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Hesperia Water District
2020 Urban Water Management Plan

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Comprehensive Water Planning

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This 2020 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.

Executive Summary
Layperson's Description

After the devastating 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 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan 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] And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

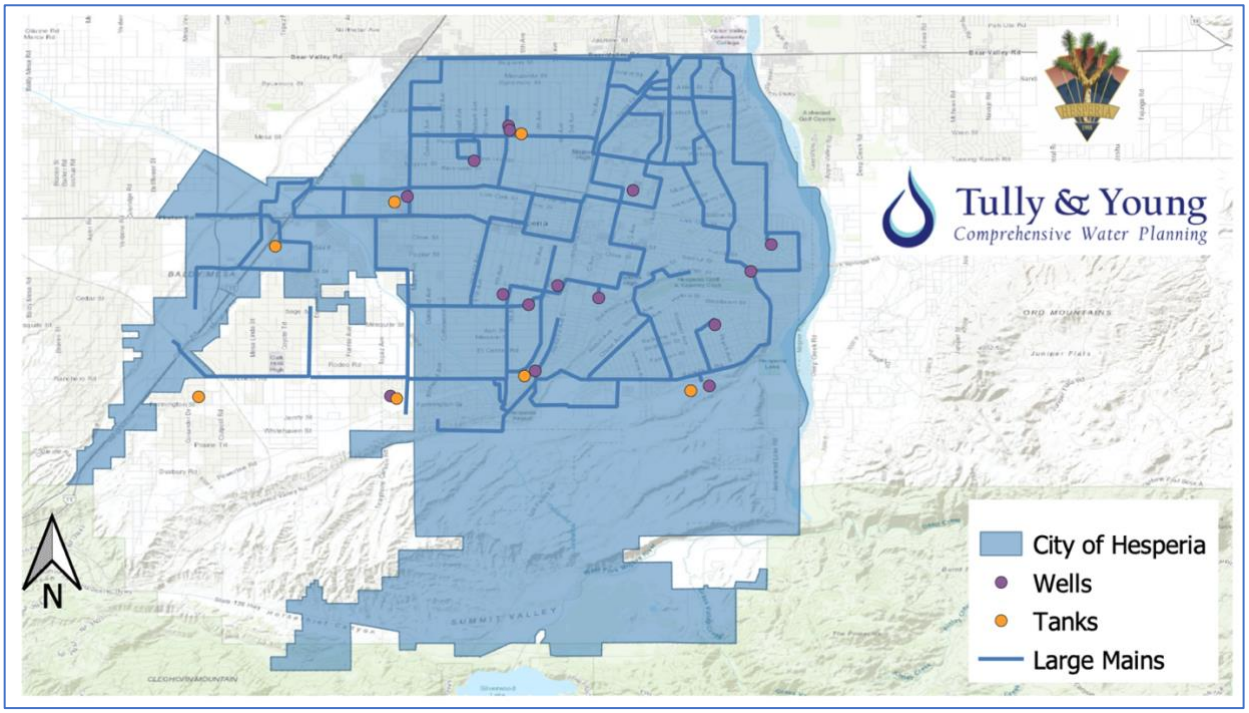
At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning 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.

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

ES-1 Hesperia Water District

The City of Hesperia, known as the "Gateway to the High Desert", is situated just north of the San Bernardino Mountains and only 35 miles from downtown San Bernardino over the Cajon pass encompassing approximately 73 square miles. The Hesperia Water District (Hesperia or District) serves as a subsidiary special district of the City of Hesperia (City). The City Council serves as the District's Board of Directors. Figure ES-1 shows the Hesperia Water District's boundaries, which are almost contiguous with the City of Hesperia, as well as the District's major water features.

Figure ES-1: Hesperia Water District's Service Area and Water System



The cultural and physical geography of Hesperia Water District guides its water resources management actions. Hesperia serves over 27,000 connections and a diverse population exceeding 97,000 people. Hesperia is located in the Mojave Desert at an elevation above 3,000 feet and the area's dry climate limits annual precipitation. Water use in the region has historically been derived from surface supplies derived from the Mojave River and groundwater supplies from the Upper Mojave River Groundwater Basin (Mojave Basin). The rapid expansion of groundwater pumping from the Mojave Basin and increased use from the surface water supplies to serve the region's growing population led to the Mojave Basin Area Adjudication (Adjudication). The Adjudication is the primary governing structure that allocates water supplies among the regional water purveyors and individual water users to meet regional water needs. The Mojave Water Agency is the Watermaster for the Adjudication.

Hesperia has historically relied upon groundwater from the Mojave Basin. Hesperia's primary supply is pumped groundwater from this Alto subarea – one of five subareas created by the Adjudication. The Adjudication assigned Base Annual Production (BAP) rights to each producer using 10 acre-feet or more,

based on historical production from 1986 to 1990. Parties to the Adjudication 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 percent of the Production Safe Yield (PSY) as defined by the Adjudication. For the 2020-21 water year, the Alto FPA is set at 55% of BAP.

The Adjudication has other components that allow Hesperia to capture water supplies to serve its customers. The Watermaster is charged with finding additional sources of supplies where entities subject to the Adjudication use more water than their annual FPA. Moreover, the Watermaster assists water users, like Hesperia, with identifying and securing long-term water supplies through permanent and temporary water transfers. And last, Mojave Water Agency imports water supplies into the Mojave Basin Area to supplement natural supplies in the region. Together, Hesperia's FPA, the Watermaster's replacement and make-up water supplies, return flow, and the District's permanent and temporary water acquisitions constitute the District's water asset portfolio. Hesperia is also developing recycled water supplies that it anticipates supplementing its water asset portfolio in the near future.

The District's service area population continues to grow – estimated to reach over 130,000 by 2045. This urban population coupled with a small amount of agricultural, commercial and industrial users constitute the total water demand in Hesperia Water District. This total demand is just over 14,000 acre-feet of water per year (where one acre-foot of water is about the size of one football field covered in one foot of water). Hesperia is analyzing its water supplies in the context of potential future growth that would increase future water demands by about 4,000 acre-feet over the 2045 planning horizon.

ES-2 Hesperia's Water Service Reliability

Hesperia's water service reliability to meet its demands hinges on the active management of the District's water supply portfolio in the context of MWA's management of the Adjudication and the supplies available within the Adjudication. More succinctly, even though Hesperia's total annual water supplies meet the District's annual water demands, the availability of some supplies are acquired through opportunities provided in the Adjudication throughout the year. In addition, the supplies must be astutely managed in order to ensure sufficient water supplies are available to meet Hesperia's demands during extended dry conditions as the FPA changes in the Alto Subbasin.

The fundamental management tenet for Hesperia's water service reliability is to coordinate its Free Production Allowance adjudicated groundwater supplies with both the Watermaster's actions for replacement and make-up supplies and the District's actions in finding additional sources of supply. In general, supplies are available to Hesperia regardless of the current year's hydrology in the context of the regional water management actions. Hesperia also holds stored water in the Mojave Basin to manage unforeseen outages. These supplies can be balanced in any given year to meet demands in the Hesperia service area. And, importantly, the District is looking to augment its water supply portfolio through a recycled water project that anticipates supply availability in 2025.

Hesperia continues to reduce its per capita water usage so as to extend the availability of each increment of water supply. The District's targeted per capita usage was 184 gallons per capita per day

(GPCD) and its actual usage was 129 GPCD – one-third less than its historical average. The District continues to reduce its per capita water usage and will further reduce this usage in its future planned land use developments and in allocating recycled water to non-potable water uses in the system.

Hesperia's long-term water supply reliability will manifest from actively managing both the supply augmentation component and water demand components of its potable water system. The District's continued active participation in the water management actions of the Watermaster as well as participation in the regional water markets will help generate supplies to support water system. Moreover, continuing to reduce per capita water usage through improved management, better land use planning, and coordinated customer outreach will further support the long-term reliability objectives.

Hesperia has reliable supplies to meet its retail customer demands in normal, single dry years, and five consecutive dry year conditions through 2045. The managed groundwater reliability is based on GSWC's share of the projected Mojave Basin's annual Free Production Allowance and the numerous current and planned projects in the Mojave Basin designed to increase the reliability of the groundwater supply. In addition, Hesperia's continued acquisition of replacement, make-up, and transferred water supplies supplement the District's asset portfolio. As such, Hesperia is not faced with shortages during normal or dry years through this UWMPs planning horizon. Because Hesperia extracts only as much groundwater as is necessary to meet customer demands, it is anticipated that supplies and demands are congruent across all the scenarios examined.

Over the long term, GSWC Barstow's water supply portfolio should be adequate to meet its potential long-term growth objectives. GSWC Barstow's long-term water service reliability considerations have three important components: (1) an increase in the annual total demand that GSWC Barstow's water supplies will need to satisfy with a decreasing per capita demand; (2) management of its existing water supply portfolio in the context of the Adjudication and MWA's water management activities; and (3) development of Hesperia's total water supply available in its water supply portfolio. All of these items are considered in Hesperia's water service reliability projections. The analysis in this 2020 UWMP contemplates all of these components in showing Hesperia's water service reliability through 2045.

In addition to these water service reliability considerations, Hesperia also has updated its Water Shortage Contingency Plan (WSCP) under the requirements in Water Code Section 10632 of the Urban Water Management Planning Act to address any potential water shortage conditions. This updated WSCP allows the District to reduce the water demands of its customers in shortage or catastrophic outage conditions. The measures contemplated in the updated WSCP include typical dry condition water management actions imbedded into six water shortage categories (up to 10%, 11-20%, 21-30%, 30-40%, 40-50% and over 50%). Importantly, in the event there were to be a catastrophic water outage in the service area, water demands will be limited to use for health and safety purposes only. Combining the updated WSCP with Hesperia's active water management of its supply portfolio provides additional buffer against unpredictable water conditions.

In summary, Hesperia's water supply portfolio, its active management of its water supply portfolio, and its WSCP provides the District with stable and reliable water service to meet its current and 2045 projected water demands. This supply reliability encompasses normal, single dry, and five consecutive dry year scenarios.

Chapter 1
Introduction

The Hesperia Water District (Hesperia or District) serves as a subsidiary special district of the City of Hesperia (City). The City Council serves as the District's Board of Directors. The City's Water Department includes several different divisions, including: Water Production Division, Water Distribution Division, Water Pipeline Division, Sewer/Stormwater Division, Customer Service/Meters Division.

The City of Hesperia, known as the "Gateway to the High Desert", is situated just north of the San Bernardino Mountains and only 35 miles from downtown San Bernardino over the Cajon pass. The City is in the Victor Valley at the foot of the north slope of the San Bernardino Mountains at an elevation of about 3,100 feet above sea level in the northern area, to about 4,000 feet in the south at the foot of the mountains. The City's key planning objectives include responsible growth for its rural, suburban, agricultural, commercial, and industrial land uses, paired with economic development that attracts and maintains quality business and industry while being beneficial to its residents.

Water supply for the District service area is sourced almost entirely from pumped groundwater from the Mojave River Groundwater Basin (Basin) and aquifers in the area. Groundwater is recharged by natural storm water flows, infiltration of the Mojave river and tributaries, imported supplies from the Mojave Water Agency to recharge basins, and irrigation and wastewater return flow. Several water projects have improved the supplies available in the Mojave Basin that tier from State Water Project supplies that are managed by the Mojave Water Agency.[6] For instance, the Mojave River Pipeline completed in 2006 provides critical recharge of the Basin delivering up to 45,000 acre-feet per year to the Mojave Basin Area to help offset dwindling supplies from regional growth and groundwater extractions. Chapter 3 describes the District's water supply in detail.

Ensuring an adequate supply of water is available to serve the existing and future needs for the District's customers is a critical component of successful operations. This Urban Water Management Plan (UWMP) draws on local, regional and statewide inputs to synthesize information from numerous sources into a reliable water management action plan designed to be referred to as management and Board level decisions arise and conditions change.

[6] Mojave Water Agency's 2020 Wholesale UWMP was adopted by the Agency on May 25, 2021 and is available at: http://www.mojavewater.org/planning.html

1.1 Background and Purpose

The District has prepared this 2020 UWMP to comply with the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers.[7] This 2020 UWMP addresses Hesperia's water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years. As required by the UWMPA, the District's 2020 UWMP specifically assesses the availability of its supplies to meet forecast water uses during average, single-dry and five consecutive drought years through 2045. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this 2020 UWMP.

The 2020 UWMP is an update to the District's 2015 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC) since 2015. The 2020 UWMP is also a comprehensive water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the District's managers, its customers, and the State of California about its water management practices. It reflects the District's planning assumptions and goals and should be used in combination with other planning resources and documents over the UWMP planning horizon.

The State of California's drought vulnerability and the additional pressures of climate change and population growth increase the importance of planning ahead to meet water demands with potentially at-risk water supplies. Such forward planning is an important outcome of this 2020 UWMP.

1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code 116275. The District qualifies as a Retail Urban Water Supplier as described in Water Code Section 10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre/feet of water per year. These qualifications require the preparation of an Urban Water Management plan every five years. The District's Public Water System detail is listed in Table 1-1.

Table 1-1: Public Water System Information

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610024	HESPERIA WD	~27,150

[7] California Water Code sections 10610 through 10657.

The State Legislature passed numerous new requirements since the 2015 UMWP which are detailed throughout this 2020 UWMP.[8] Major updates to the requirements are listed below along with a reference to the corresponding section in which they are addressed in this document.

- **Five Consecutive Dry-Year Water Reliability Assessment:** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This new requirement is addressed in Chapter 3—Water Supply, Chapter 4–Water Use, and Chapter 5—Water Service Reliability Assessment.

- **Drought Risk Assessment (DRA):** Due to the extensiveness of recent California droughts and the variability associated with climate change predictions, the California Legislature created a DRA requirement for UWMPs. The DRA requires assessment over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is addressed in Chapter 5— Water Service Reliability Assessment and Chapter 6—Water Shortage Contingency Plans.

- **Seismic Risk:** Evaluating seismic risk to water system infrastructure and facilities and having a mitigation plan is now required by the Water Code. Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this new statue. Seismic risk is addressed in Chapter 6.

- **Water Shortage Contingency Plan:** In 2018, the Legislature modified the UWMPA to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage. The WSCP is in Chapter 6 of this UWMP.

- **Groundwater Supplies Coordination:** 2020 UWMPs are required to be consistent with Groundwater Sustainability Plans following the 2014 Legislature enactment of the 2014 Sustainable Groundwater Management Act (SGMA). The reliance on groundwater is described in Chapter 3—Water Supply.

- **Lay Description:** A synopsis of the fundamental determinations of the UWMP is a new statutory requirement in 2020. This section of the is intended for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the UWMP's detailed analysis.

1.3 Coordination and Outreach

As required by the Urban Water Management Planning Act (UWMPA) the District has coordinated with nearby agencies while developing this UWMP in order to ensure consistency with other related planning

[8] California Water Code Section 10608 to 10608.44; Section 10609 to 10609.38; Section 10610 to 10657

efforts such as City General Plans (GP), Water Master Plans (WMP), and Specific Plans for identified development projects (SP). This requirement includes coordination with (a) water suppliers that share a common water source, (b) relevant water management agencies that affect the District's water assets, and relevant public agencies that may have land use or other regulatory relationships with the District. The District has prepared this 2020 UWMP in coordination with regional water purveyors, including Mojave Water Agency, and has appropriately notified and coordinated with other appropriate local government agencies as listed in Table 1-2.

As stipulated in Water Code Section 10621(b), every urban water supplier shall conduct a public hearing in order to encourage active involvement from diverse elements of the community. The District sought public participation with a public hearing and appropriate notices as required by law. These coordination efforts and Statutory Requirements for Notice are also included in Table 1-2.

Table 1-2: Public and Agency Coordination

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

The District is also located within the Mojave Integrated Regional Water Management (IRWM) Region and was a project proponent to the IRMW Plan (IRWMP) prepared by Mojave Water Agency (MWA). The IRWMP was adopted in July 2014.

1.3.1 Water Supplier Information Exchange

Water Code Section 10631 requires wholesale and retail water agencies to provide each other with information regarding water supply and demand. Since the District uses water from the Mojave basin that is managed through the Mojave Water Agency (MWA), it has coordinated with MWA and the other urban retail suppliers within the basin to provide supply and demand information. This includes, as required by UWMPA, projected water demand in five-year increments for 25 years into the future.

1.4 UWMP Adoption

The District held a public hearing regarding its 2020 UWMP on August 3, 2020. Before the hearing, the District made a draft of the 2020 UWMP available for public inspection at City Hall, 9700 Seventh Avenue, Hesperia, CA 92345, and on the City'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 District's elected body adopted this 2020 UWMP on _____,2021. A copy of the adopted 2020 UWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the City'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 2020 UWMP Tables 05.10.2021.xls"
- "FINAL SBX7-7 Verification Form 04.02.2021.xls"
- "FINAL Energy Use Tables 04.01.21.xls"

1.5 Document Organization

This UWMP is organized as follows:

- Executive Summary provides an overview of the purpose and findings of this 2020 UWMP.
- Chapter 1 establishes the basis for the UWMP, describes outreach activities and introduces the document organization.
- Chapter 2 provides a description of the District's service area, demographic characteristics and climate, and describes the future population the District anticipates needing to serve.
- Chapter 3 describes the District's current and future water supplies and the availability of the supplies through 2045.
- Chapter 4 details the customer uses, including the past and future estimated uses, and describes the District's past and on-going demand management measures.

- Chapter 5 presents the District's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.
- Chapter 6 is the District's stand-alone water shortage contingency plan, incorporated as a chapter in this UWMP, but also available to be shared and utilized separate from the UWMP.

NOTE TO DWR:

Hesperia Water District has written this Urban Water Management Plan (UWMP) primarily as a water resources planning tool to more effectively manage water supply, reliability and demand. This UWMP satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2020 UWMP Guidebook, including addressing changes to the California Water Code since 2015. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2020 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 2020 UWMP Guidebook. These tables have been separately uploaded to DWR's web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2020 UWMP Guidebook.

Chapter 2
Water Service and System Description

The City of Hesperia encompasses approximately 73 square miles in the Mojave Basin Area in San Bernardino County, California. This area, in the southeastern part of the state, is a portion of the larger Mojave Desert which ranges into Nevada with small areas that extend into Utah and Arizona. The Mojave is the driest desert in North America, and while it is sparsely populated compared to its total area, it does support large communities with significant water demands such as the City. The Mojave Region is a closed topographic basin with virtually no hydrological outlets.

The Mojave River is central to the Hesperia area history and settlement in the region. The river is more of a seasonal stream which derives its flow from drainage of 217 square miles of the northern slope of the San Bernardino Mountains. The original inhabitants were the Serrano people who lived on the Mojave River and surrounding areas. The City of Hesperia town site was laid out by railroad company land developers in 1891 and growth was slow until the highway system was completed in the 1940s. Early farmers aggressively planted the Victor Valley with fruit trees and crops, which by the 1950s made evident there was significant water overdraft occurring. This halted development in the area.

Legislation for the State Water Project (SWP) passed in 1959 to begin work on the California Aqueduct, along with the Davis-Gunsky Act, which allowed regions the opportunity to form local water agencies. Water for the community was provided by Victor Valley County Water District (VVCWD) until 1975, when the Hesperia Water District (District) was formed as a self-governed special district. The City of Hesperia was incorporated in 1988, and in 1992 the District was reorganized as a subsidiary special district of the City. The District operates a self-sustaining utility business enterprise and the City Council serves as the District's Board of Directors. The District service area is generally contiguous with City boundaries, though there are a few minor variances. The District service area is shown in Figure 2-1. Table 2-1 shows the historical and current breakdown of service connections by customer class.

The District is in the Mojave River Basin area for which Mojave Water Agency (MWA) serves as the court appointed Watermaster according to the Mojave Basin Area Stipulated Judgment (1993). An overview of the adjudication is described below and a detailed description is included in Chapter 3. MWA provides wholesale water to Hesperia Water District through management of the Mojave Basin Area groundwater system.

