are reasonable assessments related to SWP system management, and reflect MWA's local conditions. Long-term water management hydrological and regulatory issues include the Bay-Delta Water Quality Control Plan, the Coordinated Operations Agreement, the Delta Biological Opinion, the Delta Conveyance Project, modifications to San Luis Reservoir, SWP seismic considerations, DWR's Emergency Planning, and assessments related to MWA's local groundwater conditions and climate. MWA thoughtfully engages on all these issues and undertakes actions that help mitigate supply related impacts that may be caused by one or more listed items. These issues are all considered in MWA's planning and incorporated into its supply characterizations in this RUWMP.

6.5.13 Groundwater within the Remaining Areas of the Mojave Region

Besides its primary role as an importer of SWP supplies, MWA provides the geographic representation for the use of groundwater throughout the rest of the Region that is outside the service areas of the participating RUWMP retailers. The demand for water mostly reflects the other small retail water suppliers, rural domestic users, agricultural users, and large and small industries that are subject to the MBA Judgment.

Like to the other retail agencies, these users pump groundwater from the adjudicated MBA, specifically in Subregion 1 and Subregion 2 (see **Figure 2-3**). As discussed elsewhere, the basins used to meet these demands are recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water

delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Chapter 2 – The Mojave Region*.

6.5.13.1 Mojave Region's Remaining Free Production Allowance

Under the MBA Judgment, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The FPA for each participating retail water supplier is discussed and quantified for near- and long-term forecasts in each of their respective Chapters. For the remaining areas of the Mojave Region not part of the retail service areas, particularly in Subregion 1 and Subregion 2, there is a cumulative FPA that represents the near- and long-term FPA available to meet all these other users and uses. This groundwater is not controlled directly by MWA as a water supply but is managed through MWA's role as the MBA Watermaster and represented in determinations of Base FPA.

For purposes of fully representing available FPA, this subchapter uses recent FPA quantities as they are presented by the MBA Watermaster in recent reports. Specifically, the forecast availability of native groundwater is determined by removing the retailer-specific FPA from the MBA Watermaster report for Base FPA.[46] This value, along with the representation of MWA's imported supply, is reflected in the water supply summary tables presented in *Chapter 3 – Regional Water Supply Characterization*.

- Subregion 1 – Total annual Base FPA is approximately 70,400 acre-feet. Total RUWMP Retailer FPA is approximately 38,000 acre-feet. Remaining Base FPA is approximately 32,300 acre-feet.
- Subregion 2 – Total annual Base FPA is approximately 39,600 acre-feet. Total retailer FPA is approximately 8,050 acre-feet. Remaining Base FPA is approximately 31,500 acre-feet.

[46] Water Year 2024-2025 Watermaster Report, Appendix B-Summary, p. 15 of 16.

Sub-Chapter 6.6 – Water Use Characterization

This sub-chapter describes the methodology used to forecast water demands within MWA's service area that occur outside the service area boundaries of the ten participating urban water retail suppliers addressed in Chapters 7 through 16. These demands include small water systems, rural domestic users, agricultural uses, industrial uses, and golf course and recreational uses that are not otherwise quantified in the individual retailer chapters. Because MWA's service area is concurrent with the Mojave Region, these demands are part of the overall regional water use forecast and are necessary to evaluate MWA's wholesale water supply planning responsibilities.

Current regional water use, including use by participating urban water retail suppliers and other water users within the Mojave Region, is summarized in *Section 4.4.1 – Current Regional Water Use of Chapter 4 – Water Use Characterization*. Section 4.4.1 presents recent water use by major category and subregion and provides the current-use accounting used for the regional demand analysis. To avoid duplicating these tables and descriptions, this sub-chapter focuses on the methodology used to project future demands for small water systems and rural domestic users, industrial uses, golf course, recreational uses, and agricultural uses outside the service areas of the participating RUWMP retailers.

The resulting forecasts are incorporated into the regional demand summaries presented in *Chapter 4 – Water Use Characterization* and carried forward into *Chapter 5 – Regional Water Service Reliability*. Accordingly, this sub-chapter does not repeat the regional demand totals presented in Chapter 4 or the retailer-specific forecasts presented in Chapters 7 through 16. Instead, it presents the other-use demand forecasts developed for MWA's wholesale planning purposes and documents the assumptions, data sources, and methods used to develop those values. When combined with the applicable retailer forecasts, these other-use demands form the basis for the Subregion and Regional demand totals summarized in **Tables 4-5** through **4-8**.

6.6.1 Forecasting Water Demands Outside Participating Retailer Service Areas

Small retail water supplier and rural domestic uses, agricultural uses, industrial uses, recreational uses, and golf course uses were forecast separately from the demands developed for the participating urban water retail suppliers. For the adjudicated portions of

MWA's service area, these categories are tracked and reported annually by the Mojave Watermaster by adjudicated subarea. The Watermaster-reported production data were used as the primary basis for characterizing historical use and developing future demand forecasts in Subregions 1 and 2.

The Morongo Subarea is not part of the MBA adjudication, and comparable Watermaster-reported production data are not available for water uses outside of Hi-Desert Water District and Joshua Basin Water District. Accordingly, small retail water supplier and rural domestic, agricultural, industrial, recreational, and golf course demands outside of those retailer service areas were estimated using best available planning-level information, including available supplier data, land use and spatial information, and demand assumptions developed as part of MWA's broader demand analysis.

6.6.1.1 Small Water Systems and Rural Domestic Use

MWA's service area includes small public water systems and rural domestic users located outside the service area boundaries of the participating urban water retail suppliers. *Chapter 2 – The Mojave Region* presents the overall population associated with MWA's wholesale demand area; however, this sub-chapter focuses on the methodology used to translate that population into projected water demands. For the adjudicated portions of MWA's service area, small water system and rural domestic use is tracked through Mojave Watermaster reporting. Water use for small public water systems is generally metered and reported, while use by small private pumpers, which primarily reflects rural residential domestic use, is estimated by the Mojave Watermaster. These data were used to characterize recent historical use and develop a representative per-capita demand factor.

Future demand for this user class within Subregions 1 and 2 was estimated by dividing the reported total water use by the associated small water system and rural domestic population. In 2025, this user class within Subregions 1 and 2 had an estimated population of approximately 72,023 and a total water use of 14,544 acre-feet, resulting in an estimated use factor of 178 gallons per capita per day, or approximately 0.20 acre-feet per person per year. This use factor is generally consistent with values calculated using 2021 through 2024 data and was therefore determined to be representative of recent and future demand conditions for this user class.

In 2025, the small water system and rural domestic population within Subregion 3 was estimated at approximately 12,580. However, because the Morongo Subarea is not part of the Mojave Basin Area adjudication, no comparable Watermaster reporting framework exists to track small water system and rural domestic production outside the service areas of Hi-Desert Water District and Joshua Basin Water District. Thus, future demands for this user class in Subregion 3 were estimated by applying the 0.20 acre-foot per person per year use factor developed from Subregions 1 and 2 to the Subregion 3 small water system and rural domestic population projections.

The resulting demand forecast was developed by applying the representative 0.20 acre-foot per person per year use factor to the small water system and rural domestic population projections presented in **Table 6-2**. Projected demands for this user class are summarized by Subregion in **Table 6-8** and rounded to the nearest 5 acre-feet.

TABLE 6-8: PROJECTED SMALL WATER SYSTEM AND RURAL DOMESTIC DEMAND 2030-2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	11,550	11,370	10,925	10,420	9,310
Subregion 2	2,805	2,760	2,650	2,530	2,260
Subregion 3	2,475	2,435	2,340	2,230	1,995

Helendale Community Services District represents a notable component of the small water system and rural domestic demand forecast in Subregion 1. In 2025, Helendale CSD accounted for approximately 13% of Subregion 1's small water system and rural domestic demand. Although Helendale CSA does not currently meet the UWMPA reporting threshold and is therefore not required to prepare an individual UWMP, it is one of the larger small retail water suppliers within the Mojave Region and is approaching the statutory threshold for UWMP preparation. Appropriately, Helendale CSD was included in MWA's wholesale demand forecast and coordinated during development of the RUWMP, but its demands are addressed within this MWA wholesale chapter rather than in a separate retailer chapter.

6.6.1.2 Agricultural Use

Like the majority of groundwater users governed by the MBA Adjudication, agricultural users are assigned an FPA that is monitored by the Mojave Watermaster. Agricultural use has historically represented one of the larger water use categories in the Mojave Region; however, agricultural demands have declined substantially over the past several decades as production has adjusted to the adjudication framework and changing land use conditions. Watermaster Annual Production Reports prepared since the 2020 MWA Wholesale UWMP indicate that agricultural has continued to decline below levels previously projected, particularly in the Centro and Baja Subareas where some agricultural lands have converted to solar development.[47]

For purposes of this 2025 RUWMP, the 2025 agricultural demand of approximately 14,500 acre-feet is considered representative of long-term planning conditions. Therefore, agricultural demands are held constant by Subregion through 2050. The resulting agricultural demand forecast, rounded to the nearest five acre-feet, is presented in **Table 6-9**.

[47] Regional Agricultural Water Use from 2021 through 2025 is presented in Table 4-1.

TABLE 6-9: PROJECTED AGRICULTURAL DEMAND 2030-2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	3,000	3,000	3,000	3,000	3,000
Subregion 2	11,500	11,500	11,500	11,500	11,500
Subregion 3[48]	0	0	0	0	0

6.6.1.3 Industrial, Golf Course, and Recreational Uses

Industrial, recreational, and golf course uses outside the service area boundaries of the participating urban water retail suppliers were forecast separately from the small water system, rural domestic and agricultural demands. For the adjudicated portions of MWA's service area, these uses are tracked by the Mojave Watermaster and reported in the Watermaster Annual Production Reports. Based on recent reporting, these use categories have shown modest declines between 2021 and 2025, with no identified growth trend or known development activity indicating a near-term increase in demand.

For purposes of this 2025 RUWMP, 2025 water use was determined to be representative of long-term planning conditions for industrial, recreational, and golf course uses. Accordingly, the 2025 demand values are held constant by subregion through 2050. For Subregion 3, demands outside the service area boundaries of Hi-Desert Water District and Joshua Basin Water District were estimated using publicly available aerial imagery, remote sensing data, and land use information as the Morongo Subarea is not subject to a centralized Watermaster reporting framework. The resulting demand forecast, rounded to the nearest five acre-feet, is presented in **Table 6-10**.

[48] A spatial review using aerial imagery, remote sensing data, and land use information confirmed the no agricultural use in Subregion 3. This review was conducted because the Morongo Subarea is not subject to a centralized Watermaster reporting framework comparable to the MBA adjudicated subareas.

TABLE 6-10: PROJECTED INDUSTRIAL, RECREATIONAL, AND GOLF COURSE DEMAND 2030-2050 (AFY)

Subregion		2030	2035	2040	2045	2050
Industrial	Subregion 1	4,400	4,400	4,400	4,400	4,400
	Subregion 2	2,600	2,600	2,600	2,600	2,600
	Subregion 3	335	335	335	335	335
Recreational	Subregion 1	5,400	5,400	5,400	5,400	5,400
	Subregion 2	1,800	1,800	1,800	1,800	1,800
	Subregion 3	50	50	50	50	50
Golf Course	Subregion 1	5,000	5,000	5,000	5,000	5,000
	Subregion 2	0	0	0	0	0
	Subregion 3	215	215	215	215	215

The forecasts presented in **Tables 6-8** through **6-10** represent the water demand components within MWA's service area that are outside the service area of the participating urban water retail suppliers. These forecasts are not intended to replace or duplicate the regional demand summaries presented in *Chapter 4 – Water Use Characterization.* Rather, they provide the supporting other-use demand values that are combined with the applicable retailer demand forecasts to develop the Subregion and regional demand totals presented in **Tables 4-5** through **4-8**. The integrated regional demand forecast is then carried forward into *Chapter 5 – Regional Water Service Reliability*.

Sub-Chapter 6.7 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the MWA's demand management measures and water shortage response framework. As a wholesale urban water supplier, MWA's conservation and shortage response responsibilities differ from those of the participating retail water suppliers. MWA does not generally provide direct retail water service; rather, it supports regional water reliability through imported water management, groundwater recharge, stored water management, regional conservation coordination, and administration of adjudicated groundwater management responsibilities.

MWA's demand management efforts are focused on supporting efficient regional water use, coordinating conservation messaging and programs with participating agencies, and maintaining long-term reliability of the groundwater supplies that serve the Mojave Region. These efforts complement the retail-level demand management measures implemented by the participating urban water retail suppliers within their respective service areas.

MWA's Water Shortage Contingency Plan (WSCP), adopted with the 2020 UWMP and readopted as part of this 2025 RUWMP, provides the Agency's framework for evaluating water supply conditions and responding to potential shortages. The WSCP addresses water supply reliability, Annual Water Supply and Demand Assessment procedures, six standard shortage levels, shortage response actions, communication protocols, legal authorities, financial considerations, reevaluation procedures, and plan adoption and availability. Because MWA's role is regional and wholesale in nature, implementation of the WSCP emphasizes coordination with retail water agencies, management of available imported and stored supplies, and actions to mitigate extended drought conditions or catastrophic interruptions to regional water supply availability.

No substantive changes have been made to MWA's 2020 WSCP for purposes of this 2025 RUWMP. However, the water supply reliability analysis, demand forecasts, drought risk assessment, and related planning assumptions have been updated through the 2025 RUWMP. Accordingly, the WSCP remains applicable as MWA's shortage response framework, while the updated reliability findings presented in this chapter and in *Chapter 5 – Regional Water Service Reliability* provide the current basis for evaluating supply conditions over the planning horizon.

A complete description of MWA's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 4.

6.7.1 Demand Management Measures

MWA has implemented a broad set of demand management measures (DMMs) to promote efficient use of water resources and support long-term regional water supply reliability. Because MWA functions primarily as a wholesale water supplier, State Water Project contractor, and regional groundwater management agency, its DMMs differ from those implemented by retail water suppliers. MWA does not generally provide direct retail water service or regulate day-to-day customer water use within the service areas of participating urban water retail suppliers. Instead, MWA's DMMs focus on regional conservation coordination, public education and outreach, technical support, water use efficiency programs, regional supply planning, and management of imported and stored water supplies.

MWA's DMMs are implemented in coordination with participating retail agencies, small water systems, rural domestic users, and other regional water users. These efforts complement the retail-level DMMs described in the individual retailer chapters of this RUWMP and help provide a consistent regional framework for water conservation, efficient water use, and long-term reliability planning.

MWA will continue to implement and refine its DMMs to support efficient water use, regional water supply reliability, and compliance with applicable State requirements. Additional information regarding MWA's foundational, recent, and planned DMM activities is provided in the following subsections.

6.7.2 Foundational Demand Management Measures

MWA's foundational DMMs remain generally consistent with those described in the 2020 UWMP and continue to serve as the basis for regional conservation and water use efficiency efforts. These measures include metering of imported water deliveries, public education and outreach, conservation program coordination and staffing support, distribution system asset management for MWA-owned facilities, and wholesale supplier assistance.

Water Measurement and Accounting

MWA measures State Water Project deliveries received through its turnouts and tracks water delivered to recharge, recovery, and other Agency-managed facilities. These data support regional water accounting, operational planning, and long-term supply reliability analyses.

Public Education and Outreach

MWA implements public education and outreach programs to promote efficient water use throughout the Mojave Region. These efforts include conservation messaging, educational materials, public presentations, workshops, community events, and coordination with regional partners such as the Alliance for Water Awareness and Conservation.

Conservation Program Coordination and Staffing Support

MWA supports regional conservation through dedicated program coordination, staffing, and funding. These efforts include technical and administrative support for conservation programs, participation in regional events and conferences, and support for rebate, education, and outreach activities that encourage efficient water use across the Region.

MWA-Owned Facility Management

MWA operates and maintains facilities associated with imported water delivery, recharge, recovery, and regional water supply management. MWA monitors and maintains these facilities to support reliable operations, accurate flow measurement, water quality compliance where applicable, and efficient use of imported and stored water supplies.

Wholesale Supplier Assistance

MWA provides technical, financial, and programmatic assistance to retail suppliers and regional partners to support conservation and water-use efficiency. This assistance includes coordination through regional conservation programs, support for public information and education efforts, and implementation of programs that help retail suppliers and their customers reduce demand where appropriate.

6.7.2.1 Recent DMM Activities

Since the 2020 UWMP, MWA has continued to implement regional conservation, education, and coordination activities. These efforts have included continued public outreach, regional conservation messaging, coordination with participating retail agencies, support for conservation programs, and development of updated regional planning analyses through the 2025 RUWMP.

6.7.2.2 Planned DMM Activities

MWA will continue implementing DMMs that reflect its wholesale and regional water management role. Planned activities include continued coordination with participating retail agencies, ongoing public education and outreach, support for regional conservation programs, continued measurement and accounting of imported and stored supplies, and maintenance of MWA-owned facilities needed to support long-term regional water supply reliability.

6.7.3 Water Shortage Contingency Plan

MWA has adopted a WSCP in accordance with CWC Section 10632. The WSCP establishes a structured framework for evaluating regional water supply conditions, coordinating with retail water suppliers, and implementing appropriate response actions during drought, constrained imported water conditions, or other supply interruptions. Because MWA functions as a wholesale water supplier, SWP contractor, and regional groundwater management agency, the WSCP is focused on regional supply management and coordination rather than direct regulation of retail customer water use.

6.7.3.1 Summary of Water Shortage Levels and Response Actions

MWA's WSCP includes six standard shortage stages corresponding to progressively severe shortage conditions of up to 10%, 20%, 30%, 40%, 50% and greater than 50%. These stages provide a consistent framework for evaluating the relative severity of regional supply constraints. However, unlike retail shortage stages, MWA's stages are implemented primarily through wholesale and regional water management actions, including use of stored supplies, access to flexible or alternative supplies, coordination of voluntary demand reduction messaging, and operational adjustments to MWA facilities, including R-Cubed deliveries where appropriate.

- Stage 1 – Up to 10% Shortage:

  During Stage 1, MWA may access stored supplies, as needed, to address supply deficits. MWA may also coordinate voluntary conservation messaging with retail agencies, public agencies, and the broader community to encourage efficient water use and communicate the potential for future shortage conditions.

- Stage 2 – Up to 20% Shortage:

  During Stage 2, MWA may continue to access stored supplies while increasing coordination with retail agencies. MWA may also implement voluntary demand reduction messaging and reduce R-Cubed deliveries, as appropriate, to help align supply availability with projected demands.

- Stage 3 – Up to 30% Shortage:

  During Stage 3, MWA may intensify regional coordination, continue use of stored supplies, and further evaluate operational adjustments to MWA-managed facilities. R-Cubed deliveries may be reduced in coordination with affected retail agencies, while voluntary demand reduction messaging may be expanded to address increased severity of the shortage condition.

- Stage 4 – Up to 40% Shortage:

  During Stage 4, MWA may continue to rely on stored supplies, voluntary demand reduction, and reduced R-Cubed deliveries as appropriate. At this stage, MWA would evaluate regional supply conditions, operational constraints, and available management actions to preserve stored water assets and maintain reliability for essential regional needs.

- Stage 5 – Up to 50% Shortage:

  During Stage 5, MWA may implement more intensive regional supple management actions, including increased reliance on stored supplies, pursuit of alternative supplies, and continued operational coordination with retail agencies. MWA may also further reduce R-Cubed deliveries where appropriate and expand regional communication regarding shortage conditions and available response actions.

- Stage 6 – Greater than 50% Shortage:

  During Stage 6, MWA would implement emergency-level regional supply management actions necessary to address severe shortage conditions or catastrophic supply interruptions. These actions may include use of available stored supplies, pursuit of alternative supplies or transfers, operational adjustments to MWA facilities, reduction of R-Cubed deliveries, and close coordination with retail agencies, DWR, SWP contractors, and other regional partners to support continued water supply reliability for essential needs.

6.7.3.2 Summary of Monitoring Procedures and Implementation

MWA conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated regional water supply and demand conditions over a rolling twelve-month period spanning July through June. The Annual Assessment serves as the primary mechanism for evaluating near-term supply reliability and determining whether implementation of one or more WSCP shortage stages may be warranted.

MWA has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this RUWMP, the methodology and demand assumptions applied are consistent with those presented in this chapter and in *Chapter 5 – Regional Water Service Reliability.* The Annual Assessment considers available regional supplies, projected demands, infrastructure capability, imported water availability, stored water assets, and other locally applicable factors that may influence water supply reliability.

Implementation of the WSCP relies on coordination among MWA staff, retail water suppliers, regional partners, stakeholders, and the public. During shortage conditions, MWA may

communicate regional supply conditions, shortage stage determinations, available response actions, and recommended coordination measures to retailer water suppliers, regional partners, stakeholders, and the public. This approach supports consistent messaging while allowing retail suppliers to implement customer-level shortage response actions within their respective service areas.

Sub-Chapter 6.8 – Water System Reliability and Drought Risk Assessment

MWA's water system reliability and drought risk assessment findings are presented in *Chapter 5 – Regional Water Service Reliability.* The reliability analysis is informed by the MWA-specific supply and operational information presented in this chapter, including imported water supply availability and reliability considerations described in Sub-Chapter 6.4, managed groundwater storage described in Sub-Chapter 6.5, and MWA's wholesale demand forecast for uses outside the participating retail supplier service areas described in Sub-Chapter 6.6. These MWA-specific inputs are combined with the regional supply characterization presented in *Chapter 3 – Regional Supply Characterization* and the regional water use forecast presented in *Chapter 4 – Water Use Characterization* to evaluate regional reliability under the UWMPA-required considerations. Chapter 5 integrates these assumptions to satisfy the applicable water system reliability and drought risk assessment requirements, including the Five-Year Drought Risk Assessment, normal year, single dry year, and five consecutive dry year analyses through 2050.

The results demonstrated in Chapter 5 demonstrate that the Mojave Region's water supply portfolio is capable of meeting the water uses in the Region in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 6.9 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, this sub-chapter summarizes energy use associated with MWA's water management operations to the extent such information is readily available. MWA's energy reporting differs from a traditional retail water supplier because the Agency does not generally operate a retail potable water distribution system or deliver water directly to end-use customers. Instead, MWA's primary operations consist of importing SWP supplies, conveying water to recharge locations, placing water into groundwater storage, and managing regional water supply reliability. Accordingly, the energy information presented in this sub-chapter focuses on MWA-controlled water management processes for which energy and water volume data are readily obtainable, including conveyance, recharge, recovery, and related operations, as applicable.

The principal exception to MWA's recharge-focused operating model is the Regional Recharge and Recovery Project, or R-Cubed, which stores imported supplies in the Floodplain Aquifer and, when needed, recovers and delivers that water through MWA-owned wells and pipelines directly to participating retail water suppliers. Because R-Cubed includes recovery and direct delivery components, its energy use is included in MWA's energy evaluation where data are readily available.

TABLE 6-11: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR MONTH YEAR THROUGH MONTH YEAR

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	
Energy Consumed (kWh)	
Energy Intensity (kWh/acre-foot)	

Chapter 7.0 The City of Adelanto

This page is reserved for Chapter 7 – The City of Adelanto. The complete City of Adelanto retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the City of Adelanto.

