JOSHUA BASIN WATER DISTRICT

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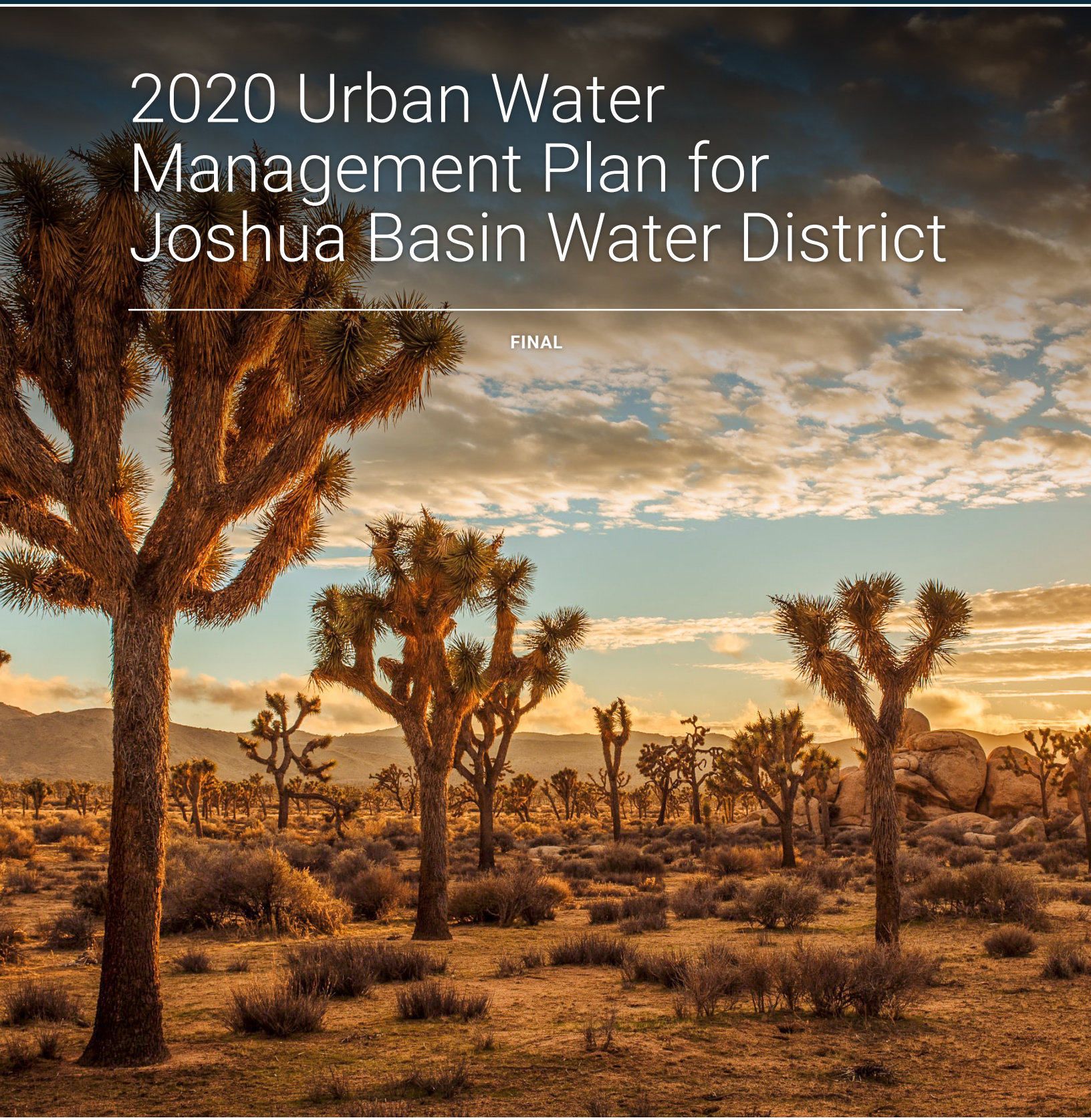
September 2022

2020 Urban Water Management Plan for Joshua Basin Water District

FINAL



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Joshua Basin Water District 2020 UWMP

September 2022

Prepared for

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KJ Project No.2044221*00

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Acronyms

AF	Acre-Feet
AFY	Acre-Feet Per Year
AWAC	Alliance for Water Awareness and Conservation
AWWA	American Waterworks Association
CII	Commercial, Industrial and Institutional
CIMIS	California Irrigation Management Information System
DAC	Disadvantaged Community
DCR	Delivery Capability Report
DMM	Demand management measure
DWR	California Department of Water Resources
ET	Evapotranspiration
GPCD	gallons per capita per day
GSP	Groundwater Sustainability Plan
HDWD	Hi-Desert Water District
IDM	Improvement District Morongo
JBWD	Joshua Basin Water District
LHMP	Local Hazard Mitigation Plan
MBP	Morongo Basin Pipeline
mg/L	milligrams per liter
MWA	Mojave Water Agency
SBX7-7	Senate Bill 7 of Special Extended Session 7
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids

USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WRF	Water Recharge Facility
WSCP	Water Shortage Contingency Plan

Section 1: Layperson's Description/Introduction

1.1 Overview

This document presents the Urban Water Management Plan 2020 (Plan) for the Joshua Basin Water District (JBWD, District) service area. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about the District and its service area characteristics.

The State of California mandates that all urban water suppliers within the state prepare an Urban Water Management Plan (UWMP). Detailed information on what must be included in these plans as well as whom must complete them can be found in California Water Code sections 10610 through 10657. According to the Urban Water Management Planning Act (Act) of 1983, an urban water supplier is defined as a supplier, either public or private, that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplies more than 3,000 acre-feet (AF) annually.

1.2 Purpose

An UWMP is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a Section which "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

"A plan is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers." (*Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal. App. 4th 33, 39.) It should not be viewed as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty and planning projections may change in response to a number of factors. "[L]ong-term water planning involves expectations and not certainties. Our Supreme Court has recognized the uncertainties inherent in long-term land use and water planning and observed that the generalized information required . . . in the early stages of the planning process are replaced by firm assurances of water supplies at later stages." (Id., at 41.) From this perspective, it is appropriate to look at the UWMP as a general planning framework that answers a series of planning questions:

- What are the potential sources of supply and what is the reasonable probable yield from them?

- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?

- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, JBWD will pursue feasible and cost-effective options and opportunities to meet demands.