Figure 2-1. Hesperia Water District Water Service Area[9]

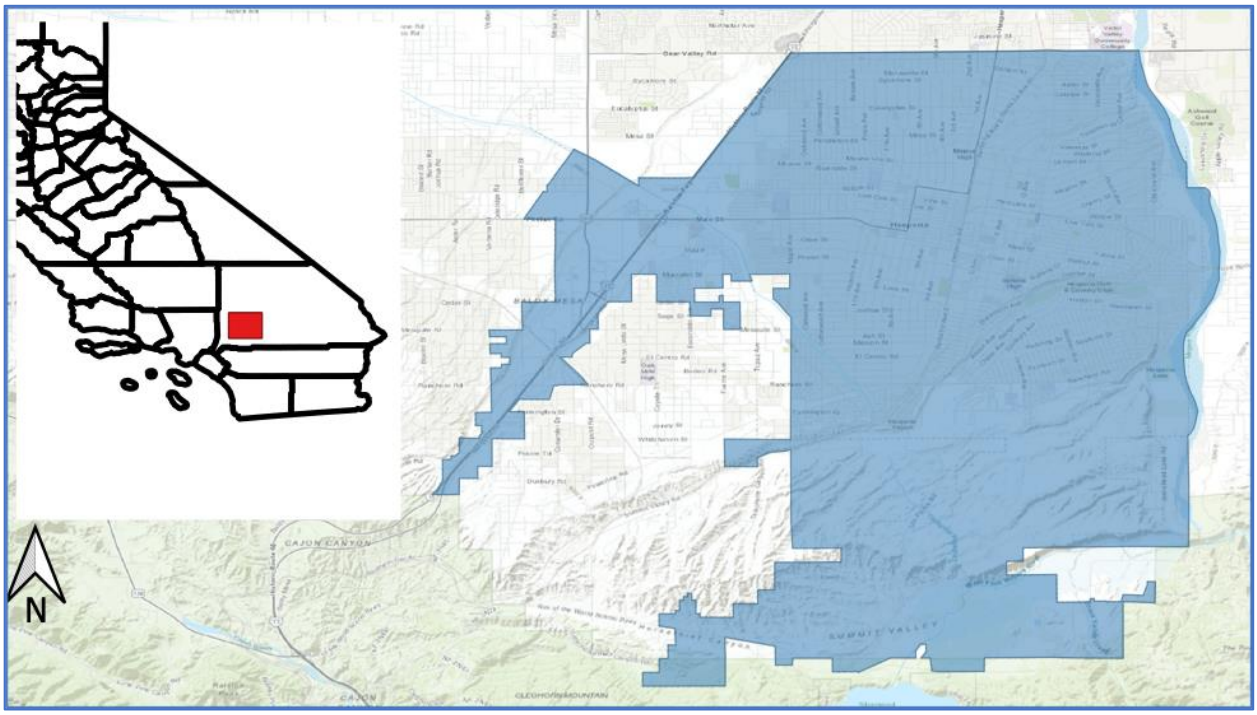


Table 2-1: Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	24,749	25,243	25,021	25,214	25,347	25,457
Multi-Family Residential	278	359	422	512	517	525
Commercial/Institutional	1,261	965	1,001	1,044	1,057	1049
Industrial	19	19	0	0	0	0
Landscape Irrigation	96	99	105	109	109	118
Other	77	392	489	510	[not in eAR]	[not in eAR]
Total	26,480	27,077	27,038	27,389	27,030	27,149

2.1 Mojave River Basin Area Adjudication Overview

Determining water rights and how to manage the over-drafted supply and increasing demand, along with factoring the higher cost of imported water from the SWP, initiated the first adjudication efforts for the MWA service area in the 1960s. A second effort at adjudication in the Mojave River Basin starting 1990 proved more successful, resulting in full adjudication of the Mojave Basin Area in 2002 between

[9] The service area depicted is derived from the California Department of Water Resources Public Water District boundaries: https://gis.water.ca.gov/app/boundaries/

the five distinct hydrological subareas: Este, Oeste, Alto, Centro, and Baja.[10] The Judgement and Adjudication help maintain proper water balances in the five subareas. The Mojave Water Agency was appointed Watermaster to implement the adjudication and judgment and maintain an ongoing assessment of the basin conditions. The Watermaster sets the available water supply according to average annual natural flow baselines coupled with managed water supplies that are characterized in the Judgement as the Base Annual Production (BAP). The BAP essentially apportioned the water supplies among the stipulating entities. Each year, however, the Watermaster identifies a Free Production Allowance (FPA) that is based on each Producer's percentage share of the BAP. The FPA has been continually in decline and will eventually stabilize when the basins reach balanced conditions.

The dynamics of the FPA and a detailed description of the Mojave Basin Area adjudication are discussed in much more detail in Chapter 3.

2.2 Integrated Regional Water Management Plan (IRWMP)

Hesperia Water District is a retail supplier of MWA wholesale water. In 2004 MWA and its regional partners adopted the first IRWMP to establish a collaborative, stakeholder driven effort to manage water resources in the region. The latest IRWMP was approved in 2014 with an amendment finalized in May 2018 after the IRWMP Standards were updated with Proposition 1 2016 IRWM Guidelines.[11] The IRWMP covers objectives, resources management strategies, localized water and land use planning, and other DWR requirements. The Regional Water Management Group (RWMG) includes Mojave Water Agency, Victor Valley Wastewater Reclamation Authority, a Technical Advisory Committee, Mojave Desert Resource Conservation District, and Morongo Basin Pipeline Commission. The planning efforts identified in this program address necessary supply and infrastructure improvements with regional benefits to further long-term supply reliability.

2.3 Service Area Climate

Hesperia Water District is located in the High Desert region of San Bernardino County and has the climate extremes that are characteristic of its region compared to the lowland areas of Southern California. Typical of the Mojave Desert, the area is very arid because of the rain shadow effect of the mountains to the south and west. Summers are extremely hot and dry with occasional monsoonal thunderstorms that can bring flash flooding and hail. Nighttime temperatures cool substantially from daytimes highs, even during the height of summer. Most precipitation occurs during the wet season in winter, with sporadic snowfall, although much lighter than the snowfall in the surrounding mountains. December and January are the coldest months; July and August are the hottest. The District averages over 3,000 ft in elevation. The wet season is from December to March with a 30-year annual average precipitation of 8.17 inches. The annual mean temperature is 60 degrees, but the desert climate causes

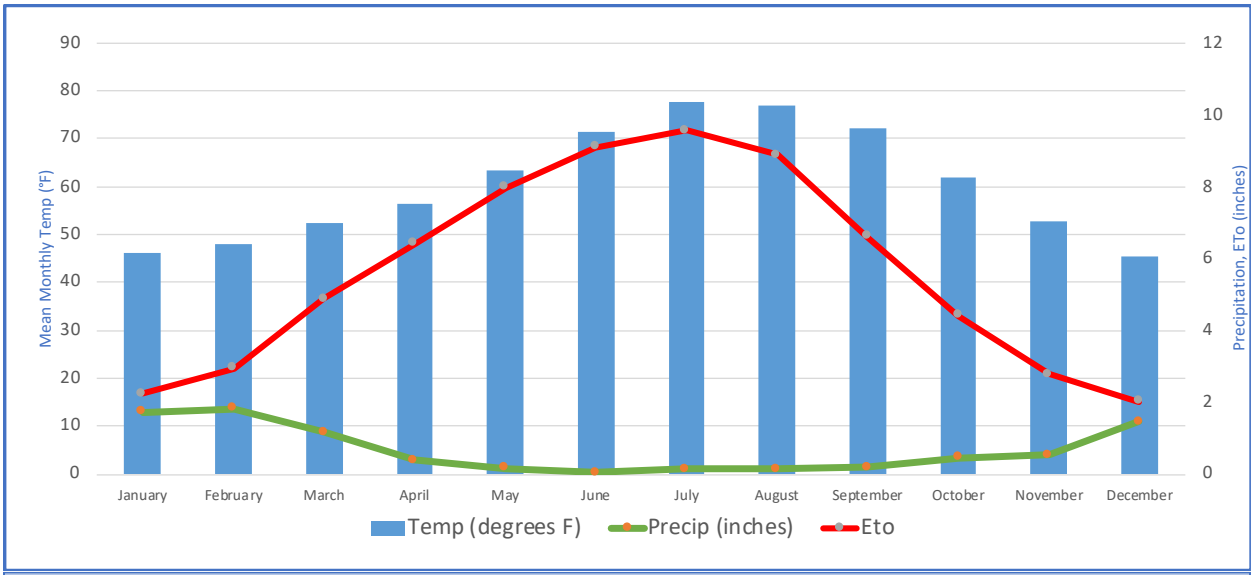
[10] Full Judgment text available at http://www.mojavewater.org/files/Judgment_5iftmzvq.pdf

[11] Mojave Region 2014 Integrated Regional Water Management Plan 2018 Amendments: https://www.mywaterplan.com/files/HDWD-IRWM-2018-Addendum_Final-Draft.pdf

extreme temperature variations with highs during the summer months regularly reaching the upper 90s and lows in winter ordinarily dropping to the low 30s.

Other climate characteristics include monsoonal moisture in the later summer, which can cause thunderstorms. Snowfall occurs occasionally, averaging about 4 inches annually. Autumns are still very warm and dry and becomes cooler by November with the rainy season beginning. Winter conditions usually begin by late November. Springs are usually warm during the days although lows are still quite cool, averaging in the high 30s and low 40s. Rainfall usually tapers off by May. Figure 2-2 shows historical average Temperature, Precipitation, and Evapotranspiration averages. Figure 2-3 provides a representation of the variability in annual precipitation.

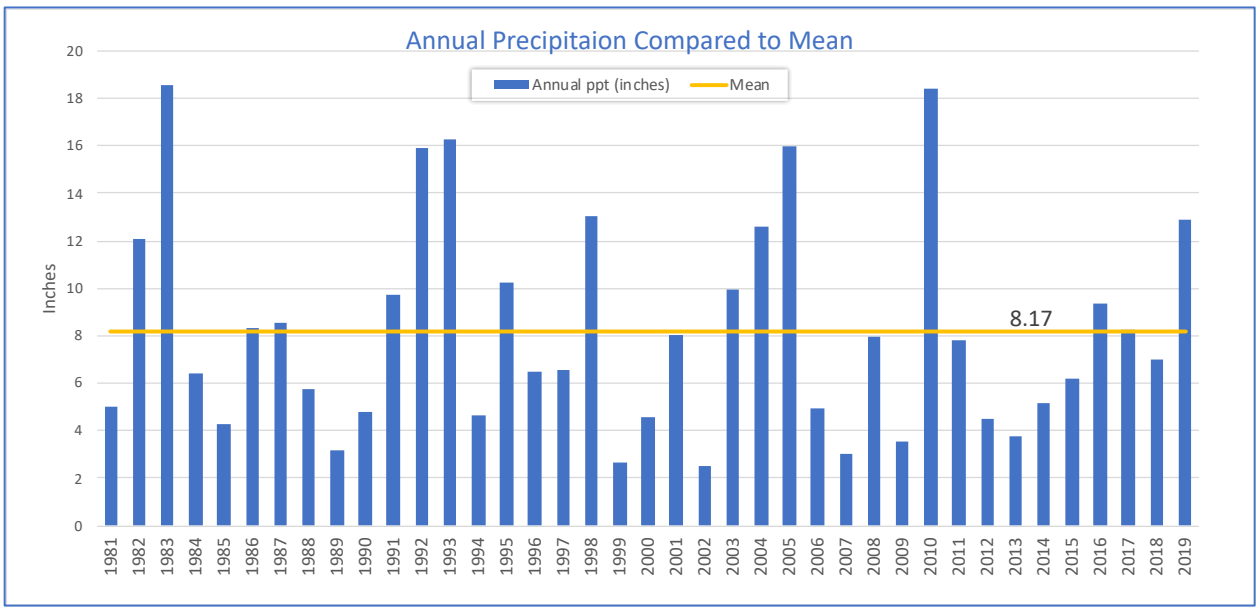
Figure 2-2: Average Climate Conditions[12]



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	46.0	48.1	52.3	56.3	63.2	71.2	77.5	77.0	72.0	61.9	52.6	45.3
Precip	1.71	1.83	1.17	0.38	0.15	0.03	0.13	0.15	0.18	0.46	0.53	1.45
ETo	2.24	2.94	4.87	6.42	7.97	9.09	9.57	8.88	6.60	4.41	2.78	2.00

[12] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 34.4234 Lon: -117.3417 Elev: 3350ft; ETo data is from CIMIS Victorville - San Bernardino - Station 117, Mar 1994-Nov 2020.

Figure 2-3: Annual Precipitation Variability (1981 – 2019)



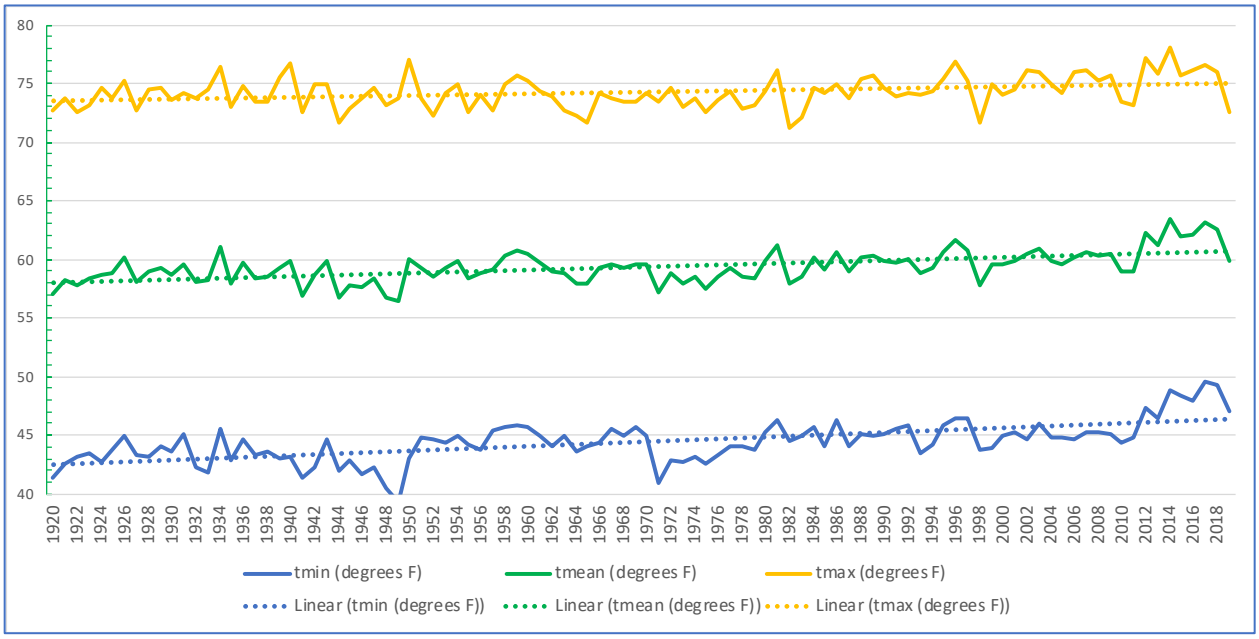
2.3.1 Climate Change

While the California Water Code 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 a historical and projected context.

Hesperia relies solely on managed groundwater in the basin (as described in Chapter 3). Any impact from climate change that causes higher average temperatures, especially during the summer, or reduced precipitation could put pressure on the local groundwater basins and lead to additional uses from the groundwater basin. Local groundwater basins are also recharged with water imported by the Mojave Water Agency from Northern California and the Sacramento Delta through the State Water Project (SWP). Effects from climate change on water flows from the Sierra Nevada snowpack into these regions could have a serious impact on water deliveries from the SWP, possibly further altering the stability of the groundwater basins. State Water Project Final Delivery Capability Report (DCR) compiled by the state Department of Water Resources (DWR) addresses the capabilities of the SWP to operate during more intense flood and drought cycles predicted to occur, including risk management for the Delta against rising sea levels. The impacts of climate on supplies is discussed in Chapter 3.

As shown by the trendlines in Figure 2-4 there has been a gradual warming in average temperatures over the past 100 years. Increasing local temperatures can result in higher evapotranspiration, leading to increasing water demand, especially from outdoor water use and irrigation, even without considering any potential population growth.

Figure 2-4: Historical Annual Temperature (1920-2019)[13]



The Mojave Integrated Regional Water Management Plan, which covers the groundwater basins Hesperia pumps from, included a climate change assessment that evaluated the vulnerability of the region's water supplies, future frequency of flooding, and a complete inventory of greenhouse gas (GHG) emissions from the water sector. The plan offers a roadmap for water retail suppliers in the area to meet federal and state requirements for additional water conservation and reducing GHG from operations. This 2020 UWMP Update includes additional climate change discussion in Chapter 3, Chapter 4, and Chapter 5.

2.4 Current and Projected 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 give valuable insight to water management and planning. This section of the UWMP addresses these factors to provide a supportable basis for forecasting future water use.

2.4.1 Current Population and Historic Trends

Mojave Water Agency commissioned a population projection from UC Riverside School of Business Center for Economic Forecasting and Development (UCR Center) which was completed in August 2020.

[13] Temperature data is from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 34.4234 Lon: -117.3417 Elev: 3350ft

The report estimated population for the MWA service area incorporated cities and towns, MWA subareas, and MWA water purveyor service areas. Hesperia Water District is a water purveyor in the MWA service area and the report included the Hesperia service area. The UCR Center uses a comprehensive forecasting model for the MWA service area, to include population estimates for the incorporated cities, subareas, and water purveyors. Structured around a long-term forecast of the San Bernardino County economy, the model includes economic indicators such as residential housing stock, home prices, and employment trends. Relying on the underlying fundamentals of each variable, research is applied to identify the relationship between the variables of interest and various moving parts of the economy. Using this methodology, the UCR Center estimates population forecasts based on the incorporated cities in the MWA service area.[14] The District service area is almost identical with the municipal boundary for the City of Hesperia, therefore city population growth trends and Department of Finance countywide population estimates were the primary factors of the estimates of population as reported in the UCR Center Forecast for the District's service area. The estimated population for the District service area was 96,362 for 2019, representing 19.75% of the MWA service area, and 4.52% of the County population.

Table 2-2 shows population growth over the last decade in the Hesperia Water District service area.

Table 2-2: Population Growth Rate – 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population	89,742	90,536	91,163	91,280	91,294	92,022	92,732	93,787	94,676	95,905
Growth Rate		0.88%	0.69%	0.13%	0.02%	0.80%	0.77%	1.14%	0.95%	1.30%
Net Growth 2010-2019: 6.67%										
Average Annual Growth: 0.74%										

2.4.2 Projected Population

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. Importantly, one of the recent statutory updates to the UWMP Act states urban water suppliers "shall coordinate with local or regional land use authorities" regarding land uses that may affect water management planning.

Population growth for California has been revised downward repeatedly as birthrates and migration have declined. San Bernardino County is no exception to this trend. From 2007 to 2018, birthrates in San Bernardino County dropped 24.2%. Net migration averaged below zero between 2010 to 2019. However, the incorporated cities of the Mojave Water Agency service area still have some of the most affordable housing in the entire Southern California region which is a main driver why the UCR Center Forecast anticipates regional population to increase by 39.2% over the next 40 years in the Mojave

[14] UC Riverside School of Business Center for Economic Forecasting and Development, Mojave Water Agency – Population Forecast, 2020 Edition

basin. As shown in Table 2-3, the District service is projected to outpace that growth compared with the region on the whole with forecasted 45% net growth through 2060.

Table 2-3: Population — Projected (2020 through 2060)

	2020	2025	2030	2035	2040	2045	2050	2055	2060
Hesperia Water District	97,380	107,045	115,279	121,959	128,221	133,910	139,001	143,602	147,734
Annual Growth Rate		9.93%	7.69%	5.79%	5.13%	4.44%	3.80%	3.31%	2.88%

2.4.3 Current and Projected Land Use

Development in the City of Hesperia is largely dedicated to residential and supporting retail commercial services. This type of land use tracks with its role as a residential community for the locally and regionally employed population. The majority of residential development is low-density, single family housing, though the City also has a number of multi-family residential buildings. Over the past several years, the residential sector accounts for between 75% and 80% of total water consumption in the District's service area on average, occasionally reaching close to 100% of delivery in certain months.[15] Water use is discussed in detail in Chapter 4.

Using the City occupancy rate of 3.5 persons per household[16], along with the previously mentioned population growth, allows for calculation of a projected number of new service connections through 2045 needed to accommodate the anticipated increased population. To estimate non-residential growth, the existing mix of residential to non-residential connections can be a proxy for estimating the future mix for the incremental new connections. Residential connections represent about 95% of the District's customers, with non-residential uses representing 5% (see Table 2-1). With the addition of 10,400 new residential units through 2045, the existing ratio would result in about 520 additional new non-residential customers. The additional connections are assumed to be have sub-classifications of about 90% Commercial/Institutional and 10% Landscape/Irrigation. Table 2-4 shows the projected cumulative new connections in 5-year increments through 2045.

Table 2-4: Cumulative New Connections

Customer Class	2025	2030	2035	2040	2045
Residential	2,800	5,100	7,000	8,800	10,400
Non-residential	140	260	350	440	520

[15] Based upon reporting by the City to the SWRCB as part of monthly conservation reporting requirements. Data is available here (last accessed December 28, 2020): https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2020dec/uw_supplier_data121620.xlsx

[16] https://censusreporter.org/profiles/16000US0633434-hesperia-ca/; American Community Survey 2019 1-year estimates

In 2008 the Hesperia City Council approved the Main Street and Freeway Corridor Specific Plan[17] which was last amended in January 24, 2020. This land use plan provides for the development of two major specific planning districts: the Freeway Corridor and the Main Street Corridor. Each of these two planning districts have four sub-districts within them, totaling eight land use districts.

As of January 2021, the City planning department approved and recorded tentative tracts for about 4,400 lots. The Draft Housing Element update to the General Plan identifies 8,125 units for new construction through the 2021-2029 update cycle, which addresses the State's Regional Housing Needs Allocation (RHNA). As part of the adoption of the General Plan, the availability of infrastructure and water/sewer services was assessed and determined that adequate water supply and sewer capacity is available to accommodate the RHNA of 8,125 units for this Housing Element cycle. The growth represented in Table 2-4, which is based upon the UCR Center Forecast, does not anticipate the RHNA will occur until after 2035.

Some of the City planning department's anticipated new residential connections are listed in Table 2-5. The City is continually processing applications, with additional development projects not in the table likely to arise in the future to accommodate the anticipated growth. These and other unnamed projects which will serve the population projections shown in Table 2-3 and the new connections shown in table 2-4 are factored into water use forecasts detailed in Chapter 4.