Chapter 8.0 County Service Area 64 Spring Valley Lake

This page is reserved for Chapter 8 – County Service Area 64 Spring Valley Lake. The complete County Service Area 64 Spring Valley Lake retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the County of San Bernardino.

Chapter 9.0 County Service Area 70J Oak Hills

This page is reserved for Chapter 9 – County Service Area 70J Oak Hills. The complete County Service Area 70J Oak Hills retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the County of San Bernardino.

Chapter 10.0 Golden State Water Company – Barstow System

This page is reserved for Chapter 10 – Golden State Water Company – Barstow System. The complete Golden State Water Company – Barstow System retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the Golden State Water Company.

Chapter 11.0 HESPERIA WATER DISTRICT

This page is reserved for Chapter 11 – Hesperia Water District. The complete Hesperia Water District retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the City of Hesperia.

Chapter 12.0 Hi-Desert Water District

This page is reserved for Chapter 12 – Hi-Desert Water District. The complete Hi-Desert Water District retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by Hi-Desert Water District.

Chapter 13.0 Joshua Basin Water District

TABLE OF CONTENTS

List of Figures

List of Tables

APPENDICES

Sub-Chapter 13.1 – Introduction

Joshua Basin Water District (District) was formed in 1963 as a public agency through the consolidation of several smaller water systems to provide reliable potable water service within its defined service area in San Bernardino County. The District is governed by an elected Board of Directors and operates through its core functional divisions of Operations, Finance, and Administration.

The District's service area overlies portions of the Copper Mountain and Joshua Tree groundwater subbasins and encompasses areas within and surrounding the communities of Yucca Valley and Twentynine Palms, including portions of Joshua Tree National Park and the Marine Corps Air Ground Combat Center at Twentynine Palms.

The District's water supply portfolio is comprised primarily of groundwater extracted from the Copper Mountain and Joshua Tree subbasins, which represent the predominant source of supply for meeting customer demands. To supplement local groundwater resources and support long-term basin management objectives, the District also utilizes imported water made available through the Mojave Water Agency (MWA), including supplies associated with the Morongo Basin Pipeline (MBP). Ensuring an adequate and reliable water supply for current and future customers is fundamental to the District's mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the District supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on District-specific system characteristics, demands, demand management measures, and reliability.

13.1.1 Background and Purpose

The District has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.[49] The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single-dry years, and multiple-dry-year scenarios through a 20-year planning horizon. This chapter presents the District's evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the District's 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory

[49] California Water Code Sections 10610 through 10657.

guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

13.1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District is also classified as an Urban Water Supplier pursuant to California Water Code (CWC) Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in an RUWMP, which the District and the other Urban Water Suppliers within the Planning Area have elected to prepare collaboratively. Details of the District's Public Water System are provided in **Table 13-1**.

TABLE 13-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections[50]
CA3610025	Joshua Basin Water District	~ 5,574

13.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and MWA, which serves as the region's wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. The District actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and District-specific operations.

As required by the UWMPA, the District coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource

[50] The number of municipal connections presented in Table 13-1 includes both active and inactive municipal service connections.

planning efforts, including General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, the District encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

13.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction.

13.1.4 RUWMP Adoption

The District elected to hold a public workshop on May 20, 2026, to provide information regarding the 2025 RUWMP and allow for public review and discussion before formal consideration of the plan. No action was taken at the May 20, 2026, public workshop. Prior to the workshop and public hearing, the District made a draft of the 2025 RUWMP available for public inspection at 61750 Chollita Road, Joshua Tree, CA 92252. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The District's elected body held a public hearing regarding the 2025 RUWMP on June 3, 2026. Following the public hearing, the District's elected body adopted the 2025 RUWMP on June 3, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the District's website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

"FINAL Submittal 2025 UWMP Tables – Joshua Basin WD – 06.01.2026.xls"

"Appendix F 2025 Checklist – Joshua Basin WD – 06.01.2026.xls"

13.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 13.2 Water Service and System Description
- Sub-Chapter 13.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 13.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 13.5 Water Use Characterization
- Sub-Chapter 13.6 Water Conservation and Shortage Response
- Sub-Chapter 13.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 13.8 Energy Intensity Analysis

Sub-Chapter 13.2 – Water Service and System Description

The Joshua Basin Water District provides potable water service to the residents and businesses within its service area, depicted in **Figure 13-1**, which encompasses Joshua Tree, other census-designated places, and portions of the Joshua Tree National Park.

Water service in the District relies entirely on groundwater extracted from wells located throughout the service area. The District manages five active wells that tap into local aquifers to provide the community's water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the District's 17 reservoir tanks, which collectively provide approximately 12.3 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The District's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes over 300 miles of water mains, thousands of service connections, 12 booster pump stations, 12 pressure-reducing stations, and thousands of valves and fire hydrants that allow the District to isolate portions of the system for maintenance or emergencies without disrupting service to the broader community. **Table 13-2** summarizes recent historical active service connections by customer type, providing an overview of the composition of the District's customer base.[51] The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

[51] Active service connection counts presented in Table 13-2 reflect the customer connection data reported in the District's Electronic Annual Report (EAR) submitted annually to the State Water Resources Control Board (SWRCB).

FIGURE 13-1: JOSHUA BASIN WATER DISTRICT SERVICE AREA

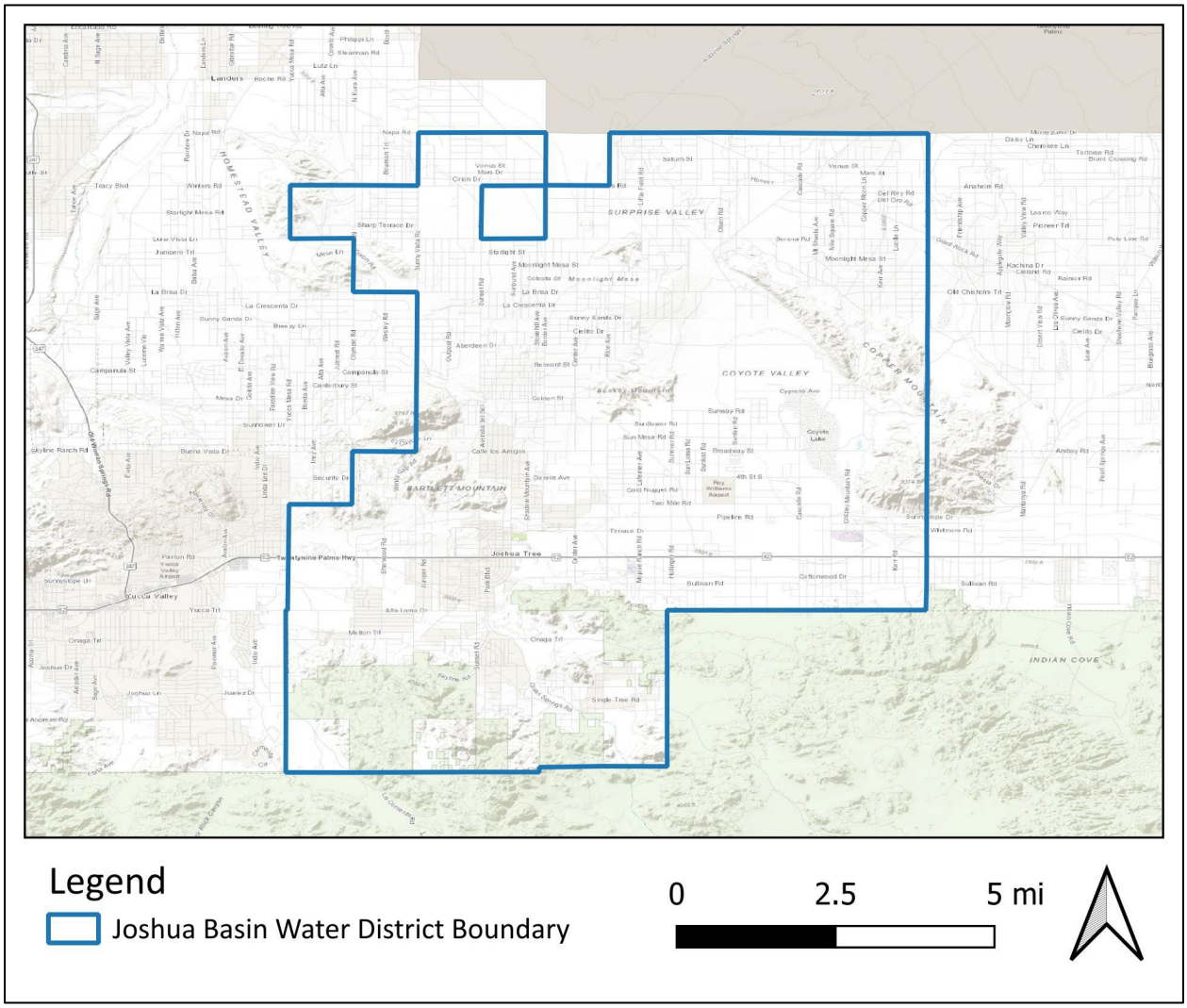


TABLE 13-2: ACTIVE CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	4,831	4,857	4,703	4,629	4,638
Multi-Family Residential	95	95	90	90	83
Commercial/Institutional	142	159	109	147	143
Landscape Irrigation	21	19	19	18	17
Total	5,089	5,130	4,921	4,884	4,881

13.2.1 Service Area Climate

Located in California's Mojave Basin, the District's service area experiences a climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and large diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 4.5 inches, occurring primarily as rainfall between December and March. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the District's service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of Planning Area's climate characteristics is provided *in Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region.*

13.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the District's water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 13.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area's economic, social, and demographic trends provide valuable insight to water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

13.3.1 Current Population and Historic Trends

Population estimates for the District are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the District reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Historical population trends within the District have generally followed broader regional growth patterns associated with residential development, employment opportunities, and

land availability in the High Desert. Much of the growth over the past several decades has been characterized by low-density residential development to serve the needs of a growing population. Continued growth is anticipated over the planning horizon, which will influence future water demand, infrastructure requirements, and resource management strategies. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 13-3 presents the District's historical population while **Table 13-4** presents the District's population growth over the last decade.

TABLE 13-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
7,515	8,062	9,534	9,929	10,227	10,375

TABLE 13-4: POPULATION GROWTH RATE - 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	9,929	10,012	10,090	10,164	10,216	10,227	10,257	10,286	10,316	10,345
Growth Rate		0.84%	0.78%	0.73%	0.51%	0.11%	0.29%	0.28%	0.29%	0.28%

13.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population within the District is generally stable and characterized by slow growth as compared to other Hi-Desert communities. The District's proximity to Joshua Tree National Park attracts seasonal visitors and short term occupants who contribute to water demand, particularly during peak visitor periods, but these users do not represent permanent service area population. Similarly, the District serves a significant number of intermittently occupied connections, including second homes and short-term rental properties, which may generate demand when occupied but are not equivalent to year-round residential population.

While the Hi-Desert continues to attract modest growth the District's service area is characterized primarily by low-density residential development and limited large-scale economic drivers, which constrain the pace of sustained population expansion over time. More broadly, incorporated areas served by municipal water providers within the RUWMP

Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region.*

Table 13-5 presents the District's projected population and associated growth rates through 2060.

TABLE 13-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
JBWD	10,375	10,536	10,673	10,800	10,919	11,029	11,131	11,225
Annual Growth Rate		1.55%	1.30%	1.19%	1.10%	1.01%	0.92%	0.84%

13.3.3 Current and Projected Land Use

The predominant land use within the District's service area is residential, consisting largely of low-density, single-family development. While substantial areas of vacant and undeveloped land remain, land use patterns reflect an emphasis on maintaining the community's rural character and open space. In contrast to other MWA retailer service areas, the District's proximity to Joshua Tree National Park has influenced the development of hospitality and commercial land uses that support tourism activity. In addition, several small-scale residential developments have been proposed within the service area. These developments are generally consistent with anticipated infill and modest growth patterns and reflected in the population projections described in this sub-chapter.

13.3.4 Economic Trends & Other Social and Demographic Factors

Economic, social, and demographic conditions within the District's service area are generally consistent with those observed throughout the RUWMP Planning Area. The local economy is influenced by a combination of tourism-related activity associated with Joshua Tree National Park, regional employment centers, and the presence of the Marine Corps Air Ground Combat Center at Twentynine Palms. These factors contribute to a mix of permanent and temporary populations, including residents, visitors, and military personnel.

Housing within the service area is predominantly composed of single-family residences, with development patterns characterized by low-density, rural residential uses. Broader economic and demographic trends, including income levels, employment patterns, and population

characteristics, generally reflect those of the surrounding High Desert region. Additional discussion of regional economic, social, and demographic conditions is provided in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization

The District's water supply portfolio is centered on locally managed groundwater resources, supported by infrastructure and management programs that ensure reliable delivery to customers. This sub-chapter describes the District's water supply sources, associated management frameworks, and the infrastructure used to extract, store, and convey water throughout the service area. Together, these elements define the operational and planning foundation for maintaining long-term water supply reliability.

13.4.1 Groundwater

Groundwater is the primary water supply source for the District. The District relies on groundwater pumped from the Copper Mountain Valley Groundwater Basin (DWR Basin No. 7-11) and the Joshua Tree Groundwater Basin (DWR Basin No. 7-62) to meet potable water demands within its service area. These basins are locally managed groundwater systems that serve as the foundation of the District's water supply portfolio.

The District manages its groundwater resources through ongoing monitoring, production management, and the use of supplemental imported supplies from MWA to support groundwater recharge and long-term basin conditions. As a long-term management objective, the District seeks to offset groundwater production through recharge of supplemental supplies to the extent imported water is available, financially feasible, and operationally practical. Although recharge and production may not balance in every individual year due to hydrologic conditions, imported water availability, infrastructure capacity, and cost, this approach supports long-term basin sustainability and allows the District to maintain a reliable, locally controlled groundwater supply portfolio capable of meeting current and projected demands.

13.4.1.1 Copper Mountain Groundwater Basin Supplies

The Copper Mountain Valley Groundwater Basin underlies a substantial portion of the District's service area and serves as a source of groundwater supply. Located in the Morongo Basin area of San Bernardino County, the basin is characterized by alluvial aquifer systems that store and transmit groundwater derived from natural recharge, subsurface inflows, and incidental recharge sources. As described in the District's 2020 UWMP, the basin contains an estimated 264,000 acre-feet of usable groundwater in storage, representing a significant long-term water supply resource. The basin is not identified by the DWR as being in a

condition of overdraft, indicating that current basin conditions support continued groundwater use under existing management practices.

Groundwater within the Copper Mountain Valley Basin is not subject to adjudication but is managed through a combination of local and regional planning efforts. The District monitors groundwater conditions through a combination of local and regional planning efforts. The District monitors groundwater conditions and manages production to support long-term basin sustainability. In addition, the District coordinates with MWA to utilize SWP supplies delivered via the MBP. These imported supplies supplement local groundwater resources and support recharge, contributing to the long-term reliability of the basin.

Historical production from the basin reflects the District's reliance on this resource to meet customer demands. **Table 13-6** presents the District's recent groundwater production from the Copper Mountain Valley Basin, which serves as the basis for estimating the District's managed groundwater supply within the basin under current and projected conditions.

TABLE 13-6: LAST FIVE YEARS OF COPPER MOUNTAIN VALLEY BASIN SUPPLY (AFY)

Year	Copper Mountain Valley Basin Supply
2021	590
2022	370
2023	117
2024	116
2025	44

The District will continue to rely on groundwater from the Copper Mountain Valley Basin as a component of its water supply portfolio. For planning purposes, projected groundwater supply from the basin is based on the District's average production over the 2021-2025 period, as shown in **Table 13-6**. This approach provides a representative estimate of baseline production under recent production patterns and supports evaluation of supply availability under normal, single dry, and multiple dry year scenarios through 2050. However, the projections presented in **Table 13-7** and **Table 13-8** are planning estimates and are not intended to prescribe the precise volume of groundwater that must be produced from the Copper Mountain Valley Basin in any given year. Actual future production from the basin may vary based on operational needs, well availability, water quality considerations, infrastructure improvements, and other District management decisions.

TABLE 13-7: PROJECTED COPPER MOUNTAIN VALLEY BASIN SUPPLY THROUGH 2030 (AFY)

Year Type		Copper Mountain Valley Basin Supply
Normal		245
Single Dry-Year		245
Multi-Year Drought	2026 (1st Year)	245
	2027 (2nd Year)	245
	2028 (3rd Year)	246
	2029 (4th Year)	247
	2030 (5th Year)	247

TABLE 13-8: PROJECTED COPPER MOUNTAIN VALLEY BASIN SUPPLY THROUGH 2050 (AFY)

Total Supply		2030	2035	2040	2045	2050
Normal		247	250	253	255	257
Single Dry-Year		247	250	253	255	257
Multi-Year Drought	Year 1	247	250	253	255	257
	Year 2	248	250	253	255	257
	Year 3	248	251	253	256	257
	Year 4	249	252	254	256	257
	Year 5	249	252	254	257	258

13.4.1.2 Joshua Tree Groundwater Basin Supplies

The Joshua Tree Groundwater Basin underlies a portion of the District's service area and serves as a source of groundwater supply within the District's water supply portfolio. The basin is located within the Morongo Basin area of San Bernardino County and is characterized by alluvial aquifer systems that store and transmit groundwater derived from natural recharge, subsurface inflows, and incidental recharge sources. As described in the District's 2020 UWMP, the basin contains an estimated 293,000 acre-feet of usable groundwater storage, representing a substantial volume of groundwater that supports the District's long-term water supply planning.

Groundwater within the Joshua Tree Basin is not subject to adjudication and is managed through a combination of local and regional planning efforts. The District monitors groundwater conditions and manages production to support improved groundwater management and long-term basin sustainability. In addition, the District coordinates with MWA to utilize imported SWP supplies delivered via the MBP. These imported supplies are used to supplement local groundwater resources and support groundwater replenishment efforts within the basin.

Historical production from the basin reflects its role in supporting system demands in conjunction with supplies from the Copper Mountain Valley Basin. **Table 13-9** presents the District's groundwater production from the Joshua Tree Basin over the 2021-2025 period, which serves as the basis for estimating the District's managed groundwater supply within the basin under current and projected conditions.

TABLE 13-9: LAST FIVE YEARS OF JOSHUA TREE BASIN SUPPLY (AFY)

Year	Joshua Tree Basin Supply
2021	722
2022	925
2023	1,155
2024	1,190
2025	1,232

The District will continue to rely on groundwater from the Joshua Tree Basin as a component of its water supply portfolio. For planning purposes, projected groundwater supply from the basin is based on the District's average production over the 2021-2025 period, as shown in **Table 13-9**. This approach provides a representative estimate of baseline production under recent production patterns and supports evaluation of supply availability under normal, single dry, and multiple dry year scenarios through 2050. However, the projections presented in **Table 13-10** and **Table 13-11** are planning estimates and are not intended to prescribe the precise volume of groundwater that must be produced from the Joshua Tree Basin in any given year. Actual future production from the basin may vary based on operational needs, well availability, water quality considerations, infrastructure improvements, and other District management decisions.

TABLE 13-10: PROJECTED JOSHUA TREE BASIN SUPPLY THROUGH 2030 (AFY)

Year Type		Joshua Tree Basin Supply
Normal		1,045
Single Dry-Year		1,045
Multi-Year Drought	2026 (1st Year)	1,045
	2027 (2nd Year)	1,045
	2028 (3rd Year)	1,049
	2029 (4th Year)	1,053
	2030 (5th Year)	1,053

TABLE 13-11: PROJECTED JOSHUA TREE BASIN SUPPLY THROUGH 2050 (AFY)

Total Supply		2030	2035	2040	2045	2050
Normal		1,053	1,065	1,077	1,085	1,094
Single Dry-Year		1,053	1,065	1,077	1,085	1,094
Multi-Year Drought	Year 1	1,053	1,065	1,077	1,085	1,094
	Year 2	1,057	1,065	1,077	1,085	1,094
	Year 3	1,057	1,069	1,077	1,089	1,098
	Year 4	1,061	1,073	1,081	1,089	1,098
	Year 5	1,061	1,073	1,081	1,094	1,102

13.4.2 Groundwater Quality

Groundwater produced by the District is sourced from wells completed in the Copper Mountain Valley and Joshua Tree Groundwater Basins and is treated, as necessary, to meet all applicable federal and state drinking water standards prior to distribution. Groundwater quality within these basins reflects a combination of natural hydrogeologic conditions and localized influences, including land use and recharge patterns. The District conducts routine groundwater quality monitoring in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the District's Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The District's most recent CCR is available through the District's website and provides the most current information on potable water quality conditions.[52]

While this section focuses on groundwater quality as it pertains to the District's supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization.*

Table 13-12 presents a summary of groundwater quality constituents based on information reported in the District's 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

[52] Joshua Basin Water District 2024 CCR available at: https://www.jbwd.com/files/331985fa3/CCR+ADA+2024.pdf

TABLE 13-12: JOSHUA BASIN WATER DISTRICT POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	0.004	10	ND - 4.9	2.2
Chlorine (ppm)	4 (as Cl2)	4.0 (as Cl2)	0.79 - 1.01	0.91
Chromium (ppb)	100	50	12 - 37	24
Fluoride (ppm)	1	2.0	0.46 - 0.83	0.66
Goss Alpha Particle Activity (pCi/L)	0	15	2.46 - 4.3	3.38
Hexavalent Chromium (ppb)	20	10	13 - 38	22.4
Nitrate as N (ppm)	45	45	2.1 - 6.3	3.22
TTHMs [total trihalomethanes] (ppb)	N/A	80	4.3 - 26	15.15
Copper (ppm)	0.3	1.3	0.013 - 0.092	0.061
Lead (ppb)	0.2	15	ND - 1.2	ND
Secondary Standards				
Chloride (ppm)	N/A	500	7 - 17	13
Color	N/A	15	N/A	ND
Manganese (ppb)	N/A	50	N/A	ND
Specific Conductance (umho/cm)	N/A	1,600	240 - 490	335
Sulfate (ppm)	N/A	500	9.2 - 120	40.8
Total Dissolved Solids (TDS) (ppm)	N/A	1,000	130 - 180	162
Turbidity (NTU)	N/A	5	ND - 3.2	0.3
Zinc (ppm)	N/A	5	N/A	ND
Federal Unregulated Contaminates				
Bromodichloromethane (ppb)	N/A	N/A	1.1 - 4.4	2.75
Bromoform (ppb)	N/A	N/A	1.5 - 11	6.25
Chloroform (ppb)	N/A	N/A	ND - 1.5	0.75
Dibromochloromethane (ppb)	N/A	N/A	1.7 - 9.1	5.4
Sodium (ppm)	N/A	N/A	37 - 60	45.25

13.4.3 Recycled Water Supplies

The District does not currently utilize recycled water as part of its water supply portfolio and has no plans to develop recycled water supplies within the planning horizon. The development of recycled water infrastructure is constrained by the District's relatively small and dispersed customer base, limited wastewater generation, and the absence of centralized wastewater treatment facilities necessary to support recycled water production and distribution. Given these conditions, recycled water is not considered a feasible or cost-effective supply option at this time. Accordingly, no recycled water supplies are included in the District's current or projected water supply portfolio.