The Act requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five-year increments (JBWD is going beyond the requirements of the Act by developing a plan which spans twenty-five years).

- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry and multiple-dry years.

- Implements conservation and efficient use of urban water supplies.

State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7) was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. The legislation requires that retailers develop and report the 2020 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates. This UWMP reports on JBWD's progress in meeting the SBX7-7 targets.

JBWD's 2020 UWMP revises the 2015 UWMP and incorporates changes enacted by legislation since that time. The Act has been modified over the years in response to the state's water shortages, droughts, and other factors. The main changes since 2015 to note include:

1. UWMP Submittal Date: 2020 UWMP updates must be adopted and submitted to DWR by July 1, 2021.
2. Reporting on Compliance with SBX7-7 Targets: The 2020 UWMP will be required to document compliance with the 20% reduction described in the 20 by 2020 Water Conservation Plan, and a comparison of actual water use against the target.
3. Reporting compliance with Water Loss Standard: The State Water Resources Control Board (SWRCB) was to adopt a water loss standard no later than July 1, 2020. JBWD will have to show how they will meet the adopted water loss standard in their 2020 UWMP. Water loss standards go into effect June 30, 2022.
4. Five (5)-year Drought Risk Assessment: In past UWMPs suppliers were to conduct a drought risk assessment assuming a period of drought lasting 3 consecutive years. This requirement has changed, and suppliers must now conduct an assessment for a drought lasting 5 years.
5. Sustainable Groundwater Management Act (AB 1739, SB1168, and SB1319): Requires UWMPs to show consistency with Groundwater Sustainability Plan (GSP) supply protections, if applicable.

6. Seismic Risk Assessment (SB 664): Requires an urban water supplier to include within its plan 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 bill authorizes an urban water supplier to comply with this requirement by submitting a copy of the most recent adopted local hazard mitigation plan or multi-hazard mitigation plan if that plan specifically addressed seismic risk to the water supplier's infrastructure.
7. WSCP Updates: State requirements call for an update to the existing WSCP and that it be formally adopted as a stand-alone plan. The WSCP must be updated in parallel to the UWMP.
8. Making Water Conservation a California Way of Life (AB 1668 and SB 606): Regulations targeting indoor water demand and affecting the need for additional water use efficiency in the State.
9. Annual Water Supply and Demand Assessments will be required, starting June 2022, and the process to do the assessment must be described in the 2020 UWMP.

Items optional in the past, but now required, include: calculating the energy intensity of water, incorporation of land use changes in demand forecasting, and calculating water savings from codes and standards.

A checklist to ensure compliance of this Plan with the UWMP Act requirements is provided in Appendix A.

It is the stated goal of the District to deliver a reliable and high-quality water supply to its customers, even during dry periods. Based on conservative water supply and demand assumptions over the next twenty-five years in combination with conservation on non-essential demand during normal years, the 2020 UWMP successfully achieves this goal.

1.3 Basis for Preparing a Plan

In accordance with the California Water Code, urban water suppliers with 3,000 or more service connections, or supplying 3,000 or more acre-feet of water per year, are required to prepare a UWMP every five years.

1.3.1 Relationship to Other Planning Done by the JBWD

Several documents were developed to enable JBWD to maximize the use of available resources and minimize use of imported water, including: JBWD's 2015 UWMP; Consumer Confidence Reports; the San Bernardino County General Plan; and the Mojave Integrated Regional Water Management Plan. Chapter 4 of this Plan describes in detail the water resources available to JBWD for the twenty-five-year period covered by the Plan. A complete reference list is provided in Section 9 of this Plan.

1.3.2 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

The District's primary source of supply is groundwater pumped from the Mojave Basin Area (MBA) and does not receive water directly from the Delta conveyance, which is also referred to

as the State Water Project (SWP) infrastructure. The MBA is adjudicated and managed by Mojave Water Agency (MWA). MWA imports SWP water from Northern California for groundwater basin recharge. As part of MWA's 2021 UWMP, the agency has prepared the Delta Reliance Tables for the region to demonstrate its consistency with the Delta Plan, and is included in Appendix F.

1.3.3 Relationship to Water Shortage Contingency Plan

Concurrent with the 2020 UWMP update, JBWD will also update its WSCP consistent with CWC Section 10632 and Section 10635. The WSCP outlines the District's action plan for a drought or catastrophic water supply shortage and specifies opportunities to reduce demand and augment supplies under such conditions. The WSCP was adopted as a stand-alone document and is referenced in this Plan and is also included as an attachment in Appendix J.

1.4 Structure and Organization of the Plan

This plan is organized as follows:

- Introduction
- Water Use
- SBX7-7 Baseline and Targets
- Water Resources
- Water Quality
- Reliability Planning
- Demand Management Measures
- References
- Appendices

Appendix A contains a checklist documenting how this UWMP meets the requirements of the Urban Water Management Planning Act and SBX7-7. Urban water suppliers are required to report and submit information in standardized tables developed by the California Department of Water Resources (DWR). These standardized tables are provided as Appendix B of this document.

This plan is being prepared for JBWD as an individual rather than Regional UWMP. Data provided in this report are for calendar year rather than fiscal year. To the extent possible water volumes are reported in AF. Tables 1-1 through 1-2 document the structure of this plan.

TABLE 1-1 PUBLIC WATER SYSTEM COVERED BY THIS PLAN

Public Water System Number	Public Water System Name	# of Active Municipal Connections 2020	Volume of Water Supplied 2020 (AF)
CA3610025	Joshua Basin Water JBWD	4,727	1,333

Table 1-2 Agency Plan and Structure

Type of Agency
☐ Agency is a Wholesaler
☑ Agency is a Retailer
Fiscal or Calendar Year
☑ UWMP Tables are in Calendar Year
☐ UWMP Tables are in Fiscal Year
Units of Measure Used in this UWMP
☑ Acre Feet (AF)
☐ Million Gallons (MG)
☐ Hundred Cubic Feet (CCF)

1.5 Cooperative Preparation of the Plan

Water agencies are permitted by the State to either work independently to develop an UWMP whereby they can coordinate their planning with other agencies to develop a cooperative regional plan. The former approach has been adopted by JBWD; however, the Plan was developed in coordination with other local agencies. Water resource specialists with expertise in water resource management were retained to assist the local water agencies in preparing the details of their Plans. Agency coordination for this Plan is summarized in Table 1-3.