Table 2-5: Known Land Use Plans

Existing or Planned Project
Main Street and Freeway Corridor Specific Plan
Tapestry
Villa Apartments East
BellaSky
Village at Hesperia Phase II
Granite Springs
Marin & Topaz
Serenity Village Senior Project
Empire Land LLC – TT-16676

2.4.4 Economic Trends & Other Social and Demographic Factors

The Inland Empire has seen some of the strongest employment growth in California since the end of the Great Recession, with the third largest workforce of the state's metropolitan areas. As a logistical hub for the region, there has been significant employment increases in the transportation, trade, and warehouse industries. With relatively more affordable housing compared to areas closer to the coast, there is also a large commuter population that work 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 soar and supply remains constrained. Over the past decade,

[17] The Specific Plan can be viewed in its entirety here: https://www.cityofhesperia.us/DocumentCenter/View/15940/MSFCSP-update

the employment growth rate for nonfarm labor in the Inland Empire 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. A main driver of this explosive growth has been in logistics, which ballooned at a rate of 47.7%, three times the rate of neighboring counties.

The Covid-19 recession has severely impacted the service sector, especially leisure/hospitality and in-store retail. The healthcare sector has also experienced significant job losses as patients cancelled routine and elective procedures due to the mandated lockdowns. The total non-farm employment rate contracted 10% in the first four months of the pandemic. However, demand for transportation and warehousing increased, driven by a shift to online commerce and direct-to-consumer shopping. Figure 2-5 provides details on the economic condition over the past decade.

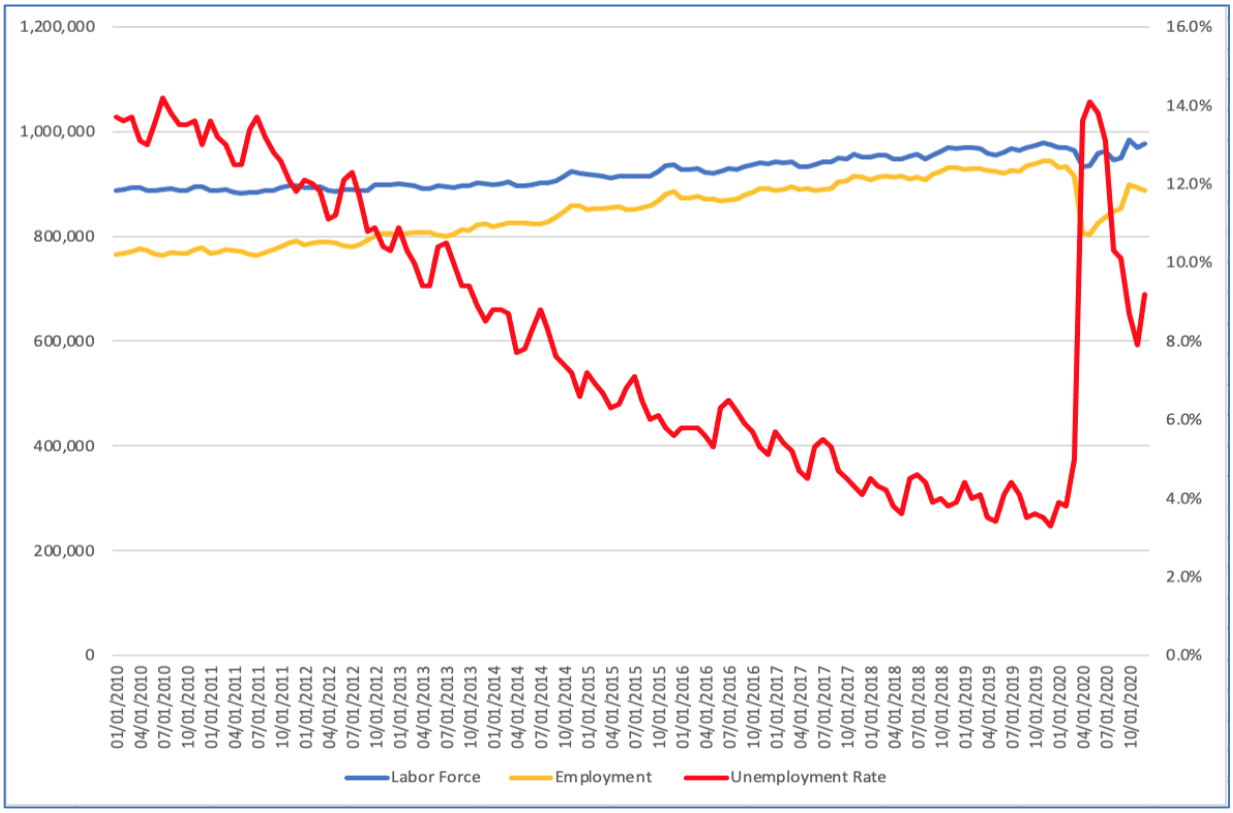
Hesperia's location at the top of Cajon Pass, the closest of the High Desert cities to more populated regions to the south, gives it a locational advantage for home buyers and businesses from San Bernardino, Riverside, Los Angeles and Orange Counties. In addition, the connection from Southern California to Las Vegas via Interstate-15 has become increasingly significant. These freeway connections have assumed increasing significance because they provide access to Hesperia from portions of the region that are facing severe shortages of affordable housing.

According to the 2010 Census Hesperia had a median household income of $46,027, with 23.1% of the population living below the federal poverty line which gives it a Disadvantaged Community status according to the DWR mapping tool. The designation is based on the median household income being less than 80% of the State's median household income. The mapping context is in order to provide funding pursuant to California Proposition 1 "Water Quality, Supply, and Infrastructure Improvement Act of 2014", Proposition 84, Integrated Regional Water Management (IRWM) Grant Program, and likely other forthcoming state assistance programs.

CA Department of Finance estimates the average occupancy in the District is 3.46 persons per household.[18]

[18] California Department of Finance, E-5 City/County Population and Housing Estimates, 1/1/2020

Figure 2-5: San Bernardino County Employment Data, 2010 - 2020[19]



2.5 Delivery System Details

This subsection focuses specifically on Hesperia Water District's potable water delivery system. The water supplies delivered through this system are described in Section 3, with water uses described in Section 4. The District provides domestic water from fifteen (15) active wells within this area, with one standby well. All wells are located in the Mojave River Groundwater Basin (Basin). Water is conveyed from the wells to the consumers via a distribution system with pipe sizes ranging between 4 and 24 inches in diameter. The District currently maintains 14 storage reservoirs within the distribution system with a total capacity of nearly 200 AF, or 64 million gallons.

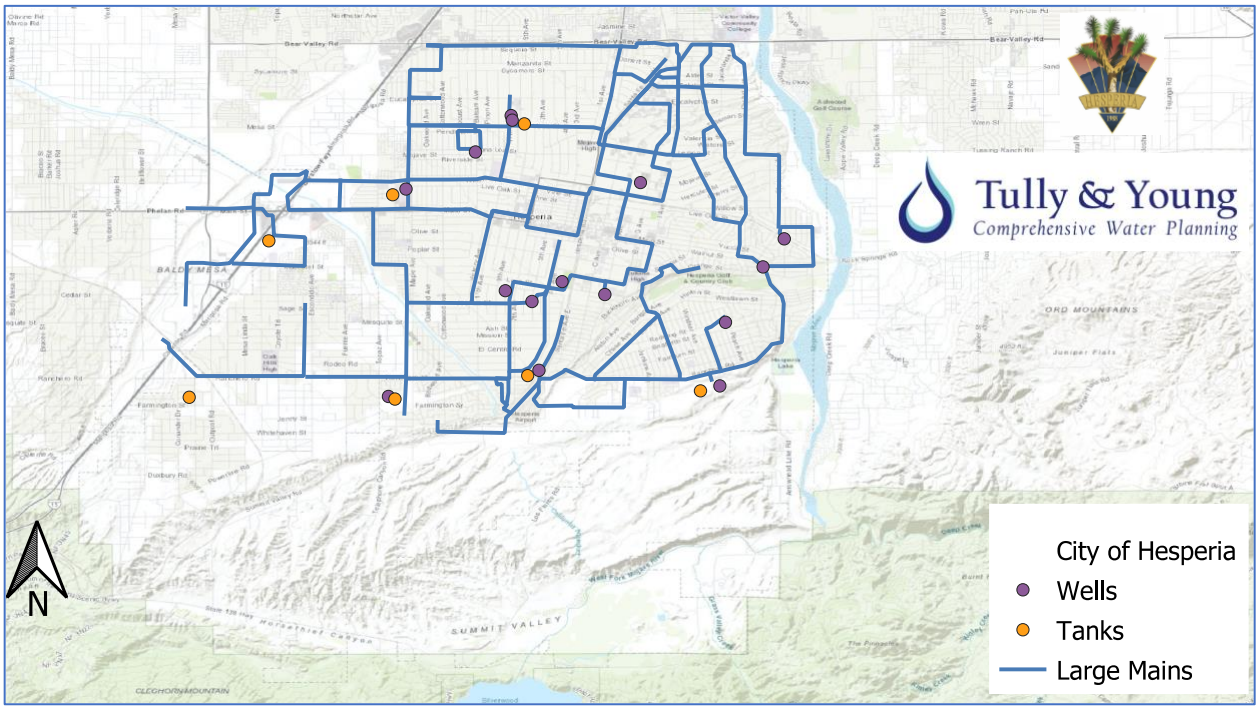
The District supplies its service area with managed groundwater derived from natural groundwater, imported water supplies, and return flow from pumped groundwater not consumptively used. Local groundwater supply is naturally recharged by surface water from the Mojave River and its watershed. Most of this water enters MWA area aquifers from the San Bernardino Mountains as rainfall and snowmelt. Local pumped groundwater accounts for nearly all of the water supplied to residential, commercial and agricultural users in the area. The District is a retail customer of Mojave Water Agency. Because the natural water supply has been in overdraft for decades, MWA relies on imported supplies to supplement the managed groundwater conditions. Details regarding the management of the

[19] U.S. Bureau of Labor Statistics

groundwater basin are included in Chapter 3 and in the Mojave Water Agency's recently adopted 2020 UWMP.[20]

MWA also operates the Regional Recharge and Recovery Project (R-Cubed), a conjunctive use project which stores SWP deliveries in recharge sites in the floodplain aquifer along the Mojave River in Hesperia and southern Apple Valley. MWA production wells recover and deliver the stored water through pipelines directly to water providers, including the District. The District's pressurized potable water distribution system is shown in Figure 2-6.

Figure 2-6: Potable Water System



2.6 Energy Intensity

Among the new statutory requirements for 2020 UMWPs is "Energy Intensity Reporting". An urban supplier shall include information it can readily obtain related to the energy used to produce, treat and deliver water.[21] "Energy Intensity" is defined as: total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery.

For purposes of the 2020 UWMP, the District uses the Total Utility Approach for reporting its energy intensity. This method sums the annual energy consumed for all water management processes, divided

[20] Mojave Water Agency's 2020 Wholesale UWMP was adopted by the Agency on May 27, 2021 and is available at: http://www.mojavewater.org/planning.html

[21] California Water Code Section 10631.2(a).

by total volume of water in acre-feet. These processes include extraction, diversion, conveyance, placement into storage, treatment, and distribution, as applicable. The total energy intensity is reported in Table 2-6.

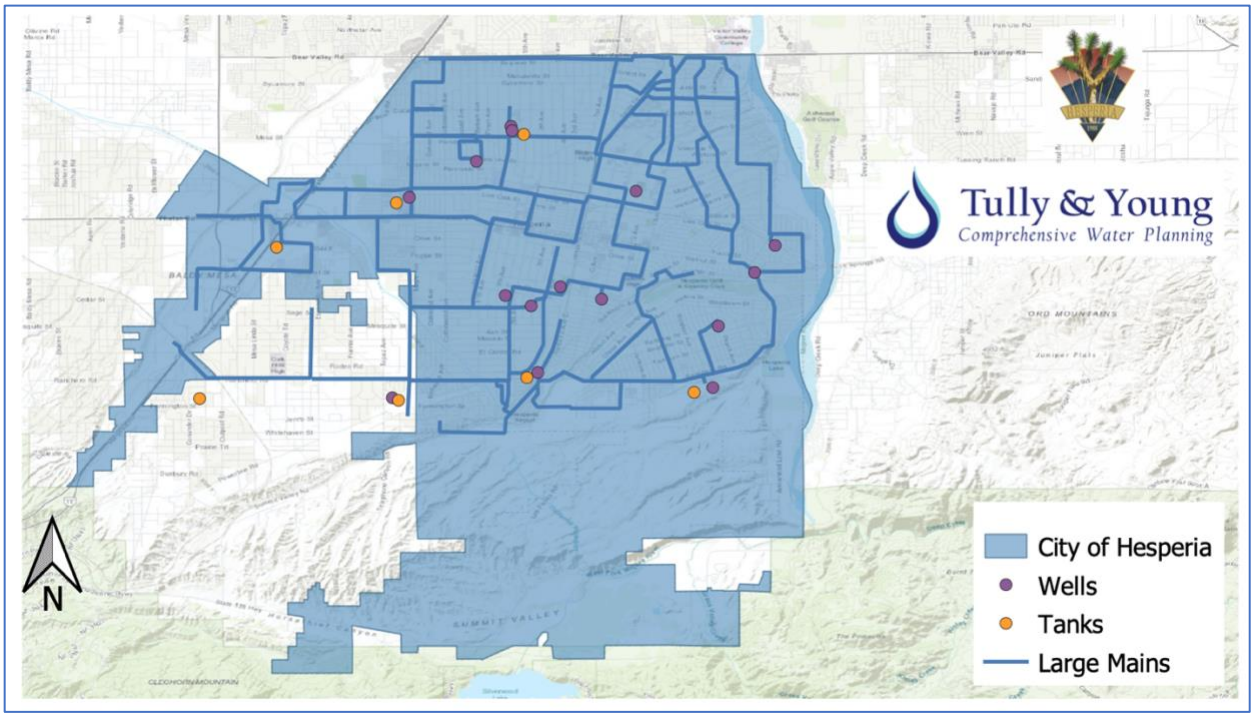
Table 2-6: Energy Intensity – Total Utility Approach for October 2019 through September 2020

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	14,043
Energy Consumed (kWh)	19,414,870
Energy Intensity (kWh/acre-foot)	1,383

Chapter 3
Water Supply

This chapter describes and quantifies the current and projected water supplies for Hesperia Water District (District). The District has historically relied upon groundwater supplies as its primary source of supply to meet demands within the District boundary. The District has also incorporated water supplies from Mojave Water Agency (MWA) as part of its groundwater management and water use activities. Last, the District has recently developed recycled water supplies that it plans to use in the future. As of December 2020, the District had not yet perfected its recycled water supplies. All of the District's water supply sources and quantities are described in the following sections. Figure 3-1 depicts the District's service area and main water system features.

Figure 3-1: Hesperia Water District's Service Area and Water System



3.1 Groundwater

Groundwater is the primary water supply source for the District. The District pumps groundwater from the Upper Mojave River Valley subbasin that is part of the groundwater basins covering the broader Mojave region. More specifically, the District pumps groundwater from the Alto Subarea of the Mojave Basin Area as defined in the Mojave Basin Adjudication[22] – the primary governance document for water extractions in the region. This section will describe the intricacies of the groundwater basins and management structure for the District's groundwater use.

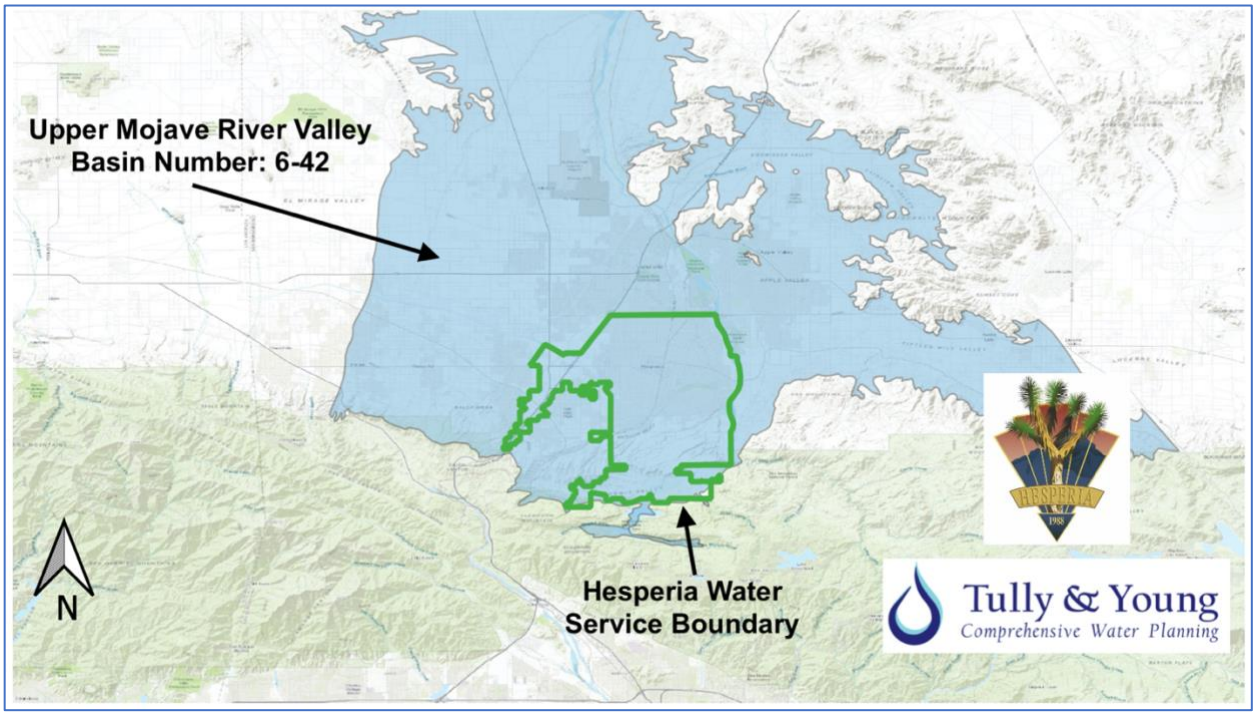
3.1.1 Mojave Groundwater Basin Description

The Mojave region overlies 36 groundwater basins and subbasins as defined by DWR Bulletin 118.[23] Collectively, these basins and subbasins are broadly grouped into two larger hydrogeologic 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 collectively as the Mojave River Groundwater Basin and the area is commonly referred to as the "Mojave Basin Area." The two remaining basins in the southeastern Mojave Region are generally referred to as the Morongo Basin/Johnson Valley Area or "Morongo Area" and 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. The surface water drainage of Lucerne Valley is in the Colorado River Hydrologic Region but is not included in with the "Morongo Basin Area," isolating this area due to the hydrogeologic conditions. The Upper Mojave River Valley Basin is shown in Figure 3-2 below and Hesperia's boundary overlying the Basin is highlighted in green.

[22] Mojave Basin Area Judgment, 1996. Judgment After Trial, City of Barstow et al. vs. City of Adelanto et al., Superior Court Case No 208568, Riverside County, CA.

[23] https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118

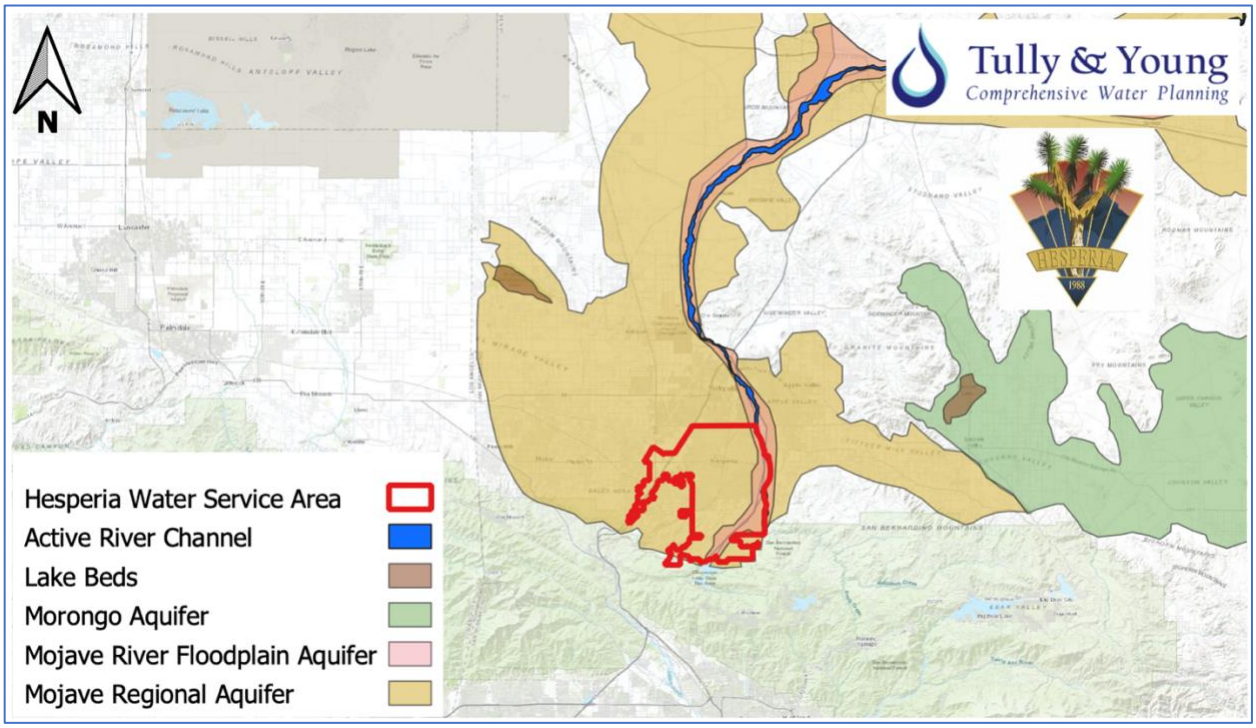
Figure 3-2: Groundwater Basins in Mojave Area



In the Mojave Basin Area, the Mojave River is the largest stream, formed by the confluence of two smaller streams - the West Fork Mojave River and Deep Creek. These streams originate in the San Bernardino Mountains. The Mojave Basin Area is essentially a closed basin meaning that very limited amounts of groundwater enters or exits the basin. However, within the basin, groundwater movement occurs between the different Subareas. Groundwater is recharged into the basin predominantly by infiltration of water from the Mojave River, which accounts for approximately 80 percent of the total basin natural recharge. Other sources of recharge include infiltration of storm runoff from the mountain, desert washes, and other activities such as irrigation return flows, wastewater discharge, and enhanced recharge with imported water. Groundwater is discharged from the Mojave Basin Area primarily by well pumping, evaporation through soil, transpiration by plants, seepage into dry lakes where accumulated water evaporates, and seepage into the Mojave River.