13.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the District due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the District has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

13.4.5 Water Transfers and Exchanges

The District does not currently participate in formal water transfer or exchange programs as part of its water supply portfolio. Unlike adjudicated basins within the MWA service area, the groundwater basins underlying the District's service area are not subject to court-ordered allocation frameworks that facilitate transfers of production rights among parties. The District's water supply is primarily derived from locally managed groundwater resources, supplemented by imported supplies made available through MWA. While the District coordinates with MWA and regional partners regarding water supply planning and use of imported supplies, these activities do not constitute formal transfer or exchange mechanisms. Accordingly, water transfers and exchanges are not included as a component of the District's current or projected water supply portfolio.

13.4.6 Supply Summary

Groundwater serves as the District's principal water supply source. These supplies, derived from the Copper Mountain Valley and Joshua Tree Groundwater Basins, are sufficient to meet existing and projected demands under a range of hydrologic conditions. The District's overall groundwater system benefits from substantial available storage across both basins and ongoing management actions to support long-term reliability. In addition, the District participates in regional programs with MWA, through which SWP supplies are delivered to the Morongo Basin via the MBP and recharged for storage. These recharged imported supplies augment local groundwater resources and support long-term basin conditions.

The District's water supplies are managed as an integrated groundwater system consisting of locally derived groundwater and recharged imported supplies. This system includes native groundwater in storage within the Copper Mountain Valley and Joshua Tree Basins, supported by natural recharged from precipitation, subsurface inflows, and incidental recharge sources. These supplies are further supported by imported water delivered by MWA and recharged within the basins, which serves to offset groundwater production. The District monitors groundwater levels and manages production across both basins to maintain system reliability and respond to changing demand and hydrologic conditions.

Given the substantial volume of groundwater in storage and the District's active groundwater management approach, sufficient supplies are available to meet projected demands under normal, single dry year, and multiple dry year conditions throughout the planning horizon. Accordingly, the District's managed groundwater production over the planning horizon represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 13-13**.

TABLE 13-13: DISTRICT'S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	1,333
2022	1,299
2023	1,276
2024	1,307
2025	1,292

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 13.5 – Water Use Characterization*. Given the District's actively managed groundwater system, which includes substantial available storage within the Copper Mountain Valley and Joshua Tree Basins as well as imported recharge, groundwater production is adjusted to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 13-14** and **Table 13-15**.[53]

TABLE 13-14: DISTRICT'S PROJECTED MANAGED GROUNDWATER SUPPLY 2026 – 2030 (AFY)

Year Type		Managed Groundwater Production
Normal		1,290
Single Dry-Year		1,290
Multi-Year Drought	2026 (1st Year)	1,290
	2027 (2nd Year)	1,290
	2028 (3rd Year)	1,295
	2029 (4th Year)	1,300
	2030 (5th Year)	1,300

TABLE 13-15: DISTRICT'S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		1,300	1,315	1,330	1,340	1,350
Single Dry-Year		1,300	1,315	1,330	1,340	1,350
Multi-Year Drought	Year 1	1,300	1,315	1,330	1,340	1,350
	Year 2	1,305	1,315	1,330	1,340	1,350
	Year 3	1,305	1,320	1,330	1,345	1,355
	Year 4	1,310	1,325	1,335	1,345	1,355
	Year 5	1,310	1,325	1,335	1,350	1,360

[53] The values presented in Table 13-14 and Table 13-15 have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 13.5 – Water Use Characterization*.

13.4.7 Delivery System Details

The District's potable water system conveys groundwater from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the District's storage reservoirs, which collectively provide approximately 12.3 million gallons of storage before being distributed through a pressurized potable water system. The distribution system consists of more than 300 miles of pipeline and approximately active 4,881 service connections.

Sub-Chapter 13.5 – Water Use Characterization

Understanding water use characteristics is essential for the District to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the District's retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District's past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.2 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District's water supplies, presented in *Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization,* to assess long-term water system reliability, presented in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment.*

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the District's 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the District's residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the District's UWUO, comparison to the District's actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the District's 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District's service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the "unconstrained demand" for purposes of the District's annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

13.5.1 Current Customer Water Use

As described in *Sub-Chapter 13.2 – Water Service and System Description*, the District provides water service to approximately active 4,881 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the District and treated to meet all applicable state and federal drinking water standards. Information regarding the District's current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the District's compliance with its UWUO, reported annually to DWR beginning in January of 2024.

13.5.1.1 Customer Water Use 2021-2025

Recent customer water use data assists the District in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The District is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The District records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Irrigation
- Other

Table 13-16 presents the District's past customer potable water use by customer classification for 2021-2025 in acre-feet.

TABLE 13-16: POTABLE CUSTOMER USE 2021-2025 (AF)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	55	47	44	59	67	72	88	90	80	79	52	54	785
	2022	48	45	43	62	58	68	84	56	76	56	51	44	692
	2023	45	35	40	42	46	61	64	76	73	55	52	47	635
	2024	42	37	40	38	49	63	70	83	83	60	73	35	673
	2025	48	45	39	44	55	61	66	84	69	53	55	41	660
Multi-Family Residential	2021	7	6	6	7	8	7	8	9	8	8	6	6	87
	2022	7	6	6	7	6	7	8	6	8	7	6	6	79
	2023	6	6	6	6	6	8	8	8	9	6	6	5	81
	2024	6	6	6	6	6	8	7	10	9	7	8	5	84
	2025	6	6	5	5	6	7	7	9	8	8	7	6	80
Commercial/ Institutional	2021	11	9	8	12	15	16	20	23	18	21	13	12	176
	2022	11	10	10	14	14	15	23	10	18	13	13	11	160
	2023	12	9	8	9	11	15	14	17	18	14	12	11	151
	2024	9	8	8	8	10	15	16	20	21	15	14	10	153
	2025	10	10	9	10	12	15	16	20	17	15	13	11	157
Irrigation	2021	0.2	0.1	0.2	0.3	0.3	0.3	0.5	0.4	0.5	0.5	0.3	0.3	4
	2022	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	3
	2023	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	2
	2024	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	2
	2025	0.2	0.1	0.1	0.2	0.3	0.6	0.5	1.2	0.5	0.2	0.2	0.1	4
Other	2021	10	10	8	11	12	12	16	17	16	15	12	15	154
	2022	13	11	12	17	14	16	21	15	18	15	15	13	181
	2023	22	12	14	14	13	18	17	20	21	17	16	16	201
	2024	15	12	14	15	17	19	19	23	25	17	20	15	211
	2025	17	18	15	16	19	19	19	26	21	17	19	17	225
Total Metered Deliveries	2021	84	72	65	89	101	108	133	138	123	124	83	87	1,206
	2022	80	72	71	100	92	105	137	88	121	91	85	74	1,115
	2023	85	62	68	72	77	102	103	122	121	91	87	80	1,070
	2024	72	62	69	67	83	105	112	136	138	99	116	65	1,123
	2025	81	79	69	75	92	102	109	140	117	93	94	75	1,126

The "Other" water use category included in **Table 13-16** captures a range of small, non-standard uses including fire services, vacation rentals, and long-term rentals.

13.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the District's water distribution system up to the point of delivery to the customer's system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).[54] An electronic copy of the audit in Excel format is to be submitted to DWR by January 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB's April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the District shall assess compliance every three years as an average of recent losses. Additionally, the District will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR's 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR's Water Loss Audit Program. **Table 13-17** summarizes the District's reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 13-17: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2022	2023	2024
7.3%	14.3%	16.3%	12.6%
		Average:	12.6%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the District's distribution system loss represents about 12.6% of water entering the system.

[54] Title 23 California Code of Regulations Section 638.1 et seq.

13.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed using information submitted as part of the District's annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 474 gallons per mile of the distribution system (i.e., mains) per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 10.6%. Using the information from the same period, the average "apparent" water loss averaged 2.5% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 13.1%, although recent AWWA audits discussed above show losses closer to 12.6%.

13.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the District's derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

13.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the District to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the District to measure progress on achieving water efficiency goals.

The District's 2020 GPCD target was established in the 2015 UWMP as 157 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The District's calculation of their 2020 actual GPCD used the same methodology: "Gross water" was defined as total water production measured and reported based upon well production records. This value, divided by the District's estimated population in 2020, resulted in a compliance value of 116 GPCD. Because this value was less than the District's established target, the District was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the District was determined to have an actual GPCD of 111, calculated using the same methodology presented above.

13.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In each of the first three reporting years, the District submitted required annual reports to the SWRCB and demonstrated that actual water use remained below its calculated UWUO, confirming compliance in 2025

13.5.3 Forecasting Customer Use

Future water use within the District's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization,* this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the District's future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the District, are presented in the following subsections and corresponding tables.

13.5.3.1 Existing Customer Future Use

Future water use associated with the District's existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in Subsection 13.5.2.1, the District's current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization.* In general, this approach utilizes total annual potable water production

divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the District has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the District's service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered "hardened" and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the District's existing customer demand is projected to remain at approximately 1,285 acre-feet per year, based on a representative GPCD of 111, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District's representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

13.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization.* This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the District's service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the District's GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the District, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 0 GPCD
- Total Non-Residential Use: 47 GPCD
- Total Use: 94 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO

indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization.* Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District's representative loss percentage has been applied to new customer demand projections.

Table 13-18 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the District's ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment.*

TABLE 13-18: FORECAST FUTURE WATER USE (VALUES IN ACRE-FEET PER YEAR)

2025	2030	2035	2040	2045	2050
1,285	1,300	1,315	1,330	1,340	1,350

13.5.3.3 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The water use forecast presented in **Table 13-18** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions. Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 13-18** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.[55]

[55] California Water Code Section 10632(a)(2) states water suppliers should use "unconstrained demand" when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

13.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

13.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the District's customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of "unconstrained demand" derived from the District's long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

13.5.4.1 Projecting Water Use for Five-Year Drought Risk Assessment

The DRA requires the District to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of "unconstrained demand" representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the District's projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the District's Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the District's long-term water use forecast developed for the 2025 RUWMP and the District's retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the District's evaluation of water supply reliability across planning timeframes.

Table 13-19 presents the District's projected unconstrained water demands for the DRA period (2026-2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment.*

TABLE 13-19: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
1,290	1,290	1,295	1,300	1,300

13.5.4.2 Projecting Water Use for Annual Assessments

The District conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The District has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

13.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the District's sub-chapter within the 2025 RUWMP, the District's service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region.*[56] Accordingly, the water use forecast presented in **Table 13-19** is inclusive of disadvantaged community water use.

[56] California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: https://gis.water.ca.gov/app/dacs/

Sub-Chapter 13.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the District's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The District has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the District's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the District evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the District's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the District's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 13a.

13.6.1 Demand Management Measures

The District has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The District is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the District leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The District will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

13.6.1.1 Foundational Demand Management Measures

The District's foundational DMMs remain generally consistent with those described in the 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances and prohibited provisions, universal metering, conservation-oriented pricing, public education and outreach, programs to monitor and manage distribution system losses, and coordination and staffing support for conservation program implementation through customer communication, enforcement, demand monitoring, and rate-based conservation actions.

Water Waste Prevention Ordinances

The District has adopted and enforces water waste prevention ordinances that prohibit inefficient water use practices. As reflected in the 2020 UWMP and WSCP, these provisions include restrictions on outdoor irrigation during specified hours, limitations on irrigation following measurable rainfall, prevention of runoff to adjacent properties and public rights-of-way, restrictions on washing of hard surfaces except for health and safety purposes, requirements for automatic shut-off nozzles for vehicle washing, and prompt repair of leaks. These ordinances establish the regulatory framework for reducing unnecessary water use and are implemented through monitoring, customer notifications, and enforcement actions as needed.

Metering

All potable water connections within the District are metered, allowing for accurate measurement of customer water use. Metering supports volumetric billings, enables customers to better understand and manage their water use, and provides the data necessary for system monitoring and implementation of water shortage response actions.

Conservation Pricing

The District utilizes a water rate structure designed to recover the costs of providing service across varying levels of water usage. As described in the WSCP, the District has the ability to

implement drought- or shortage- based rate adjustments during periods of constrained supply, which may incidentally encourage reductions in water demand.

Public Education and Outreach

The District implements public education and outreach programs to promote water conservation and increase customer awareness of efficient water use practices. These efforts include ongoing communication through newsletters, website updates, social media, and direct customer outreach, as well as coordination with regional partners to promote consistent conservation messaging.

Programs to Assess and Manage Distribution System Losses

The District conducts ongoing efforts to monitor and manage distribution system losses, including leak detection, routine system maintenance, and repair activities. As described in the WSCP, the District evaluates production and metered use data to identify potential losses and prioritize corrective actions to improve system efficiency and reduce real water losses.

Customer Service and Support

The District provides customer support services to assist with water use efficiency, including customer notifications for unusually high water use, assistance with identifying leaks, and access to water use information. These services enable customers to identify and address inefficiencies and support overall conservation efforts.

Conservation Program Coordination and Staffing Support

The District supports implementation of DMMs through internal staffing and coordination with regional partners, including MWA. This coordination supports consistency in conservation messaging, facilitates information sharing, and enhances the overall effectiveness of conservation program implementation.

13.6.1.2 Recent DMM Activities

Since adoption of the 2020 UWMP, the District has continued to implement its foundational demand management measures as the primary approach to water conservation. Efforts have focused on maintaining and reinforcing existing programs, including ongoing customer outreach, enforcement of water waste prevention provisions, and implementation of water shortage response actions as needed. The District continues to coordinate with regional partners and evaluate opportunities to enhance conservation program effectiveness consistent with local conditions and available resources.

13.6.1.3 Planned DMM Activities

At this time, the District does not anticipate implementing new demand management programs beyond those currently in place. The District's existing DMMs provide a

comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. Planned activities are focused on continued implementation and enhancement of existing measures, including ongoing customer outreach and education, enforcement of water waste provisions, and monitoring of water use and system conditions to support efficient operations. The District will continue to coordinate with regional partners to maintain consistent conservation messaging and identify opportunities for program improvements, as appropriate. The District remains committed to the efficient and responsible use of water resources and will continue to support customer awareness and conservation practices. Consistent with applicable State requirements, including UWUO and water loss reporting requirements, the District will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

13.6.2 Water Shortage Contingency Plan

The District has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the District can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the District may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the District's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the District's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

13.6.2.1 Summary of Water Shortage Response Actions

The District's WSCP establishes six defined water shortage levels that correspond to increasing degrees of supply constraint, targeted demand reductions, and specific customer and District response actions. This staged framework allows the District to implement progressively more restrictive measures as conditions warrant, while maintaining essential public health, sanitation, and fire protection services. The WSCP defines shortage states ranging from up to a 10% shortage through shortages greater than 50%, and identifies

associated District actions, customer restrictions, and supply augmentation measures, outreach, and enforcement tools. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage:

  The District emphasizes voluntary conservation, expanded public information, customer education, and continued enforcement of baseline water waste prohibitions. Actions include increasing awareness of conservation measures, promoting methods to reduce water use, focused outreach to large users, and publishing WSCP stages and actions. Customers are encouraged to conserve voluntarily and comply with existing water waste restrictions.

- Stage 2 – Up to 20% Shortage:

  The District expands public outreach and steps up enforcement of conservation measures. Stage 2 also includes mandatory restrictions such as limits on outdoor irrigation hours and reduced watering frequency. The WSCP identifies drought rate or surcharge measures and continued enforcement as tools available to help achieve the required reduction.

- Stage 3 – Up to 30% Shortage:

  The District intensifies conservation messaging and enforcement and may provide direct notices to all customers, suspend issuance of potable construction meters, and active emergency intertie or mutual aid actions if needed. Customer restrictions become more stringent, including limiting outdoor irrigation to two days per week, prohibiting irrigation of ornamental turf on public street medians, and restricting irrigation during daytime hours.

- Stage 4 – Up to 40% Shortage:

  Stage 4 builds on prior measures with additional mandatory restrictions and operational controls. Outdoor watering is further reduced to one day per week, customers may be required to repair leaks, breaks, or malfunctions within 48 hours, and the District may limit new meter installations and prohibit certain decorative or non-essential uses. These actions are intended to achieve significant demand reductions while preserving critical service levels.

- Stage 5 – Up to 50% Shortage:

  The District may impose severe restrictions on non-essential uses and compel mandatory water consumption goals or allocations for customers. Outdoor irrigation with potable water may be prohibited, and stronger enforcement and pricing actions may be used to manage increasingly constrained supplies. Stage 5 reflects emergency shortage conditions in which demand management actions become substantially more restrictive.

- Stage 6 – Greater than 50% Shortage:

Stage 6 represents catastrophic failure or extreme shortage conditions. In addition to all prior measures, the District may activate crisis communications, coordinate with regulatory and public safety agencies, recall temporary meters, suspend new development approvals and new water connections, and restrict outdoor water use to health and safety purposes only. Customer actions at this stage focus on curtailing all non-essential uses and prioritizing critical water needs.

Response actions are cumulative across stages, such that measures implemented at earlier stages remain in effect and are intensified as shortage conditions worsen. The WSCP also provides for supply augmentation and operational adjustments, including use of additional groundwater production and, where available, SWP supplies through MWA, alongside customer demand reductions. The District determines the appropriate shortage stage based on its Annual Water Supply and Demand Assessment and may also act in response to emergency conditions, infrastructure failures, or disaster declarations.

13.6.2.2 Summary of Monitoring Procedures and Implementation

The District's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The District monitors key indicators of water supply reliability, including groundwater production, groundwater levels, customer demand, and overall system conditions. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The District's Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 13.5.4 Forecasting Water Use for DRA and Annual Assessment* of *Sub-Chapter 13.5 – Water Use Characterization*.

Implementation of the WSCP includes coordination among District staff and communication with customers and regional partners. When a water shortage stage is implemented, the District provides public notification of applicable restrictions and conservation measures and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the District's water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 13.5 – Water Use Characterization* to assess the District's ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the District's water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the District's capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the District's Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the District's water supply reliability and inform the implementation of the District's WSCP, as described in *Sub-Chapter 13.6 – Water Conservation and Shortage Response*.

13.7.1 Five Year Drought Risk Assessment

The DRA evaluates the District's ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA are based on the District's unconstrained demand forecast described in *Sub-Chapter 13.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the District's managed groundwater supplies, which include groundwater production from the Copper Mountain Valley and Joshua Tree Basins, stored groundwater, and recharged imported supplies delivered via the

MBP. As described in – *Water Supply and Infrastructure Characterization*, the District actively manages these resources as an integrated groundwater system to support long-term reliability. Given the substantial volume of groundwater in storage across both basins and the District's groundwater management approach, the District has flexibility to adjust groundwater production and utilize available stored supplies to meet projected demands under a range of hydrologic conditions.

The DRA compares projected water demand to available supplies to evaluate the District's capacity to meet customer needs over the five-year period. **Table 13-20** presents the results of this analysis, including projected demand, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 13-20: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	1,290	1,290	1,295	1,300	1,300
Demand	1,290	1,290	1,295	1,300	1,300
Difference	0	0	0	0	0

13.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The District's long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

13.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the District's availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the District's capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the District's supplies are managed through its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 13-21 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 13-21: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	1,300	1,315	1,330	1,340	1,350
Demand	1,300	1,315	1,330	1,340	1,350
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	1,300	1,315	1,330	1,340	1,350
Demand	1,300	1,315	1,330	1,340	1,350
Difference	0	0	0	0	0

13.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the District's ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the District continues to manage its supplies within its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. This managed approach enables the District to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 13-22 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the District has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 13-22: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	1,300	1,315	1,330	1,340	1,350
	Demand	1,300	1,315	1,330	1,340	1,350
	Difference	0	0	0	0	0
Year 2	Supply	1,305	1,315	1,330	1,340	1,350
	Demand	1,305	1,315	1,330	1,340	1,350
	Difference	0	0	0	0	0
Year 3	Supply	1,305	1,320	1,330	1,345	1,355
	Demand	1,305	1,320	1,330	1,345	1,355
	Difference	0	0	0	0	0
Year 4	Supply	1,310	1,325	1,335	1,345	1,355
	Demand	1,310	1,325	1,335	1,345	1,355
	Difference	0	0	0	0	0
Year 5	Supply	1,310	1,325	1,335	1,350	1,360
	Demand	1,310	1,325	1,335	1,350	1,360
	Difference	0	0	0	0	0

13.7.3 Annual Reliability Assessment

Each year, the District considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the District's Water Shortage Contingency Plan. The District has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

13.7.4 Water Supply Reliability Summary

The District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 13.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the District evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The District's water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the District's service area, rather than long-distance conveyance or advanced treatment processes.

The District continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 13-23**.

TABLE 13-23: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR JAN 2025 THROUGH JAN 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	1,292
Energy Consumed (kWh)	35,720
Energy Intensity (kWh/acre-foot)	28

Chapter 14.0 LIBERTY UTILITIES – APPLE VALLEY

This page is reserved for Chapter 14 – Liberty Utilities – Apple Valley. The complete Liberty Utilities – Apple Valley retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by Liberty Utilities – Apple Valley.

Chapter 15.0 Phelan Piñon Hills Community Services District

This page is reserved for Chapter 15 – Phelan Piñon Hills Community Services District. The complete Phelan Piñon Hills Community Services District retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by Phelan Piñon Hills Community Services District.

Chapter 16.0 Victorville Water District

This page is reserved for Chapter 16 – Victorville Water District. The complete Victorville Water District retail specific chapter is included in the full 2025 Mojave RUWMP and is adopted separately by the City of Victorville

Appendix 1 – Notices

August 27, 2025

Notice of Intent to Prepare a Regional Urban Water Management Plan for the Mojave Region

This notice is to inform you that the urban water suppliers within the greater Mojave region are preparing a 2025 Regional Urban Water Management Plan (UWMP) pursuant to the California Water Code (CWC). All wholesale and retail urban water suppliers serving more than 3,000 customer connections are required to prepare an UWMP every five (5) years. The following urban water suppliers are collectively preparing this Regional UWMP:

City of Adelanto Water District
County Service Area 64
County Service Area 70 J
Helendale Community Services District
Hesperia Water District
Hi-Desert Water District
Golden State Water Company – Barstow System
Joshua Basin Water District
Liberty Utilities – Apple Valley Water Company
Mojave Water Agency
Phelan Piñon Hills Community Services District
Victorville Water District

The purpose of a Regional UWMP is to allow the urban water suppliers to coordinate and efficiently address the State's requirements as mandated in the CWC through a regional representation of water supply reliability. While the Regional UWMP will provide overarching and consistent information on water supplier reliability, each urban retail supplier will also update its unique Water Shortage Contingency Plan (WSCP), tailored to its specific service area and operations. Each urban supplier will separately adopt the Regional UWMP and its unique WSCP by July 1, 2026.