TABLE 1-3 AGENCY COORDINATION

	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
Mojave Water Agency	X			X	X	
Bighorn-Desert View Water Agency	X				X	
Hi-Desert Water District	X				X	
Twentynine Palms Water District	X		X		X	
Twentynine Palms Marine Corps Base	X				X	
San Bernardino County Planning Department	X				X	

1.5.1 Public Outreach

JBWD has encouraged community participation in water planning. Notices of public meetings were published in the local press and at JBWD's website.

Table 1-4 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter covers, website postings and invitation letters are attached in Appendix C.

TABLE 1-4 PUBLIC PARTICIPATION TIMELINE

August 25, 2020	Administrative Draft UWMP	Kick-Off Meeting
August 1, 2022	Public Draft UWMP	Draft released to public
August 17, 2022	Public Hearing	Review contents of Draft UWMP and take comments
August 17, 2022	Board Adoption	UWMP and WSCP considered for approval by District Board of Directors

1.5.2 Plan Adoption

JBWD began preparation of this Plan in August 2020. The final draft of the Plan was adopted by the JBWD Board on August 17, 2022 (see Appendix D for the adoption Resolution) and submitted to DWR within thirty days of Board approval. This plan includes all information necessary to meet the requirements of Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656).

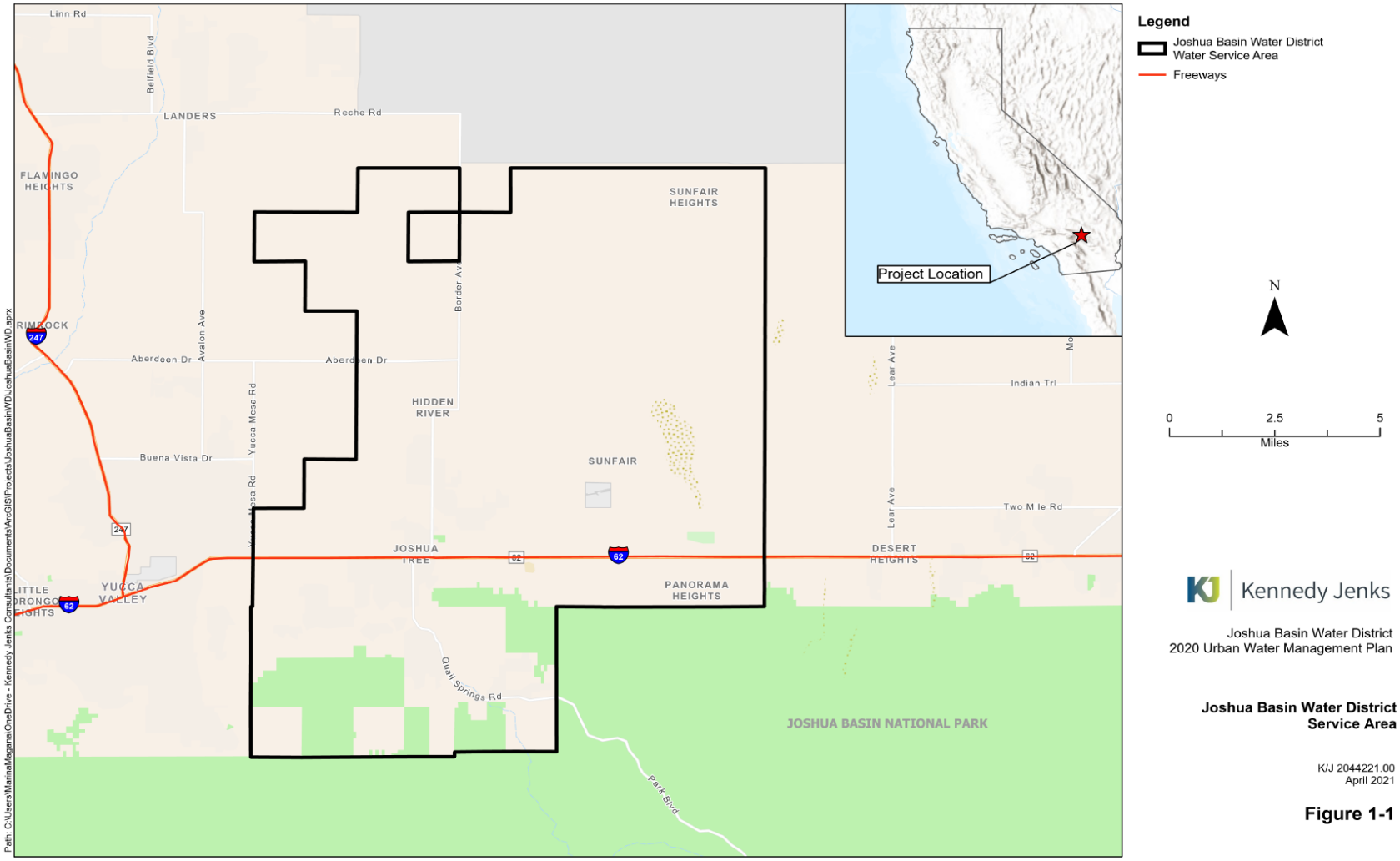
1.6 Water Management within the Joshua Basin Service Area

JBWD was formed as a public agency in 1963, when the District purchased and combined several smaller existing water systems. Since that time, JBWD has grown to provide 1,323 AFY (average, 2015-2020) to serve 4,852 connections within its 96-square mile service area, between Yucca Valley, Twentynine Palms, Joshua Tree National Park and the Twentynine Palms Marine Corps Base.

JBWD provides groundwater and imported water in its service area. JBWD is situated above the Copper Mountain and Joshua Tree groundwater subbasins. Additionally, JBWD has local entitlements to SWP water supplies through cost participation in the Morongo Basin Pipeline (MBP) Project.

See Figure 1-1 for a depiction of the JBWD service area and location.

FIGURE 1-1 JOSHUA BASIN WATER DISTRICT SERVICE AREA



Kennedy Jenks

Joshua Basin Water District
2020 Urban Water Management Plan

Joshua Basin Water District Service Area

K/J 2044221.00
April 2021

Figure 1-1

1.7 Water System Description

JBWD owns and operates 310 miles of water system pipeline, 5 wells, 17 water storage tanks, 11 booster stations and a groundwater recharge facility. Roughly 175 miles of JBWD's pipelines were installed 40 to 70 years ago and the District's municipal meters were replaced approximately 20 years ago. Much of the District's infrastructure is nearing or has surpassed its useful life.