Recent investigations by MWA, USGS, and others have resulted in an improved understanding of the geology and hydrogeology of the Mojave Basin Area. Specifically, a more refined examination of the hydrostratigraphy has allowed for differentiation between the more permeable Floodplain Aquifer that has a limited extent along the Mojave River and the more extensive but less permeable Regional Aquifer. The aerial extent of the Floodplain and Regional aquifers is shown on Figure 3-3 along with Hesperia's service area boundary.

Figure 3-3: Floodplain and Aquifers in Mojave Basin Area



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 depositional environment. These highly permeable sediments can yield large quantities of water to wells. The Floodplain Aquifer is directly recharged by infiltration of surface flows from the Mojave River during the winter rainy season. Recharge is greater near the mountain front where surface flows are more frequent.

The Regional Aquifer underlies and surrounds the Floodplain Aquifer with interconnected alluvial fan and basin fill deposits that drain toward the Mojave River. The Regional Aquifer is generally recharged by groundwater movement from the Floodplain Aquifer to the Regional Aquifer, infiltration of runoff from the higher altitudes of the San Gabriel and San Bernardino Mountains, and smaller amounts of runoff from local intermittent streams and washes.

As shown in Figure 3-4, the Mojave Basin is subdivided into five subbasins per the adjudication: Alto, Baja, Centro, Este, and Oeste areas. The Alto, Centro, and Baja Subareas contain both the Floodplain Aquifer and the Regional Aquifer while Oeste and Este Subareas only contain the Regional Aquifer. Figure 3-5 shows a close up of the Hesperia jurisdictional area within the Alto subarea boundary of the Mojave Basin Adjudication. The significance of these subareas in the context of the Mojave Basin Adjudication are described more fully below.

Figure 3-4: Mojave Adjudication Subareas

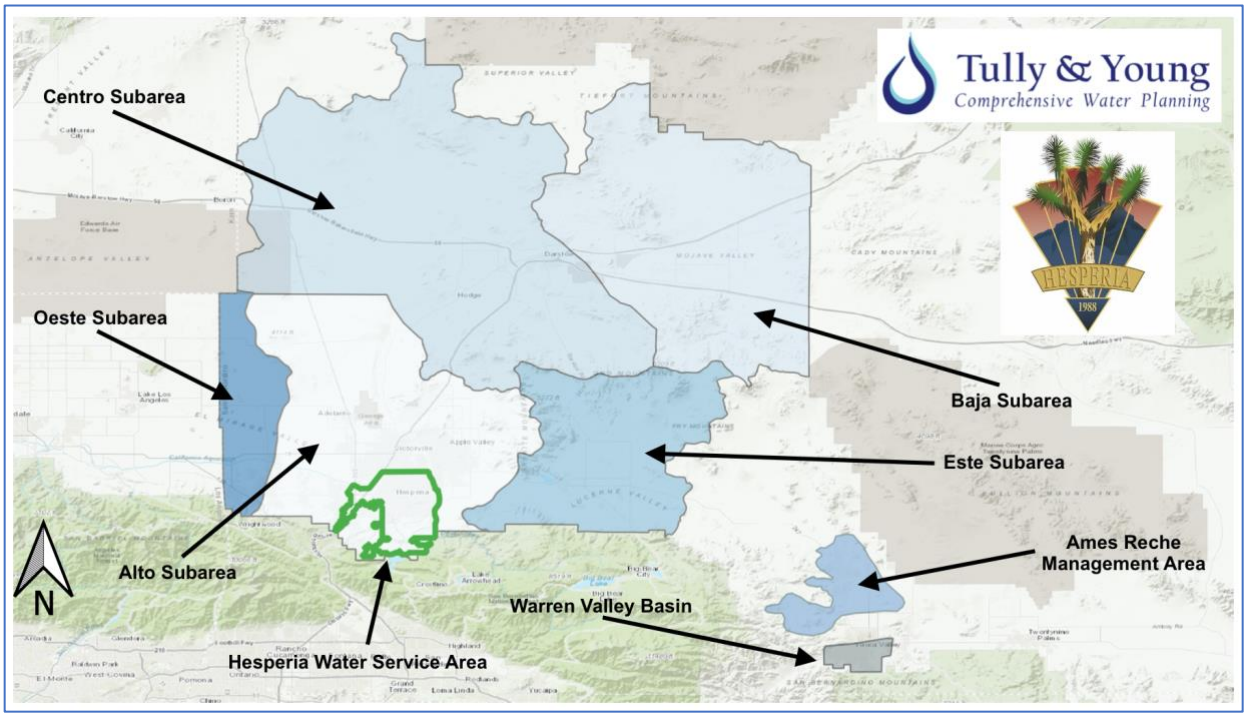
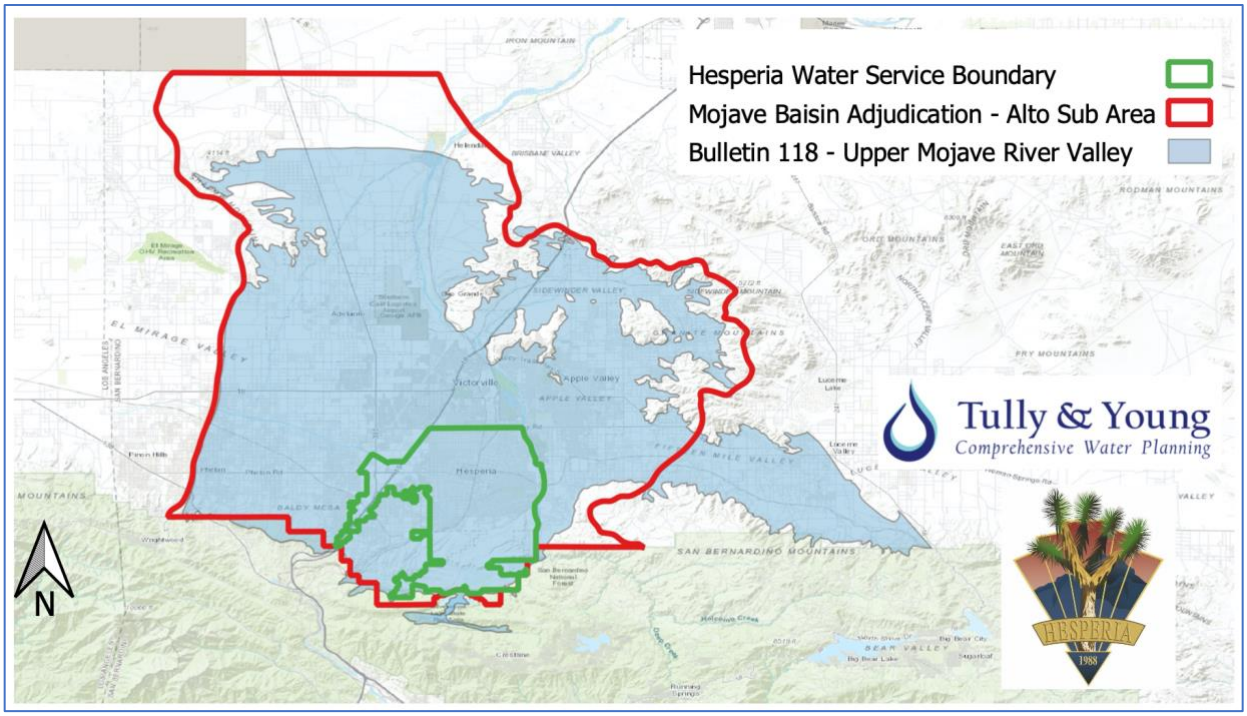


Figure 3-5: Hesperia Boundary within Alto Sub Area



3.1.2 Mojave Basin Area Adjudication

The Adjudication of the Mojave Basin Area was the legal process that allocated the right to produce water from the available natural water supply. Until adjudication proceedings were initiated and an independent Court issued the Mojave Basin Area Judgment, water production rights and obligations had never been defined in the Mojave Basin. Triggered by the rapid growth within the Mojave Water Agency service area, particularly in the Victor Valley area (the cities of Adelanto, Apple Valley, Hesperia, Victorville and surrounding communities), the City of Barstow and the Southern California Water Company filed a complaint in 1990 against upstream water users claiming that the increased withdrawals and lowering of groundwater levels reduced the amount of natural water available to downstream users. The complaint requested that 30,000 acre-feet of water be made available to the Barstow area annually and that MWA obtain supplemental water for use in other areas of MWA's service area.

The Mojave Water Agency filed a cross-complaint that declared that the native waters of the Mojave River and underlying groundwater were insufficient to meet the current and future demands made upon them. The cross-complaint asked the court to determine the water rights of all surface water and groundwater users within the Mojave Basin Area and the Lucerne and El Mirage Basins. During the following two years, negotiations resulted in a proposed Stipulated Judgment that: 1) formed a minimal class of producers using 10 acre-feet or less per year who were dismissed from the litigation, and 2) offered a physical solution (an equitable remedy designed to alleviate overdrafts in a basin, consistent with the constitutional mandate to prevent waste and unreasonable water use and to maximize the beneficial use of the limited resource) for water production by the remaining producers. The Riverside Superior Court (Court) bound the stipulating parties to the Stipulated Judgment in September 1993, and further bound the non-stipulating parties to the terms of the Stipulated Judgment in January 1996 following trial. The Court appointed the Mojave Water Agency as Watermaster of the Mojave Basin Area.

Some of the non-stipulating parties appealed the Judgment of the Superior Court and the Appellate Court issued a final decision in June 1998. The final decision of the Appellate Court held the stipulating parties to the terms of the Stipulated Judgment, but excluded the appealing parties, with the exception of one appellant who sought a revised water production right under the Judgment. MWA requested the California Supreme Court to review the Appellate Court's decision in July 1998. The Supreme Court affirmed the Appellate Court's decision in August 2000, regarding the Stipulated Judgment and the exclusion of the appealing parties from the Judgment but overturned the decision of the Appeals Court as to the one party seeking additional production rights. Since 1996, most of the appealing parties have stipulated to the Judgment.

For management purposes, the Mojave Basin Area is separated into five distinct "Subareas" (see Figure 3-3). The Subarea boundaries are generally based on hydrologic divisions defined in previous studies, evolving over time based on a combination of hydrologic, geologic, engineering and political considerations. Also, for the purposes of implementing the Judgment, the northern part of the Alto Subarea was defined as a sub-management unit – the Alto Transition Zone. This zone was created to acknowledge local geology and to better understand the water flow from Alto to Centro.

The Mojave Basin Judgment assigned Base Annual Production (BAP) rights to each producer using 10 acre-feet or more, based on historical production from 1986 to 1990. Parties to the 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 percent of the Production Safe Yield (PSY) as defined by the Judgment. The FPA is set as follows for each Subarea for water year 2020-2021:[24]

- Alto Subarea - 65 percent of BAP for agriculture and 55 percent of BAP for municipal and industrial
- Oeste Subarea - 65 percent of BAP
- Este Subarea - 70 percent of BAP
- Centro Subarea - 70 percent of BAP
- Baja Subarea – 25 percent 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 the 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.

Hesperia is located in the Alto subarea. Hesperia's BAP is 21,585 AFY.[25] The District is categorized as municipal and industrial and therefore is allowed an FPA of 55% of its BAP for the upcoming year. Thus, Hesperia's FPA for 2020-2021 is 11,871 AFY.[26]

3.1.3 Mojave Water Agency Role with Hesperia Water District Supplies

Mojave Water Agency is integral in the groundwater basin management in the Mojave Area. MWA acts as the Watermaster for managing supplies and the agency charged with importing water supplies to meet long-term basin sustainability objectives. In other words, MWA's actions to obtain and deliver imported supplies to the groundwater basins is one of the primary actions that improve regional groundwater management. The following sections provide context for MWA's water management activities as those activities impact Hesperia Water District.

[24] Watermaster Report at 37. Revised by Court Order on 6/16/20 revising Watermaster report to reduce Alto FAP and Court Order on 8/18/2020 revising Watermaster report to reduce Oeste FAP.
[25] Twenty-Sixth Annual Report of the Mojave Basin Area Watermaster for Water Year 2018-19, May 1, 2020 at Appendix H (hereafter "Watermaster Report").
[26] Watermaster Report at Appendix H.

MWA State Water Project Supplies

In June of 1963, MWA entered a State Water Project water service contract (SWP Contract) with the State of California Department of Water Resources (DWR). The SWP Contract authorized DWR to deliver SWP water to MWA under certain terms and conditions. MWA's original SWP Contract has numerous amendments that modify the original 1963 terms and conditions. The SWP Contract was "consolidated" into the "Consolidated Contract" to provide a more approachable reference document" for contract terms.[27]

MWA's water supply activities intersect with groundwater management in the MWA service area. MWA provides its surface water for groundwater recharge as part of the Mojave Basin Area Adjudication (Mojave Adjudication) and the Warren Basin Adjudication (Warren Adjudication). For both adjudications, MWA imports SWP water through its SWP Contract and delivers the water to designated recharge sites to meet the essential purposes of the adjudications. MWA also stores its water assets in the Mojave Basin and the Morongo Basin for future access and delivery for intended uses. The details of these groundwater management activities are described more fully elsewhere in this chapter.

MWA Regional Recharge and Recovery Project (R3 Project)

The Regional Recharge and Recovery Project, known as "R-Cubed," is a conjunctive use project that stores State Water Project (SWP) water underground in the local aquifer and later recover and distribute the water to local retail water purveyors. R-Cubed is part of a comprehensive solution developed by the MWA and the region's stakeholders to ensure a sustainable water supply for the region. The project delivers SWP water from the California Aqueduct to recharge sites in the floodplain aquifer along the Mojave River in Hesperia and southern Apple Valley. MWA-owned production wells on either side of the Mojave River located immediately downstream of the recharge area will then recover and deliver the stored water through pipelines directly to retail water agencies. Water providers that benefit from the R-Cubed Project include Liberty Utilities in Apple Valley, City of Adelanto, Hesperia Water District, San Bernardino County Service Area 64 and the Victorville Water District.

3.1.4 Adjudicated Groundwater Supplies

The groundwater system incorporates a number of sources that mix and blend to become the groundwater sources available in the Mojave Basin Area. Local supplies consisting of percolated natural supplies, wastewater imports, and return flows derived from wastewater and percolation make up the total groundwater supply. Percolated natural supplies are derived from stream flow in the drainage basins like the Mojave River as well as infiltrating natural precipitation. Wastewater imports come from Lake Arrowhead Community Services District, Big Bear Area Regional Wastewater Agency, and Crestline

[27] The Consolidated Contract has the following disclaimer: "This document integrates Mojave Water Agency's State Water Project water supply contract and amendments to the contract entered into since June 22, 1963. It is intended only to provide a convenient reference source, and the Department of Water Resources is unable to provide assurances that this integrated version accurately represents the original documents. For legal purposes, or when precise accuracy is required, users should direct their attention to original source documents rather than this integrated version."

Sanitation District also augment the supplies in the groundwater basin. Return flows are percolated supplies that are derived from non-consumptive uses including septic system percolation, applied irrigation water, treated wastewater, or returns through storm drains and other items. And last, MWA surface water imports are used to augment the groundwater supplies. All of these supplies together constitute the supplies available to meet demands in Hesperia's service area.

Hesperia's Free Production Allowance

Hesperia's Free Production Allowance (FPA) changes over time as the Mojave Basin Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the Mojave Basin. Hesperia's free production allowance has continued to be significantly reduced as a percentage of the Base Annual Production number. In 2020-21 water year, the FPA is 55% of BAP. Hesperia's FPA is tracked through two entries in the Watermaster's report: "Hesperia Water District" and "Hesperia, City of." Hesperia Water District's BAP is 14,171 acre-feet per year and the City of Hesperia's BAP is 6,736 acre-feet per year. The combined BAP for these entities 20,907 AFY.

Importantly, the City of Hesperia's BAP and the Hesperia Water District's BAP are still separated in the documentation. As such, we have aggregated the supplies to simplify the analysis of the available assets. Thus, the current 55% FPA of these sources is 11,499 acre-feet.[28] Hesperia's total FPA for the last five years is shown in Table 3-1.

Table 3-1: Last Five Years of Hesperia FPA Supply (AFY)[29]

Year	Percent FPA	Hesperia FPA Supply
2016	60%	12,385
2017	60%	12,391
2018	60%	12,545
2019	55%	11,500
2020	55%	11,500

The 55% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the District's projected FPA in a Normal Year, Single Dry Year, and Five Consecutive Dry years through 2025 is set at 55% and is shown in Table 3-2.

[28] This number has been rounded for simplicity of management. The actual number is 11,498.85 acre-feet

[29] The District's reporting data rounded the 11,499 to 11,500 in 2019 and 2020.

Table 3-2: Projected Mojave Adjudication FPA for District through 2025 (AFY)

Year		Projected Hesperia Combined FPA
Normal		11,499
Single Dry		11,499
Multi-Year Drought	2021 (1st year)	11,499
	2022 (2nd year)	11,499
	2023 (3rd year)	11,499
	2024 (4th year)	11,499
	2025 (5th year)	11,499

Although the Production Safe Yield of the Mojave Basin appears to be stabilizing in the Alto subregion, out of an abundance of caution we have reduced the future FPA to 50% in order to address long-term water supply planning options. Table 3-3 shows the District's projected FPA in a Normal Year, Single Dry Year, and Five Consecutive Dry Years from 2025 through 2045 at 50%.

Table 3-3: Projected Mojave Adjudication FPA for District through 2045 (AFY)

Projected Hesperia Combined FPA		2025	2030	2035	2040	2045
Normal		10,454	10,454	10,454	10,454	10,454
Single Dry Year		10,454	10,454	10,454	10,454	10,454
Multi-Year Drought	Year 1	10,454	10,454	10,454	10,454	10,454
	Year 2	10,454	10,454	10,454	10,454	10,454
	Year 3	10,454	10,454	10,454	10,454	10,454
	Year 4	10,454	10,454	10,454	10,454	10,454
	Year 5	10,454	10,454	10,454	10,454	10,454

3.1.5 Carryover Water Supplies

Hesperia does hold some carryover supplies as part of its overall water supply management in the Alto Subarea. Specifically, Hesperia's current carryover supply totals 4,402 acre-feet.[30] Although these supplies may be available to meet Hesperia's water needs, we do not account for these supplies in the availability analysis in this Chapter in order to preserve these supplies for purposes of meeting emergency supply conditions.

3.1.6 Replacement and Make-up Water Supplies

Hesperia has taken actions to augment its water supplies through the Watermaster's water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed

[30] Watermaster Report at Appendix H.

Hesperia's annual FPA from the Alto Subbasin. Table 3-4 shows the last five years of replacement and make-up water supplies provided to Hesperia.

Table 3-4: Last Five Years of Replacement and Make-up Water Supplies (AFY)

Year	Water Acquisitions
2016	4,982
2017	5,287
2018	5,910
2019	4,742
2020	6,162

Table 3-5 depicts Hesperia's projected replacement water supplies that will be made available for District's uses through 2025.

Table 3-5: Projected Water Supply Acquisitions through 2025 (AFY)

Year		Projected Water Acquisitions
Normal		2,543
Single Dry		2,785
Multi-Year Drought	2021 (1st year)	2,785
	2022 (2nd year)	3,028
	2023 (3rd year)	3,270
	2024 (4th year)	3,512
	2025 (5th year)	3,754

Table 3-6 shows the projected replacement supplies available to Hesperia through 2045 in Normal, Single Dry, and Five Consecutive Dry Years.