In accordance with CWC Section 10642, which encourages "active involvement of diverse social, cultural, and economic elements of the populations" in preparing a UWMP, the public will, at a minimum, have the opportunity to participate in the planning process through public hearings anticipated to occur in April or May of 2026 as part of each urban supplier's adoption process. A draft copy of the 2025 Regional UWMP will be made available for review prior to hearings, providing an opportunity for (1) Community input regarding water supply reliability; (2) Consideration of the economic impacts of complying with CWC status governing the Regional UWMP; and (3) Discussion of each agency's WSCP.

Detailed information, including contacts for each agency, future public hearing notices, schedules, and draft plan materials, will be available at the Mojave Water Agency's website at https://www.mojavewater.org/basin-management/regional-planning/urban-water-management-plan/, or at similar links hosted by each urban retail water supplier.

Questions regarding this notice or the 2025 Regional UWMP process may be directed to the appropriate retail agency using the contact information found on the website.

NOTICE OF PUBLIC HEARINGS

ON THE 2025 MOJAVE REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Mojave Water Agency (MWA) and the ten urban water suppliers participating in the 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP), as listed in **Table 1**, will hold public hearings to receive comments on the proposed 2025 RUWMP, including each participating agency's specific chapter contained within the 2025 RUWMP and each agency's Water Shortage Contingency Plan (WSCP).

The 2025 RUWMP is a regional planning document prepared collaboratively by MWA and participating urban water suppliers within the Mojave Region in accordance with the California Urban Water Management Planning Act.

The 2025 RUWMP includes:

- Regional chapters addressing Region-wide water supplies, water demands, and water service reliability;
- A chapter addressing MWA's role as the Region's wholesale water supplier, including its water supply and management responsibilities; and
- Retailer-specific chapters for each participating urban water supplier.

Each retailer-specific chapter addresses conditions within the respective agency's service area, including water service and system description, population and land use, water supply and infrastructure, water use characterization, water conservation and shortage response, and water system reliability. Each participating agency's WSCP describes the actions that may be implemented to respond to water shortage conditions and maintain water service reliability within its service area.

The urban water suppliers participating in the 2025 RUWMP, along with their respective public hearing dates and proposed dates to consider adoption, are presented in **Table 1.**

TABLE 1: PARTICIPATING AGENCIES AND HEARING INFORMATION

Agency	Public Hearing	Adoption
Hesperia Water District	June 2nd 2026	
Hi-Desert Water District	June 3rd 2026	
Joshua Basin Water District	June 3rd 2026	
Golden State Water Company - Barstow	May 27th 2026	
Liberty Utilities - Apple Valley	June 4th 2026	
San Bernardino County Service Area 64	June 23rd 2026	
San Bernardino County Service Area 70J	June 23rd 2026	
Phelan Pinion Hills CSD	June 10th 2026	
City of Adelanto Water District	June 10th 2026	
Mojave Water Agency	June 11th 2026	
Victorville Water District	June 16th 2026	

Each participating agency will hold its own public hearing to consider adoption of the 2025 RUWMP as it applies to its service area, including the applicable regional chapters, its respective retailer-specific chapter, its WSCP and all applicable appendices. MWA will separately consider adoption of the entirety of the 2025 RUWMP and its WSCP.

Draft documents will be made available in advance of each agency's public hearing in accordance with applicable noticing requirements. At the time of the hearing, all interested parties may appear and provide comments.

Hesperia Water District

The Hesperia Water District will hold a public hearing as follows:

Date: May 19, 2026

Time: 6:30 PM

Location: City Council Chambers 9700 Seventh Ave., Hesperia CA, 92345

Copies of the draft 2025 RUWMP, including the Hesperia Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 9700 Seventh Ave., Hesperia CA, 92345 during regular business hours and online at https://hesperia.legistar.com/Calendar.aspx

Hi-Desert Water District

The Hi-Desert Water District will hold a public hearing as follows:

Date: June 3, 2026

Time: 4:00 PM

Location: 55439 29 Palms Highway Yucca Valley, CA 92284

Copies of the draft 2025 RUWMP, including the Hi-Desert Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 55439 29 Palms Highway Yucca Valley, CA 92284 during regular business hours and online at www.hdwd.com

Joshua Basin Water District

The Joshua Basin Water District will hold a public hearing as follows:

Date: June 3, 2026

Time: 5:00 PM

Location: 61750 Chollita Road Joshua Tree CA 92252

Copies of the draft 2025 RUWMP, including the Joshua Basin Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 61750 Chollita Rd., Joshua Tree, CA during regular business hours and online at www.jbwd.com

Golden State Water Company – Barstow

Golden State Water Company – Barstow will hold a public hearing as follows:

Date: May 27, 2026

Time: 11:00 AM

Location: https://us06web.zoom.us/j/81445290033?pwd=UijEvrIofbbXI4bRWJDhDO3PRaXi0J.1
Passcode: 757372

Copies of the draft 2025 RUWMP, including the Golden State Water Company – Barstow retailer-specific chapter and the Company's WSCP and applicable appendices, will be available for public review online at https://www.gswater.com/

Liberty Utilities – Apple Valley

Liberty Utilities – Apple Valley will hold a public hearing as follows:

Date: June 4, 2026

Time: 9:00 AM

Location: https://teams.microsoft.com/meet/284381397435981?p=HKnYB1DhSKyacIZB6S
Passcode: uc3Ee7km

Copies of the draft 2025 RUWMP, including the Liberty Utilities – Apple Valley retailer-specific chapter and Liberty Utilities – Apple Valley WSCP and applicable appendices, will be available for public review online at https://libertyutilities.com/

San Bernardino County Service Area 64

The San Bernardino County Service Area 64 will hold a public hearing as follows:

Date: June 23, 2026

Time: 10:00 AM

Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415

Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 64 retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at https://sanbernardino.legistar.com/Calendar.aspx

San Bernardino County Service Area 70J

The San Bernardino County Service Area 70J will hold a public hearing as follows:

Date: June 23, 2026

Time: 10:00 AM

Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415

Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 70J retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at https://sanbernardino.legistar.com/Calendar.aspx

Phelan Pinion Hills Community Services District

The Phelan Pinion Hills Community Services District will hold a public hearing as follows:

Date: June 10, 2026

Time: 5:00 PM

Location: 4176 Warbler Road, Phelan, CA 92371

Copies of the draft 2025 RUWMP, including the Phelan Pinion Hills Community Services District retailer-specific chapter and the CSD's WSCP and applicable appendices, will be available for public review at 4176 Warbler Road, Phelan, CA 92371 during regular business hours and online at www.pphcsd.org

City of Adelanto Water District

The City of Adelanto Water District will hold a public hearing as follows:

Date: June 10, 2026

Time: 11:00 AM

Location: Stadium - Conference Room 12000 Stadium Way Adelanto, CA, 92301

Copies of the draft 2025 RUWMP, including the City of Adelanto Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 11600 Air Expressway Adelanto, CA 92301 during regular business hours and online at https://adelantoca.gov/services/water_sewer/index.php

Mojave Water Agency

The Mojave Water Agency will hold a public hearing as follows:

Date: June 11, 2026

Time: 9:30 AM

Location: MWA Board Room 13846 Conference Center Drive Apple Valley, CA 92307

Copies of the draft 2025 RUWMP and the Agency's WSCP and applicable appendices, will be available for public review at 13846 Conference Center Drive Apple Valley, CA 92307 during regular business hours and online at https://www.mojavewater.org/about-mwa/agency-calendar/meetings/

Victorville Water District

The Victorville Water District will hold a public hearing as follows:

Date: June 16, 2026

Time: 6:00 PM

Location: City Hall 14343 Civic Drive Victorville, CA 92392

Copies of the draft 2025 RUWMP, including the Victorville Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at City Hall 14343 Civic Drive Victorville, CA 92392 during regular business hours and online at https://www.victorvilleca.gov/Government/City-Departments/City-Clerk/Agendas-Meetings-Minutes

NOTICE OF PUBLIC HEARINGS
ON THE 2025 MOJAVE REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Mojave Water Agency (MWA) and the ten urban water suppliers participating in the 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP), as listed below, will hold public hearings to receive comments on the proposed 2025 RUWMP, including each participating agency's specific chapter contained within the 2025 RUWMP and each agency's Water Shortage Contingency Plan (WSCP). The 2025 RUWMP is a regional planning document prepared collaboratively by MWA and participating urban water suppliers within the Mojave Region in accordance with the California Urban Water Management Planning Act.

The 2025 RUWMP includes:

- Regional chapters addressing Region-wide water supplies, water demands, and water service reliability;
- A chapter addressing MWA's role as the Region's wholesale water supplier, including its water supply and management responsibilities; and
- Retailer-specific chapters for each participating urban water supplier.

Each retailer-specific chapter addresses conditions within the respective agency's service area, including water service and system description, population and land use, water supply and infrastructure, water use characterization, water conservation and shortage response, and water system reliability. Each participating agency's WSCP describes the actions that may be implemented to respond to water shortage conditions and maintain water service reliability within its service area. The urban water suppliers participating in the 2025 RUWMP, along with their respective public hearing dates are presented below.

Each participating agency will hold its own public hearing to consider adoption of the 2025 RUWMP as it applies to its service area, including the applicable regional chapters, its respective retailer-specific chapter, its WSCP and all applicable appendices. MWA will separately consider adoption of the entirety of the 2025 RUWMP and its WSCP. Draft documents will be made available in advance of each agency's public hearing in accordance with applicable noticing requirements. At the time of the hearing, all interested parties may appear and provide comments.

Hesperia Water District
The Hesperia Water District will hold a public hearing as follows:
Date: May 19, 2026
Time: 6:30 PM
Location: City Council Chambers 9700 Seventh Ave., Hesperia CA, 92345
Copies of the draft 2025 RUWMP, including the Hesperia Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 9700 Seventh Ave., Hesperia CA, 92345 during regular business hours and online at https://hesperia.legistar.com/Calendar.aspx

Hi-Desert Water District
The Hi-Desert Water District will hold a public hearing as follows:
Date: June 3, 2026
Time: 4:00 PM
Location: 55439 29 Palms Highway Yucca Valley, CA 92284
Copies of the draft 2025 RUWMP, including the Hi-Desert Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 55439 29 Palms Highway Yucca Valley, CA 92284 during regular business hours and online at www.hdwd.com

Joshua Basin Water District
The Joshua Basin Water District will hold a public hearing as follows:
Date: June 3, 2026
Time: 5:00 PM
Location: 61750 Chollita Road Joshua Tree CA 92252
Copies of the draft 2025 RUWMP, including the Joshua Basin Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 61750 Chollita Rd., Joshua Tree, CA during regular business hours and online at www.jbwd.com

Golden State Water Company – Barstow
Golden State Water Company – Barstow will hold a public hearing as follows:
Date: May 27, 2026
Time: 11:00 AM
Location: https://us06web.zoom.us/j/81445290033?pwd=UijEvrIofbbXI4bRWJDhDO3PRaXi0J.1 Passcode: 757372
Copies of the draft 2025 RUWMP, including the Golden State Water Company – Barstow retailer-specific chapter and the Company's WSCP and applicable appendices, will be available for public review online at https://www.gswater.com/

Liberty Utilities – Apple Valley
Liberty Utilities – Apple Valley will hold a public hearing as follows:
Date: June 4, 2026
Time: 9:00 AM
Location: https://teams.microsoft.com/meet/284381397435981?p=HKnYB1DhSKyacIZB6S Passcode: uc3Ee7km
Copies of the draft 2025 RUWMP, including the Liberty Utilities – Apple Valley retailer-specific chapter and Liberty Utilities – Apple Valley WSCP and applicable appendices, will be available for public review online at https://libertyutilities.com/

San Bernardino County Service Area 64
The San Bernardino County Service Area 64 will hold a public hearing as follows:
Date: June 23, 2026
Time: 10:00 AM
Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415
Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 64 retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at https://sanbernardino.legistar.com/Calendar.aspx

San Bernardino County Service Area 70J
The San Bernardino County Service Area 70J will hold a public hearing as follows:
Date: June 23, 2026
Time: 10:00 AM
Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415
Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 70J retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at https://sanbernardino.legistar.com/Calendar.aspx

Phelan Pinion Hills Community Services District
The Phelan Pinion Hills Community Services District will hold a public hearing as follows:
Date: June 10, 2026
Time: 5:00 PM
Location: 4176 Warbler Road, Phelan, CA 92371
Copies of the draft 2025 RUWMP, including the Phelan Pinion Hills Community Services District retailer-specific chapter and the CSD's WSCP and applicable appendices, will be available for public review at 4176 Warbler Road, Phelan, CA 92371 during regular business hours and online at www.pphcsd.org

City of Adelanto Water District
The City of Adelanto Water District will hold a public hearing as follows:
Date: June 10, 2026
Time: 11:00 AM
Location: Stadium - Conference Room 12000 Stadium Way Adelanto, CA, 92301
Copies of the draft 2025 RUWMP, including the City of Adelanto Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 11600 Air Expressway Adelanto, CA 92301 during regular business hours and online at https://adelantoca.gov/services/water_sewer/index.php

Mojave Water Agency
The Mojave Water Agency will hold a public hearing as follows:
Date: June 11, 2026
Time: 9:30 AM
Location: MWA Board Room 13846 Conference Center Drive Apple Valley, CA 92307
Copies of the draft 2025 RUWMP and the Agency's WSCP and applicable appendices, will be available for public review at 13846 Conference Center Drive Apple Valley, CA 92307 during regular business hours and online at https://www.mojavewater.org/about-mwa/agency-calendar/meetings/

Victorville Water District
The Victorville Water District will hold a public hearing as follows:
Date: June 16, 2026
Time: 6:00 PM
Location: City Hall 14343 Civic Drive Victorville, CA 92392
Copies of the draft 2025 RUWMP, including the Victorville Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at City Hall 14343 Civic Drive Victorville, CA 92392 during regular business hours and online at https://www.victorvilleca.gov/Government/City-Departments/City-Clerk/Agendas-Meetings-Minutes
May 13, 20, 27 2026
LYRK0516190

NOTICE OF PUBLIC HEARINGS ON THE 2025 MOJAVE REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Mojave Water Agency (MWA) and the ten urban water suppliers participating in the 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP), will hold public hearings to receive comments on the proposed 2025 RUWMP, including each participating agency's specific chapter contained within the 2025 RUWMP and each agency's Water Shortage Contingency Plan (WSCP).

The 2025 RUWMP is a regional planning document prepared collaboratively by MWA and participating urban water suppliers within the Mojave Region in accordance with the California Urban Water Management Planning Act.

The 2025 RUWMP includes:

- Regional chapters addressing Region-wide water supplies, water demands, and water service reliability;

- A chapter addressing MWA's role as the Region's wholesale water supplier, including its water supply and management responsibilities; and

- Retailer-specific chapters for each participating urban water supplier.

Each retailer-specific chapter addresses conditions within the respective agency's service area, including water service and system description, population and land use, water supply and infrastructure, water use characterization, water conservation and shortage response, and water system reliability. Each participating agency's WSCP describes the actions that may be implemented to respond to water shortage conditions and maintain water service reliability within its service area.

Each participating agency

will hold its own public hearing to consider adoption of the 2025 RUWMP as it applies to its service area, including the applicable regional chapters, its respective retailer-specific chapter, its WSCP and all applicable appendices. MWA will separately consider adoption of the entirety of the 2025 RUWMP and its WSCP.

Draft documents will be made available in advance of each agency's public hearing in accordance with applicable noticing requirements. At the time of the hearing, all interested parties may appear and provide comments.

Hi-Desert Water District
The Hi-Desert Water District will hold a public hearing as follows:

Date: June 3, 2026
Time: 4:00 PM
Location: 55439 29 Palms Highway Yucca Valley, CA 92284

Copies of the draft 2025 RUWMP, including the Hi-Desert Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 55439 29 Palms Highway Yucca Valley, CA 92284 during regular business hours and online at www.hdwd.com

Joshua Basin Water District
The Joshua Basin Water District will hold a public hearing as follows:

Date: June 3, 2026
Time: 5:00 PM
Location: 61750 Chollita Road Joshua Tree CA 92252

Copies of the draft 2025 RUWMP, including the Joshua Basin Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 61750 Chollita Rd., Joshua Tree, CA during regular business hours and online at www.jbwd.com

Pub. S.: 05/20, 05/27/2026

Appendix 2 – Reduced Delta Reliance

Appendix 2
Mojave Region Delta Reliance

This Appendix provides the Delta Reliance assessment for the Mojave Water Agency (MWA) and the RUWMP participating retail water service agencies located within the Mojave Region. These retail agencies in the Mojave Region covered by this RUWMP assessment include: Liberty Utilities – Apple Valley Water Company, City of Adelanto Water District, San Bernardino County Service Area 64, San Bernardino County Service Area 70J, Golden State Water Company – Barstow System, Hesperia Water District, Hi-Desert Water District, Joshua Basin Water District, Phelan Piñon Hills Community Services District, and Victorville Water District. These retail agencies are subject to the minimum threshold requirements of the Urban Water Management Planning Act (UWMP Act) and work with MWA on managing regional water supplies as described more thoroughly in the 2025 RUWMP. Additional entities that are not currently subject to the UWMP Act but may subject to the UWMP Act in the future and that rely upon water supplies derived from MWA's and the retail agencies' management are also considered in this assessment. Last, this assessment is consistent with all applicable water management activities within the Region including the Mojave Basin Area Adjudication Judgement, the Warren Valley Basin Judgment, and the Ames/Reche Groundwater Storage and Recovery Program Management Agreement.

A.1 Delta Reform Act and Certification of Consistency

The Delta Reform Act of 2009 required state and local agencies to prepare a written certification of consistency with Delta Plan policies before initiating a covered action in the Delta.1 The written certification of consistency must be submitted to the Delta Stewardship Council and include detailed findings as to whether the covered action is consistent with applicable Delta Plan policies.2 The submitted certification of consistency may be appealed by any person and the Delta Stewardship Council may grant the appeal to address contested issues.3 In short, water suppliers that anticipate participating in a proposed covered action must comply with the requirements of the Delta Reform Act.

[1] California Water Code section 85057.5.
[2] California Water Code section 85225.
[3] California Water Code section 85225.10-85225.25.

Proposed covered actions may include a conveyance facility or a new diversion that involves transferring water through, exporting water from, or using water in the Delta. For urban purveyors that may participate in a proposed covered action, should provide information in their Urban Water Management Plans (UWMP) that can be used to demonstrate consistency with the Delta Plan. Specifically, the urban purveyors need to demonstrate consistency with Delta Plan Policy WR P1 – Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).4 WR P1 subsection (a) states that:

> *Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*
>
> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above. WR P1 subsection (c)(1) states:

> *Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
>
> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

[4] Cal. Code Regs., tit. 23 section 5003.

(C) Included in the Plan, commencing with 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).

The analysis in this RUWMP Appendix includes all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future proposed covered action.

A.2 Expected Outcomes for Reduced Delta Reliance and Regional Self Sufficiency

The expected outcomes for this Delta reliance and improved regional self-reliance assessment were developed using guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2025, issued in January 2026 (Guidebook 2025), which generally reflected the guidebook issued in March 2021 (Guidebook 2020). The data used in this assessment represent the total regional efforts of MWA and the retail agencies and were developed as part of a region-wide coordination process to prepare the 2025 Regional Urban Water Management Plan (RUWMP). Table 1 shows the expected outcomes for reduced Delta reliance within the Mojave Region.

TABLE 1: EXPECTED OUTCOMES FOR REDUCED RELIANCE ON THE DELTA

Year	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Water Supplies from the Delta Watershed	34.2%	34.2%	31.0%	26.1%	24.6%	23.5%	22.9%	22.3%	21.7%
Change in Water Supplies from the Delta Watershed		-0.1%	-3.3%	-8.2%	-9.6%	-10.7%	-11.4%	-12.0%	-12.5%

The methodology for demonstrating reduced reliance on the Delta is consistent with DWR's Guidebook 2020 and Guidebook 2025. MWA calculated its expected outcomes for reduced Delta reliance by measuring its current and anticipated water use against a baseline condition. MWA chose 2010 normal water year as its baseline. Data for the 2010 baseline

were taken from relevant regional planning documents. MWA then assessed its Delta Reliance against the 2010 baseline for years 2015 through 2050.

The analysis uses normal water year demands to assess the supplies that would be used in the future. In addition, because WR P1 considers water use efficiency savings as a source of supply, prior the UWMP Act water conservation mandates (e.g. 20% by 2020) and more recent requirements that help support water use efficiency quantification in the Region.[5] Table 2 shows the Region's water demands without water use efficiency and the reported water use efficiency.

TABLE 2: DEMANDS WITHOUT WATER USE EFFICIENCY

Total Service Area Water Demands (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045	2050
Water Demands with Water Use Efficiency	145,066	138,009	129,595	121,700	123,400	125,000	126,500	128,800	130,700
Reported Water Use Efficiency	-	17,735	38,571	72,800	77,112	81,378	85,682	89,024	92,557
Water Demands without Water Use Efficiency	145,066	155,744	168,166	194,500	200,512	206,378	212,182	217,824	223,257

MWA and the participating retail urban water suppliers must also report the expected outcomes for measurable improvement in regional self-reliance. Given water management within the Region as described throughout the 2025 RUWMP, Table 3 shows the expected outcomes for supplies contributing to regional self-reliance for the Region as a whole.

[5] In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized Urban Water Use Objectives for each urban retail water supplier. In contrast to the SB X7-7 per-capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional sectors. The standards become progressively more stringent through 2040.

The data presented in this section demonstrate the expected outcomes for reduced Delta reliance and regional self-sufficiency. The information has been noticed and presented in accordance with applicable law.