1.8 Population

Having accurate population growth trends is an important part of successful regional water management. Realizing it is such an important part of the planning process, Mojave Water Agency (MWA) initiated the *Mojave Water Agency Population Forecast* completed in August 2020 by UC Riverside Department of Economics (UC Riverside, 2020). The population forecast utilized historical population trends to drive future results. Historical populations were derived from the California Department of Finance, which provides population estimates from 1970 forward on an annual basis. With this data, econometric models were produced to capture historical correlations within countywide population growth. The results of this forecast are summarized below in Table 1-5.

TABLE 1-5 CURRENT AND PROJECTED JBWD POPULATION

	2020	2025	2030	2035	2040	2045
JBWD Population	10,227	10,375	10,536	10,673	10,800	10,919

Note: For growth rates see Section 2.3.5.2.

1.8.1 Demographics and Socioeconomics

JBWD's service area falls within the Mojave Region, intersecting portions of Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. JBWD's service area is identified as an economically disadvantaged community (DAC), with a significant portion of the population falling below the poverty line (approximately 25% based on the census data available for the region). Table 1-6 shows the breakdown of demographic and socioeconomic indicators for the area using the most recent US Census Bureau data available.

TABLE 1-6 AVERAGE DEMOGRAPHICS FOR JOSHUA TREE CENSUS-DESIGNATED PLACE

Demographic Category	Value
Age and Sex	
Persons under 5 years, percent	8.50%
Persons under 18 years, percent	17.90%
Persons 65 years and over, percent	21.40%
Female persons, percent	52.00%
Race and Hispanic Origin	
White alone, percent	87.30%
White alone, not Hispanic or Latino, percent	70.60%
Black or African American alone, percent	1.30%
American Indian and Alaska Native alone, percent	0.20%
Asian alone, percent	1.70%
Native Hawaiian and Other Pacific Islander alone, percent	0.60%
Two or More Races, percent	7.30%
Hispanic or Latino, percent	19.30%
Housing	
Owner-occupied housing unit rate, 2014-2018	51.00%
Median value of owner-occupied housing units, 2014-2018	$124,600
Families & Living Arrangements	
Persons per household, 2014-2018	2.34
Economy	
In civilian labor force, total, percent of population age 16 years+, 2014-2018	43.00%
Persons in poverty, percent	24.60%

Source: US Census Bureau (census.gov)

1.9 Land Uses in the Service Area

Land uses within the District's service area are predominantly single-family and multi-family residential, rural and open space.

1.10 Climate

The climate in JBWD's water service area is arid with average annual rainfall of less than five inches, most of which occurs during the winter months. Precipitation over the past five years has averaged between 4 to 4.5 inches of rain per year. For these calculations, data from Stations 117 (Victorville), 233 (Joshua Tree), and 234 (Newberry Springs) were averaged to derive the climate characteristics of the JBWD service area boundary.

Temperatures range in average from 31 to 67°F during the winter and from 59 to 93°F degrees during the summer. Table 1-7 presents the region's annual average climate data from Stations 117 and 234.

TABLE 1-7 VICTORVILLE, JOSHUA TREE, AND NEWBERRY SPRINGS CLIMATE DATA

Month	Standard Monthly Average Evapotranspiration (ETo) (inches)	Average Monthly Rainfall (inches)	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Temperature (°F)
January	2.46	0.54	61.71	34.84	47.71
February	3.50	0.49	65.55	36.56	50.85
March	5.75	0.46	69.80	41.69	56.00
April	7.40	0.49	78.01	48.15	63.65
May	8.95	0.13	83.89	52.67	69.09
June	10.29	0.04	96.75	62.23	81.03
July	10.08	0.29	101.52	69.41	86.66
August	9.38	0.06	100.50	68.61	85.57
September	7.18	0.16	90.54	59.14	75.53
October	5.03	0.29	80.20	48.48	64.49
November	3.19	0.26	71.34	39.64	54.98
December	2.25	0.98	60.38	33.36	46.21

Source: California Irrigation Management Information System (CIMIS) data provided from Station No. 117, 233, and 234, San Bernardino region. Station 233 ET data available from January 2012 to December 2015. Station 117 and 234 data was taken from January 2016 to August 2020.

1.11 Potential Effects of Climate Change

A topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies. DWR's California Water Plan considers how climate change may affect water availability, water use, water quality, and the ecosystem.[1] The California Water Plan Update 2018 builds upon previous updates, and provides recommended actions, funding scenarios, and an investment strategy to meet the challenges and goals laid out in the prior 2013 Plan[2].

Chapter 3 of the California Water Plan, "Actions for Sustainability", Volume 1, Chapter 5 of the California Water Plan, "Managing an Uncertain Future," evaluated three different scenarios of future water demand based on alternative but plausible assumptions on population growth, land use changes, water conservation and also what future climate change might have on future water demands. Future updates will test different response packages, or combinations of resource management strategies, for each future scenario. These response packages help decision-makers, water managers, and planners develop integrated water management plans that provide for resources sustainability and investments in actions with more sustainable outcomes. The 2018 Update provides recommended actions in order to support each of the identified goals of the plan. The goals are 1) Improve Integrated Watershed Management, 2) Strengthen Resiliency and Operational Flexibility of Existing and Future Infrastructure, 3) Restore Critical Ecosystem Functions, 4) Empower California's Under-Represented or Vulnerable Communities, 5) Improve Inter-Agency Alignment and Address Persistent Regulatory Challenges, and 6) Support Real-Time Decision-Making, Adaptive Management, and Long-Term Planning.

[1] Final California Water Plan Update 2013
[2] California Water Plan Update 2018

In its 2019 *State Water Project Delivery Capability Report (DCR)*, DWR included the potential effects of climate change in its analysis of SWP delivery reliability under future conditions. For that report, DWR selected a range of historic hydrologic conditions from 1922 through 2015, accounting for sea level rise, to examine in the hydrologic model.

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Evaporative coolers and outdoor water use are a large component of water demands in the JBWD's service area. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase vegetative evapotranspiration, which increases water demand.

These effects and their potential to impact the supplies available to JBWD have been evaluated indirectly in the *DWR 2019 DCR*, and in the Mojave Water Agency's IRWMP, and the potential to impact demand is considered in the JBWD's assessment of demands in Chapter 2 of this UWMP.