Table 3-6: Projected Water Supply Acquisitions through 2045 (AFY)

Projected Water Acquisitions		2025	2030	2035	2040	2045
Normal		4,800	5,833	6,532	7,282	7,963
Single Dry Year		4,896	5,949	6,649	7,399	8,080
Multi-Year Drought	Year 1	4,896	5,949	6,649	7,399	8,080
	Year 2	4,896	5,949	6,649	7,399	8,080
	Year 3	4,896	5,949	6,649	7,399	8,080
	Year 4	4,896	5,949	6,649	7,399	8,080
	Year 5	4,896	5,949	6,649	7,399	8,080

3.2 Groundwater Quality

There have been numerous regional efforts to increase the understanding of the water quantity and quality of the regional groundwater basins. For instance, Mojave Water Agency established a Cooperative Water Resources Program (CWRP) with the USGS to maintain a monitoring network that currently includes approximately 850 monitoring wells. 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 other studies have been conducted by various agencies to characterize groundwater quality in the Mojave region. The most recent study was the Salt and Nutrient Management Plan (SNMP) completed in 2015.[31] 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 flowpaths 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 and arsenic, in the Mojave Desert region.

The 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 SNMP, TDS and nitrate were analyzed as appropriate indicator constituents of salts and nutrients. Table 3-7 shows the key SNMP findings in the Alto Subregion.

Table 3-7: Average Existing TDS and Nitrate Concentrations by in the Alto Subregion

SNMP Analysis Subregion	Average Existing TDS Concentration (mg/L)	Average Existing Nitrate-NO3 Concentration (mg/L)
MOJAVE RIVER BASIN		
Alto Transition Zone - Floodplain (Helendale)	915	10
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

The drinking water quality of the Hesperia Water District must comply with the Safe Drinking Water Act (SDWA), which is composed of primary and secondary drinking water standards. Compliance with primary drinking water standards is regulated by the U.S. Environmental Protection Agency (EPA).

[31] All of the relevant water quality studies are available at http://www.mojavewater.org/regional-studies.html. (Hereafter "2015 Salt and Nutrient Plan").

Compliance with both primary and secondary standards is required by the State Water Resources Control Board, Division of Drinking Water (DDW).

Hesperia continually monitors the water quality within its water system and samples water at the sources as well as within the distribution system to ensure compliance with regulatory standards. Table 3-8 below shows the most recent water quality report issued by Hesperia demonstrating compliance with water quality regulatory standards from Hesperia Wells.

Table 3-8: Hesperia Potable Water Quality

Water Quality Standards	Goal Level	Max Level	Range	Average
Primary Standards				
Arsenic (ppb)	0.004	10	ND-3.3	0.38
Chromium (ppb)	100	50	ND-18	3.49
Fluoride (ppm)	1	2	ND-.71	0.18
Nitrate (ppm)	10	10	ND-2.8	1
Trihalomethanes (ppb)	n/a	80	ND	ND
Haloacetic Acid (ppb)	0.43	60	ND	ND
Chlorine (ppm)	4	4	.2-.3	0.25
Lead (ppb)	ND	15	.2	ND
Copper (ppm)	0.13	1.3	.3	0.13
Secondary Standards				
Chloride (ppm)	n/a	500	3.1-38	13.89
E.C (uhmo/cm)	n/a	1600	150-360	234
Sulfate (ppm)	n/a	500	1.7-26	10.93
Turbidity (NTU)	n/a	5	ND-.6	0.13
Odor (tons)	n/a	3	1-2	1.2
TDS (ppm)	n/a	1000	84-250	144.6
Federal Unregulated Contaminates				
Alkalinity (ppm)	n/a	n/a	75-110	89.12
Bicarbonate (ppm)	n/a	n/a	52-180	97.5
Calcium (ppm)	n/a	n/a	2-42	22.48
Hardness (ppm)	n/a	n/a	5-140	69.13
Magnesium (ppm)	n/a	n/a	ND-8	3.4
pH (units)	n/a	n/a	7.4-9.6	7.58
Potassium (ppm)	n/a	n/a	ND-10.2	1.95
Sodium (ppm)	n/a	n/a	ND-42	24.5

3.3 Recycled Water Supplies

The Victor Valley Wastewater Reclamation Authority is a Joint Powers Authority that provides treatment and distribution of recycled water for its member entities, which include the Town of Apple Valley, the cities of Hesperia and Victorville, and San Bernardino County Services Areas 42 (Oro Grande) and 64 (Spring Valley Lake). This section identifies existing and projected wastewater flows by the VVWRA within Hesperia Water District service area, and the planned opportunities for the use of recycled water.

A portion of Hesperia's wastewater is treated by the VVWRA, which shares a common interest in maximizing the beneficial uses of treated wastewater. The wastewater not treated by VVWRA is treated by individual septic systems. Since the City of Hesperia is also the local planning agency with an adopted general land use plan, coordination is necessary between the City and District so the location of future growth is known and accommodations for wastewater are provided.

The City worked in cooperation with VVWRA to prepare a 2015 update to VVWRA Wastewater Master Plan that analyzes the sewer collection system, identifies system improvements necessary to address the system deficiencies, and provides cost estimates and a schedule of implementation for the proposed capital improvement projects. The City does not currently have a recycled water system, but has developed a 2015 Recycled Water Master Plan (RWMP) that serves to identify opportunities to implement a recycled water program within Hesperia's service area.

The City owns, operates, and maintains a wastewater collection system. The City's sewer system connects to VVWRA's 3-mile interceptor that runs along the northeast boundary of the City, and ultimately flows to the RWWTP that is owned and operated by the VVWRA. VVWRA was originally formed to meet the requirements of the Federal Clean Water Act and provide wastewater treatment for the growing area. According to the City's 2015 WWMP, approximately 11 percent of the geographic area studied in the Master Plan is currently served by the City's sewers which ultimately flow to the VVWRA RWWTP. The remaining area is either undeveloped or served by on-site systems (septic tanks). Based upon the Wastewater Master Plan, the wastewater flow volume from the service area is 2.0 mgd or 2,240 AFY.

The City of Hesperia has future plans to expand its sewer collection system and, in conjunction with VVWRA, construct sub-regional wastewater treatment plants to treat the City's future wastewater flows and create a supply source for its planned recycled water system. Currently none of the wastewater is treated or disposed of within the District service area. All of the flows are treated and disposed of at the VVWRA's RWWTP.

The District does not currently have a recycled water system. The City and VVWRA have constructed a "sub-regional" wastewater treatment plant with an initial capacity of 1.0 mgd that is expandable to 4.0 mgd. This facility would result in a source of 1,000 to 5,000 AFY of recycled water available for use. The 2015 RWMP identified 38 potential recycled water customers through the year 2040, along with their estimated demand for recycled water. For the UWMP planning horizon of 2045, the RWMP projected an average daily recycled water demand of 2.96 mgd (4,000 AFY) and an average daily supply of 4.46 mgd (6,000 AFY). The RWMP does not include recycled water supplies and demands that may occur under the Tapestry Project. Recycled water use could be incorporated throughout the Tapestry Project, and according to the Water Supply Assessment completed for the project, approximately 40% of the project water demands would be met with recycled water. As such, should significant portions of the project be built during the 25-year planning horizon examined in this UWMP, the recycled water deliveries would be higher than what has been currently been included.

The projected recycled water uses for this 2020 UWMP are conservative in comparison to the projections included in both the RWMP and the Tapestry Project Water Supply Reliability Report. Hesperia's 2015 UWMP anticipated that in 2020 there would be 560 AF of recycled water use. The

actual recycled water use was zero, because permitting for the recycled water had not been completed. Table 3-9 shows the projected recycled water supplies 2021-2025 in a Normal, Single Dry, and Five Consecutive Dry Years with a minimal amount of recycled water available in 2025. Table 3-10 shows the projected recycled water supplies from 2025-2045 in Normal, Single Dry, and Five Consecutive Dry Years.

Table 3-9: Projected Recycled Water Supplies 2021-2025 (AFY)

Year		Recycled Supplies
Normal		0
Single Dry		0
Multi-Year Drought	2021 (1st year)	0
	2022 (2nd year)	0
	2023 (3rd year)	0
	2024 (4th year)	0
	2025 (5th year)	500

Table 3-10: Projected Recycled Water Supplies 2025-2045 (AFY)

Recycled Supplies		2025	2030	2035	2040	2045
Normal		500	1,000	1,500	2,000	2,500
Single Dry Year		500	1,000	1,500	2,000	2,500
Multi-Year Drought	Year 1	500	1,000	1,500	2,000	2,500
	Year 2	500	1,000	1,500	2,000	2,500
	Year 3	500	1,000	1,500	2,000	2,500
	Year 4	500	1,000	1,500	2,000	2,500
	Year 5	500	1,000	1,500	2,000	2,500

As discussed in previous sections, recycled water is not currently available for use by customers within the District service area and this UWMP does not account for the availability of the recycled water in addressing overall water supplies for the District. However, the water supplies identified in this section may replace or supplement the future water supply acquisitions that are noted in Section 3.1.6. The commingling of various water supply sources synthesizes the flexible management opportunities that the District anticipates. For instance, the City's RWMP identifies potential recycled water users and their demand schedules, in addition to pressure and flow requirements, to best match the system to the needs of potential customers. The implementation of these potential schedules have legal, technical, political, and economic considerations that may require further assessment in order to improve the use of recycled water in the City's service area.

3.4 Desalination Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). At this time, no desalination opportunities are practical or economically feasible for Hesperia, and Hesperia has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan.

3.5 Water Transfers and Exchanges

In addition to its groundwater resources and future alternative supplies, like recycled water, the District continues to explore opportunities to purchase water supplies from other water agencies and sources. Transfers, exchanges, and groundwater banking programs are important opportunities to investigate in order to enhance the long-term reliability of the District's supplies currently available to meet the demands.

The District has executed numerous permanent transfers of groundwater Base Annual Production (BAP) rights from other parties in the Alto subarea to increase the District's available groundwater supplies. These permanent transfers augment the BAP available to the District in any given year. The District continues to pursue these types of permanent transfers and anticipates augmenting its BAP over time.

The District regularly executes temporary water transfers of available Free Production Allowance (FPA) to augment its baseline pumping. In some instances, these additional temporary transfers are executed by the District in direct transactions with interested parties. In other instances, the FPA transfers may arise through replacement and make up water obligations or even as cross-basin transactions from the Centro Subbasin. These supplies are also incorporated into the relevant transactions that make up the District's annual water supplies. The District anticipates engaging in further water transfer and exchange programs to augment its short-term and long-term water supplies.

3.6 Climate Change

While the California Water Code 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. Hesperia's primary climate change concern involves its capability of MWA providing imported SWP water for groundwater recharge. As shown in MWA's 2020 UWMP, MWA uses DWR's Delivery Capability Report (DCR) to assess current and future reliability of SWP Contract Table A supplies. The DCR modified the normal year reliability of Table A Contract Allocations from 62% to 58% by incorporating, among other things, climate change. In addition, the DCR used a 7% supply reliability number for a single dry year. MWA took a more conservative approach to short-term and long-term reliability to incorporate potential unforeseen conditions attributable to climatic variability. Moreover, MWA chose to taper its long-term SWP projections to a 52% reliability by 2040 to account for climatic variability. Last, MWA used the driest year on record with the lowest Table A percentage allocation of 5% to characterize both the single dry year supply availability as well as two of the five years in the Five Consecutive Dry Year drought scenario. Accordingly, MWA's conservative approach to capture SWP supply availability captures future unpredictable climatological issues that may impact water supply reliability beyond the considerations reflected by DWR in its 2020 DCR. The result did not show long-term impacts to managed groundwater in the Mojave Basin Adjudication area.

3.7 Supply Summary

All of Hesperia's water supplies are aggregated into the District's historical total managed groundwater system. The managed groundwater consists of supplies provided through the Adjudication, make-up and replacement supplies, as well as transfers and exchanges. Total managed groundwater pumping from 2016 through 2020 is shown in Table 3-11 below.

Table 3-11: Hesperia Managed Groundwater Pumping 2016-2020 (AFY)

Year	Groundwater Pumping
2016	13,615
2017	13,832
2018	14,046
2019	13,224
2020	14,317

The District's projected managed groundwater pumping from 2021-2025 is shown in Table 3-12.

Table 3-12: Hesperia Projected Managed Groundwater Supply 2021-2025 (AFY) [32]

Year		Managed Groundwater Pumping
Normal		14,560
Single Dry		14,560
Multi-Year Drought	2021 (1st year)	14,560
	2022 (2nd year)	14,530
	2023 (3rd year)	14,770
	2024 (4th year)	15,010
	2025 (5th year)	15,250

The District's projected managed groundwater pumping from 2025-2045 is shown in Table 3-13.

Table 3-13: Hesperia Projected Managed Groundwater Supply 2025-2045 (AFY)

Managed Groundwater Pumping		2025	2030	2035	2040	2045
Normal		15,250	16,290	16,990	17,740	18,420
Single Dry Year		15,250	16,290	16,990	17,740	18,420
Multi-Year Drought	Year 1	15,250	16,290	16,990	17,740	18,420
	Year 2	15,250	16,290	16,990	17,740	18,420
	Year 3	15,250	16,290	16,990	17,740	18,420
	Year 4	15,250	16,290	16,990	17,740	18,420
	Year 5	15,250	16,290	16,990	17,740	18,420

[32] The numbers in this Tables 3-12 and 3-13 have been rounded to reflect congruency with projected demands in Chapter 4.

Chapter 4
Water Use

Understanding water use characteristics is essential to enable Hesperia Water District to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This chapter characterizes the District's retail customer water needs – current and forecast over the next few decades. Characteristics such as how water uses vary among different land use classifications, throughout the year, and under differing hydrologic conditions, all help with 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, changing climate conditions and trends in customer water use behaviors. A thorough analysis examines each water use sector for a variety of factors, then aggregates the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District's water supplies (see Chapter 3) to assess long-term water system reliability (see Chapter 5).

Several legislative changes were enacted since the District completed its 2015 UWMP. The new requirements must be addressed in the District's 2020 UWMP in addition to completing requirements from the prior statutory language. While there have been many changes, the critically important items the District must address are highlighted below:

- Provide quantified distribution system losses for each of the 5 preceding years. [CWC 10631(d)(3)(A) and (C)]
- Include a drought risk assessment (DRA) for a drought period that lasts five consecutive water years, starting from the year following the assessment, which would be 2021 for this round of UWMPs. The DRA requires a comparison of water supplies with total projected water use. Therefore, the District must produce a projected water use for the years 2021 through 2025 as part of the water use projections up to 2045. [CWC 10635(b)]
- Conduct an annual water supply and demand assessment on or before July 1 of each year (following adoption of its 2020 UWMP) where the annual assessment includes current year unconstrained demand. The District will consider "unconstrained demand" as the expected water use in the upcoming year, based on recent water use, before any projected response actions it may trigger under its Water Shortage Contingency Plan (see Chapter 6). [CWC 10632.1]

This section is organized as follows:

- Current Customer Water Use – This subsection presents data reflecting the District's residential and non-residential customers for 2016 through 2019 as well as the actual 2020 water use and presents the District's distribution system losses for this same period.
- Compliance with 2020 Urban Water Use Target – This subsection documents the derivation of the 2020 GPCD value and comparison to the 2020 GPCD target.
- Demand Management Measures – This subsection provides a narrative description of each water demand management measure implemented by the District over the past five years, and describes the District's planned measures for the foreseeable future.
- 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, including land-use classifications, unit demand factors, 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 5-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 California Water Code 10631.1.

4.1 Current Customer Water Use

As described in Chapter 2, the District has been serving potable water to about 27,000 customer connections for the past several years. Under normal operations, all of the water supplied to its customers is drawn from the District's multiple wells (see Chapter 3) and delivered through an array of pipelines and turnouts (see Figure 2-6). The current customers, their recent and expected water use trends, and the District's on-going demand management efforts targeting these customers provide a foundational basis for this UWMP's water use forecast to 2045.

Furthermore, the actual water use in 2020 is the basis for determining the District's compliance with its 2020 gallons per capita per day (GPCD) target established in its 2015 UWMP. This subsection presents this relevant information.

4.1.1 Customer Water Use: 2016 to 2019

Recent customer water use can help the District understand water use trends, effects of 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. Water Code Section 10631(d)(1) also requires the District to quantify past customer water use.[33]

[33] California Water Code Section 10631(d)(1)

Table 4-1 presents the District's past customer potable water use by customer classification for 2016 through 2019. The District records potable water use within four primary categories:

- Single-family residential
- Multi-family residential (including mobile homes)
- Commercial and Institutional
- Landscape Irrigation
- Other (e.g. Fire suppression, street cleaning, line flushing, construction meters, temporary meters)

Table 4-1: Potable Customer Use: 2016 to 2019 (values in acre-feet)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2016	708	463	607	562	812	719	1,172	973	1,206	913	911	586	9,632
	2017	684	409	538	487	850	748	1,183	930	1,236	863	910	650	9,487
	2018	765	513	651	483	809	792	1,169	941	1,263	891	922	605	9,802
	2019	665	437	559	416	763	724	980	924	1,241	853	952	600	9,115
Multi-Family Residential	2016	50	14	43	18	72	37	74	64	75	58	84	50	639
	2017	84	54	70	57	87	90	110	84	123	83	95	69	1,006
	2018	86	59	79	63	86	85	112	94	123	92	98	61	1,038
	2019	79	57	67	54	80	86	92	93	124	90	99	62	982
Commercial Institutional	2016	106	59	115	83	163	112	256	152	247	170	189	87	1,739
	2017	119	57	100	81	186	155	243	173	257	142	183	100	1,796
	2018	144	71	123	81	173	140	244	175	266	171	185	78	1,851
	2019	118	54	101	66	154	130	213	168	270	148	211	79	1,711
Landscape Irrigation	2016	23	1	15	2	38	5	64	6	75	7	53	3	292
	2017	25	1	16	2	54	15	76	21	88	7	59	5	368
	2018	38	3	27	3	44	6	88	7	94	7	58	3	378
	2019	26	1	10	1	43	4	72	6	91	6	54	3	316
Other	2016	0	2	3	2	6	6	3	10	8	9	39	10	100
	2017	3	4	5	6	6	4	4	4	4	4	3	6	55
	2018	2	2	3	5	8	6	2	15	7	4	0	0	55
	2019	1	1	0	7	2	7	31	0	8	32	2	1	93
Total Metered Deliveries	2016	888	539	781	668	1,091	879	1,570	1,205	1,610	1,157	1,277	736	12,403
	2017	915	525	729	633	1,183	1,012	1,616	1,213	1,707	1,098	1,250	830	12,712
	2018	1,034	648	883	635	1,120	1,029	1,615	1,232	1,753	1,165	1,263	747	13,124
	2019	889	550	737	544	1,042	951	1,387	1,191	1,735	1,128	1,317	744	12,215

The District also recorded industrial use in 2016, but subsequently do not separate this category from the Commercial/Institutional category in later years.

This historic data provides insight into the relative ratio of differing customer classifications to each other as well as seasonal variations. For instance, commercial demands remain fairly constant month to month and generally year to year, with the values reflecting the timing of meter reads. In contrast,

single family residential use is higher in the late summer months compared to the winter, when cooler temperatures result in lower water needs. Generally, water demand is higher across customer classes in the summer and early fall months due to the service area's desert environment and extreme summer heat.

The single-family residential classification also illustrates two important characteristics of the District's water service: (1) it represents about 75% of the District's annual demand, and (2) it has late summer demands that are twice the monthly volume needed in winter months. Combined with the multi-family residential use, overall residential use represents over 80% of the District's potable water service.

The potable use seasonal variations provides the District with additional insight necessary for assessing the seasonal reliability of its water supplies and developing and quantifying successful water management approaches and water shortage contingency response actions.

4.1.2 Customer Use in 2020

Customers served by the District are metered at their connection to the District's potable water distribution system. These metered values are collected periodically for each customer account and summarized into the District's annual reporting to the SWRCB Division of Drinking Water and to DWR.[34] The 2020 actual customer use presented in Table 4-2 represents the summarized delivery to all the District's potable customers. It does not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the District's efforts to treat, store and route the water throughout the extensive distribution system to each customer's connection.

Further, comparing to the total values in Table 4-1, the 2020 customer use in each sector is within the ranges seen by the District in the 2016 through 2019 average use and actually lower than use in 2018.

Table 4-2: Potable Customer Water Use: 2020 Actual Use (values in acre-feet)

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-family Residential	633	464	627	463	760	739	1,215	1,025	1,282	956	1,018	629	9,812
Multi-family Residential	78	58	77	58	88	75	113	114	114	102	105	71	1,052
Commercial/ Institutional	115	62	122	63	111	107	237	160	252	137	192	71	1,629
Landscape Irrigation	10	1	20	2	32	6	86	36	103	29	65	14	403
Other	1	7	0	0	5	3	10	4	5	5	3	43	87
Subtotal	836	591	846	587	996	931	1,660	1,340	1,755	1,229	1,383	828	12,982

[34] The annual SWRCB report is referred to as the 'electronic Annual Report' or eAR, and the annual DWR report is known as the Public Water System Statistics report.

4.1.3 Existing Distribution System Losses

Distribution system water losses (also known as "apparent or 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) (Title 23 California Code of Regulations Section 638.1 et seq.). An electronic copy of the audit in Excel format is to be submitted to the Department by October 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to Code of Regulations Section 638.5. The District's system loss for the last 5 years are shown in Table 4-3, with the 2016 through 2019 values reflecting reported data to DWR consistent with the AWWA method and the 2020 value based on reported deliveries and system production.

Table 4-3: Distribution System Loss: 2016 through 2020

2016	2017	2018	2019	2020
6.2%	5.6%	4.8%	4.3%	9.8%

As can be anticipated given 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.