TABLE 3: SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE

Water Supplies Contributing to Regional Self-Reliance	2010	2015	2020	2025	2030	2035	2040	2045	2050
Water Use Efficiency	0	17,735	38,571	72,800	77,112	81,378	85,682	89,024	92,557
Water Recycling	62,000	47,825	52,536	47,495	49,699	50,930	52,172	53,559	53,560
Conjunctive Use Projects	54,045	57,349	57,349	57,349	57,349	57,349	57,349	57,349	57,350
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	148,456	177,644	184,160	189,658	195,203	199,932	203,466
Service Area Water Demands without Water Use Efficiency	2010	2015	2020	2025	2030	2035	2040	2045	2045
Service Area Water Demands without Water Use Efficiency	145,066	155,744	168,166	194,500	200,512	206,378	212,182	217,824	223,257
Change in Regional Self Reliance (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045	2045
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	148,456	177,644	184,160	189,658	195,203	199,932	203,466
Change in Water Supplies Contributing to Regional Self-Reliance		6,864	32,411	61,599	68,115	73,613	79,158	83,887	87,421
Percent Change in Regional Self Reliance	2010	2015	2020	2025	2030	2035	2040	2045	2045
Water Supplies Contributing to Regional Self-Reliance	80.0%	78.9%	88.3%	91.3%	91.8%	91.9%	92.0%	91.8%	91.1%
Change in Water Supplies Contributing to Regional Self-Reliance		-1.1%	8.3%	11.3%	11.9%	11.9%	12.0%	11.8%	11.1%

Appendix 3 – MWA Regional DWR Checklist

Retail (x = required)	Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location	Chapter Location
x	x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Chapter 6	6.4, 6.6, 6.7
x	x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Chapter 6	Beginning of each sub-chapter
x	x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Chapter 6	6.1
x	n/a	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1		
x	x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Chapter 6	6.1
x	x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Chapter 6	6.1
x	x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Chapter 6	6.1
x	x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Chapter 6	6.1
x	n/a	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R		
n/a	x	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	Chapters 3 and 6	3.1, 6.4
x	x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Chapter 6	6.2
x	x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Chapter 6	6.2
x	x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Chapter 6	6.3
x	x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Chapter 6	6.3
x	x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Chapter 6	6.3
x	Optional	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Chapter 4	n/a
x	Optional	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Chapter 6	n/a
x	n/a	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6		
x	n/a	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3		
x	x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Chapter 5	n/a
n/a	x	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	Chapter 4	n/a
x	n/a	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1		
x	x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Chapters 3 and 4	n/a
x	x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Chapter 6	6.4
x	x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Chapter 3	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	n/a	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	n/a	n/a
x	x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Chapters 3 and 6	6.5
x	x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Chapters 3 and 6	6.5
x	x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Chapter 3	n/a
x	x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Chapter 3	n/a
x	n/a	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2		
x	x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Chapter 3	n/a
x	x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Chapter 3	n/a

x	x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Chapter 6	6.4
x	x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Chapter 6	6.9
x		7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Chapter 6	6.5
x	x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Chapter 6	6.5
x	x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Chapter 6	6.5
x	x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Chapter 6	6.8
x	x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Chapter 6	6.5
x	x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Chapter 6	6.5, 6.8
x	x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Chapter 6	6.5
x	x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Chapter 6	6.5, 6.8
x	x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Chapter 6	6.7
x	x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Chapter 6	6.7
x	x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a		
x	x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a		
x	n/a	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a		
x	x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a		
x	x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a		
n/a	x	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	Chapter 6	6.7
x	n/a	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a		
x	x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Chapter 6	6.1
x	x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Chapter 6	6.1
x	x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a

x	x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a

APPENDIX 4 – MWA WSCP

Mojave Water Agency
Water Shortage Contingency Plan

Mojave Water Agency

Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) addresses the plan preparation requirements in Water Code Section 10632 of the Urban Water Management Planning Act (The Act). The WSCP is incorporated into the 2025 Urban Water Management Plan (UWMP) and used by Mojave Water Agency (MWA) to respond to water shortage contingencies in the MWA service area as they may arise.

MWA provides wholesale water to retail agencies within its service area. The retail agencies are the direct purveyor of water service to retail customers. As such, MWA relies on a coordinated approach to water shortage management with the retail water agencies within its service area. MWA's efforts in Water Shortage Contingency Planning are focused on maintaining and augmenting groundwater supplies in order to mitigate against extended drought conditions and catastrophic water outages. And because MWA is a wholesale urban water supplier, elements that pertain only to retail water suppliers are not addressed in this WSCP.[1] This chapter will address all aspects of MWA's WSCP actions and address specific outage scenarios that MWA's water management actions alleviate.

Section 10631 of the Urban Water Management Plan Act lists the following required elements for wholesale water purveyors:

1. An analysis of water supply reliability
2. Procedures for conducting an annual water supply and demand assessment
3. Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage and the shortage response actions that align with the defined shortage levels.
4. Communication protocols and procedures
5. A description of legal authorities
6. A description of financial consequences
7. Reevaluation and improvement procedures
8. Special Water Feature Distinction (10632(b))

[1] Water Code sections 10632(a)(6), 10632(a)(8)(C), and 10632(a)(9) apply exclusively to retail urban purveyors.

9. Plan Adoption, Submittal, and Availability

This WSCP is a stand-alone plan that may be adopted independently from the UWMP and may be amended or refined and readopted as needed over coming months and years independently from the UWMP.

1.1 Water Supply Reliability Analysis

Mojave Water Agency is a special act district created in 1960 under Chapter 97 of the California Water Code Water Appendices. MWA service area covers 4,900 square miles in San Bernardino County and delivers water for regional groundwater management that is used by numerous retail water purveyors, ten of which are required to prepare an UWMP under the Urban Water Management Planning Act. Regional water supplies consist of naturally recharged groundwater, return flows, wastewater imports and imported State Water Project supplies. These supplies are discussed in greater detail in Chapter 4.

The water demands in the MWA service area currently serve a population approaching 600,000 people that is expected to grow to nearly 700,000 people by 2065.[2] MWA's service area demand analysis includes both the population assessment and relevant land use information provided by each retail provider. In short, the MWA service area demands are set to increase from 121,250 acre-feet per year in 2030 to over 126,000 acre-feet per year in 2045. Moreover, MWA's regional demands projection for 2050 exceed 127,270 acre-feet. These long-term demands are included in the 2025 UWMP in order to improve long-term water management and planning actions. These demands are discussed in detail in Chapter 6.

MWA has sufficient available regional supplies to meet the regional demands through 2050. These supplies include not only the sources noted above, but also stored water within the SWP system and groundwater storage within the MWA service area. In concert with the supplies noted above, these stored supplies allow MWA to provide reliable water supplies to retail agencies in dry year conditions. Accordingly, as shown in Chapter 4, MWA has reliable water supplies available to meet normal, single dry, and five consecutive dry year water demands through 2065.

[2] *Mojave Water Agency Population Forecast, 2020 Edition*, August 2020, UC Riverside School of Business Center for Economic Forecasting and Development

1.2 Annual Water Supply and Demand Assessment Procedures

The WSCP describes MWA's procedural methodology for managing shortages and developing its Annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment will be submitted to DWR by July 1 each year with the first Annual Assessment due July 1, 2022. The Annual Assessment examines MWA's anticipated water reliability for the current year and one additional dry year to determine what, if any, water shortages stages may be triggered during the required period. The Annual Assessment will be used by MWA decisionmakers to prepare for and initiate implementation of any needed response actions, as well as to inform customers, the general public, interested parties, and local, regional, and state government entities to prepare for such required actions, if necessary.

1.2.1 Analytical and Decision-making Processes

MWA plans to conduct its Annual Assessment according to the following timeline and process:

By February 1 Initial data collection, analysis, and coordination with retail agencies

By March 1 Preliminary Draft Annual Assessment subject to internal review

By April 1 Draft Annual Assessment and results briefing for MWA decision-makers

By May 1 Approval of Annual Assessment to MWA Decision-makers

By June 1 Public Release of Annual Assessment and Public Notifications

By July 1 Submit Annual Assessment to DWR in advance of July 1 deadline

MWA will prepare its Annual Assessment using the following key data and analytical methods:

- Prepare supply estimates for each water source for the analysis period.
- Update unconstrained regional demand and estimate anticipated actual water use for the analysis period.
- Update infrastructure assessment, including estimated water supply production capability on a monthly basis for the analysis period.
- Identify and quantify any locally applicable factors that may influence or disrupt supplies during the analysis period.

For the purposes of conducting the Annual Assessment, MWA's definition of "dry year" mimics characteristics of 2021-2022 water year where SWP allocation was 5%.

1.2.2 Submittal Procedure

MWA will submit its Annual Assessment to DWR via email by July 1 each year. At the time of DWR submittal, MWA will also notify all retail water agencies, the public, and other stakeholders concerning the results of the Annual Assessment and where it is available for review.

1.3 Six Standard Water Shortage Stages and Shortage Response Actions

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% percent shortage) as compared to the normal reliability condition. These water shortage stages have been standardized to allow for a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. Changes in supply availability will trigger an appropriate water shortage stage. MWA will then implement the response actions as specified below.

The WSCP is required to identify locally appropriate shortage response actions that align with the defined shortage stages and include demand reduction actions, supply augmentation actions, system operational changes, and mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions. For each response action the WSCP is to provide an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

MWA has grouped the actions to be taken during a water shortage condition into six stages, providing flexibility to address water shortages up to and exceeding the 50 percent shortage level condition. The following is an overview of the staged response MWA could follow during a given water shortage condition including sequential Stages (1-6) based on shortage severity, relative supply conditions for each stage, and percent shortage reduction levels. MWA will adopt the six standard water shortage stages for this 2025 WSCP as shown in Table 1 below.

Table 1: Shortage Stages and Response Actions

Shortage Stage	Shortage Percentage	Shortage Response	
1	Up to 10%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-10% met by communicating voluntary demand reduction
2	10%-20%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R^3 Deliveries	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-20% met by communicating voluntary demand reduction • 0-20% through reduced R^3 deliveries
3	20%-30%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R^3 Deliveries	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R^3 deliveries
4	30%-40%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R^3 Deliveries	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R^3 deliveries
5	40%-50%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R^3 Deliveries	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R^3 deliveries
6	More than 50%	• Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R^3 Deliveries	• 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R^3 deliveries

Stage 1 (up to 10 percent shortage) – When Stage 1 is implemented, voluntary water conservation is encouraged. The drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the retail agencies. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 10% water conservation savings.
- Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Initiating a Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed

Stage 2 (11 - 20 percent shortage) – When Stage 2 is implemented, voluntary water conservation is strongly encouraged. MWA coordinates actions with regional retail water purveyors. The drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 20% water conservation savings.
- Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed

- Reduce R3 deliveries as appropriate with retail agencies

Stage 3 (21 - 30 percent shortage) – When Stage 3 is implemented, voluntary water conservation is strongly encouraged and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and emphasizes MWA's ability to assist with supply re-allocation. The seriousness of the drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 4 (31 - 40 percent shortage) – When Stage 4 is implemented, voluntary water conservation is strongly encouraged and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The seriousness of the drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.

- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 5 (41 - 50 percent shortage) – When Stage 5 is implemented, voluntary water conservation is stressed to all regional purveyors and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The dire situation caused by the water shortage is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 6 (greater than 50 percent shortage) – When Stage 6 is implemented, voluntary water conservation is stressed to all regional purveyors and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The emergency situation caused by the water shortage is explained to the public and governmental bodies. MWA explains conditions leading to supply reductions to all retail purveyors. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

1.3.1 Supply Augmentation Actions

The following water supply augmentation actions may be used as response actions for the appropriate Water Shortage Stage. MWA may access its stored water sources in various locations inside and outside its service area. This storage occurs as carryover water in the SWP as well as groundwater storage within the MWA Service Area. These stored supplies may be transferred or exchanged with other purveyors that can assist in providing water supplies to MWA's service area. In addition, MWA will work with the California Department of Water Resources (DWR) to access supplies that may be made available in the statewide conveyance systems. Lastly, MWA may take additional supply augmentation actions that become available during the identified water shortage condition like acquiring water from other entities through transfers or exchanges that may be delivered into MWA's service area.

1.3.2 Operational Changes

The following water system operational changes may be used as response actions for the appropriate Water Shortage Stage. MWA may use its water storage and conveyance facilities to expedite water acquisitions, transfers, and exchanges that may alleviate identified water shortage conditions. MWA will assess the utility associated with full operational capacity at its R^3 facility and coordinate operational actions with retail agencies that will help address water shortage conditions. Moreover, where operational flexibility exists in MWA's six turnouts from the East Branch of the State Water Project, MWA may exercise operational options to facilitate water shortage mitigation actions.

1.3.3 Emergency Response Plan for Catastrophic Water Shortages

This section identifies actions to be undertaken by MWA to prepare for, and implement during, a catastrophic interruption of water supplies. A catastrophic interruption could result from natural and man-made events that causes a water shortage severe enough to trigger a Stage 1-6 water supply shortage condition. In addition, MWA's SWP water supplies are conveyed through the California Aqueduct system operated by DWR, and DWR has created several emergency plans to address catastrophic outages. This section addresses the catastrophic outage scenarios and relevant actions that MWA will undertake should a catastrophic outage occur.

Earthquakes are an issue of concern in the Mojave Basin region. The southern portion of the San Andreas Fault borders the western edge of Mojave Water Agency's Service Area and an earthquake on that fault could significantly impact water service and infrastructure. The California Department of Water Resources (DWR) has noted that an earthquake could damage the California Aqueduct conveyance system through structural damage or electrical failures which could potentially halt water deliveries to MWA. In short, an earthquake may create regional turmoil that could impact local infrastructure or cause power outages for extended periods of time.

DWR has a contingency California Aqueduct outage plan for restoring the California Aqueduct to service should a major break occur because of an earthquake or other catastrophic reason. DWR estimates that a major break in the California Aqueduct would take approximately four months to repair. Although extended water supply shortages may manifest for MWA's imported water supplies, the retail agencies and MWA have alternative water supplies available to meet fundamental customer demands. Retail agencies have access to managed groundwater throughout the MWA Service Area and MWA has stored imported water supplies that could be used to meet crisis conditions. Local effects of a catastrophic outage on local water systems may require additional cooperative efforts among regional water purveyors.

In addition to earthquakes, the SWP could experience other emergency outage scenarios. Past examples include slippage of aqueduct side panels into the California Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Baños), flood damage to the East Branch of the Aqueduct in 2015, and historic subsidence and leakage repairs needed along the Main Branch and East Branch of the Aqueduct since the 1980s, and potential for further subsidence issues being identified as recently as 2025. All of these outages were short-term in nature (on the order of weeks to several months), and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation and continue SWP deliveries while repairs were

made. Thus, the SWP contractors generally experienced no interruption in total annual deliveries but local actions to mitigate the outage were implemented.

It is important to note that all of MWA's SWP imported supply is used to replenish groundwater recharge facilities. These groundwater augmentation efforts insulate regional purveyors against an outage of the SWP system. As noted in Chapter 4, MWA has over 200,000 acre-feet of stored water available for extraction and use in the MWA service area. Combining this stored water with other stored supplies by the local retail agencies as well as the existing groundwater supplies in the region, MWA and its wholesale member agencies may sustain water supplies in a catastrophic outage of the SWP delivery systems. Even an interruption in SWP supplies for several months would not provide any immediate threat to potable water deliveries from groundwater production wells.

MWA developed its Regional Recharge and Recovery Project, known as "R³," to increase flexibility in its water system. The R³ project is a basin management tool and conjunctive use project that distributes stored water via groundwater wells pumping from the Mojave Basin to local retail water purveyors. This groundwater pumping production is done to benefit each of the retail water agencies and in lieu of pumping from other groundwater production facilities of these retail agencies. This groundwater management project allows water to be pumped in a portion of the basin to be used in lieu of other groundwater production in other portions of the basin so that the various areas of the basin can be actively managed. The R^3 project includes groundwater recharge facilities, groundwater production wells, booster pumps, storage reservoirs, interconnections to the retail customer water system, water meters, and chlorination facilities. The R^3 facilities provide redundant capacity to the retail agencies during catastrophic outage events. Although MWA may stop deliveries in the R^3 facilities to the retail agencies at any time, the facilities may help provide water supplies during crisis conditions. In short, working in parallel with the retail agencies, the R^3 facilities can be used to supplement the facilities that each retail water agency may have to handle catastrophic outages.

The R^3 facilities also have a separate Emergency Response Plan (ERP).[3] This ERP identifies emergency procedures, response actions, and responsible personnel that would be activated in the event of an emergency with the R^3 facilities. Specifically, the ERP addresses responses to leaks or service interruptions, low pressure, power outage, contamination, and physical destruction of the R^3 facilities.[4] Accordingly, MWA's R^3 ERP provides an additional buffer against emergency and catastrophic outage that may impact Statewide, regional, or local water distribution and treatment facilities.

[3] R^3 System Emergency/Disaster Response Plan Update 2019, Mojave Water Agency.
[4] ERP at 2-3.

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 problematic event, the contamination would be isolated and should not significantly impact the total water supply in the region. In addition, such an event would be addressed in the retailers' emergency response plan as well as the R^3 ERP.

1.3.4 SWP Emergency Outage Scenarios

There are numerous events that could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Delta near the Harvey O. Banks Pumping Plant, a flood, an earthquake event that severely damages the California Aqueduct along its San Joaquin Valley traverse, or an earthquake event along the East Branch of the California Aqueduct. Such events could impact some or all SWP contractors south of the Delta.

The response of DWR, MWA, and other SWP contractors to such events would be highly dependent on the type and location of any such event. In typical SWP operations, water flowing through the Delta is diverted at the SWP's main pumping facility, located in the southern Delta, and is pumped into the California Aqueduct. During the relatively heavier runoff period in the winter and early spring, Delta diversions generally exceed SWP contractor demands, and the excess is stored in San Luis Reservoir. The SWP California Aqueduct terminal reservoirs, such as Pyramid and Castaic Lakes, are also replenished during these periods. During the summer and fall, when diversions from the Delta are generally more limited and less than contractor demands, releases from San Luis Reservoir are used to make up the difference in deliveries to contractors. The SWP share of storage capacity at San Luis Reservoir is 1,062,000 AF.

MWA receives its SWP deliveries through the East Branch of the California Aqueduct. The other contractors receiving deliveries from the East Branch are Metropolitan Water District, Antelope Valley-East Kern Water Agency, Palmdale Water District, Crestline-Lake Arrowhead Water Agency, Desert Water Agency, San Gabriel Valley Municipal Water District, San Bernardino Valley Municipal Water District, San Gorgonio Pass Water Agency, and Coachella Valley Water District. The East Branch has two terminal reservoirs, Silverwood Lake and Lake Perris, which were designed to provide emergency storage and regulatory storage (i.e., storage to help meet peak summer deliveries) for several of the East Branch contractors. However, MWA does not have contract rights to storage capacity in those reservoirs. Silverwood Lake is within the MWA service area and releases from the lake flow into the primary groundwater basins within the MWA service area. In addition to SWP storage south of the Delta in San Luis Reservoir and the terminal reservoirs, a number of contractors have stored water in groundwater banking programs in the San Joaquin Valley and more recently

along the East Branch, and many also have surface and groundwater storage within their own service areas.

Three scenarios that could impact the delivery to MWA of its SWP supply or other supplies delivered to it through the California Aqueduct are described below. For each of these scenarios, it was assumed that an outage of six months could occur. MWA's ability to meet demands during the worst of these scenarios is presented following the scenario descriptions.

Scenario 1: Levee Breach near the Sacramento-San Joaquin Delta

The California Department of Water Resources (DWR) has estimated that in the event of a major earthquake in or near the Delta, regular water supply deliveries from the SWP could be interrupted for up to three years, posing a substantial risk to the California business economy. Accordingly, a post-event strategy has been developed which would provide necessary water supply protections. The plan has been coordinated through DWR, the Army Corps of Engineers (Corps), Bureau of Reclamation, California Office of Emergency Services (Cal OES), the Metropolitan Water District of Southern California, and the State Water Contractors. Full implementation of the plan would enable resumption of at least partial deliveries from the SWP in less than six months.

DWR Delta Flood Emergency Management Plan ("Emergency Pathway"). DWR has developed the Delta Flood Emergency Management Plan to provide strategies for a response to Delta levee failures, which addresses a range of failures up to and including earthquake-induced multiple island failures during dry conditions when the volume of flooded islands and saltwater intrusion are large. Under such severe conditions, the plan includes a strategy to establish an emergency freshwater pathway from the central Delta along Middle River and Victoria Canal to the export pumps in the south Delta. The plan includes the pre-positioning of emergency construction materials at existing and new stockpiles and warehouse sites in the Delta, and development of tactical modeling tools (DWR Emergency Response Tool) to predict levee repair logistics, water quality conditions, and timelines of levee repair and suitable water quality to restore exports. The Delta Flood Emergency Management Plan has been extensively coordinated with state, federal and local emergency response agencies. DWR, in conjunction with local agencies, the Corps and Cal OES, regularly conduct simulated and field exercises to test and revise the plan under real time conditions.

DWR and the Corps provide vital Delta region response to flood and earthquake emergencies, complementary to an overall Cal OES structure. Cal OES is preparing its Northern California Catastrophic Flood Response Plan that incorporates the DWR Delta Flood Emergency Management Plan. These agencies utilize a unified command structure and response and

recovery framework. DWR and the Corps, through a Delta Emergency Operations Integration Plan, would integrate personnel and resources during emergency operations.

Levee Improvements and Prioritization. The DWR Delta Levees Subvention Program has prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta region. These efforts have been complementary to the DWR Delta Flood Emergency Management Plan, which along with use of pre-positioned emergency flood fight materials in the Delta, relies on pathway and other levees providing reasonable seismic performance to facilitate restoration of the freshwater pathway after a severe earthquake. Together, these two DWR programs have been successful in implementing a coordinated strategy of emergency preparedness for the benefit of SWP and CVP export systems. Moreover, levee improvements along the pathway and Old River levees consisting of crest raising, crest widening, landside slope fill and toe berms meet the needs of local reclamation districts and substantially improve seismic stability to reduce levee slumping and create a more robust flood-fighting platform. Many urban water supply agencies have participated or are currently participating in levee improvement projects along the Old and Middle River corridors.

Scenario 2: Complete Disruption of the California Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the California Aqueduct (the portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the California Aqueduct, deliveries from San Luis Reservoir could be interrupted. DWR has informed the SWP contractors that a four-month outage could be expected in such an event. MWA's assumption is a six-month outage.

Arroyo Pasajero is located downstream of San Luis Reservoir and upstream of the primary groundwater banking programs in the San Joaquin Valley. Assuming an outage at a location near Arroyo Pasajero that resulted in the California Aqueduct being out of service for six months, supplies from San Luis Reservoir would not be available to those SWP contractors located downstream of that point. This would include MWA.

Scenario 3: Complete Disruption of the East Branch of the California Aqueduct

The East Branch of the California Aqueduct begins at a bifurcation of the California Aqueduct south of Edmonston Pumping Plant, which pumps SWP water through and across the Tehachapi Mountains. From the point of bifurcation, the East Branch is an open canal. If a major earthquake (e.g., an event similar to or greater than the 1994 Northridge Earthquake)

were to damage a portion of the East Branch, deliveries could be interrupted. The exact location of such damage along the East Branch would be key to determining emergency operations by DWR and the East Branch SWP contractors. Specifically, MWA's six turnouts on the system could all be differently impacted, and some potentially not impacted at all. For this scenario, it was assumed that the East Branch would suffer a single-location break and deliveries of SWP water from north of the Tehachapi Mountains or of contractor water stored in groundwater banking programs in the San Joaquin Valley would not be available. It was also assumed that Silverwood and Perris dams would not be damaged by the event and that water in Silverwood and Perris Lakes would be available to the East Branch SWP contractors.

In any of these three SWP emergency outage scenarios, DWR and the SWP contractors would coordinate operations to minimize supply disruptions. Depending on the particular scenario or outage location, some or all of the SWP contractors south of the Delta might be affected. But even among those contractors, potential impacts would differ given each contractor's specific mix of other supplies and available storage. During past SWP outages, the SWP contractors have worked cooperatively to minimize supply impacts among all contractors. Past examples of such cooperation have included certain SWP contractors agreeing to rely more heavily on alternate supplies, allowing more of the outage-limited SWP supply to be delivered to other contractors, and exchanges among SWP contractors, allowing delivery of one contractor's SWP supply or other water to another contractor, with that water being returned after the outage was over.