1.12 Fundamental Findings of the Urban Water Management Plan

It is the stated goal of JBWD to deliver a reliable and high-quality water supply to its customers, even during dry periods. Based on conservative water supply and demand assumptions over the next twenty-five years, the UWMP successfully achieves this goal. JBWD anticipates having adequate supplies, even during dry periods, to meet customer demands.

Section 2: Water Use

2.1 Overview

This chapter describes historic and current water usage and the methodology used to project future demands within JBWD's service area through 2045. Water usage is divided into sectors such as residential, industrial, landscape, and other. To undertake this evaluation, existing land use data and new housing construction information were compiled by JBWD. This information was then compared to historic trends for new water service connections and customer water usage information. In addition, weather and water conservation effects on historic water usage were factored into the evaluation.

2.2 Non-Potable Versus Potable Water Use

The District only serves potable water supplies within its service area. The District does not provide recycled water.

2.2.1 Water Use Sectors

JBWD categorizes its water use customers into the following:

- Single-Family Residential – A single-family dwelling unit, generally a single lot containing a single home.
- Multi-Family Residential – Multiple dwelling units contained within one building or a complex of several buildings.
- Commercial/Industrial – This is a single water use category for water customers conducting business in the service area and which are not a governmental entity or institutional use. Industrial uses are minimal in the JBWD service area. Most water use in this sector reflects water use for retail businesses.
- Institutional/Governmental – Water use for governmental and public purposes (e.g., schools, hospitals, college, County Offices).
- Landscape – Water for landscape irrigation accounted for by a dedicated meter, whether those landscapes are in a residential, commercial, or institutional setting.

Approximately 85 percent of the JBWD's demand comes from the residential sector. Actual water deliveries in 2015 and 2020 are provided in Table 2-2. Data was derived from JBWD Billed Consumption Report. JBWD recognizes that a percentage of residential, commercial, and institutional water sales are going to landscape water use.

2.3 Historical and Current Water Use

The District's 2020 potable water demands were obtained from the District's Customer Billing Record. Each local land use classification was consolidated into a corresponding District land use classification (e.g., Single Family Residential, Multi-Family Residential, Commercial/Industrial, Government/Institutional, Fire, etc.). Table 2-1 summarizes the District's active potable water connections in 2020. Figure 2-1 illustrates the percent of total District potable water usage by sector type in 2020.

Table 2-2 quantifies the water use per sector for the District, which *does not consider savings from codes, standards, ordinances, or transportation and land use plans.*

TABLE 2-1 ACTIVE POTABLE WATER CONNECTIONS (2020)

Sector	Number of Active Connections
Single Family Residential	4,471
Multi-Family Residential	95
Commercial/Industrial	91
Government/Institutional	49
Landscape	21
Total	**4,727**

TABLE 2-2 WATER DELIVERIES - 2015 AND 2020

Use Type	Level of Treatment	2015 Volume (AFY)	2020 Volume (AFY)
Single-family	Drinking Water	903	791
Multi-family	Drinking Water	76	91
Commercial/Industrial	Drinking Water	75	43
Institutional/governmental	Drinking Water	86	94
Landscape	Drinking Water	0	2
	Total	**1,140**	**1,022**

2.3.1 Past Sales

In the past 5 years, JBWD has not sold any water to other water agencies as shown in Table 2-3.

TABLE 2-3 HISTORIC SALES TO OTHER WATER AGENCIES

Agency	2016	2017	2018	2019	2020
Sales (AF)	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

2.3.2 Other Water Uses

JBWD has not had water use related to long-term system storage, saline water barriers, agricultural irrigation, or wetlands. Beginning in 2014, JBWD began receiving SWP water from Mojave Water Agency, averaging 600 AF per year for the past seven years. Like all water agencies, JBWD does have some unaccounted-for water. Unaccounted-for water is the difference between the amount of water produced and the amount of water billed to customers.

Table 2-4 summarizes "other" water uses, besides metered deliveries and sales to other agencies.

TABLE 2-4 "OTHER" WATER USES

Water Use[(a)]	2015	2020
Groundwater Recharge/Storage/Banking	0	0
Long Term System Storage	0	0
Saline Water Intrusion Barrier	0	0
Agricultural Irrigation	0	0
System Losses	181	300
Firefighting	0	4
Total	**181**	**304**

Note:

(a) Any water accounted for in Tables 2-1, 2-2, and 2-3 is not included in this table.

2.3.3 Distribution System Water Losses

In addition to the traditional demand sources, there is another component that impacts the District's water resources known as "water losses." This component is typically defined as the difference between water production and water sales. These water losses can come from authorized, but unmetered sources, such as firefighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters.

For the 2020 UWMP, a water retailer must use the distribution system loss methodology provided by DWR to calculate these losses, based on the American Water Works Association's (AWWA) M36 Manual.

As required by DWR, as part of this UWMP JBWD performed a water loss audit (see output provided in Appendix E and section 7.1.1.5). As estimated by that audit, over the past 4 years (calendar year 2015-2018) unaccounted for water was approximately 13 percent of produced water within JBWD's system. Apparent loss (loss due to meter reading inaccuracies) is estimated to be two (2) percent while real loss (actual leaks) is estimated to be approximately 14 percent. A review of the audit is currently being conducted to better understand sources of measurement error and true water loss. JBWD is conducting this investigation into measurement error as the District feels the water loss audit is overestimating loss and needs to be refined. For this reason, it is assumed that water loss will remain the same over time.

The District is aware of and concerned by the water used for illegal marijuana grows in the service area. The amount of water used by these grows is counted in the District's metering system. However, how much water used by these illegal grows is not easily quantified. The District has and will continue to work with the local authorities to help with this concern.

2.3.4 Summary of Historical and Current Water Use

Table 2-5 below presents information on all water uses for the years 2015 and 2020.

TABLE 2-5 CURRENT AND HISTORICAL "OTHER" WATER USES

Water Use	2015	2020
Total Water Deliveries (from Tables 2-1 and 2-2)	1,140	1,022
Sales to Other Water Agencies (from Table 2-3)	0	0
Additional water uses and losses (from Table 2-4)	181	300
Total	**1,321**	**1,322**

2.3.5 Projected Water Use

2.3.5.1 Current and Projected Land Use

JBWD's projected water usage was estimated considering various factors, including historical and current demands and land use data. The most recent San Bernardino County (County) Parcel and General Land Use Data was utilized in conjunction with the 2020 Edition Population Forecast provided by Mojave Water Agency. First, the existing parcels within the District service area were categorized into simplified land use categories that align with the demand categories shown in Section 2.3.1 (Single Family Residential, Commercial/Industrial, etc.). This parcel data also listed whether the parcel was classified as "vacant" or not. By examining the subset of parcels that were vacant, the ratio of remaining residential to commercial/industrial parcels was obtained. The District is aware that there are short term rentals within the service area that also creates a demand for water on the District. This water use is capture within the single-family and multi-family water uses. However, future updates to this plan may try to estimate this water use as a separate category.