4.2 Compliance with 2020 Urban Water Use Target

Pursuant to California Water Code Section 10608.24(b),[35] the District must demonstrate its 2020 water use met the GPCD target adopted in its 2015 UWMP. As set forth in the 2015 UWMP, the District's 2020 GPCD target was established as 184 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 California Water Code Section 10608.20(b). The District's 2020 actual GPCD must use the same methodology to derive "gross water use" for 2020, then divide by the estimated 2020 population presented in Chapter 2.

As presented in the District's 2015 UWMP, gross water was determined to be the total water production as measured and reported based upon well production records, which for 2020 was reported to the SWRCB as 14,043 acre-feet. As shown in Table 2-4, the District's population in 2020 was estimated to be 97,380. This results in a calculated 2020 compliance value of 129 GPCD, which is less than the District's established target. Thus, the District is in compliance with CWC Section 10608.24(b). The important compliance calculation parameters are summarized in Table 4-4.

[35] 10608.24. (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

Table 4-4: Demonstration of Compliance with 2020 GPCD Target

2020 Volume into Distribution System =	14,043	acre-feet
Allowable Adjustments	0	acre-feet
2020 Gross Water Use =	14,043	acre-feet
2020 Population =	97,380	people
2020 Actual GPCD =	129	
2020 Target GPCD =	184	
Compliance Achieved?	Yes	

4.3 Demand Management Measures

Pursuant to California Water Code Section 10631(e), the District needs to provide a narrative discussion of the water demand management measures it has implemented, is currently implementing, and plans to implement. The historic and on-going measures can help the District understand the effectiveness on managing existing customer uses so as to help guide refinements, emphasis or augmentation that will help position the District to best meet its to-be-established water use objective.[36]

To date, the District's overall water management efforts have resulted in significant and long-term water conservation savings. During the 2013 to 2015 drought, the District's residents showed great ability to temporarily reduce water usage and some of the efforts have had long-term viability, providing on-going savings into the future. The District is a member of the regional water conservation organization, Alliance for Water Awareness and Conservation (AWAC)[37]. AWAC is a group of more than 20 water agencies in the Mojave Water Agency service area focused on achieving water conservation goals such as GPCD targets and public education on water conservation. The District also partners with MWA to implement water conservation programs, along with the State's Save Our Water program.[38]

The District's demand management measures are highlighted in this subsection.

4.3.1 Foundational Demand Management Measures

This subsection describes the foundational demand management measures (DMMs) that underpin the District's operations and customer deliveries. These particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs.

Water Waste Prevention Ordinances

Wasteful water is prohibited in the District's service area as recognized by City Ordinance No. 2011-06, which updated Section 14.04.160 of the City's Municipal Code. Section 14.04.170 details the City's

[36] Beginning in 2023, all urban water suppliers will be required to begin reporting their use compared to a "Water Use Objective" that is being established pursuant to the recently enacted California Water Code Section 10609.20.
[37] http://www.hdawac.org/
[38] https://saveourwater.com/

water conservation emergency plan.[39] Emergency orders, such as restrictions put in place by the Governor in 2017, work in conjunction with, or supersede parts of the municipal code. However, the fundamental water waste prohibitions align with state-mandated requirements.

Metering

All water service connections in the District's service area are metered. The District has also been upgrading old meters with Advanced Metering Infrastructure (AMI) meters so that it can more accurately detect areas of excessive water consumption. All customers are expected to have smart meters by 2023.

Conservation Pricing

The District's water rate structure is set to generate the necessary funds to efficiently operate the District's water system and maintain reliable water supplies. The District uses a variable base rate which is different for customer depending on the size of pipe, water meter, peak use or other factors. It also uses a 3-tier variable usage rate for single-family residential customers which increases as water use increases. Multi-family residential, public building, industrial, irrigation customers have block rates based on consumption. The fee structure will continue to help customers manage their water use in an efficient manner. Under normal water supply conditions, this rate structure has effectively reduced customer water use.

Public Education and Outreach

The District regularly engages its customer base with a number of conservation and demand management outreach programs. Promoting water wise activities, watering schedules, and educational programs are part of the District's regular outreach efforts, which include a conservation web page providing resources to the community for conserving water.[40] The District provides a variety of grade-appropriate curriculum and tours, participates in educational events and supplies materials to teachers of all grade levels. As previously mentioned, the District is also an active participant with the MWA and the AWAC in regional conservation programs.

Programs to Assess and Manage Distribution System Real Loss

The District's water loss assessment and management program includes annual water audits and an ongoing leak detection and repair. This includes an ongoing meter calibration and replacement program for all production and distribution meters. The District's activities include:

- Daily inspections of water wells and pumping equipment
- Weekly inspections of water tanks and exercising critical system valves
- Annual calibration of its production meters
- Annual water audit and water balance

[39] Full text of the Code can be found here: https://library.municode.com/ca/hesperia/codes/code_of_ordinances/237774?nodeId=TIT14PUUT

[40] http://ca-hesperia.civicplus.com/287/Water-Conservation

- Well production meter data collection and validation
- Proactive leak identification and repair in the District's distribution system
- Water meter replacement program to help detect system loss

Conservation Program Coordination and Staffing Support

The District has one full-time water conservation program staff. Additionally, other staff from various departments provide technical and administrative support, as well as serve as speakers at a variety of events. The conservation budget is used to fund various rebate and conservation and education programs. The conservation coordinator works with customers, neighboring water suppliers and the MWA to promote conservation through public education, water audits, landscape studies to affect water conservation, and monitoring conservation efforts.

4.3.2 Recent DMM Activities

The District has continued to aggressively promote and implement water conservation actions with great success. The District has achieved on-going conservation levels through the attentive actions of its citizens. Highlights of the District's recent actions and conservation measures include:

- School presentation at Topaz Elementary School in Hesperia and Mojave Vista Elementary School in Victorville in 2016
- Water conservation booth for Hesperia Days which is an annual event to celebrate the City of Hesperia(2016 to 2019, four events)
- Water conservation booth for National Night Out annual event put on by the Hesperia Police Department (2016 to 2019, four events)
- Water conservation booth for Home and Garden Show annual event held in the summer and fall (2016to 2018, six events)
- Participated in the Cash for Grass Program in 2016
- Bill inserts, newsletters that provide information on water conservation
- Lobby displays and brochures for special water related programs

4.3.3 Planned DMM Activities

In addition to ongoing water conservation commitments, the District will continue to evaluate the need for additional programs and actions necessary to achieve water use objectives in compliance with California Water Code Section 10609.20. Resources will be dedicated in the District's budget for demand management activities which will help comply with these future water use objectives. Special consideration will be taken regarding changing urban water use patterns in the service area as well as the configuration of anticipated new residential customers to assure use remains efficient.

4.4 Forecasting Customer Use

Forecasting future water demands begins with understanding existing customer demands and trends, recognizing the additional customers expected through growth, and considering the factors that will influence the water use of both existing and new customer well into the future – especially factors that directly affect the efficiency of water use.

Pursuant to California Water Code 10610.4(c), an urban water supplier "*shall be required to develop water management plans to actively pursue the efficient use of available supplies*." One challenge from this directive is reflecting how the pursuit of efficient use is best represented in the forecast water uses that are the cornerstone of good planning. As required by the Act, the future water uses of both existing customers and those added over the 25-year planning horizon should reflect the "efficient use" of water.

There are several factors that affect the forecast of future water use for existing and new District customers, ranging from State and local landscape regulations, building code requirements, and other water-use mandates, to changes in the types of housing products being offered. These factors are incorporated into determining appropriate per-capita water use values for use in forecasting future water needs in the District. Relevant characteristics of the factors include:

- California Model Water Efficient Landscape Ordinance
- Green Building Standards Code (hereafter the "CAL Green Code")
- Per-capita urban water conservation objectives

As described in Chapter 2, the District is expected to experience on-going population growth, consistent with other urban retail suppliers in this part of San Bernardino County. Forecasting the needs of these future customers is dependent upon the growth assumptions and the unique water use characteristics of existing customers in the District's service area.

As detailed in Table 2-3, the MWA-commissioned population forecast provided estimated population growth to add about 35,000 residents by 2045. This growth will include a range of new residential and non-residential connections as detailed in Table 2-4 depending on the varied development proposals such as those listed in Table 2-5. Residential customers will include both single-family dwelling units built under a variety of densities and multi-family residential dwelling units. Non-residential uses are expected to include a blend of commercial, institutional, and active landscapes such as parks, in ratios similar to the current residential-to-non-residential connections.

For purposes of this UWMP, the forecasted future demand will reflect the needs of existing customers and future new customers. The methodology to forecast existing customer use and new customer use varies slightly but is primarily based upon multiplying the population of each by a gallons-per-capita-per-day water factor as described below.

4.4.1 Existing Customer Future Use

District monthly water use data submitted to the State Water Resources Control Board (SWRCB) to satisfy reporting regulations was obtained to establish the recent and current water use characteristics. This included total water produced for each month for 2020. The total annual production (see Table 4-4) was divided by the existing population, generating a gallons-per-capita-per-day (gpcd) value that is representative of the District's total gpcd when considering all residential and non-residential users. This information established a "current" gpcd for the population that was used to create a representative gpcd for future customers as discussed below. As shown in Table 4-4, the District's existing value is 129 gpcd.

To be conservative and assure the analysis of water system reliability is adequate (see Chapter 5), the District is maintaining the annual "current" retail customer potable water use as shown in Table 4-4, a total delivered quantity of about 13,000 acre-feet, with a total production need of about 14,000 acre-feet when considering system losses.

While these existing customers may undertake a variety of conservation measures – actively through decisions to modify a behavior or a water use, or passively through the purchase of appliances and fixtures that simply use less water – they may also maintain their use as-is. Holding the current use as a constant for all existing customers into the future will provide a conservative number that can be re-evaluated prior to the 2025 UWMP and the compliance with forthcoming water use objectives.[41]

4.4.2 New Customer Future Use

In addition to the District-reported information to the SWRCB is information regarding the percentage of total monthly use the District driven by 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 often were slightly 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 the District, these values were as follows:

- Total Residential use = 94 gpcd
- Indoor Residential use = 72 gpcd
- Outdoor Residential use = 22 gpcd (this may include services including evaporative coolers that cause higher summertime gpcd rates)
- Total non-residential use = 35 gpcd

These estimated gpcd values were then used to create an anticipated gpcd value for each new customer. The new gpcd values for each large retail suppliers were created using the following steps:

[41] Per California Water Code Section 10609.20, urban water suppliers shall calculate a water use objective composed of, among other factors, aggregated efficient indoor water use based upon standards of no more than 55 gpcd.

1. As stipulated by the Water Code, each new residential user should have an indoor factor of 55 gpcd, dropping to 50 gpcd in the future.[42] For purposes of this forecast, 55 gpcd is used for all new customers until 2030, then 50 gpcd is used for growth through 2065.

2. 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 55 gpcd or 50 gpcd to generate a total residential gpcd value for future customers.

3. The different between the residential gpcd and the total gpcd created a representative non-residential gpcd value unique to each large retail supplier. This non-residential gpcd was added to the residential gpcd to create an expected total gpcd for each new customer.

4. The new gpcd value was multiplied by the incremental additional population anticipated during each five-year increment through 2045.

Using this methodology provided a reasonable forecast of the District's future needs. Based upon the estimated water use of the existing and new customers, the District anticipates a minor increase in potable water use over the planning horizon to accommodate the anticipated growth. Table 4-5 presents the resulting customer water use forecast, with values rounded to the nearest 10 acre-feet. This characterization is important when evaluating the District's water service reliability as detailed in Chapter 5.

Table 4-5: Forecast Future Water Use (values in acre-feet per year)[43]

2020	2025	2030	2035	2040	2045
14,040	15,250	16,290	16,990	17,740	18,420

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

The water use forecast represents expected water needs under normal climatic conditions. Often, to reflect lower rainfall conditions which may trigger water users to begin irrigating sooner, adjustments to this forecast should be made. However, in the high desert climate of the Mojave area, water users are generally not managing landscape or agricultural irrigation systems based upon any variance from "normal." In other words, rainfall to meet landscape or crop water needs is not relied upon, thus the lack of it does not change behavior as it may in climates with higher rainfall.

[42] The assumed per-person rate of 55 gallons per day is derived from California Water Code Section 10609.4(a)(3), which states a value of 55 gallons per capita (i.e., per person) per day ("gpcd") be used for estimating indoor residential use targets. Water Code Section 10609.4(a) establishes the indoor residential water use 'standard' to be 52.5 gpcd beginning in 2025 and as low as 50 gpcd by 2030, though the Water Code also provides provisions for the water use target to revert above 50 gpcd. For purposes of this UWMP, the higher value of 55 gpcd is assumed.

[43] These numbers have been rounded for ease of analysis.

As a result, the forecast presented in Table 4-5 is not adjusted for single dry or multiple dry years. The forecast represents the "unconstrained demand" that would be expected in all year types.[44]

4.4.5 Climate Change Considerations

Including climate change analysis into a water use analysis will assist the District in understanding the potential effects on long-term reliability, which in turn, allows the District to proactively begin planning appropriate responses. For example, hotter and drier weather may lead to an increased demand in landscape irrigation, especially during spring and fall months, increasing the pressure on water supplies that may have availability restrictions during these periods.

However, as indicated previously, the High Desert climate already has low rainfall and extreme temperatures. Thus, adjustments for the near-term planning horizon are not warranted.

Long-term effects of climate change may increase the evapotranspiration rates of landscapes. But such effects will be nominal when compared to the existing rates already occurring in the high desert climate. The District will continue to assess the potential effect of climate change in future UWMPs and through other regional water planning efforts.

4.5 Forecasting Water Use for the DRA and Annual Assessment

The California Legislature created two new UWMP requirements to help suppliers assess and prepare for drought conditions: The Drought Risk Assessment,[45] and the Annual Water Supply and Demand Assessment.[46] These new planning requirements were established in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change.

The Drought Risk Assessment (DRA) requires assessing water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

As a slight variant, the Annual Water Supply and Demand Assessment (Annual Assessment) undertakes a similar analytical exercise as the DRA but is to focus on actual, and not hypothetical, conditions anticipated for the upcoming water year. The previously presented water use forecasts facilitate both of these planning exercises as described in the following subsections.

4.5.1 Projecting Water Use for 5-year Drought Risk Assessment

A critical component of new statutory language for the 2020 UWMP cycle is the requirement to prepare a five-year DRA using a supplier-defined hypothetical drought conditions expected to occur from 2021

[44] 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.
[45] California Water Code Section 10635(b)
[46] California Water Code Section 10632.1

through 2025. This drought condition is meant to allow suppliers to test the resiliency of their water supply portfolio and their Water Shortage Contingency Plan actions to meet severe conditions.

DWR recommends that suppliers first estimate expected water use for the next five years without drought conditions (also known as unconstrained demand). In other words, unconstrained demand is water demand absent any water supply restrictions and prior to implementing any short-term WSCP demand reduction actions. If normal water use includes water conservation programs, either currently implemented or planned for implementation, estimated water use values would incorporate the effect of those conservation programs when reporting projected water use during this period.

Total water use for 2021, for example, is developed by modifying the water use representation for "current" conditions (see Table 4-2) taking into consideration the anticipated factors affecting water use, with each subsequent year further adjusted, as appropriate. Adjustments year-to-year reflect several factors the District anticipates may occur, including increases from growth. To make these adjustments, the difference in annual water use between the "current" condition and the forecast potable use in 2025 is prorated equally across each of the years 2021 through 2025, so that the same 2025 forecast water use is matched. With an initial annual estimate, each year is further adjusted to reflect anticipated increases in the "unconstrained demand" during a single dry year, which, as discussed previously, is not necessary in the High Desert climate. The resulting unconstrained demand during a dry year for 2021 through 2025 are shown in Table 4-6.

Table 4-6: Forecast DRA Water Use for 2021 through 2025 (acre-feet per year)

2021	2022	2023	2024	2025
14,560	14,530	14,770	15,010	15,250

4.5.2 Projecting Water Use for Annual Assessments

The District will need to perform an Annual Assessment and submit the findings to DWR beginning in 2022. To evaluate the plausible water service reliability conditions under current "normal" and "single-dry" conditions, as further described in Chapter 5, it is recommended that the District use the 2020 gross water use shown in Table 4-4.

4.6 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, retail suppliers are required to include the projected water use for lower income households in 2020 UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, annual median income is assumed to be about $46,000 for the District (see Chapter 2.4.4), with the entire service area recognized by the state as a qualified Disadvantage Community.[47] Because of this designation, the forecast water use presented in Table 4-5 is fully inclusive of disadvantaged community use.

[47] https://gis.water.ca.gov/app/dacs/

Chapter 5
Water System Reliability

This chapter provides the District's water system reliability findings as required under Water Code Section 10635 and provides reliability information that the District may use in completing an annual supply and demand assessment pursuant to Water Code Section 10632.1.

Assessing water service reliability is the fundamental purpose for the District in preparing its 2020 UWMP. Water service reliability reflects the District's ability to meet the water needs of its customers under varying conditions. The District's 2020 UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the District's water supply and its customers' water uses. The reliability assessment looks beyond past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the details imbedded in the Chapters 3 and 4 and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents three system reliability findings:

- Five Year Drought Risk Assessment: The 2021 through 2025 Drought Risk Assessment (DRA) for the District's service area.
- Long-Term Service Reliability: The reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Drought Years in five-year increments through 2045.
- Annual Reliability Assessment: The reliability findings for an existing condition for both a Normal Year and Single Dry Year that can inform an annual supply and demand assessment for 2021 or 2022.

In summary, so long as the District continues to acquire and manage groundwater assets, the District has reliable water supplies available for its service area through 2045.

5.1 Five Year Drought Risk Assessment

The Drought Risk Assessment is a new requirement for the 2020 UWMP cycle. The DRA requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years. The District has prepared an assessment of the water supplies and demands for its system. The District will not use more water than is necessary to meet demands in any given year. Moreover, the District continues to encourage its customers to use water efficiently (see Chapter 4). Although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, may require the District to reduce its water services.

The District has discretion over how much managed groundwater it pumps and how much water it receives from MWA. Thus, the District's supplies and demands are congruent in all scenarios examined in this chapter. Table 5-1 below shows the District's DRA that integrates its supplies for 2021 through 2025 as described in Chapter 3 and reflects the dry year unconstrained water uses described in Chapter 4. As the table shows, the District has sufficient water assets available in all years.

Table 5-1: Five Year Drought Risk Assessment (AFY)

	2021	2022	2023	2024	2025
Supply	14,560	14,530	14,770	15,010	15,250
Demand	14,560	14,530	14,770	15,010	15,250
Difference	0	0	0	0	0

5.2 Long Term Service Reliability

The Urban Water Management Planning Act 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 2020 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.

5.2.1 Long Term Service Reliability

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 2020 through 2045.

Normal and Single Dry Conditions 2025-2045

The District's future water supplies in normal and single dry conditions reflect the same conditions described for the DRA and as detailed in Chapter 3. Specifically, the District has sufficient and reliable water supplies to meet forecast customer water needs through 2045 considering water use forecasts for both normal and dry condition. All of this information is detailed in Chapter 3 and 4 and reflected in the numbers shown in the tables below. Table 5-2 shows the normal year supplies and demands on an annual timestep from 2025 through 2045.

Table 5-2: Normal and Single Dry Year Water Supply and Demand through 2045 (AFY)

Normal Year	2025	2030	2035	2040	2045
Supply	15,250	16,290	16,990	17,740	18,420
Demand	15,250	16,290	16,990	17,740	18,420
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	15,250	16,290	16,990	17,740	18,420
Demand	15,250	16,290	16,990	17,740	18,420
Difference	0	0	0	0	0

Five Consecutive Dry Years 2025 – 2045

The District defines a drought condition lasting five consecutive years as one that requires the District to reduce water service to its customers. The Districts groundwater supplies coupled with its supplies from MWA result in limited constraints in dry years and the District's overall water supplies are considered reliable. However, although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, may require the District to reduce its water service to its customers. Nevertheless, the District assumes that these conditions that would require less water supply deliveries to the District's customers do not manifest in assessing the supply availability in the future.

The District also assumes that dry year demand conditions would remain unconstrained during the dry conditions causing a slight increase in the actual demand from District's customers. This characterization of water demands provides a conservative estimation of demand conditions in a five-year drought scenario. Together, the supply availability as paired against the slightly increased demand conditions demonstrate that the District has sufficient supplies to meet five consecutive dry year conditions through 2045. Table 5-3 below shows the annual water supply and demand conditions in five consecutive dry years from 2025 through 2045.