Of these three SWP outage scenarios, the scenario of an East Branch outage along with no delivery of stored water from Silverwood Lake presents the worst-case scenario for MWA. In this scenario, MWA and retail agencies would continue to rely solely on local managed groundwater supplies (native water, natural recharge, return flow, and stored imported water).

Seismic Risk Assessment and Hazard Mitigation Plan

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. This requirement can be met by submittal of a copy of the most recent adopted local hazard mitigation plan (LHMP) or multi-hazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multi-hazard mitigation plan addresses seismic risk. MWA has submitted a copy of the San Bernardino County Multi-

Jurisdictional Hazard Mitigation Plan, approved by the Federal Emergency Management Agency (FEMA) on December 3, 2022 (HMP).[5]

The fundamental hazards identified in this plan include Earthquake, Wildfire, Flood, Drought, Terrorism and Climate Change. The HMP addresses the vulnerabilities associated with these items, the other plans and financial issues that impact implementation of the HMP, as well as a comprehensive mitigation strategy. Accordingly, the HMP is incorporated by reference into MWA's WSCP.

1.4. Communication Protocols

MWA will engage in specific communication protocols in developing and implementing the WSCP and coordinate with the Regional Water Purveyors and neighboring public agencies to communicate water shortage conditions. MWA will seek to engage customers and provide notice with locally relevant actions that further the water shortage response actions. These actions may include:

- Publishing information on MWA's website.
- Establishing a telephone hotline.
- Coordinating through direct correspondence with local agencies on water supply management
- Preparing social media posts to communicate MWA actions.
- Advertising actions on other local audio and video media.
- Coordinating voluntary and mandatory water shortage condition activities with other local agencies.

Taken together, these communication actions will result in a more effective implementation of MWA's WSCP.

1.5 Legal Authorities

MWA is empowered to implement and enforce its water shortage response actions specified in this section through the following legal authorities: California Water Code Water Appendix, Chapter 97, the Mojave Basin Area Adjudication, and the Warren Valley Judgment. MWA has authorities to manage water supplies in its service area, including management of SWP supplies and R^3 facilities. MWA's role as Watermaster under the Mojave Basin Area Adjudication empower it with the authorities to address excessive water use among

[5] https://oes.sbcounty.gov/wp-content/uploads/sites/110/2024/06/HMP-2022.pdf

participating agencies. The Warren Valley Judgment addresses unauthorized or excessive use issues among the participating agencies. However, MWA does not have direct authority to limit groundwater pumping within its service area.

1.6 Financial Consequences of WSCP

MWA has assessed the financial conditions associated with developing and delivering water supplies within its service area boundary. As shown in Chapter 4, MWA has developed alternative water supplies that can be accessed to continue water deliveries during extended dry conditions. Accordingly, although MWA may experience minor financial fluctuations due to water shortage conditions, the redundancy in its water storage systems as well as its coordinated approach to managing dry conditions with the retail agencies will insulate MWA from significant financial consequences. Therefore, this WSCP does not anticipate that implementation of MWA's WSCP will create financial conditions that are detrimental to MWA.

1.7 Re-evaluation and Improvement Procedures

MWA will continually review and assess its procedures for implementing the WSCP. Specifically, MWA will use the monitoring and reporting protocols identified above as a quality assurance and quality control measure to understand the effectiveness of water shortage activities. These re-evaluation and improvement procedures will include developing reports, memoranda, and presentations that assess the effectiveness of water shortage actions and the WSCP. These protocols will be continually assessed and updated by MWA management staff.

1.8 Special Water Feature Distinction

MWA's water shortage response actions focus on health and safety issues and working with retail agencies to manage available supplies. MWA will work with the retail agencies on communicating and implementing those agencies' special water feature distinction issues that may arise during critical water shortage conditions.

1.9 Plan Adoption, Submittal, and Availability

The WSCP has been adopted, submitted, and is available as required by the Urban Water Management Planning Act. As a stand-alone document, the WSCP is also subject to separate adoption, submittal, and availability processes, and whenever it is separately amended or revised in the future. MWA has followed all applicable law in adopting the WSCPs. The current adopted WSCP for the shall be available to its customers and to the to all

local agencies in Mojave Water Agency's service area within San Bernardino County no less than 30 days before its adoption. A copy of the current WSCP is available for public inspection during business hours at www.mojavewater.org and is available for download at www.mojavewater.org/planning.html

.

APPENDIX 13A – JBWD WSCP

JOSHUA BASIN WATER DISTRICT

Proudly providing water from an ancient source...well into the future

2025 Water Shortage Contingency Plan for Joshua Basin Water District

Table of Contents

List of Tables

List of Appendices

Acronyms

AF	Acre-Feet
AFY	Acre-Feet per Year
AWWA	American Waterworks Association
CCF	hundred cubic feet
DWR	Department of Water Resources
GPCD	Gallons Per Capita Per Day
HMP	Hazard Mitigation Plan
JBWD	Joshua Basin Water District
LHMP	Local Hazard Mitigation Plan
MWA	Mojave Water Agency
SWP	State Water Project
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan

DWR Checklist Table for WSCP

Water Code Section	Summary as Applies to UWMP/WSCP	2020 WSCP Location
Subject: Water Shortage Contingency Planning | 2020 UWMP Guidebook Location: Appendix J		
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Full Document
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Section 2.5
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Section 2
10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Section 3.1
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Section 3.1
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Section 3.3
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Section 3.4
10632(a)(4)(C)	Specify locally appropriate operational changes.	Section 3.5
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state- mandated prohibitions are appropriate to local conditions.	Section 3.7.4
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Section 3.4, 3.7
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Section 4.1
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Table 4.1
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Section 6
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Chapter 3
10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Section 4.1
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Section 7.1
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Section 7.3
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Table 7-1
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Section 5.2
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Section 1.4

10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Section 3.4

Section 1: Introduction

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought that limits supplies, an earthquake that damages water delivery or storage facilities, a regional power outage or a toxic spill that affects water quality. This Plan addresses the requirements in the California Water Code Section 10632, which requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP, Plan) as part of its Urban Water Management Plan (UWMP). This WSCP serves as a guide for the intended actions by Joshua Basin Water District (JBWD, the District) during water shortage conditions to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages.

This plan describes the actions JBWD will take to identify and respond to water shortage per requirements of the Urban Water Management Act, Section 10632 of the California Water Code.

1.1 Declaration of Purpose of WSCP

The WSCP adopts regulations and restrictions on outdoor water use through the six standard water shortage stages, including domestic (residential), commercial/institutional/industrial, landscape, parks, and golf courses, and agriculture. These regulations are effective immediately and shall be effective until the District Board of Directors (Board) finds that water shortage no longer exists.

The overall principle of the District's WSCP is to reliably meet water demands during shortages caused by droughts, supply reductions and emergency conditions.

The purpose of the WSCP is to:

- Monitor and compare anticipated supplies and demands consistent with Water Code Section Water Code Section 10632(a)(2);
- Keep water use within supply and delivery capability;
- Define procedures to be used when supply cannot meet demand or continuing pumping will result in harm to supply source;
- Familiarize all of JBWD customers (residential, business, industrial, institutional/governmental and others) with procedures to be implemented when voluntary or mandatory water restrictions are in effect.

The District has developed a Draft Water Shortage Contingency Ordinance (included in Appendix A) that provides a framework and guides the District actions in the event of a water shortage emergency. The draft ordinance includes voluntary and mandatory stages to address a reduction in water supply, at various levels reduce demand by up to 50%. Prohibitions, penalties, and financial impacts of shortages have been developed by the District and are summarized in Section 7.

1.2 Reduced Water Use During Water Shortage Events

This WSCP establishes changes that may be imposed on water users during Water Shortage Events. Such events may be a lengthy drought that has limited groundwater supplies, the sudden presence of an unforeseen toxin, which may require shutting the main groundwater pumping system, or an emergency condition brought about by an earthquake, fire, or other interruption in water delivery to the system. These actions are discussed in later sections of this WSCP.

A consideration for planning is water needed (gallons per capita per day [GPCD]) to maintain health and safety. The American Water Works Association (AWWA 2011) suggests that on the high end, water necessary for health and safety is 58 GPCD. AWWA suggests that with water savings fixtures and habit changes water needed for health and safety can be as low as 30 GPCD (AWWA 2011). These estimates are consistent with the amount of water recommended for health and safety by the US Bureau of Reclamation, which uses 50 GPCD for drought planning purposes (Reclamation 2010).

1.3 Plan Preparation, Adoption, Submittal and Availability

JBWD began preparation of this Plan in 2021. The public hearing for the Water Shortage Contingency Plan was noticed in the local newspapers (The Desert Star), as prescribed in Government Code 6066, which included the time and place of the hearing (August 17, 2022 at the District's office located at 61750 Chollita Road in Joshua Tree), as well as the location where the plan was available for public inspection. Interested parties, including other local agencies, were notified of the public hearing. The 2020 UWMP was made available from the District's website for public inspection prior to the public hearing, so that comments could be received and discussed by the District's Board of Directors prior to plans adoption on August 17, 2022 at the District's office.

The final draft of the Plan was adopted by the Board of Directors (provided in Appendix D of the UWMP) and was submitted to the Department of Water Resources (DWR) within 30 days of approval. Additionally, the adopted plan will be made available per the requirements of the Water Code.

As part of the 2025 RUWMP process, the District review this WSCP and determined that its shortage levels, response actions, communication protocols, monitoring procedures, enforcement provisions, and financial response framework remain appropriate for District operations and current planning conditions. No substantive revisions have been made to the WSCP since its 2022 adoption. The District is therefore readopting this WSCP in conjunction with the adoption of the 2025 RUWMP to maintain consistency with the current regional planning cycle and to reaffirm the District's shortage response framework.

Following readoption, the District will submit the 2025 RUWMP and associated WSCP documentation to DWR through the required submittal process. The adopted WSCP will also be made available to the public, provided to applicable local agencies, and posted on the District's website in accordance with California Water Code requirements.

1.4 Water Shortage Contingency Plan Refinement Procedures

JBWD will convene the following departmental staff as needed to refine the WSCP:

- Engineering Staff
- Administrative Staff
- Operational Staff

The WSCP will be updated and refined as appropriate and needed following significant changes to JBWD's supply portfolio or significant changes to the water allocation plans of its supply agencies (Mojave Water Agency [MWA]), but no less than every 5 years.

1.5 Relationship to the Urban Water Management Plan

Water Code Section 10632(a) requires that every urban water supplier prepare and adopt a water shortage contingency plan as part of its urban water management plan. Although the WSCP is a stand-alone document that may be amended separately from the UWMP, it is informed by the water supply reliability analyses prepared as part of the District's UWMP planning process.

The District's 2025 RUWMP includes the water supply reliability and drought risk assessment information required by the Urban Water Management Planning Act, including evaluation of normal year, single dry year, and five consecutive dry year conditions. Those analyses are presented in the District's retail-specific chapter of the 2025 RUWMP, including Sub-Chapter 13.7 Water System Reliability and Drought Risk Assessment.

This WSCP provides the District's procedural framework for identifying, declaring, communicating, and responding to water shortage conditions. Accordingly, while the 2025 RUWMP evaluates the District's long-term and near-term water supply reliability, this WSCP describes the actions the District may implement if supply conditions, regulatory requirements, emergency conditions, or the Annual Water Supply and Demand Assessment indicate that shortage response actions are necessary.

Section 2: Procedures for Annual Water Supply and Demand Assessment

California Water Code Division 1, Section 350, states:

> "The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection."

These Annual Assessment procedures described herein are one tool to be used to determine if a water shortage is to be declared.

New provisions in Water Code Section 10632.1. require that an urban water supplier such as JBWD, conduct an annual water supply and demand assessment ("Annual Assessment"), on or before July 1 of each year, to be submitted to DWR. An urban water supplier that relies on imported water from the State Water Project (SWP) or the Bureau of Reclamation shall submit its Annual Assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later. The requirement to perform the Annual Assessment begins in July 2022.

Droughts occur with unpredictable frequency, intensity, and duration. Developing and maintaining a healthy groundwater supply to serve its customers has always been an ongoing District priority, and the District wants to be prepared for drought and water shortages. The District regularly monitors its water supplies and demands and produces a Consumer Confidence Report (CCR) annually.

Water supply projections and hydrologic conditions are significant components in deciding when a drought response is needed. The amount of the water supply shortage contributes to the severity of drought declared and the necessary level of response from the District and customers.

2.1 Timeline for Conducting the Annual Assessment

Table 2-1 provides targets for performing the Annual Assessment. The table outlines actions for the current year and one year of drought. By starting to plan in 2022, JBWD will get a snapshot of conditions and can start lining up the resources to mitigate supply and start outreach to customers to manage demand. Major actions are proposed in February, when an initial estimate of supply is made and compared to demand. A final annual assessment is proposed in May 2023.

TABLE 2-1. CALENDAR FOR PERFORMING ANNUAL ASSESSMENT

Target Date	Action
Oct-Jan	Monitor groundwater supply Monitor demand trends
Feb	Confirm anticipated weather (e.g., National Weather Service Climate Prediction Center, La Niña, US Drought Seasonal Outlook) Prepare initial assessment of supplies (*Supply Table 1*) Make initial assessment of unconstrained demand (*Demand Tables 1, 2, 3*) Make initial estimate of shortage If shortage anticipated, form Water Shortage Task Force
Mar	Prepare informational item to the Board of Directors confirming assessment of supplies and identify any additional supply mitigations
Apr	Start public outreach Identify supplier efficiency actions Complete Draft Annual Assessment and present to the Board of Directors
May	Continue public outreach Finalize Annual Water Assessment and submit to DWR If necessary, prepare notices of public hearing on water shortage
Jun-Sept	Continue public outreach If necessary, declare water shortage and implement supply mitigations and demand reduction actions Monitor customer response to water shortage messaging and other actions

2.2 Factors Affecting Demand and Supply

Weather affects the District's supply in multiple ways. Due to drought conditions the area has recently received far less than the historical average of approximately five inches of annual rainfall. There is negligible infiltration of direct precipitation in areas where alluvial deposits are thick, and substantial amount of available runoff is lost to evaporation after flowing into the basin.

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Evaporative coolers and outdoor water use are large components of water demands in the District's service area.

2.2.1 Weather Outlook

Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand.

While no long-term study or correlation between weather parameters and the local groundwater supply have been performed, there are general “rules of thumb” that can be considered when looking at the groundwater supply.

- Potential for La Niña. ENSO (El Niño Southern Oscillation) is the warming and cooling of the ocean water along the Equator in the Eastern Pacific Ocean near South America. The warm phase is called El Niño and the cold phase is called La Niña. When the Eastern Pacific Ocean is 0.5 degrees Celsius above normal for 5 consecutive 3-month average periods, an El Niño is declared. When the Eastern Pacific Ocean is 0.5 degrees Celsius below normal for 5 consecutive 3-month average periods, a La Niña is declared. The El Niño and La Niña are declared as Weak, Moderate, or Strong depending on how far from normal the water temperature gets. When the temperature is above 1.5 degrees Celsius, it is declared as strong. When the temperature is above 1.0 degrees Celsius, it is declared as Moderate. When the temperature is above 0.5 degrees Celsius, it is declared as Weak. The effect on the District trends to be wetter with El Niños and drier with La Niñas. The National Weather Service Climate Prediction Center provides information on potential for La Niña conditions.

- US Drought Information Seasonal Outlook. The National Weather Service Climate Prediction Center provides information geographically on drought conditions and categorizes geographies as “Drought Persists”, “Drought Remains but Improves”, “Drought Removal Likely”, and “Drought Development Likely”.

2.3 Current Year Unconstrained Demand

DWR guidance for the Annual Assessment is to consider the expected water use in the upcoming year, based on recent water use, and before any projected response actions a Supplier may trigger under its WSCP.

2.3.1 Land Use

In order to evaluate water demand, the District will examine current use and coordinate and with the County of San Bernardino to understand near-term projected land uses. The land use evaluation will start with the current general plan and a summary of built dwelling-units (residential) and square footage (non-residential). Using known development projects constructed since the adoption of the general plan, a summarized total of the existing land use within the District’s service area through the end of the recent calendar year will be developed.

The District will coordinate with the County to help identify pending and approved projects that are anticipated to utilize water in the in current calendar year and one future calendar year.

2.3.2 Current Demand

The District will create a table that will summarize the total water consumption (potable and untreated) for each consumption category within the District's water service area for the most recent 10-year average, by month (*Demand Table 1*). Based on anticipated weather, the District may adjust *Demand Table 1* to assume an increase in current demands. *Demand Table 1* will estimate existing demand in the current calendar year and demand in the subsequent calendar year. For the purposes of the analysis the subsequent year will be assumed to be a drought year.

2.3.3 Potential Demand

JBWD will create a table showing anticipate demands from "Under Construction and Approved Projects" (*Demand Table 2*). In *Demand Table 2* anticipated water use will be forecasted by month. The calculations in Demand Table 2 will use the most recently developed demand factors inclusive of water loss and including a contingency to account for annual demand variations that are likely to occur.

2.3.4 Total Near-Term Demands

Near-Term Demands (*Demand Table 3*) will be the sum of the demands reflected in *Demand Table 1* plus *Demand Table 2*.

2.4 Assessing Supply in Current Year and One Dry Year

JBWD will evaluate the local water sources available including Joshua Tree Basin groundwater, Copper Mountain Basin groundwater, and SWP water. Table 2-2 summarizes the factors to be considered.

Using Table 2-2 above as a guide, JBWD will develop a summary of each water source available in the upcoming year assuming the subsequent year will be a dry year. JBWD will develop *Supply Table 1*, in which a quantified summary of each anticipated supply source is provided for the upcoming year assuming the subsequent year is a dry year. Anticipated water supply will be forecasted by month using past supply patterns.

TABLE 2-2 ANNUAL ASSESSMENT OF SUPPLY

Source	Factors to be Evaluated in Current Year	Establishing Supply in Assumed Subsequent Dry Year
SWP Water/Mojave Water Agency (MWA)	What is anticipated SWP Allocation for upcoming 12 months	What is anticipated SWP dry year allocation
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
	Any constraints on wheeling water to Mojave Water Agency (MWA)/JBWD system	Any constraints on wheeling water to MWA/JBWD system
Joshua Tree Groundwater Basin	Regulatory limitations	Regulatory limitations
	Annual extractions past 10-years	Annual extractions past 10-years
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
	Consider if supply would be managed differently if it is known subsequent year will be dry year	
Copper Mountain Groundwater Basin	Regulatory limitations	Regulatory limitations
	Annual extractions past 10-years	Annual extractions past 10-years
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
	Consider if supply would be managed differently if it is known subsequent year will be dry year	

2.5 Assessing Water Supply Reliability

JBWD will compare *Supply Table 1* and *Demand Table 3* and determine if a supply shortage is anticipated, the level of shortage, and prepare if necessary to implement its WSCP.

2.6 Coordination with Cities and Counties

Should a water shortage be declared, JBWD, will coordinate with any District or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code, and also to ensure that City/County facilities are being operated in a water efficient manner. Coordination will also include other agencies within the District's service area such as schools, parks, and others.

.

Section 3: Six Standard Water Shortage Levels

3.1 Stages of Action to Respond to Water Shortages

As required by California Water Code Section 10632(a)(3)(A), this WSCP is framed around six standard water shortage stages, which correspond to progressive ranges of percent supply reductions from zero to more than fifty percent. Table 3-1 presents a description of the six water supply shortage stages, defined as stages I to VI.

Each stage may be triggered by a declaration from federal or state authorities, or JBWD to address events that result in a water shortage. The stages and applicable triggers are summarized in Table 3-2.

Table 3-1. Rationing and Reduction Goals (DWR Table 8-1)

Deficiency or State Mandated Reduction	Stage	Demand Reduction Goal	Type of Program	Water Shortage Condition
1-10%	1	10% reduction	Voluntary	Minor Shortage
11-20%	2	20% reduction	Mandatory	Moderate Shortage
21-30%	3	30% reduction	Mandatory	Severe Shortage
31-40%	4	40% reduction	Mandatory	Critical Shortage
41-50%	5	50% reduction	Mandatory	Emergency Shortage
>50%	6	>50% reduction	Mandatory	Catastrophic Failure

TABLE 3-2 STAGES OF JBWD WATER SHORTAGE CONTINGENCY PLAN

Stage	Percent Supply Reduction	Triggers
I	Up to 10%	• Results of the Annual Assessment • Federal, state, or local disaster declaration that may impact water supplies • State declaration due to drought or system maintenance • Unplanned JBWD water system maintenance
II	Up to 20%	• Results of the Annual Assessment • Federal, state, or local disaster declaration that may impact water supplies • State declaration due to drought or system maintenance • Unplanned JBWD water system maintenance requiring more time to repair

Stage	Percent Supply Reduction	Triggers
III	Up to 30%	• Results of the Annual Assessment • Federal, state, or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure • State outdoor irrigation restriction; and/or • Unplanned JBWD water system failure or emergency
IV	Up to 40%	• Federal, state, or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure • State outdoor irrigation restriction; and/or • Unplanned JBWD water system failure or emergency
V	Up to 50%	• Results of the Annual Assessment • Federal, state, or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure • State outdoor irrigation restriction; and/or • Advanced JBWD water system failure or emergency
Stage VI	50% or higher	• Results of the Annual Assessment • Federal, state, or local disaster declaration that may impact water supplies • MWA failure to supply SWP for groundwater recharge • State determination due to drought or significant system failure • Natural or human-caused catastrophe disrupting delivery of water to, or within the service area • Severe JBWD water system failure

3.1.1 Procedures for Water Shortage Level Determination

The results of the Annual Assessment will be used to determine the water shortage level. In case of emergencies, a special meeting may be called by a majority of the Board on less than twenty-four-hour notice and without an agenda to deal with the disruption of service. If an emergency arises which would ordinarily be brought to the attention of the Board, but insufficient time exists, the General Manager has administrative authority to take action as deemed appropriate and reasonable.

3.2 Water Shortage Response Actions

Once a shortage stage is declared, JBWD may implement shortage response actions required by the customer and through operational changes, as listed in Section 3.5. These actions will be supported by communication protocols (discussed in Section 4), enforcement actions (discussed in Section 3.8.2) and monitoring and reporting efforts (discussed in Section 5) activities appropriate at each shortage stage level.