Using the average historical water deliveries by usage category from 2015 to 2020 (see Table 2-5) combined with the existing developed land use data (see Table 2-6 unit demand factors with units of AFY per acre (AFY/Ac) for each usage category were developed.

TABLE 2-6 UNIT DEMAND FACTORS

Usage Type	AFY/Ac
Single-Family Residential	0.08
Multi-Family Residential	1.30
Commercial/Industrial	0.07

Institutional	0.14

Note: Based on 2015-2020 consumption and land use classifications.

Lastly, the land use data of the remaining undeveloped parcels within the JBWD service area was analyzed to develop a ratio of undeveloped residential acreage to undeveloped commercial, industrial, and landscape acreages. The remaining undeveloped parcel acreages by land use are shown in Table 2-7, as well as the area ratios.

TABLE 2-7 ACREAGE OF REMAINING UNDEVELOPED WITHIN JBWD SERVICE AREA

Usage Type	Acreage	Ratio to Residential Acreage
Single-Family	32,059	-
Multi-Family	394	-
Commercial [(a)]	572	0.018
Institutional/Governmental	334	0.010

Note: Includes Commercial/Industrial Usage

Based on the land use classifications of the remaining undeveloped parcels within the JBWD service area, for every 1 acre of residential area developed, approximately 0.017 acres of commercial, 0.010 acres of institutional will develop. Since no specific timelines are available for when the various commercial, or industrial projects will be completed, this method assumes that acreages associated with each land use type will increase in parallel with one another from the year 2020 up to "Buildout" (when all of the area inside of the JBWD service area is assumed to be developed) at the ratios/rates identified above.

2.3.5.2 Water Demands for Future Developments

JBWD has collaborated with MWA to estimate population growth and growth in water demand. Based on the MWA model, it is predicted that the service area population will grow at the following rates:

- 2020 – 2025, 0.3 percent per year
- 2025 – 2030, 0.3 percent per year
- 2030 – 2035, 0.3 percent per year
- 2035 – 2040, 0.2 percent per year
- 2040 – 2045, 0.2 percent per year

The population forecast methodology is described in section 1.7 of this UWMP. Using population and trends in water use, MWA provided JBWD with demand forecasts for future developments through 2045 and these are shown in Table 2-8.

In addition to the demands anticipated from general growth, JBWD has evaluated known potential developments. It is assumed all water demand from these known developments will be realized by year 2025.

TABLE 2-8 ESTIMATED DEMANDS FROM ANTICIPATED FUTURE DEVELOPMENTS

Development Name	2025	2030	2035	2040	2045
Altamira Residential Development/ TTM 18255 [a]	0	0	0	0	0
NextEra[b]	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Note: Altimira and Nextera are no longer in progress.

2.3.5.3 Projected Sales and Other Water Uses

JBWD does not anticipate any regular or single large sales to other agencies in the future. As in the past, JBWD does not anticipate future water use related to long-term system storage, saline water barriers, agricultural irrigation, or wetlands. As described earlier, JBWD is actively working to identify what portions of the system are involved in the high-water loss estimate; for this reason, it is assumed that water loss will decrease, rather than increase over time. For the purpose of projections, system loss is assumed to remain the same, as shown in Table 2-9.

TABLE 2-9 FUTURE SALES AND "OTHER" WATER USES

Water Use	2025	2030	2035	2040	2045
Sales to Other Agencies	0	0	0	0	0
Groundwater Recharge/Storage/Banking	0	0	0	0	0
Long Term System Storage	0	0	0	0	0
Saline Water Intrusion Barrier	0	0	0	0	0
Agricultural Irrigation	0	0	0	0	0
Other	0	0	0	0	0
System Losses	171	171	171	171	171
Total	**171**	**171**	**171**	**171**	**171**

Note: Average non-revenue water from past 4 years of water audit reports.

Given the projected population from Table 1-5, the calculated # persons per residential acre, the unit demands from Table 2-6, and the area ratios for the remaining undeveloped parcels within the JBWD service area from Table 2-7, water delivery projections were developed through the year 2045, and are presented in Table 2-10. A linear growth rate for development was assumed between 2025 and 2045.

TABLE 2-10 TOTAL PROJECTED WATER DELIVERIES (*MODIFIED DWR TABLE 4-2*)

Demand Category	2025	2030	2035	2040	2045
Single family	854	856	857	857	867
Multi-family	88	88	88	88	89

Commercial	61	60	60	59	59
Institutional/Governmental	104	103	102	100	101
Landscape	1	1	1	1	1
Total	**1,108**	**1,108**	**1,108**	**1,106**	**1,117**

2.3.5.4 Total Projected Water Use

Table 2-11 presents information on all projected water uses for the years 2020 to 2045.

TABLE 2-11 TOTAL PROJECTED WATER USE

Water Use	2025	2030	2035	2040	2045
Total Water Deliveries (from Tables 2-10 and 2-11)	1,108	1,108	1,108	1,106	1,117
Sales to Other Water Agencies (from Table 2-12)	0	0	0	0	0
Additional water uses and losses (from Table 2-9)	171	171	171	171	171
Total	**1,279**	**1,280**	**1,279**	**1,277**	**1,288**

2.3.6 Characteristic Five-Year Water Use

A new requirement for the 2020 UWMP cycle is the preparation of a five-year Drought Risk Assessment (DRA), in which water suppliers compare available water supplies with projected water use for the drought period. The first step in preparing the DRA is estimating expected gross water use for the next five years (2021 to 2025) without drought conditions, i.e. without accounting for short-term demand reduction actions or other drought effects.

Table 2-12 presents estimated normal year water use over the next five years, based on factors anticipated to impact water use over the planning period, as described above. As noted above, baseline water demands take into account ongoing water conservation programs and permanent water conservation measures. Increases in demands above 2020 levels and through 2025 are a result of anticipated growth in the District's service area.