Table 5-3: Five Consecutive Dry Years Water Supply and Demand through 2045 (AFY)

		2025	2030	2035	2040	2045
Year 1	Supply	15,250	16,290	16,990	17,740	18,420
	Demand	15,250	16,290	16,990	17,740	18,420
	Difference	0	0	0	0	0
Year 2	Supply	15,460	16,430	17,140	17,880	18,540
	Demand	15,460	16,430	17,140	17,880	18,540
	Difference	0	0	0	0	0
Year 3	Supply	15,670	16,570	17,290	18,020	18,660
	Demand	15,670	16,570	17,290	18,020	18,660
	Difference	0	0	0	0	0
Year 4	Supply	15,880	16,710	17,440	18,160	18,780
	Demand	15,880	16,710	17,440	18,160	18,780
	Difference	0	0	0	0	0
Year 5	Supply	16,090	16,850	17,590	18,300	18,900
	Demand	16,090	16,850	17,590	18,300	18,900
	Difference	0	0	0	0	0

5.3 Annual Reliability Assessment

The District may consider current supply and demand conditions and perform an annual water supply and demand assessment (Annual Assessment) pursuant to Water Code Section 10632.1 to evaluate real-time or near-term circumstances that are different than the DRA scenario. This assessment would evaluate actual current water supply and use conditions. For purposes of this UWMP, the "current" water use conditions as described in Chapter 4 are compared to the availability of the District's existing water supplies as described in Chapter 3. Two scenarios are illustrated:

- Normal Year condition: reflecting the availability of supplies under normal conditions and the "current" water uses.
- Single-Dry Year condition: reflecting the availability of supplies under a severe, single-dry year and elevated "current" water uses reflecting increased demands expected in a single dry year.

5.3.1 Normal Year Supply and Current Water Use

The District's current normal year water supply and demand conditions represent the expected water supply and demand conditions that would likely occur based upon a reasonable assessment of regional and statewide hydrology and limited regulatory constraints. Under these conditions, the District anticipates that its access to its groundwater supplies would be fully available.

The District's characterization of current water use conditions represent an historical assessment of water use within the District as well as reasonable characterizations of growth and potential customer use patterns. The combination of these considerations present a normal water year use assessment that is incorporated into this reliability determination. The demands also account for reasonable water conservation measures derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. These demand conditions are described in significant detail in Chapter 4 and reflected in the monthly demand assessments shown below.

Table 5-4 below shows the normal year water supply and demand conditions for the District's service area.

Table 5-4: Normal Year Water Supply and Demand (AFY)

Normal Year	Current
Supply	14,040
Demand	14,040
Difference	0

5.3.2 Single Dry Year Supply and Dry-Year Current Demand

The District defines a single dry year condition as one that may require reduced water deliveries to customers caused by regulatory decrees, as noted in 5.2.1. Nevertheless, the District's water supplies are reliable in single dry year conditions based upon the groundwater basin as described in Chapter 3.

Single dry year demands include the anticipated demands based upon historical trends in water usage in drought conditions by the District's customers. As described in Chapter 4, demands in dry conditions in the District remain stable because of the climatological conditions.

Table 5-5 below shows the single dry year water supply and demand conditions.

Table 5-5: Single Dry Year Water Supply and Demand (AFY)

Single Dry Year	Current
Supply	14,040
Demand	14,040
Difference	0

5.4 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 2020 through 2045.

Chapter 6
Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) addresses the requirements in Water Code Section 10632 of the Urban Water Management Planning Act (The Act). The WSCP is incorporated into the 2020 Urban Water Management Plan (UWMP) and is used by the Hesperia Water District (Hesperia or District) to respond to water shortage contingencies as they may arise. The WSCP addresses possible conditions in which the water supply available to customers of the District is insufficient to meet the normally expected customer water use at a given point in time due to drought, regulatory action constraints, and natural and man-made disasters. This WSCP describes the Hesperia's strategy for allocating water during such water supply shortages, while assuring customers that at all times it will meet the minimum health and safety requirements of a drinking water purveyor.

This WSCP consists of the following required elements:

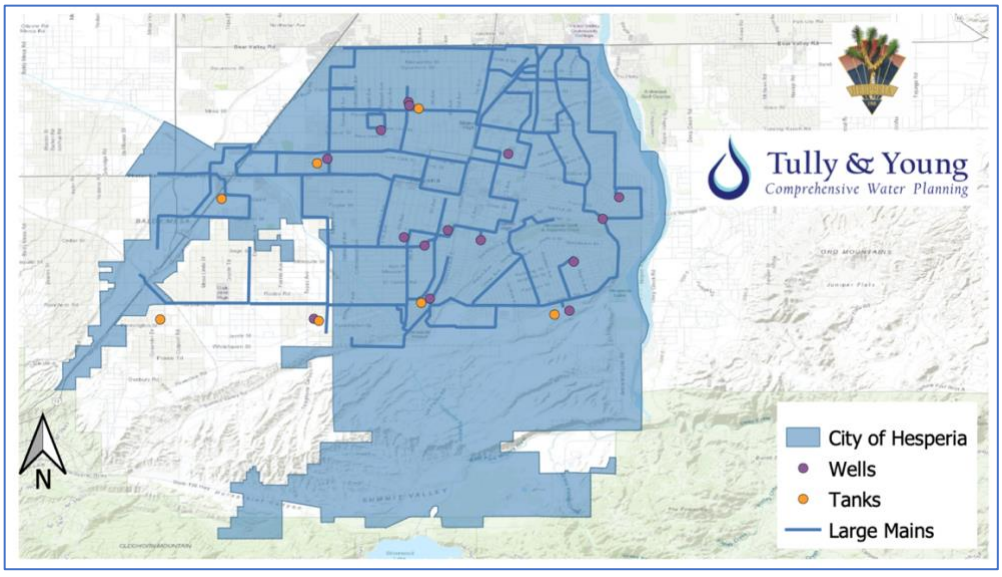
1. An analysis of water supply reliability.
2. Procedures for conducting an annual water supply and demand assessment.
3. Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage.
4. Shortage response actions that align with the defined shortage levels.
5. Communication protocols and procedures.
6. Customer compliance, enforcement, appeal, and exemption procedures.
7. A description of legal authorities.
8. A description of financial consequences.
9. Monitoring and reporting requirements.
10. Reevaluation and improvement procedures.
11. Special Water Feature Distinction.
12. Plan Adoption, Submittal, and Availability.

The Act contains specific requirements for each of these elements.[48] As required by Water Code Section 10632 this WSCP is incorporated into the UWMP, yet it is also a stand-alone plan that is adopted independently from the UWMP and may be amended or refined and readopted over coming months and years as needed (see subsection 6.12 Plan Adoption, Submittal, and Availability, below). Hesperia has enacted Chapter 14.04.170 of the Hesperia Municipal Code to address water shortages.[49] These local rules were developed to help manage water shortage conditions in the event of drought, catastrophic outage, or regulatory mandate requiring statewide reduction in water use. This WSCP is fully integrated with the District's most recent Municipal Code Chapter 14.04.170.

6.1 Water Supply Reliability Analysis

The Hesperia Water District is a public agency created under the County Water District Act (Water Code Sections 30000 et seq.) providing water service to residential, commercial, industrial and institutional water users within the boundaries of the District. The Hesperia Water District was established as a subsidiary district of the City of Hesperia in 1990. The District operates a self-sustaining utility business enterprise and the City Council serves as the District's Board of Directors. The District is located in the High Desert region of San Bernardino County and is bordered by the Town of Apple Valley to the northeast, the City of Victorville to the north, and the unincorporated community of Phelan to the west. The area south of the Hesperia includes the unincorporated community of Oak Hills and currently undeveloped lands. The District delivers quality, reliable water to over 26,000 active service connections serving a population of approximately 95,000 within a service area of 74 square miles that closely approximates the City of Hesperia's boundaries, with minor exceptions as shown in Figure 6-1.

Figure 6-1: Hesperia's Service Area



[48] California Water Code Section 10632, available at: (https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10632)
[49] Hesperia Municipal Code Chapter 14.04.170 Water Conservation and Water Shortage Plan.

As described in Chapter 5 of the UWMP, the District has a reliable water supply in normal, single dry and five consecutive dry years through 2045. Hesperia relies on managed groundwater water that is pumped from the Mojave River Groundwater Basin (basin) with supplemental supplies derived from MWA imported water, return flows, and replacement and make-up supplies. Water is conveyed from the wells to Hesperia consumers via a distribution system with pipe sizes ranging between 4 and 24 inches in diameter. The District currently maintains 14 storage reservoirs within the distribution system with a total capacity of nearly 200 AF, or 64 million gallons.

Groundwater is subject to management in compliance with a groundwater adjudication, the Mojave Basin Area Judgment (Judgement). Imported water is used to recharge the groundwater basin and offset pumping, such that water levels in the basin have generally remained stable under the Judgment. The groundwater supply is anticipated to remain reliable because the long-term average of the groundwater basin includes dry periods, and any single or multiple-year dry cycle does not impact the long-term yield of the basin. The District's water supply sources may be impacted by climate factors, catastrophic events, and regulatory measures – all of which are considered in the reliability assessment in Chapter 5. The District regularly evaluates its overall water supply reliability through its Urban Water Management Plan and through regional planning efforts in coordination with MWA and other neighboring water purveyors.

Although the District has a secure water supply, this WSCP serves as a roadmap to help the District meet the challenges that may arise from future droughts, regulatory actions, and unforeseen man-made and natural disasters.

6.2 Annual Water Supply and Demand Assessment Procedures

The WSCP describes the District's procedural methodology for managing shortages and conducting its required Annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment is to be submitted to California Department of Water Resources (DWR) by July 1 each year with the first Annual Assessment due July 1, 2022. The Annual Assessment examines Hesperia's anticipated water reliability for the current year and one additional dry year. The Annual Assessment will be prepared at the beginning of each calendar year to evaluate near-term water supply reliability and determine what, if any, water shortages stages may be triggered during the required period. The Annual Assessment will be used by Hesperia decision-makers 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 governmental entities to prepare for such required actions.

6.2.1 Analytical and Decision-making Processes

Hesperia plans to conduct its Annual Assessment according to the following timeline and process:

By February 1 Initial data collection and analysis

By March 1 Preliminary Draft Annual Assessment internal review and revisions

By April 1 Draft Annual Assessment and results briefing for Hesperia decision-makers

By May 1 Public Notification and Release of Draft Annual Assessment

By June 1 Approval of Annual Assessment by Hesperia decision-makers

By June 15 Submit Annual Assessment to DWR in advance of July 1 deadline

The District will prepare its Annual Assessment using the following key data and analytical procedures (which may be modified as needed):

- Prepare supply estimates for each water source on a monthly basis for the analysis period.
- Update unconstrained customer demand and estimate anticipated actual water use on a monthly basis 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.
- Refine the definition of "dry year" as relevant to dry conditions like water year 2015 and 2021.
- Identify any shortfall between projected supply and anticipated demand.
- Identify and incorporate any applicable constraints (infrastructure, regulatory, etc.).
- Develop, analyze, and propose water resource management strategies to address any shortfall between projected supply and anticipated demand with reference to the water shortage stages identified in this WSCP.
- Present the Annual Assessment (and resulting water shortage stage declaration, if applicable) to the District decision-makers.

If the results of the Annual Assessment indicate the need for any alternative water shortage response actions which may be addition to those specified in Section 6.4, below, the alternative response actions will be described and submitted in the Annual Assessment, as specified in CWC 10632.2.

6.2.2 Submittal Procedure

The District will submit its Annual Assessment to the DWR via email by June 15 each year, but in no case later than July 1 each year. At the time of DWR submittal, Hesperia will also notify the MWA, the City of Victorville, the Town of Apple Valley, San Bernardino County, the public, and other stakeholders concerning the results of the Annual Assessment and where it is available for review.

6.3 Six Standard Water Shortage Stages and Triggers

New state requirements for the WSCP require 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 service reliability condition. The District has adopted the six standard water shortage stages as shown in Tables 6-1 through 6-6 that are included in Section 14.04.170 of the Municipal Code. Each stage corresponds to a range of reduction in anticipated water supply availability and is aligned with shortage response actions which can reduce water demand as needed to address the water shortage. Reduction of available water supply by the

indicated percentages will trigger an appropriate water shortage stage and the District will implement the response actions identified in Tables 6-1 through 6-6.

6.4 Shortage Response Actions

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.

6.4.1 Stages of Shortage Response Actions

The District has identified shortage response actions to be implemented during each of the six sequential stages and corresponding water shortage conditions. These actions are based on specific hydrological and regulatory conditions and the fundamental need to meet water service requirements within the District's service area. Moreover, the shortage response actions provide the District with some flexibility to address water dynamic water shortage conditions while protecting the District against extreme conditions where supplies are drastically reduced beyond 50%. The following is an overview of the staged response actions the District could follow during a given water shortage condition based on shortage severity, relative supply conditions for each stage, and percent shortage reduction levels. A water shortage declaration would be made by resolution of the Board of Directors, with administrative discretion delegated to the General Manager.

The shortage response actions derived from Municipal Code Chapter 14.04.170 that may be implemented in each stage include, but are not limited to, the following:

Stage 1 (up to 10 percent shortage) "Water Alert" – If water supplies are threatened with constraint, the Plan calls for an introductory Stage 1 drought response, during which customers are informed of possible shortages and asked to voluntarily conserve 10 percent. In addition, customers are prohibited from wasting water or unreasonably using water for beneficial purposes. For example, prohibited water uses under this stage include allowing water to run off unused into a gutter, ditch, or drain; failing to repair a controllable leak; washing sidewalks, driveways, parking areas, tennis courts, patios, or other paved or areas; utilizing a hand-held hose without an automatic shut-off nozzle; and irrigating during a precipitation event. Additional prohibitions will apply to new developments prohibiting single pass-through cooling water systems; commercial car washes and laundries without recirculating water systems; and decorative fountains without recirculating water systems.

This stage includes performing public outreach and education about the shortage and methods individuals can implement to reduce their water use. The District will inform the public and neighboring governmental bodies of the potential shortage condition and will coordinate with customers to implement the actions consistent with this Stage.

Stage 2 (11 - 20 percent shortage) "Water Warning" – In the event Stage 2 is implemented the District will continue to encourage community-oriented voluntary conservation measures, enforce conservation measures, and implement mandatory water use reduction measures to decrease demand by up to 20 percent. Stage 2 activities include a continuation of activities described under Stage 1, as well as greater conservation and water use restrictions. These additional restrictions include beyond those identified in Stage 1, limiting outdoor irrigation only between the hours of 10:00 PM and 5:00 AM and vehicle washing must be done using a bucket or hand-held hose with an automatic shut-off nozzle, or take place at a commercial car wash. Customer baseline water use will be monitored and addressed with excess use above the shortage percentage subject to financial penalties under Ordinance 14.04.170.090.

The District will also continue to engage in public outreach and education as it applies to the water shortage conditions and the actions necessary to achieve up to 20% reduction in use.

Stage 3 (21 - 30 percent shortage) "Severe Shortage" – Stage 3 includes all response actions taken in Stages 1 and 2 and is focused on continuing to encourage customers to voluntarily reduce water use regarding turf watering, fillings pools, etc., mandatory-watering restrictions will be implemented following additional shortage actions described in Stage 2. Increased monitoring related to prescribed water conservation actions will occur under this stage. Customer baseline water use will be monitored and addressed with excess use above the shortage percentage subject to financial penalties under Ordinance 14.04.170.090.

The District will also continue to engage in public outreach and education as it applies to the water shortage conditions and the actions necessary to achieve up to 30% reduction in use.

Stage 4 (31 - 40 percent shortage) "Critical Shortage" – Stage 4 includes all response actions taken in prior stages regarding mandatory conservation and intensifies their implementation and enforcement. Stage 4 restrictions will be implemented if the Stage 3 demand reduction and other response actions are deemed insufficient to achieve reductions due to water supply shortages. All Stage 3 response actions will be intensified, and water production will be monitored daily by Hesperia for compliance with necessary reductions. Customer baseline water use will be monitored and addressed with excess use above the shortage percentage subject to financial penalties under Ordinance 14.04.170.090.

The District will also continue to engage in public outreach and education as it applies to the water shortage conditions and the actions necessary to achieve up to 40% reduction in use.

Stage 5 (41 - 50 percent shortage) "Water Crisis" – Stage 5 includes all response actions taken in prior stages regarding mandatory conservation. The primary focus of Stage 5 is to ensure the protection of the water supply for all public health and safety purposes. This Stage will require reductions in water demand by up to 50 percent and will follow all voluntary and mandatory actions described in Stages 1-4. Customer baseline water use will be monitored and addressed with excess use above the shortage percentage subject to financial penalties under Ordinance 14.04.170.090.

The District will also continue to engage in public outreach and education as it applies to the water shortage conditions and the actions necessary to achieve up to 50% reduction in use.

Stage 6 (greater than 50 percent shortage) "Water Emergency" – Stage 6 includes all response actions taken in prior stages focused on reducing water demands by more than a fifty percent in response to greater than 50 percent water shortages. This water emergency stage actions become effective when the Board of Directors declares that the District is unable to provide sufficient water supply to meet ordinary demands, to the extent that insufficient supplies are available for human consumption, sanitation, and fire protection. The declaration is to be based on their judgment concerning the degree of the immediate or future supply deficiency. This stage requires only use of water for human health and safety purposes. No additional water uses are permitted, including any outdoor irrigation for anything other than maintenance of legacy vegetation. Customer baseline water use will be monitored and addressed with excess use above the shortage percentage subject to financial penalties under Ordinance 14.04.170.090.

The District will also continue to engage in public outreach and education as it applies to the water shortage conditions and the actions necessary to achieve greater than 50% reduction in use. Tables 6-1 through 6-6 show a summary of the staged response actions.

Table 6-1: WSCP Actions to Reduce Customer Use - Stage 1

Stage 1 Water Alert: Savings up to 10%
1. Waste and unreasonable use of water prohibited and voluntary conservation encouraged (up to 10%).
2. Water shortage situation and possible subsequent water shortage stages explained to the public and governmental bodies (up to 10%)
3. Establish customer use baselines.
4. Identify customers with high per capita water usage to achieve proportionally greater reduction than those with low use.
5. Water use penalties under 14.04.160 available.
6. Actions may include, but are not limited to: Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers and educational programs in area schools.
7. Consumption Reduction Methods, including: • Encourage customers to fix leaks or faulty sprinklers promptly (*0-1%*). • Decorative water features (water fountains, etc.) to recirculate water and be leak proof (*0-1%*). • Direct customers to irrigate landscapes during cooler morning and evening hours to reduce evaporation and minimize landscape runoff (*0-5%*). • Landscape watering shall be confined to a user's property and shall not runoff onto adjacent properties, roadsides or gutters (*0-5%*). • No landscape watering shall occur while it is raining (*0-5%*). • Use a shutoff nozzle on hoses (*0-1%*). • Washing down impervious surfaces such as driveways and sidewalks is prohibited unless for public health and safety purposes (*0-1%*). • Unauthorized use of hydrants is prohibited. Authorization for use must be obtained from water supplier (*0-1%*). • Commercial, industrial, institutional equipment must be properly maintained and in full working order (*0-1%*). • Encourage customers to wash only full loads when washing dishes or clothes (*0-1%*). • Encourage customers to use pool covers to minimize evaporation (*0-1%*). • Encourage restaurants to only serve water to customers on request (*0-1%*).

Table 6-2: WSCP Actions to Reduce Customer Use – Stage 2

Stage 2 Moderate Shortage: Savings up to 20%
1. All measures implemented in Stage 1 2. Voluntary conservation usage reductions (up to 20%) 3. Mandatory conservation rules and restrictions and some prohibitions on end uses (10-20%). 4. Water Use Penalties under 14.04.160 available. 5. All consumption reduction methods from Stage 1 and intensified as needed; additionally: • Mandatory outdoor irrigation restrictions including limiting number of watering to 3 days per week, and time when irrigation can occur (e.g., between 9:00 pm and 9:00 am). Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering (5-10%). • Fix leaks or faulty sprinklers within 7 days (0-1%). • Restaurants serve water only upon customer request (up to 1%). • Pool covers required (up to 5%) • Non-essential potable water uses strongly discouraged (up to 20%) • No restrictions on landscape watering with non-potable water. • Assess customer usage against baseline (up to 20%).

Table 6-3: WSCP Actions to Reduce Customer Use - Stage 3

Stage 3 Severe Shortage: Savings up to 30%
1. All measures implemented in Stages 1 and 2 2. Some or all of the following: • Adherence to customer baselines and actual water use reductions water allocations and mandatory conservation rules (20-30%) • Customer water usage in excess of baseline to be monitored and recorded • Water use prohibitions include further restrictions of days and daytime hours for watering, excessive watering resulting in gutter flooding, using a hose without a positive shutoff device, prohibition on use of decorative fountains with non-recirculating pumps, prohibition on washing down sidewalks or patios, not repairing leaks in a timely manner, etc. (up to 30%) 3. All activities are intensified and production is monitored daily for compliance with necessary reductions from customer baseline (up to 30%) 4. Water Use Penalties under 14.04.160 available 5. All Consumption Reduction Methods from Stage 2 and intensified as needed; additionally: • Fix leaks or faulty sprinklers within 3 days (*0-1%*). • Decorative water features that use potable water must be drained and kept dry (*0-1%*). • Car washing is only permitted using a commercial carwash that recirculates water or by high pressure/low volume wash systems (*0-1%*). • Require a construction water use plan be submitted to the water supplier that addresses how impacts to existing water users will be mitigated (such as dust control) (*0-1%*). • With the exception of landscapes watered with non-potable water, limit the installation of new landscaping to drought tolerant trees, shrubs and groundcover. Prohibit installation of new turf or hydroseed. Customers may apply for a waiver to irrigate during an establishment period for the installation of new turf or hydroseed. (*0-1%*) • During Warm/Dry Season: Up to two days per week turf watering when using potable water (*5-20%*) and irrigation between 10 pm and 7 am. Cool/Wet Season: Turf shall not be watered unless utilizing non-potable water during extended dry spells (*1-5%*). • Mandatory rationing as measured against customer baseline (up to 30%)

Table 6-4: WSCP Actions to Reduce Customer Use - Stage 4

Stage 4 Critical Shortage: Savings up to 40%
1. All measures implemented in Stages 1-3 2. All activities are intensified and production is monitored daily for compliance with necessary reductions from customer baseline. (up to 40%) 3. All Consumption Reduction Methods from Stage 3 and intensified as needed; additionally: • Fix leaks or faulty sprinklers within 1 day (*0-1%*). • Existing pools shall not be emptied and refilled using potable water unless required for public health and safety purposes (*0-1%*). • Water use for new landscape installations or renovations is not authorized (*0-1%*). • Previous waivers for watering during an establishment period will be revoked (*0-1%*). • Warm/Dry Season outdoor irrigation: Up to one day per week turf watering when using potable water (*10-30%*) from 11 pm to 6 am. Cool/Wet Season: Turf shall not be watered unless utilizing non-potable water during extended dry spells (*1-5%*). 4. Water use penalties under 14.04.160 available.