TABLE 3-3 CUSTOMER AND JBWD WATER SHORTAGE ACTIONS

Stage	District Actions	Customer Actions
Stage I	• Initiate public information campaign • Increase awareness of conservation measures • Commence enforcement of conservation measures • Promote methods to reduce water use • Conduct focused outreach to large water users • Publish Water Shortage Contingency Plan stages and actions per stage	• Voluntary water conservation • Adhere to conservation measures • Consider conversion to more efficient irrigation methods
Stage II	• Expand public information campaign • Step up enforcement of conservation measures • Continue previous actions	• Comply with mandatory conservation regulations • Continue previous actions
Stage III	• Continue previous actions • Intensify public information campaign • Expand enforcement of conservation measures • Provide incentives to single metered multi-family units to install individual meters or sub-meters • Send direct notices to all customers • Provide regular media, District Board, and County briefings • Activate emergency connections with mutual aid agencies • Suspend issuance of potable construction meters. • Evaluate size of monetary fines for water waste	• Continue previous actions • Limit washing of sidewalks, driveways, walkways, parking lots, or any other hard-surfaced area by hose or flooding unless otherwise necessary • Comply with prohibited outdoor irrigation of ornamental landscape or turf with potable water through an irrigation system between 9:00 am and 6:00 pm and limit system use to two days a week
Stage IV	• Continue previous actions	• Continue previous actions • Obligation to fix leaks, breaks, or malfunctions within 48 hours
Stage V	• Continue previous actions • Compel mandatory water consumption goals and allocations for all customers and users	• Prohibit all outdoor irrigation with potable water • Continue previous actions
Stage VI	• Continue previous actions • Implement crisis communication plan • Activate Emergency Operations Center • Coordinate actions with regulatory agencies • Coordinate actions with public safety agencies to address enforcement and fire protection issues • Recall all temporary meters and activate water fill stations • Suspend issuance of new development approvals and new water connections other than those required to be processed by state law	• Continue previous actions • Terminate outdoor water use for irrigation, pools, and fountains • Water may only be used outdoors for public health and safety purposes • Be on alert for Boil Water Orders if they become necessary

3.3 Supply Augmentation

Any water shortage event should trigger a review of potential sources for supplemental water supply. The groundwater basins in the District's area are the limiting factor in groundwater production but are expected to continue to produce reliable supplies even in a catastrophe. Water stored in the District's distribution system storage tanks are monitored and managed to not allow the reservoir volumes to drop to very low levels. Standard practice is to maintain, at a minimum, the required emergency and fire flow within all tanks at all times. In an emergency, these stored water volumes are available for distribution or truck delivery, as necessary.

Potential sources for supplemental water include pumping additional groundwater or imported water supply from MWA. Any supplemental water supply project or improvements to existing facilities to allow for entitled flows should be a priority for consideration in immediate capital projects if shortage (e.g., demands exceeding supplies) greater than ten percent is anticipated or when a Stage 3 Water Shortage Event continues for more than 18 months. Supply augmentation in near term is presented in Table 3-4 below.

TABLE 3-4 SUPPLY AUGMENTATION ACTIONS

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier *(based on DWR's WUE database categories)*	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
3	Groundwater	158 AF	Pump Additional Groundwater
3	State Water Project	Will vary	Amounts would vary depending on if SWP is available and the amount
4	Groundwater	215 AF	Pump Additional Groundwater
4	State Water Project	Will vary	Amounts would vary depending on if SWP is available and the amount
5	Groundwater	473 AF	Pump Additional Groundwater
5	State Water Project	Will vary	Amounts would vary depending on if SWP is available and the amount
6	Groundwater	631 AF	Pump Additional Groundwater
6	State Water Project	Will vary	Amounts would vary depending on if SWP is available and the amount

3.4 Demand Reduction Actions

Currently, JBWD implements water conservation measures and irrigation practices aimed at increasing everyday water use efficiency. Those measures, plus those to be enacted in the various stages, are presented in Table 3-5.

TABLE 3-5 PROHIBITIONS DURING DIFFERENT SHORTAGE STAGES

Stage	Prohibition/Requirement
In Effect at All Times	Water waste is prohibited at all times. Water waste includes but is not limited to: • Application of potable water to driveways and sidewalks is prohibited. • Use of hose that dispenses potable water to wash a motor vehicle is prohibited, except where the hose is fitted with a shut-off nozzle or device • Water leaks shall be repaired in a timely manner and sprinklers shall be adjusted to eliminate over-spray. • Hosing of hardscape surfaces, except where health and safety needs dictate, is prohibited. Other • Water for construction purposes, including but not limited to de-brushing of vacant land, compaction of fills and pads, trench backfill, and other construction uses shall be in an efficient manner. • All new construction, including residential, commercial, and industrial, shall be equipped with low flow toilets and fixtures.
Stage I	• No watering of outdoor landscapes within 48 hours of measurable rainfall. • Car washing and outside cleaning activities prohibited except when performed with buckets and automatic hose shutoff devices. • The serving of drinking water other than upon request in eating or drinking establishments is prohibited. • Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom.
Stage II	• All restrictions/prohibitions/initiatives from Stage I are in effect • Landscape watering between the hours of 1000 and 1800 hours is prohibited • Outdoor watering is limited to 3 days per week. • Irrigation with potable water outside of newly constructed homes and buildings not delivered by drip or micro spray is prohibited.
Stage III	• All restrictions/prohibitions/initiatives from Stage I and Stage II are in effect and are mandatory. • Irrigation with potable water of ornamental turf on public street medians is prohibited. • Outdoor watering is limited to 2 days per week. • Potable water cannot be used to maintain fountains, reflection

Stage	Prohibition/Requirement
	ponds and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life.
Stage IV	• All restrictions/prohibitions/initiatives from Stage I, Stage II, and Stage III are in effect and are mandatory. • Outdoor watering is limited to 1 day per week. • Filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc. is prohibited. Topping off is allowed to the extent that the designated water allocation is not exceeded. • Meters will only be installed for new accounts where the building permit was issued prior to the declaration of the water shortage.
Stage V	• Filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc. is prohibited. Topping off is allowed to the extent that the designated water allocation is not exceeded. • Meters will only be installed for new accounts where the building permit was issued prior to the declaration of the water shortage
Stage VI	• All restrictions/prohibitions/initiatives from previous Shortage Stages are in effect and are mandatory. • No meters will be installed for new accounts. • Outdoor irrigation is prohibited, with the exception of drip or hand watering to preserve established trees.

As described in the table above, prohibitions and restrictions on water features that are artificially supplied with water, such as ornamental lakes, ponds and decorative fountains are treated differently from swimming pools and spas, as defined in Section 115921 of the California Health and Safety Code.

3.4.1 Shortage Stage Allocation

Besides prohibitions, when shortage is greater than 30%, the District may implement allocation limits for each customer class. At the direction of the General Manager each customer will be classified and assigned a monthly allotment according to the methods described in the Draft Water Shortage Contingency Ordinance. Customers will be notified of their classification and allotment by mail before the date when allocation goes into effect. In a disaster, prior notice of allotment may not be possible. In such cases, notice may be provided by other means, such as telephone, radio, television, or newspaper. Customers may appeal the classification on the basis of use or the allotment on the basis of incorrect calculation. The appeals process is set forth in the Draft Water Shortage Contingency Ordinance and described in Section 6.

Specific water allotments for Shortage Stages 4 through 6 shortages were developed using the California Water Code Stage 2, 3, and 4 health and safety allotments of 58 GPCD, or 28 hundred cubic feet (CCF) per person per year as the basis.

3.5 Operational Changes

The District shall comply with the restrictions similar to those implemented for the public to the extent possible and not inconsistent with the restrictions provided for the District in this section. The District will encourage all water customers to cooperate with the water restrictions imposed by each stage.

Limit use of potable water to irrigate newly planted street, park and/or golf course trees, street medians, and general irrigation on all District properties. Non-potable water from wastewater treatment shall be used by District personnel if available for such purposes. No new plantings shall be installed by the District during Stage 3 or higher Water Shortage Events, unless necessary for erosion control. Other actions include efficient water use practices identified in Table 3-5, such as minimizing waste of water in construction, following a modified outdoor landscape watering schedule for District facilities depending on shortage stage, and fixing any identified leaks in the distribution system or other related water infrastructure components.

3.6 Actions to Prepare for Catastrophic Interruption

The distribution infrastructure within groundwater basins from which the District relies are the limiting factor in groundwater production but is expected to continue to produce reliable supplies even in a catastrophe with the management action items identified herein and in the Local Hazard Mitigation Plan described below. Water stored in the District's distribution system storage tanks are monitored and managed to not allow the reservoir volumes to drop to very low levels. Standard practice is to maintain, at a minimum, the required emergency and fire flow within all tanks at all times. In an emergency, these stored water volumes are available for distribution or truck delivery as necessary. Potential supply impacts from catastrophic interruption of SWP supplies are provided for in the MWA WSCP.

3.7 Local Hazard Mitigation Plan

Per the Water Code Section 10632.5, Suppliers are required to assess seismic risk to water supplies as part of their WSCP. The plan also must include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

Pursuant to Water Code, the seismic risk assessment must include a description of the vulnerability of each of its water system(s) facilities. Suppliers are encouraged to assess the vulnerability of external facilities or components that extend outside the Supplier's service distribution area (e.g., transmission pipes, delivery canals, surface water diversion pumps) since failure of them would still ultimately disrupt the Supplier's ability to serve their customers.

The Local Hazard Mitigation Plan (LHMP) for the District was developed and adopted in June 2019 to formulate mitigation measures for the future protection of JBWD's critical infrastructure and the community's safety. The LHMP was completed with the coordination and involvement of the JBWD staff and representatives from the local community. The following plans were utilized to obtain information on the hazards that face the area and the mitigation goals of the County of San Bernardino:

- Bighorn Desert View LHMP
- Twentynine Palms Water District LHMP
- San Bernardino County Hazard Mitigation Plan (HMP)
- USGS Golden Guardian Shake Out 2008
- Joshua Basin Water District's Water Master Plan
- California HMP 2013
- San Bernardino County Flood Control
- FEMA Flood Insurance Study for San Bernardino County

The goal of the LHMP is to reduce the future impacts of a hazard, including property damage, disruption to local and regional economies, and the amount of public and private funds spent for recovery. The District has identified the following hazards to be the most likely to affect District's service area:

- Earthquake: There are many faults running through the District's service area.
- Terrorist Event: A major terrorist event at the Marine Base Twentynine Palms could have a negative effect on the water supply or damage the infrastructure utilized by the District, leaving the District with no power and no water in the system due to ruptured pipelines, contamination, or other damages.
- Lightning Strikes: Lightning strikes on wells, pumps, motors, and electrical equipment are common and can happen at any location in the District Service area. The area is prone to lightning storms during monsoon season from July to September each year.
- Flash Flooding: Flash flooding is very common in the San Bernardino County deserts and happens almost yearly. These events uncovered pipelines installed within paved and unpaved roads throughout the distribution system. USGS and the County of San Bernardino do not keep records on the events of flash flooding and there are no flood control systems in the Joshua Basin.
- Climate Change/Drought: The District relies on groundwater and the impacts from climate change are long-term. Climate change could affect the groundwater extraction, increase flash flood risks, decrease groundwater recharge, and cause increased pumping costs in the water supply wells.

The District has identified hazards in the community, assessed those hazards that pose the most significant risk, and identified projects to help reduce and/or eliminate those risks. Global measures that apply across all hazards include:

- Continually improve the community's understanding of potential impacts due to hazards, and the measures needed to protect lives and critical infrastructure
- Provide public outreach to inform the public of the hazards identified to the drinking water system in emergencies, how to conserve water in the event of a disaster and how to obtain drinking water when water may not be available

- Continually provide State and Local Agencies with updated information about hazards, vulnerabilities, and mitigation measures at the District
- Review local codes and standards to verify that they protect human life and the District's facilities
- Review and verify that the District's owned and operated infrastructure meet minimum standards for safety
- Review the District's facilities and developments in high-risk areas to verify that these areas are appropriately protected from potential hazards

The information contained in the Plan is intended to guide staff and inform other emergency responding agencies and includes plans and procedures for the response team.

The LHMP is included in Appendix D.

3.8 Benefit of Shortage Response Actions

As discussed above, supply actions and actions within JBWD operations will help reduce water shortage. Closing the "gap" between supplies and demands through customer actions, will include:

- Public Information
- Enforcement
- Restrictions on Non-Essential Water Uses
- Pricing

The water shortage response actions and their anticipated effect are summarized in Table 3-5.

3.8.1 Public Information

Without exception, experience has shown that a well-informed public is generally more willing to heed requests to voluntarily conserve or alter water use patterns and will be more likely to comply if mandatory water use restrictions become necessary. DWR (2008) estimates that public information campaigns have alone reduced demand in the range of 5 to 20 percent, depending on the time, money, and effort spent. Public information supports voluntary and mandatory measures by educating and convincing the public that a critical water shortage exists and provides information on how water is used and how they can help. The DWR Drought Guidebook highlights that when the public perceives the drought to be severe, they changed behaviors (such as flushing the toilet less often).

The information provided to the public should include a description of the conditions that will trigger implementation of shortage stages as well as a description of what the plan entails (restrictions, enforcement provisions, etc.). It is also advisable to provide practical "consumer" information that will help water users comply with the plan. For example, information about restrictions on lawn watering might be accompanied with information about watering practices.

Based on past experience, with minimal public outreach, a water savings of 5 percent is assumed, with extensive public outreach a water savings of 7 percent is assumed, public information combined with enforcement (Section 3.7.2) is assumed to achieve a savings of up to 22 percent.

3.8.2 Enforcement

A study examining the effectiveness of drought management programs in reducing residential water-use (Virginia Polytechnic Institute 2006) showed considerable variation in the effectiveness of drought management programs and highlighted the importance of public information and enforcement. Results, shown in Table 3-6, indicate that overall reductions in residential water-use ranged from 0-7 percent for voluntary restrictions and from 0-22 percent for mandatory restrictions. The observed differences were statistically attributed to information efforts for voluntary restrictions and both information and enforcement efforts for mandatory restrictions.

TABLE 3-6 DROUGHT PROGRAM MANAGEMENT VARIABLES EFFECT ON RESIDENTIAL WATER-USE

Classification	Estimated change in Water-Use	Statistically Different than no effect?
Voluntary Restrictions		
Little or no information disseminated	-2%	No
Moderate level of information	-2%	No
Aggressive information dissemination	-7%	Yes
Mandatory Restrictions		
Low information and low enforcement	-5%	No
Moderate information and low enforcement	-6%	Yes
Aggressive information and low enforcement	-12%	Yes
Low information and moderate enforcement	-4%	No
Moderate information and enforcement	-9%	Yes
Aggressive information and moderate enforcement	-15%	Yes
Moderate information and aggressive enforcement	-20%	Yes
Aggressive information and enforcement	-22%	Yes

Source: Virginia Polytechnic Institute 2006.

The analysis highlights the key role that public outreach and information plays in the success of drought response actions. Voluntary restriction programs with little to moderate levels of information dissemination had no appreciable effect on water-use. Voluntary restriction programs with active promotional efforts, however, reduced water-use by an estimated 7 percent from what would have otherwise occurred without any restriction program. Thus, for voluntary restrictions, only the most intense programs had even a moderate level of success in reducing water-use.

Mandatory restriction programs without a significant enforcement component broadly mirrored the outcomes achieved by the voluntary programs. Programs with mandatory restrictions that invested minimal effort in information dissemination did not appreciably reduce residential water-use. Programs with no active enforcement efforts but with moderate to high levels of informational dissemination achieved 6 and 12 percent reductions in water-use, respectively. These estimated reductions are similar to those achieved by voluntary programs with aggressive informational campaigns.

The experience the City of Santa Cruz had implementing its Drought Contingency Plan and successfully reaching its reduction goals supports the importance of a strong public information program. Analysis of the implementation program identified the key ingredient to its success was "the public's understanding, awareness, and belief that the District was confronted with a true water shortage problem. Media coverage of water problems across California reinforced the

situation. Without that sense of a real and imminent problem, it's likely the level of cooperation and willingness demonstrated by the community in making changes they did might have been considerably reduced." (Santa Cruz 2010)

Delivering accurate and timely information to water users, news media and local governments with updates on conditions, restrictions, and helpful contact information is key.

With aggressive information dissemination and enforcement its assumed JBWD could achieve a 22 percent water savings.

3.8.3 Restrictions on Non-Essential Water Uses

The Stages of Action focus on curtailing water waste and non-essential water use. Outdoor water use, including washing sidewalks and watering ornamental landscapes are targeted. These uses are typically considered to be discretionary or nonessential, are highly visible, and therefore relatively easy to monitor, and often are a substantial component of water demand, particularly during the summer months when drought conditions are likely most severe.

AWWA estimates that voluntary outdoor water use limits can result in a water savings of up to 10 percent and mandatory outdoor water limits can achieve up to a 56 percent reduction in outdoor water use (AWWA 2008, AWWA 2011). There have not been detailed studies on outdoor water use in the JBWD service area. However, a comparison of low water use months, when water use is assumed to be primarily indoor (January and February) with high-water use months when outdoor water use is greatest has been used to estimate the percent of outdoor water demand. Based on this comparison, it is estimated that outdoor water use may make up between 20 to 50 percent of District water use. To be conservative and so as to not overestimate the savings that could be achieved by curtailing outdoor water use, this Plan assumes outdoor water use is 30% of the JBWD demand:

- Voluntary outdoor water limits could save 10% of outdoor water use or about 35 AFY (about 3% of total water use)
- Restricting water use to twice a week could reduce outdoor water use by 33 percent or about 114 AFY (about 10% of total water use)
- Restricting water use to once a week could reduce outdoor water use by 56 percent or about 193 AFY (about 17% of total water use)
- Eliminating outdoor water use would reduce demand by approximately 30%, about 343 AFY.

3.8.3.1 Additional Mandatory Restrictions

The State, through the State Water Board, adopted drought emergency conservation regulations in July 2014. The Board expanded, updated, extended, and readopted the emergency regulations several times and in the prohibitions on wasteful water use practices were in place until November 25th, 2017.

As directed by Executive Order B-40-17, the State Water Board is conducting a rulemaking to put in place permanent prohibitions on wasteful water use practices. This rulemaking is part of the broader legislation, *Making Water Conservation a California Way of Life*.

The specific outcome of the permanent prohibitions cannot be known at this time. The emergency conservation regulations in effect through November 2017 included the following prohibitions:

- Application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
- The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use
- The application of potable water to driveways and sidewalks
- The use of potable water in a fountain or other decorative water feature except where the water is part of a recirculating system
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall
- The serving of drinking water other than upon request in eating or drinking establishments
- Irrigation with potable water of ornamental turf on public street medians.

JBWD's water use restrictions are consistent with the State's prohibitions to prevent water waste.

TABLE 3-7 EFFECTIVENESS DEMAND REDUCTION AND OTHER ACTIONS

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Explanation	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	7%	Based on AWWA 2008 assumes savings of 7%	No
2	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	10%	Based on AWWA 2011 assumes savings of 10%	Yes
3	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes

3	Implement or Modify Rate Structure	10%	Based on AWWA 2011 assumes savings of 10%	Yes
3	Landscape - Other landscape restriction or prohibition	3%	Outdoor water limited to 3 days a week. Based on AWWA 2011	Yes
4	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
4	Implement or Modify Rate Structure	15%	Based on AWWA 2011 assumes savings of 15%	Yes
4	Landscape - Other landscape restriction or prohibition	10%	Outdoor water limited to 2 days a week. Based on AWWA 2011.	Yes
5	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
5	Implement or Modify Rate Structure	15%	Based on AWWA 2011 assumes savings of 15%	Yes
5	Landscape - Other landscape restriction or prohibition	17%	Outdoor water limited to 1 day a week. Based on AWWA 2011.	Yes
6	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
6	Implement or Modify Rate Structure	15%	Based on AWWA 2011 assumes savings of 15%	Yes
6	Landscape - Other landscape restriction or prohibition	30%	Outdoor water use prohibited	Yes

Section 4: Communications Protocols

The District will periodically provide the public with information about the WSCP, including its implementation. Such information will include, but will not be limited to, stages of action, restrictions on water use, water-saving tips, monetary assessment, and fines for noncompliance of prohibited activities for water conservation, water use efficiency, and failure to achieve water budget reductions redefined in the WSCP.

4.1 Customer Outreach

Customer participation is a key element in responding to a supply shortage. While general media coverage of a drought is likely to increase awareness, JBWD should still develop and implement a specific and comprehensive outreach program. The goals of the outreach program will be to:

- Educate customers and public about state and local drought conditions
- Make water shortage stages and customer responsibilities clear
- Target specific customer groups with specialized messaging
- Provide information to customers and general public that will assist them in reducing water demand

JBWD regularly communicates with its customers and has a long history of promoting conservation. Staff continues to implement customer outreach programs. Ongoing outreach activities are summarized in Table 4-1. Conservation giveaways also provide a means for JBWD to interact with customers for water efficiency messaging.

TABLE 4-1 JBWD OUTREACH PROGRAMS

Action	Description	Years Implemented				
		2016	*2017*	*2018*	*2019*	*2020*
Monthly E-Newsletter	The monthly Tier Drop Newsletter provides information on capital improvement projects, conservation programs, public meetings, workshops, and special events.	x	x	x	x	x
Website	JBWD regularly updates the website with FAQs, public notices, water quality data, water conservation information, public meeting information, project updates, and more.	x	x	x	x	x
Outreach Events	15-20 public outreach events per year, consisting of job fairs, District-sponsored events, Chamber of Commerce events, with giveaways and informational handouts.	x	x	x	x	x
Social Media	JBWD maintains a presence on Facebook and, YouTube.	x	x	x	x	x

Action	Description	Years Implemented				
		2016	*2017*	*2018*	*2019*	*2020*
Public Engagement Materials	Water quality Consumer Confidence Report. Brochures "Protecting our Pipes"; "Understanding Water and Wastewater Charges"; "Customer Assistance Program"; "Water Disaster Preparedness"; and "Fats, Oils, and Grease".	x	x	x	x	x
Targeted Outreach	Brochures, annual mailer, postcards, and door hangers.	x	x	x	x	x
Conservation Giveaways	JBWD continues to offer customers water conservation giveaways including materials such as "Doing Our Part to Save Water" yard signs, low-flow showerheads, faucet aerators, toilet leak detection kits, shower times, dish squeegees, and more.	x	x	x	x	x

Public outreach will be enhanced during anticipated water shortages. In additional to traditional outreach (monthly e newsletter, billing statements), JBWD will consider utilizing new and innovative outreach efforts using social media. Proposed outreach should include, but not be limited to:

- Multi-media Tear Drop *Conservation Stories*, a campaign that will include testimonial water conservation case studies, experiences and lessons learned from a variety of JBWD customer types (residential, institutional, and commercial). This campaign can be published in the monthly newsletter.
- Social media sites (YouTube, Facebook) to distribute *Conservation Stories* and other messaging.
- Specific JBWD website section dedicated to the drought.
- Customized state and regional partner outreach materials and links.
- Water shortage declarations provided as inserts to monthly water bills.
- Post-cards and mailings to JBWD customers.
- Targeted outreach (contact by letters and phone calls) to large water users
- Employee outreach and education to ensure consistent organization messages concerning drought and conservation.
- Enhanced community presence of JBWD materials (handouts at schools, plumbing centers, hardware stores, farmers markets, and community events).

Proposed coordination with retail water agencies and land use agencies is summarized below:

Outreach Target	Goals of Coordination	Schedule
All customers of JBWD	Educate customers and public about drought conditions	Feb of first year of drought and ongoing through drought
General Public	Make water shortage stages and customer responsibilities clear	
	Target specific customer groups with specialized messaging	
	Provide information to customers and general public that will assist them in reducing water demand	

Table 4-2 provides a summary of public outreach actions and the applicable water shortage stage when this action would be employed.