TABLE 2-12 PROJECTED FIVE-YEAR WATER USE

Use Type	2021	2022	2023	2024	2025
Single-family	803	816	829	841	854
Multi-family	91	90	89	88	88
Commercial	47	50	54	57	61
Institutional/Governmental	96	98	100	102	104
Landscape	2	2	2	1	1
System Losses	274	248	223	197	171
Total	**1,313**	**1,304**	**1,296**	**1,287**	**1,278**

2.4 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the Housing Eement of any city, county, or city and county in the service area of the supplier. The County of San Bernardino last updated its Housing Element in January 2014 and it is currently being updated. The 2014 housing element estimates that approximately 45 percent of all households in the unincorporated County are “extremely-low”, “very-low”, or “low” income. The County Housing Element provides information on regional housing needs and states goals for new housing to accommodate extremely-, very-, and low-income households. Despite this, the County of San Bernardino housing element does not provide any information that can be used to develop trends to calculate the future number of low-income household units or associated water demand specific to the JBWD service area.

Table 2-13 makes an estimate of future extremely-, very-, and low-income household water demands in the JBWD service area. Table 2-13 assumes a similar occurrence of low-income households in the JBWD service area as in the unincorporated County (i.e., 45 percent). These demands are included within the water demands described in Table 2-10.

TABLE 2-13 PROJECTIONS OF FUTURE LOW INCOME HOUSEHOLD WATER USE

Water Use[(a)]	2020	2025	2030	2035	2040
Estimated Extremely-, Very- and Low-Income Household Water Use	397	424	425	425	425

Note: Assumes 45 percent all future households in JBWD water service area qualify as “extremely", "very-low” or “low” income per the definition provided in Senate Bill 1087

.

Further, JBWD will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households, unless one of the following occurs:

- JBWD specifically finds that it does not have sufficient water supply;
- JBWD is subject to a compliance order issued by the State Department of Public Services that prohibits new water connections; or

- the applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

2.5 Climate Change Considerations

A major factor that affects water usage is typically weather. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool, wet years, historic water usage has decreased, reflecting less water usage for exterior landscaping and evaporative coolers. This factor is discussed below in detail.

2.5.1 Weather Effects on Water Usage

California faces the prospect of significant water management challenges due to a variety of issues including population growth, regulatory restrictions, and climate change. Climate change is of special concern because of the range of possibilities and their potential impacts on essential operations, particularly operations of the State Water Project. The most likely scenarios involve accelerated sea-level rise and increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months. These changes can cause major problems for the maintenance of the present water export system through the fragile levee system of the Sacramento-San Joaquin Delta. The other much-discussed climate scenario or impact is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers. The 2019 Draft State Water Project Capability Report anticipates that approximately 59% of contractual deliveries will be met on any given year.

These changes to the SWP water supply would impact JBWD as the groundwater relied upon by the District receives recharge from the SWP via the Morongo Pipeline. Climate change would affect how much SWP water is available, when it is available, how it can be captured and how it is used due to changes in priorities. Expected impacts to the SWP imported water supply include pumping less water south of the Delta due to reduced supply and pumping more local groundwater to augment reductions in surface water supplies and reliability issues since groundwater is a more reliable source of water.

2.5.2 Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. Since 2005 there have been a number of regulatory changes related to conservation including new standards for plumbing fixtures, a new landscape ordinance, a state universal retrofit ordinance, new Green Building standards, demand reduction goals and more.

Alliance for Water Awareness and Conservation (AWAC), is a collaborative group of over twenty agencies committed to achieving water conservation goals within the 4,900 square mile service area of MWA.

AWAC Goals

- Serve as a network to assist agencies in educating the public on water conservation.

- Provide resources with a consistent message to help agencies meet their respective conservation goals.

- Maintain current gallons per capita per day (GPCD) or lower and continue to position agencies for meeting future conservation needs.

- Exchange ideas between agencies, especially at quarterly meetings.

AWAC's Mission

To promote the efficient use of water and increase awareness of conservation as an important tool to ensure an adequate water supply.

AWAC's Vision

To be a collaborative alliance providing leadership, education, resources, support, ideas and solutions to agencies region-wide to conserve and protect our water supplies

In 2003, JBWD, MWA, and other retail water purveyors in the MWA Service Area formed the Alliance for Water Awareness and Conservation (AWAC). The mission of the AWAC, a coalition of 25 regional organizations, is to promote the efficient use of water and increase communities' awareness of conservation as an important tool to help ensure an adequate water supply. The AWAC have developed water conservation measures that include public information and education programs. The water conservation achieved by AWAC within the JBWD service area is reflected in JBWD's historic and future water demands.

Section 3: SBX7-7 Baseline and Targets

3.1 Existing and Targeted Per Capita Water Use

As required by the Water Conservation Bill of 2009 (SBX7-7), this section identifies the water use targets in 2015 and 2020 to demonstrate a 20% reduction in per capita water use by 2020. Included are calculations of the baseline gross water use expressed as per capita daily water use (gallons per capita per day, or GPCD), baseline and target population, and year 2020 urban water use target. This section includes a description of how JBWD calculated its baseline and target per capita water demands, in accordance with Method No. 3 in "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use" (DWR Methodologies, 2011) as described below. JBWD first calculated the base daily water use, interim water use target and compliance water use target in 2010. JBWD completed the SB X7-7 Verification Forms in the 2020 UWMP, included as Appendix G, and summarized in Tables 3-1 and 3-2 of this chapter.

Methodology 3:

- Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft 20 by 2020 Water Conservation Plan. JBWD falls within the Colorado Hydrologic Region (target for this region is 211 GPCD).

3.1.1 Base Daily Per Capita Water Use

Two baseline periods are to be determined during the calculation of the base daily per capita water use. The first is a continuous 10-year period used to calculate baseline per capita water use. JBWD is not eligible to use a 15-year base period. Years 1995 to 2004 have been selected for calculation of the 10-year base period. The second is a continuous 5-year period used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction requirements of at least a 5% reduction per capita water use. The years 2003 to 2007 have been selected for calculation of the 5-year base period.

Figure 1-1 illustrates the JBWD service area used to estimate the Base Daily Per Capita Water Use. Table 3-1 and Table 3-2 summarize the Base Daily Water Use calculation for JBWD. In order to calculate Base Daily Per Capita Water Use for past years, it was necessary to develop population estimates for past years. The population for JBWD was taken from the 1990, 2000, and 2010 Census; population in intervening years interpolated.