Table 6-5: WSCP Actions to Reduce Customer Use - Stage 5

Stage 5 Shortage Crisis: Savings up to 50%
1. All measures implemented in Stages 1-4 2. Source of supply for the System is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes (up to 50%) 3. All activities are intensified and production is monitored daily for compliance with necessary reductions from customer baseline (up to 50%). 4. All Consumption Reduction Methods from previous stages and intensified as needed 5. Update current water shortage condition response measures based on Board approvals and direction, state policy directives, emergency conditions, or to improve customer response 6. Water use penalties under 14.04.160 available. 7. Catastrophic Event (Supply reduction up to 50%): Implement Applicable Actions for Catastrophic Events (such as boil water order)

Table 6-6: WSCP Actions to Reduce Customer Use - Stage 6

Stage 6 Emergency Shortage: Savings greater than 50%
1. All measures implemented in Stages 1-5 2. Source of supply for the System is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes. Customer rationing may be implemented. (>50%) 3. All activities are intensified and production is monitored continually for compliance with necessary reductions from customer baseline (more than 50%). 4. All Consumption Reduction Methods from previous stages and intensified as needed 5. Update current water shortage condition response measures based on Board approvals and direction, state policy directives, emergency conditions, or to improve customer response 6. Catastrophic Event (Supply reduction greater than 50%): Implement Applicable Actions for Catastrophic Events. 7. Water use penalties under 14.04.160 available.

6.4.2 Demand Reduction Actions

The District has identified a range of available and feasible customer demand reduction actions that can be used adaptively and implemented with progressively greater intensity to meet the supply shortage challenges faced under each water shortage condition. These demand reduction actions are identified by the associated water shortage stage in which they may be implemented. Other response actions not specified in this Plan may also be identified by the District to implement the essential purposes of this Plan or the UWMP (see CWC 10632.2).

Tables 6-1 through 6-6 summarizes the Demand Reduction Actions associated with each water shortage stage and shortage level, provides an estimate of the action's effectiveness as related to that stage.

6.4.3 Mandatory Prohibitions

This section is required to identify any mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions. Hesperia adopted an ordinance to prohibit water waste, Chapter 14.04.160 of the Municipal Code. The ordinance prohibits intentional or unintentional water waste and unreasonable uses of water and encourages beneficial water use.

Chapter 14.04.160 reads in its entirety:

A. Wasting Water. No customer shall unreasonably or wastefully use district's water. Where water is unreasonably or wastefully used on a customer's premises, the district may fine the customer after giving the customer notice if such conditions are not immediately corrected. In the event the customer does not immediately correct the unreasonable or wasteful use of water identified in the notice, the district may continue to fine the customer or disconnect the customer's service. Unreasonable or wasteful use of water is presumed where a customer is not in compliance with a water shortage plan

under section 14.04.170. In the event the district assesses fines or disconnects water service, the district shall not be liable to the customer or to any employee, licensee, invitee or permittee of the customer on account of any bodily injury or property damage alleged to have occurred on account of such action taken by the district.

B. Unreasonable and Wasteful Water Use – Remedial Actions. No customer or other person acting on behalf of or under the direction of a customer shall cause or permit the unreasonable or wasteful use of water. If the general manager of the district or his designee finds that any customer or other person is in violation of the provisions in this section, in addition to any other remedies available, any one or more of the following actions may be taken by the general manager:

1. Initiate a fine of no more than $100 per day for each day the unreasonable or wasteful water use violation is not remedied by the customer after giving prior written notice of potential fine if the violation is not immediately corrected. Notice may be by delivery to the customer or person appearing to be in charge on the premises, or by placing the notice on the door handle, gate, or other conspicuous place on or about the property receiving the water service and immediately mailing a copy of the notice to the customer at the last known mailing address in the district's customer records. Notice shall be given at least twenty-four (24) hours by the general manager or his designee before fine assessment unless the general manager, or his designee, in his discretion, determines that a shorter period of notice is required in view of the nature of the violation and to protect the public health and safety, in which case the notice shall be given as expeditiously as the general manager or his designee finds to be reasonable under the circumstances.

2. Disconnect water service either for unreasonable or wasteful water use (if separate meter and turnoff facilities are available for those purposes) or to the entire premises served, as deemed appropriate under the circumstances by the general manager, after giving prior written notice that service will be disconnected if the violation is not immediately corrected. Notice may be by delivery to the customer or person appearing to be in charge on the premises, or by placing the notice on the door handle, gate, or other conspicuous place on or about the property receiving the water service and immediately mailing a copy of the notice to the customer at the last known mailing address in the district's customer records. Notice shall be given at least twenty-four (24) hours by the general manager or his designee before disconnection unless the general manager, or his designee, in his discretion, determines that a shorter period of notice is required in view of the nature of the violation and to protect the public health and safety, in which case the notice shall be given as expeditiously as the general manager or his designee finds to be reasonable under the circumstances.

3. Request initiation of proceedings for prosecution by the district attorney or any other proper prosecuting officer of any violation of this section.

4. The customer may appeal the assessment of fines, termination of service, or initiation of prosecution by appearing before the district at a regularly scheduled board meeting.

Disconnection of service will be administered in compliance with then-applicable state regulations.

Certain prohibited activities are also listed among the demand reduction actions on Tables 6-1 through 6-6.

6.4.4 Emergency Operations Plan for Catastrophic Water Shortages

This section identifies actions to be undertaken by Hesperia to prepare for, and implement during, a catastrophic interruption of water supplies. In addition to climate, other events that can cause water supply shortages are earthquakes, chemical spills, dam failures, canal breaks, waterline ruptures, and energy outages at treatment and pumping facilities, which could cause a water shortage severe enough to trigger a Stage 1-6 water supply shortage condition.

The District has an adopted an Emergency Operations Plan which provides procedures and guidance to District personnel in responding to emergency situations including catastrophic events, both natural and manmade. The plan provides procedures for preparing, mobilizing, and employing District resources and coordinating outside resources during an emergency. The District provides periodic training, including simulated events and responses to keep District personnel fully trained on implementation of emergency procedures. Mobilization is consistent with Standardized Emergency Management and the Incident Command System.

In addition to specific actions to be undertaken during a catastrophic event, Hesperia performs maintenance activities, such as annual inspections for earthquake safety, and budgets for emergency items, such as auxiliary generators, to prepare for potential events.

Table 6-7 is a summary of actions cross-referenced against specific catastrophes for three of the most common possible catastrophic events: regional power outage (such as Public Safety Power Shutoff or "PSPS" events), natural disasters (such as earthquake, flood or storm damage, or fire), and malevolent acts.

Table 6-7: Summary of Actions for Catastrophic Events

Possible Catastrophe	Summary of Potential Actions
Regional Power Outage	1. Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. 2. Establish water distribution points and ration water if necessary. 3. If water service is restricted, attempt to provide potable water tankers or bottled water to the area. 4. Make arrangements to conduct bacteriological tests, in order to determine possible contamination. 5. Utilize backup power supply to operate pumps in conjunction with elevated storage.
Natural Disaster	1. Assess the condition of the water supply system. 2. Complete the damage assessment checklist for reservoirs, water treatment plants, system transmission and distribution. 3. Coordinate with Governor's Office of Emergency Services utilities group or fire District to identify immediate firefighting needs. 4. Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. 5. Prepare report of findings, report assessed damages, advise as to materials of immediate need and identify priorities including hospitals, schools and other emergency operation centers. 6. Take actions to preserve storage. 7. Determine any health hazard of the water supply and issue any "Boil Water Order" or "Unsafe Water Alert" notification to the customers. 8. Cancel the order or alert information after completing comprehensive water quality testing. 9. Make arrangements to conduct bacteriological tests, in order to determine possible contamination.
Malevolent acts	1. Assess threat or actual intentional contamination of the water system. 2. Notify local law enforcement to investigate the validity of the threat. 3. Get notification from public health officials if potential water contamination 4. Determine any health hazard of the water supply and issue any "Boil Water Order" or "Unsafe Water Alert" notification to the customers, if necessary. 5. Assess any structural damage from an intentional act. 6. Isolate areas that will take the longest to repair and or present a public health threat. 7. Arrange to provide emergency water.

6.4.5 Seismic Risk Assessment and 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 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.

Hesperia intends to submit a copy of the San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan, approved by the Federal Emergency Management Agency (FEMA) on July 13, 2017 (HMP). This Hazard Mitigation Plan is currently under review and may have updates before the next Urban Water Management Plan cycle in 2025.

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 Hesperia's WSCP.

6.5. Communication Protocols

The District maintains an established and effective communications program to inform its customers, neighbors, and other stakeholders of water service issues, updates, and policies. Implementation of the WSCP will utilize the existing communication program structure to inform customers and others of the declared shortage stage and respective actions and restrictions in place.

The District Board meetings addressing the Annual Assessment and any potential water shortage declaration will be noticed using normal Board meeting public notification procedures. The meeting will also be announced through regular press release protocols.

Once a shortage stage as been declared by the Board of Directors, the District will notify its customers and others through a range of efforts. The stage and restrictions will be identified in a press release, customer billing statements, and posted on the District's website. Specifically, the District's website will be updated to feature the shortage declaration, restrictions, and resources available to customers from the District and other entities to help meet the restrictions. Subsequent District Board meetings will include a review of the shortage condition, customer response results, and discussion and recommendations for potential modifications. The District will also coordinate with the neighboring public agencies to declare a local emergency with respect to anticipated water supplies and demands in the event conditions necessitate.

The District's communications protocols may include, but are not limited to, some or all of the following locally relevant actions. These communications protocols will be used at the discretion of District staff based on then-current and anticipated water shortage conditions:

- Publishing information on Hesperia's website.

- Staffing a telephone hotline.
- Providing bill inserts and direct mailings above and beyond those legally required.
- Directly calling and/or emailing customers.
- Developing materials for non-English speaking customers.
- Preparing social media posts to communicate Hesperia actions.
- Advertising actions on other local audio and video media.
- Coordinating voluntary and mandatory water conservation activities with other local and regional governing bodies.

6.6. Compliance and Enforcement

The District's Emergency Water Conservation Plan has significant compliance and enforcement options for implementing its water shortage planning. Financial penalties, flow restrictors, and disconnected water service are among the options available to the District to ensure compliance with the required water shortage actions. Appeals processes are also available for those that are subject to the enforcement provisions of the Municipal Code.

The following civil actions can be initiated by the District:

- First violation. A written warning of the violation shall be issued to the respective water customer.
- Second violation within 6 months. A $100 penalty will be imposed on the water customer.
- Third violation within 12 months. A monthly $200 penalty will be imposed on the customer and will continue until the violation is corrected to the satisfaction of the District.

In addition, the General Provisions of the California Municipal Code states that the District may begin an administrative proceeding against the customer to impose and collect the administrative fine and the r District's enforcement costs, if a notice of public nuisance has been issued to the customer and corrective work specified in the notice has not been completed within specified time.

6.7. Legal Authorities

The District is empowered to implement and enforce its WSCP under its organizing statutes and Section 14.04.170 of the Municipal Code.

In addition, the District is able to exercise general powers granted to water distributors in CWC §§350-359. CWC §350 authorizes the governing body of a distributor of a public water supply to declare a water shortage emergency 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 there would be insufficient water for human consumption, sanitation, and fire protection. Upon a finding of such an emergency condition, the distributor can adopt such regulations and restrictions on the delivery and consumption of water as will conserve the water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection (CWC §353). The regulations and restrictions remain in force and effect until the supply of water available for distribution within such area has been replenished or augmented, and restrictions may include the right

to deny new service connections and discontinue service for willful violations (CWC §355 and §356). The District also coordinates with the Solano County Water Agency and Solano County within which it provides water supply services for the possible proclamation of a "local emergency" under California Government Code, California Emergency Services Act (Article 2, Section 8558).

6.8. Financial Consequences of WSCP

The Act requires an analysis of the impacts of implementation of this WSCP and likely financial consequences to the District. This section addresses aspects of revenue reduction, expense increases, and additional costs that may arise, and identifies financial response actions.

6.8.1 Revenue and Expenditure Impacts

Hesperia has established water rates that support its on-going operation and maintenance activities, as well as the capital projects required to provide a safe and reliable water supply to its customers. Water rates are tied to Hesperia's customers' normal water consumption activities, which will be reduced through voluntary or mandatory water conservation by customers. Thus, in times of shortage, there will be revenue reductions to Hesperia. In addition to the revenue reductions, Hesperia will also experience an increase in expenses resulting from augmented communication actions, increased enforcement activities, and the administration of water shortage management actions identified in the WSCP.

When a drought or water shortage occurs, the District's costs increase due to the additional activities and duties of instituting a stage of action. Not only will there be costs for materials, and time from permanent staff, but additional staff may need to be hired to assist in implementing the Water Shortage Contingency Plan. Staff will regularly report the identified and anticipated revenue and expenditure impacts and recommend appropriate responses to the District Board. The District maintains a reserve fund to supplement revenue shortfalls.

6.8.2 Drought Rate Structures and Surcharges

Hesperia does not currently have drought rate structures or surcharges. As water rate structures are subject to the regular rate review, the District may choose to consider adopting drought rate structures or surcharges to address the financial consequences of longer-term water shortages. Should the District decide to proceed, such rate changes would be adopted in compliance with then current legal requirements..

6.9. Monitoring and Reporting

The District will conduct regular monitoring and reporting to ensure WSCP implementation is effective and responsive to conditions as they unfold. The District will then use this information to restore and maintain the water supply and demand balance. Similar to the supply and demand projections used to establish a shortage condition, the District will monitor the same data to determine effectiveness and efficacy.

Monitoring activity is expected to include, but not be limited to:

- Gathering monthly or bi-weekly customer water use data.
- Preparing technical assessments of customer water use and identifying deficiencies.
- Analyzing trends in water supply availability, including meteorological events, regional water supply coordination actions, and statewide regulatory trends.
- Assessing water conservation activities and the effectiveness of enforcement actions as applicable to achieving conservation objectives.

District staff will report to decision makers at least quarterly on status and results. Data reporting will include preparation of written reports and presentations, as necessary, for Hesperia management meetings and other public meetings summarizing key information and data, including but not limited to:

- Actual water demands compared to projected demands by customer class and in total.
- Actual supply availability and utilized compared to projected availability for each supply source.
- Projected supply availability for next 12 months for each supply source.
- Monthly reporting of water production and conservation, as required by the State Water Resources Control Board.

These and other data will be regularly evaluated by staff to assess the effectiveness of response measures and to identify the need for any changes or modifications to the declared water shortage stage or actions based on the results. With regard to monitoring and reporting, District staff may determine the need for additional monitoring and reporting measures, or the need to develop or amend ordinances, or update the WSCP as a whole. Any WSCP update or modification will be conducted through the District Board meeting process, unless specific conditions require otherwise.

6.10. Re-evaluation and Improvement Procedures

Hesperia will continually review and assess its procedures for implementing the WSCP. Specifically, Hesperia will use the monitoring and reporting protocols identified above as a quality assurance and quality control measure to understand the effectiveness of water conservation activities. These re-evaluation and improvement procedures will include developing reports, memoranda, and presentations that assess the effectiveness of water conservation actions and the WSCP. These materials will be provided to Hesperia's customers and decision-makers for consideration. Public comments on the published materials and management considerations should be incorporated into the development and implementation of future actions. These protocols will be continually assessed and updated by Hesperia management staff.

6.11. Special Water Feature Distinction

For purposes of water shortage contingency planning and implementation, the District defines as "special water features" those that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains. Such special water features are considered distinct from swimming pools and spas (as defined in subdivision (a) of Section 115921 of the Health and Safety Code).

Water shortage response actions will focus on health and safety issues and balancing continuation of these uses with the severity of the water shortage condition. The relative total water use from these sources is a consideration for how special water features and swimming pool uses could be curtailed during specific water shortage conditions. For instance, when swimming pool filling and refilling would exceed a customer's use allocation under the various drought stages in the Municipal Code, then these actions are prohibited and can be subject to drought penalties and other District enforcement actions. Hesperia determined that special water features are a relatively small discretionary use but may be restricted under all identified water shortage condition.

6.12. 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 the following separate adoption, submittal, and availability processes, and whenever it is separately amended or revised in the future. Hesperia may refine or amend this WSCP as necessary and in compliance with the normal public notice and adoption. Hesperia has followed all applicable law in adopting the WSCPs. The current adopted WSCP shall be available to District customers and to MWA, the City of Victorville, the Town of Apple Valley, San Bernardino County within 30 days of its adoption. A copy of the current WSCP is available for public inspection during business hours at the District office at 9700 Seventh Ave., Hesperia (subject to current COVID 19 restrictions). The current WSCP is posted and available for download here [___[URL]____].

Appendix A
Delta Reliance Analysis

This Appendix provides the Delta Reliance assessment for Hesperia Water District (Hesperia or District). The Mojave Water Agency (MWA) service area boundary includes the following retail water service agencies: Liberty Utilities – Apple Valley Water Company, Bighorn-Desert View Water Agency, City of Adelanto Water District, San Bernardino County Service Area 64, San Bernardino County Service Area 70J, Golden State Water Company – Barstow System, Helendale Community Services District, Hesperia Water District, Hi-Desert Water District, Joshua Basin Water District, Phelan Pinon 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. Additional entities that are not currently subject to the UWMP Act but may be 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. This assessment is consistent with all applicable water management activities within the MWA service area boundary including the Mojave Basin Area Adjudication, 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.[50] 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.[51] The submitted certification of consistency may be appealed by any person and the Delta Stewardship Council may grant the appeal to address contested issues.[52] In short, water suppliers that anticipate participating in a proposed covered action must comply with the requirements of the Delta Reform Act. For more detail on the specific provisions of the Delta Reform Act covered by this Delta Reliance Analysis, see Mojave Water Agency's 2020 Urban Water Management Plan, Appendix A.

[50] California Water Code section 85057.5.
[51] California Water Code section 85225.
[52] California Water Code section 85225.10-85225.25.

A.2 Expected Outcomes for Reduced Delta Reliance and Regional Self Reliance

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 2020 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. Table A-1 shows MWA's expected outcomes for reduced Delta reliance.

Table A-1: Expected Outcomes for Reduced Reliance on the Delta

Year	2010	2015	2020	2025	2030	2035	2040	2045
Total Water Supplies from the Delta Watershed	34.2%	34.2%	31.9%	28.7%	26.2%	24.4%	22.9%	22.2%
Change in Water Supplies from the Delta Watershed		-0.1%	-2.4%	-5.6%	-8.0%	-9.8%	-11.4%	-12.1%

Table A-2 shows the expected outcomes for supplies contributing to regional self-reliance.

Table A-2: Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance	2010	2015	2020	2025	2030	2035	2040	2045
Water Use Efficiency	-	17,735	33,701	46,803	54,025	59,962	64,920	68,828
Water Recycling	62,000	47,825	52,536	47,495	49,699	50,930	52,172	53,559
Conjunctive Use Projects	54,045	57,349	57,349	57,349	57,349	57,349	57,349	57,349
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	143,586	151,647	161,073	168,241	174,441	179,736
Service Area Water Demands without Water Use Efficiency	2010	2015	2020	2025	2030	2035	2040	2045
Service Area Water Demands without Water Use Efficiency	145,066	155,744	163,296	176,846	188,351	196,641	203,965	210,600
Change in Regional Self Reliance (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	143,586	151,647	161,073	168,241	174,441	179,736
Change in Water Supplies Contributing to Regional Self-Reliance		6,864	27,541	35,602	45,028	52,196	58,396	63,691
Percent Change in Regional Self Reliance	2010	2015	2020	2025	2030	2035	2040	2045
Water Supplies Contributing to Regional Self-Reliance	80.0%	78.9%	87.9%	85.8%	85.5%	85.6%	85.5%	85.3%
Change in Water Supplies Contributing to Regional Self-Reliance		-1.1%	7.9%	5.8%	5.5%	5.6%	5.5%	5.4%

The data presented in this section demonstrate the expected outcomes for reduced Delta reliance and regional self-sufficiency. The information contained in this Appendix is also intended to be an addendum to the District's 2015 UWMP consistent with WR P1 subsection (c)(1)(C). The information has been noticed and presented in accordance with applicable law. Further information related to these determinations may be found in Mojave Water Agency's 2020 Urban Water Management Plan, Appendix A.