TABLE 4-1 WATER SHORTAGE PUBLIC OUTREACH PLAN

Element	Description	Applicable Drought Stage I-II	III	IV	V	VI
Quarterly Newsletter	Quarterly newspaper that discusses regular JBWD news. Will be enhanced to specifically provide information on: Water supplies/ Actions JBWD taking to improve supply Water Conservation Tips Actions JBWD taking to reduce JBWD's water use News Items - *Conservation Stories* Feature Stories - Any Proposed Water Shortage Declaration Feature Stories - Any Applicable Restrictions Feature Stories - Proposed and Applicable Allocations	◆	◆	◆	◆	◆
Website	"Report Water Waste" link on home page Rotator Message graphic on Home Page Water supplies/ Actions JBWD is taking to improve supply Comprehensive Customer Conservation actions section Actions JBWD is taking to reduce JBWD's water use News Items - *Conservation Stories* Home Page Stories - Any Proposed Water Shortage Declaration Home Page Stories - Any Applicable Restrictions Home Page Stories - Proposed and Applicable Allocations	◆	◆	◆	◆	◆
Billing Messages	Conservation messages within monthly bills Any proposed Water Shortage Declaration Any applicable restrictions Any applicable allocations		◆	◆	◆	◆

Element	Description	Applicable Drought Stage I-II	III	IV	V	VI
Talking Points	Develop talking points related to conservation and drought for: Board of Directors Management Customer Service Staff	◆	◆	◆	◆	◆
Media Contact	Contact the following media with information on water supply, conservation, and drought: Hi-Desert Star	◆	◆	◆	◆	◆
Enhanced Media Contact	JBWD will develop a media kit that will include: Press Release on Water Shortage Declaration Frequently Asked Questions Information Sheet/Brochure Photographs Conservation Partner Links JBWD will present Letters to the Editor from Board Members, Management, and key constituents concerning the Water Shortage Declaration.		◆	◆	◆	◆
Collateral Materials	Water Conservation Tip Handouts Restaurant table cards Hotel room notices	◆	◆	◆	◆	◆
Enhanced Collateral Materials	Distribution of materials at plumbing centers, hardware stores, schools, farmers markets: Water conservation tips Print materials related to "Conservation Stories"		◆	◆	◆	◆

Element	Description	Applicable Drought Stage I-II	III	IV	V	VI
Partner Resources	JBWD should continue to utilize partnership opportunities to share conservation messages and links that are being implemented by state and regional agencies and organizations, including: State of California Water Conservation Programs Association of California Water Agencies Programs	◆	◆	◆	◆	◆
Customized Partner Materials	JBWD will work with regional and state partner organizations to utilize and customize conservation related materials specific to the Joshua Tree area, including: Broadcast public service announcements Print Ads Web banners and links Posters Print materials		◆	◆	◆	◆
Conservation Stories Outreach Campaign Materials	JBWD will produce "Conservation Stories", a public outreach campaign that will feature residents and representatives from businesses and organizations who are taking steps to conserve water in the Joshua Tree Area. Campaign shall include: Informational Video Podcast style audio segments Broadcast public service announcements Print advertisements Web banners on JBWD website Conservation postcards Posters, pop-up banners and collateral materials Social media "Conservation Stories"	◆	◆	◆	◆	◆

Element	Description	Applicable Drought Stage I-II	III	IV	V	VI
Establish and Maintain Social Media Presence	JBWD will develop and maintain social media sites including YouTube, Twitter, and Facebook to share "Conservation Stories" and images with the public. The YouTube site will be uses as an operational tool for uploading videos that will then be embedded directly on the JBWD website. Social media icons that link to JBWD social media sites will be added to the JBWD website Home Page. Facebook will be used to post "Conservation Stories" briefs and images along with drought and conservation related news items, links, and graphics. Flicker will be used to upload photos to galleries related to drought and conservation efforts. The JBWD Twitter site will be linked to other JBWD social media resources to automatically provide updates when new items are posted.	◆	◆	◆	◆	◆
Targeted Outreach	JBWD will conduct focused targeted outreach to specific customer segments, including the Top 10 water users by sector. Outreach will include: Phone calls Letters Postcards Letters	◆				
Enhanced Targeted Outreach	JBWD will conduct focused targeted outreach to specific customer segments, including the Top 20 water users by sector. Outreach will include: Phone calls Letters Postcards Letters		◆			
Additional Targeted Outreach	JBWD will conduct focused targeted outreach to specific customer segments, including the Top 30-50 water users by sector. Outreach will include: Phone calls Letters Postcards			◆	◆	◆

Element	Description	Applicable Drought Stage I-II	III	IV	V	VI
	Letters					
JBWD Customer Touch-Points	JBWD will utilize existing customer touch-point opportunities to share drought information with the public, including: JBWD vehicle signage Facility conservation signage and materials Door hangers and notices	◆	◆	◆	◆	◆
Enhanced JBWD Customer Touch-Points	JBWD will undertake customer outreach activities at local and regional events. JBWD will staff table/booths to provide information on: low flow shower heads low flow faucet aerators toilet leak detectors low flow garden hose nozzles drought tolerant landscape guides native seed coasters		◆	◆	◆	◆
JBWD Employee Communications	JBWD will conduct outreach to employees in order to promote consistent organizational messages concerning drought and conservation.	◆	◆	◆	◆	◆
Individualized letters to all customers	Letters communicating specific restrictions and allocations applicable to their account		◆	◆	◆	◆
Townhalls/Public Meetings	JBWD will plan and host meetings to share water shortage information with residents and provide an opportunity for residents to voice concerns.		◆	◆	◆	◆
Customer Assisted Enforcement	Maintain water-waste hotline		◆	◆	◆	◆

4.2 Neighboring Retail Water Agencies and Land Use Agencies

The purpose of meeting with neighboring water agencies and land use agencies is to ensure that residents in the District are receiving consistent messages about the drought, drought severity, and are aware of the actions they can take to reduce demand. Key agencies would include the Mojave Water Agency (MWA), Bighorn-Desert View Water Agency (BDVWA), Hi-Desert Water District (HDWD), Twentynine Palms Water District (TPWD), Marine Corps Air Ground Combat Center (MCAGCC), and the County of San Bernardino.

In June 2015, JBWD joined the Emergency Response Network of the Inland Empire (ERNIE). ERNIE facilitates public agency preparedness for, response to, and recovery from local and regional disasters to ensure the delivery of critical public services through mutual aid and communications. ERNIE meets monthly and provides regular training for utilities in emergency response and long-term emergency planning. Through the ERNIE network JBWD can receive mutual aid from other local water districts. JBWD may also provide mutual aid to its sister agencies if resources are not needed within the District itself. JBWD maintains an emergency intertie with Hi-Desert Water District.

If a disaster overwhelms the local resources, JBWD will coordinate with the California Water/Wastewater Agency Response Network (CalWARN) system for statewide mutual aid. JBWD will immediately contact the State Water Resources Control Board Division of Drinking Water, San Bernardino County Fire, Operations of Emergency Services, and the California Utilities Emergency Association to coordinate mutual aid and assistance. If local resources are overwhelmed by the disaster, the County of San Bernardino Fire Operations of Emergency Services will contact the State of California Governor's Office of Emergency Services for assistance.

All the agencies listed below participate in the Alliance for Water Awareness and Conservation (AWAC), whose mission is to achieve water conservation goals within the 4,900 square mile service area of Mojave Water Agency. The members of AWAC are known to each other, and it would be relatively simple to add a special drought subcommittee to this group. The intent of these meetings will be to develop a common message to the community about the drought and to find opportunities to share costs (e.g., share costs of radio announcements and newspaper advertisements). As the drought progresses, the meetings will serve to refine the drought messaging to address any common misconceptions or common customer questions. Monthly meetings are proposed, starting in February, ongoing through the drought.

Should a water shortage be declared, JBWD will coordinate with any District or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Proposed coordination with retail water agencies and land use agencies is summarized below:

Participants	Goals of Coordination	Schedule
Apple Valley Heights County Water District Bighorn-Desert View Water Agency City of Adelanto Golden State Water Company - Apple Valley Golden State Water Company - Barstow Helendale Community Services District Hesperia Water District Hi-Desert Water District Indian Wells Valley Water District Juniper Riviera Water District Liberty Utilities Mariana Ranchos Water District Phelan Pinon Hills Community Services District San Bernardino County Special Districts Water and Sanitation Twentynine Palms Water District Thunderbird County Water District Victorville Water District	Identify opportunities to share public outreach costs Develop common brochures Develop common website messages Refine drought messaging based on customer response Determine need for proclamation of local emergency	Feb to Aug

Section 5: Monitoring and Reporting

Certain aspects of water conservation can be readily monitored and evaluated, such as metered water use and production quantities. Other aspects such as public education are more difficult to measure in terms of effectiveness. Additionally, weather patterns make it more difficult to compare one year's water demand and conservation results with another year's usage.

When severe shortages occur and some degree of mandatory reduction is required, a program's effectiveness can be judged directly by water billings. In these cases, targeted results must be met, and even reluctant customers will, on the whole, meet the goals. Specific methods to evaluate effectiveness of water conservation programs to be employed by the District are:

1. Monitoring of Metered Water Usage – This will determine how much has been used. Compiling statistics to track usage of customer groups to determine trends is currently being done through the water billing computer system. Meter readings/billings can be compared and analyzed to determine the effectiveness of conservation for all customer classes.
2. Monitoring Production Quantities – In normal water supply conditions, production figures are recorded daily by the District's automated system. The Water Production Supervisor and the Production Lead monitor the accuracy of the monthly production totals. The totals are incorporated into the monthly water supply report to the State by the Water Treatment Supervisor.

To verify that conservation reduction goals are being met, production and metered usage reports will be provided to the JBWD General Manager and Water Utility Manager during each stage of the conservation period. Water production figures will be compared to previous year production figures for the same time period to ascertain if conservation goals are being reached. Results will be posted on the JBWD website.

Additional actions available to JBWD include:

1. Transition current customer water meters to "smart meters" to allow timely monitoring by customer of water use patterns..
2. Provide incentives to property owners to install individual meters or sub-meters in multi-family structures for resident/property owners to track water usage.
3. The District shall develop means to distribute reclaimed water to interested users for landscape irrigation and other non-potable uses.

Section 6: Enforcement

Enforcement of restrictions shall be in accordance with California Water Code Section 375, water waste prohibited. The provisions of the section apply to all persons using District water, both in and outside the District, and within the District water service areas.

6.1 Enforcement of the Water Waste Prohibition

Prohibited actions and penalties for violating the Water Waste Ordinance are specified in the Municipal Code. JBWD's ordinance on water use efficiency is included in Appendix A.

6.1.1 Civil Penalties

For the first violation of any of the provisions of the code, a written notice is to be given.

For the second violation of any of the provisions of the code, a non-compliance charge is imposed in an amount of $50, payable as part of the water bill, by the customer at the premises at which the violation occurred.

For the third violation of any of the provisions of the code a non-compliance charge is imposed in an amount equal to $100. This penalty is payable as part of the water bill, by the customer at the premises at which the violation occurred.

6.1.2 Notices

The District will give notice of each violation to the customer at the premises at which the violation occurred, as follows:

- For a first, second or third violation, the District may give written notice of the fact of such violation to the customer personally or by regular mail.

- If the penalty assessed is, or includes the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time whatever, notice of the violation will be given in the following manner:

    - By giving written notice thereof to the customer personally; or
    - If the customer is absent from or unavailable at either the customer's place of residence or place of business, by leaving a copy with an adult at either place, and sending a copy through the United States mail addressed to the customer at either the customer's place of business or residence; or
    - If such place of residence and business cannot be ascertained, or an adult cannot be found on the premises, then by affixing a copy in a conspicuous place on the property where the failure to comply has occurred and also by delivering a copy to a person residing at the premises, if such person can be found, and also by sending a copy through the United States mail addressed to the customer at the customer's billing address and to the place where the property is situated;

- All notices will contain, in addition to the facts of the violation, a statement of the possible penalties for each violation, a statement informing the customer of the customer's right to a hearing on the violation, a brief summary of the appeal process specified herein, and the date and time termination will occur.

6.1.3 Appeals

Any customer against whom a penalty is to be levied shall have a right to an appeal, in the first instance by the District General Manager, with the right of appeal to the District Board of Directors, on the merits of the alleged violation, upon the written request of that customer to the District clerk within 15 days of the date of notification of the violation. Penalties, including termination of water service, will be stayed until a decision is reached and a written decision is made by the District General Manager or their designee.

A request for an appeal must be in writing and filed with the District secretary. The filing by a customer of a request for an appeal for any form of relief must be made within 15 days of the decision of the water superintendent. Filing of such a request will automatically stay the implementation of the proposed course of action, pending the decision of the District's General Manager. No other or further stay will be granted. The appeal hearing will be scheduled to occur within a reasonable, prompt period of time following the written notice of appeal. The water user may present any evidence which would tend to show that the alleged wasteful water use has not occurred. Formal rules of evidence will not apply, and all relevant evidence customarily relied upon by reasonable persons in the conduct of serious business affairs will be admissible, unless a sound objection warrants its exclusion by the District public works director. The decision of the District public works director shall be final.

Where water service is disconnected, it will be reconnected upon correction of the condition or activity and the payment of the estimated reconnection charge.

6.2 Enforcement of Water Reductions

The JBWD Board of Directors may choose to take actions through ordinance and resolution that establish mandatory water regulations that may include enforcement actions such as those previously implemented which includes:

A customer who does not meet the mandatory reduction above the health and safety baseline (6 CCF bimonthly use) shall pay a surcharge.

The JBWD General Manager may prescribe rules and regulations for the implementation of ordinance provisions.

Section 7: Financial Consequences of Actions During Shortages

Consumption reduction will impact revenues by decreasing the amount of water sold to customers. Water shortages may also impact construction activities. A reduction in construction activities will reduce water service connection fees collected by the District.

As consumption decreases, some expenditures are expected to increase. Staff costs for community education, enforcement of ordinances, monitoring and evaluation of water use, drought planning, and dealing with customer questions and complaints are expected to rise. Operations and maintenance costs may also increase because of the need to identify and quickly repair all water losses. A shift to alternative sources would change pumping, purchase, and treatment costs as different water supplies incur different purchase, treatment, and distribution costs.

JBWD has structured its rates into two main components: a fixed service charge and a commodity rate. The fixed service charge has been set with the intent of covering the water utility's fixed costs (meter infrastructure, billing, administration). The fixed service charge is meant to provide a fixed amount of income to JBWD independent of water consumption. Currently about 25 percent of JBWD's revenue comes from the fixed service charge. The commodity rate is a cost per unit consumed by the customer and is meant to recover the District's variable costs for providing water service. The commodity charge also sends the customer a price signal and rewards customers who conserve water. A decrease in consumption would impact revenue from the commodity charges as estimated in Table 7-1 below:

TABLE 7-1 REVENUE IMPACTS OF REDUCED WATER DEMAND

Demand Reduction	Annual Revenue Reduction ($ million)	% of ~$24M Water Base Revenue
10%	-$1.73 M	- 7%
20%	-$3.45 M	- 14%
30%	-$5.18 M	- 22%
40%	-$6.90 M	- 29%
50%	- $8.63 M	- 36%

A reduction in water revenue could be mitigated substantially through deferral or avoidance of capital fund expenditures. This would meet short-term cash flow needs, although it should only be considered on a short-term basis.

The water purchases, utility costs and chemical costs are not a linear function of the water usage reduction. However, in order to provide an estimate of the cost savings, it is assumed that if there is a ten percent reduction in usage, there will also be a ten percent reduction in associated costs.

7.1 Revenue Impacts of Reduced Sales and Increased Costs

Water Shortage Rates would be implemented when mandatory stages are enacted by the District Board of Directors. A rate schedule has been created for each mandatory stage of this plan. The rates would resume to normal rates once the Water Shortage Event is retracted based on triggers in this plan.

1. Goals of Water Shortage Rates:
   - Meet community expectations to provide safe and reliable water supply during shortages at rates that are fair and as low as possible.
   - Maintain fiscal stability in the event of a sudden or long-term water shortage.
   - Achieve state mandates and legal requirements.

2. Principles of the Water Shortage Rates:
   - The rates will be increased for each stage of mandatory conservation to ensure full revenue loss recovery.
   - Any additional expenses from the water wholesaler or regulatory agencies due to drought will be passed onto customers through a water shortage pass-through when the District's Water Enterprise is charged.

3. Codifying the Water Shortage Rates:
   - Customers will be given 30 days-notice prior to the rates going in effect unless the District Board takes extraordinary action.

JBWD prepared water shortage rates as part of its 2015 Water Shortage Rates Study. JBWD implemented drought shortage rates in FY16, FY17, FY18, FY19, FY20. An update to the water shortage rates are being studied as part of JBWD's current rate study.

In the case of future water use reductions resulting from the implementation of the WSCP, JBWD would likely experience impacts to operating revenue and would draw as necessary and as possible from reserves. Depending on the level of mandatory water reductions, the District could experience a decrease in revenue between 3 to 33%, based on water use reductions of 5 to 50%, respectively. Future or continued reductions in consumption would ultimately cause a rate structure adjustment, or the District may consider implementation of a drought surcharge rate that would generate enough revenue to fund operations without drawing from reserves.

7.2 Mitigation Actions to Address Revenue Reductions

A reduction in water revenue could be mitigated by use of the established reserve fund, deferral or avoidance of capital fund expenditures, use of less costly water supplies (if possible), and implementation of drought surcharge rates. This would meet short-term cash flow needs, although it should only be considered on a short-term basis.

A summary of measures to overcome revenue and expenditure impacts is provided in Table 7-1.

TABLE 7-1 MEASURES TO OVERCOME REVENUE IMPACTS DURING SHORTAGE

Measure	Summary of Effects
Use of Reserve Funds	Use of reserves may provide short-term rate stabilization but would require delays in capital expenditures and rebuilding of reserves after the water shortage.
Re-evaluate Capital Expenditure Plans	Delay major construction projects for facilities as well as upgrades and replacements.
Shift Water Sources to Less Costly Supplies if Possible	Reduce costs associated with purchase, treatment, and distribution of water.
Shortage Rates	Increase revenue.

It should be noted that expenditure impacts could be reduced 2-10 percent during mandatory conservation efforts less than 50 percent because of the reduction in costs associated with the treatment and deliver of potable water. Rate adjustments could also be employed either solely or in conjunction with capital expenditure reductions.

7.3 Financial Consequences of Limiting Excessive Water Use

Per the California Water Code Section 365 et al., retail water suppliers are required to prohibit or discourage excessive water use. Reporting this is not a required part of the UWMP; however, Water Code Section 10632(a)(8)(C) requires the financial consequences of these actions be reported as part of the UWMP.

Water Code Section 367 states that there are three types of drought emergencies:

- Declared statewide drought emergency
- When a supplier implements its mandatory reductions per their WSCP
- A declared local drought emergency

Water Code Section 366 states that a retail water supplier must prohibit excessive use through one of two strategies:

- Rate structure, specifically, a rate structure that includes block tiers, water budgets, or rate surcharges over and above base rates for excessive water use by a residential water customer.

- An excessive water use ordinance, specifically an ordinance that includes a procedure to identify and address excessive water use by metered single-family residential customers and customers in multiunit housing complexes in which each unit is individually metered or submetered and may include a process to issue written warnings to a customer and perform a site audit of customer water usage prior to deeming the customer in violation.

Section 8: References

American Water Works Association, 2011. Drought Preparedness and Response. Manual of Water Supply Practices, M60.

American Water Works Association. 2008. Forecasting Urban Demand. Second Edition.

California Department of Water Resources (DWR). 2008. Preparing for California's Next Drought : Changes Since 1987-92.

District of Santa Cruz Water Department, Water Conservation Office, December 2010. The 2009 Water Shortage An Evaluation of Water Management Strategies, Actions, and Results.

JBWD. 2022. 2020 Urban Water Management Plan.

US Bureau of Reclamation. 2010. Central Valley Project Municipal and Industrial Water Shortage Policy Review.

Virginia Polytechnic Institute and State University Blacksburg, Virginia, 2006. The Effectiveness of Drought Management Programs in Reducing Residential Water-Use in Virginia. http://water.ky.gov/wa/Documents/AdditlDroughtResources/VirginiaStudyonDroughtProgramEffectiveness.pdf

Appendix 13B – JBWD DWR Checklist

Retail (x = required)	Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location	Retail Chapter Location
x	x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Chapter 13	13.4, 13.6
x	x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Chapter 13	Beginning of each sub-chapter
x	x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Chapter 13	13.1
x	n/a	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Chapter 13	13.2, 13.5
x	x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Chapter 13	13.1
x	x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Chapter 13	13.1
x	x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Chapter 13	13.1
x	x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Chapter 13	13.1
x	n/a	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Chapter 13	13.1
n/a	x	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	Chapter 13	n/a
x	x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Chapter 13	13.2
x	x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Chapter 13	13.2
x	x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Chapter 13	13.3
x	x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Chapter 13	13.3
x	x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Chapter 13	13.3
x	Optional	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Chapter 13	13.5
x	Optional	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Chapter 13	13.5
x	n/a	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Chapter 13	13.5
x	n/a	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Chapter 13	13.5
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Chapter 13	13.5
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Chapter 13	13.5
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Chapter 13	13.5
x	x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Chapter 13	13.5
n/a	x	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	Chapter 13	13.5
x	n/a	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Chapter 13	13.5
x	x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Chapter 13	13.4
x	x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Chapter 13	13.4
x	x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Chapter 13	13.4
x	x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Chapter 13	13.4
x	x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Chapter 13	13.4
x	x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Chapter 13	13.4
x	n/a	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Chapter 13	13.4
x	x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Chapter 13	13.4
x	x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Chapter 13	n/a
x	x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Chapter 13	n/a
x	x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Chapter 13	n/a
x	x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Chapter 13	n/a
x	x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Chapter 13	n/a
x	x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Chapter 13	13.4
x	x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Chapter 13	13.4
x	x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Chapter 13	13.8

x		7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Chapter 13	13.4
x	x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Chapter 13	13.7
x	x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Chapter 13	13.4
x	x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Chapter 13	13.5
x	x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Chapter 13	13.5
x	x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Chapter 13	13.7
x	x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Chapter 13	13.7
x	x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Chapter 13	13.7
x	x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Chapter 13	13.7
x	x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Chapter 13	13.7
x	x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	n/a	n/a
x	x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Chapter 13	13.6
x	x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Chapter 13	13.6
x	x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Chapter 13	13.6
x	x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Chapter 13	13.6
x	x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Chapter 13	13.6
x	x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Chapter 13	13.6
x	x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Chapter 13	13.1
x	x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	n/a	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies* .	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	n/a	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought* .	Water shortage contingency planning	n/a	Chapter 13	13.6
x	n/a	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	n/a	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Chapter 13	13.6
x	n/a	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Chapter 13	13.6
n/a	x	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	Chapter 13	13.6
x	n/a	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Chapter 13	13.1
x	x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Chapter 13	13.1
x	x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Chapter 13	13.1
x	x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Chapter 13	13.1
x	x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Chapter 13	13.1
x	x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Chapter 13	13.1
x	x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Chapter 13	13.1
x	x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a
x	x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Appendicies	n/a