TABLE 3-1 BASELINE PERIOD RANGES

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	1,515	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in baseline period[1]	10	years
	Year beginning baseline period range	1995	
	Year ending baseline period range[2]	2004	
5-year baseline period	Number of years in baseline period	5	years
	Year beginning baseline period range	2003	
	Year ending baseline period range[3]	2007	

Notes:
[1]If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[2]The ending year must be between December 31, 2004 and December 31, 2010.

[3]The ending year must be between December 31, 2007 and December 31, 2010.

As shown in the first tier of Table 3-2, JBWD's Baseline GPCD is estimated to be 174. As shown in the second tier of Table 3-2 JBWD's 5-year Baseline GPCD is 166.

TABLE 3-2 GALLONS PER CAPITA PER DAY

Years		Service Area Population	Gross Water Use (gallons)	Daily Per Capita Water Use
10 to 15 Year Baseline GPCD				
Year 1	1995	7,594	1,357,607	179
Year 2	1996	7,677	1,424,872	186
Year 3	1997	7,761	1,479,759	191
Year 4	1998	7,846	1,305,781	166
Year 5	1999	7,932	1,180,948	149
Year 6	2000	8,073	1,417,675	176
Year 7	2001	8,207	1,460,527	178
Year 8	2002	8,343	1,479,274	177
Year 9	2003	8,481	1,422,139	168
Year 10	2004	8,621	1,502,486	174
10-15 Year Average Baseline GPCD				**174**
5 Year Baseline GPCD				
Years		**Service Area Population**	**Gross Water Use (gallons)**	**Daily Per Capita Water Use**
Year 1	2003	8,481	1,422,139	168
Year 2	2004	8,621	1,502,486	174
Year 3	2005	8,764	1,428,388	163
Year 4	2006	8,909	1,236,752	139
Year 5	2007	9,057	1,673,892	185
5 Year Average Baseline GPCD				**166**
2015 Compliance Year GPCD				
2015		9,745	1,222,164	125
2020 Compliance Year GPCD				
2020		10,227	1,401,099	116

3.1.2 Compliance Water Use Targets

In addition to calculating base gross water use, the “20 by 2020” legislation requires that a retail water supplier identify its demand reduction targets. The methodologies for calculating demand reduction targets were described above. JBWD is choosing to meet SBX7-7 targets as an individual agency rather than as part of a regional alliance. JBWD has selected Method 3, achieving 95% of the applicable Colorado Hydrologic Region target. The Colorado Hydrologic Region target is 211 GPCD, 95% of this target is 200 GPCD. However, as shown in Table 3-3, JBWD’s 5-year Baseline GPCD is 166.

As described earlier, the Maximum Allowable GPCD is 95% of the 5-year Baseline GPCD or 157. The Compliance Water Use Target, under Method 3 (200 GPCD) is more than the Maximum Allowable GPCD; the 2020 GPCD target, therefore, must be adjusted to the Maximum Allowable GPCD, 157. These calculations are summarized in Table 3-3.

TABLE 3-3 WATER USE TARGET CALCULATION - METHOD 3

Selected 10-year Average Base Daily Water Use	174	GPCD
Selected 5-year Average Base Daily Water Use	166	GPCD
Compliance Water Use Target (95% Colorado Region Target)	200	GPCD
Maximum Allowable Water Use Target (5% Reduction on 5-year Baseline GPCD)	157	GPCD
2020 Target	157	GPCD
2015 Target	166	GPCD

3.1.3 Achievement of Compliance Targets

The JBWD 2020 GPCD was calculated using a population estimate provided by MWA (see Section 1.8). As shown in 3-2, JBWD had a 2015 GPCD of 125, which means the District has exceeded the reductions required by the Interim Target. The table also shows that JBWD had a 2020 GPCD of 116 demonstrating compliance with the 2020 Compliance Water Use Target as well as shown in Table 3-4.

TABLE 3-4 2020 COMPLIANCE GPCD
(Modified from SBX7-7 Table 9; DWR Table 5-2)

Actual 2020 GPCD	Target GPCD	Total Adjustments*	Adjusted 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?
116	157	0	116	Yes

Note: In 2020 there were no extraordinary events, economic adjustments, or weather normalization.

Section 4: Water Resources

4.1 Overview

This section describes the water resources available to JBWD for the 25-year period covered by this Plan. Both currently available and planned supplies are examined. JBWD relies on groundwater for its supply. Sustainable use of groundwater is dependent upon recharge either natural or artificial.

This section assesses supplies in an average year, a single dry year, and during multiple dry years.

- An average year (also called normal year) is the average supply over a range of years and represents the median water supply available to JBWD.
- The single dry year is the year that represents the lowest water supply available to JBWD.
- The multiple dry years is the lowest average water supply available to JBWD for three or more consecutive dry years.

Although, JBWD does not currently use nor does it have immediate plans to use surface water, storm water, or recycled water, these could be future supply sources.

Water supply available to JBWD has been studied for many years as represented with the following reports:

- In 1996, Krieger and Stewart, Inc. prepared a Groundwater Management Plan (GWMP) for the JBWD that evaluated the existing conditions of the Joshua Tree and Copper Mountain subbasins. The GWMP provided estimates for the amount of groundwater in storage, the safe yield of groundwater bodies within the District's boundaries, the water quality characteristics of area groundwater, and the quantity and distribution of groundwater production within the District.
- In 2004 the US Geological Survey conducted extensive investigations on groundwater recharge and prepared a finite-difference numerical groundwater model for JBWD (Nishikawa et al., 2004). The geohydrology of the study area was refined through collection and review of water-level and water-quality data, geologic and electric logs, and gravity data. The specific goals of the USGS study were to identify the thickness of the water-bearing units, define the aquifers, and study groundwater level changes.
- In 2006 JBWD retained the services of Dudek and Associates to evaluate the sustainability of groundwater production and the potential impact of future growth and demand due to changes in population.
- In 2009, JBWD retained the services of Environmental Science Associates to prepare a Final Environmental Impact Report for the Recharge Basin and Pipeline Project.

4.2 Local Water Supplies

4.2.1 Groundwater

JBWD supplies water to the community from two groundwater basins as defined by the California Department of Water Resources (DWR) Bulletin 118-03 (DWR 2021). These basins - the Copper Mountain Valley (DWR Basin 7-11) and Joshua Tree (DWR Basin 7-62) Groundwater Basins - overlie a broad hydrologic region also defined in DWR Bulletin 118-03 as the Colorado River hydrologic region (Region 7). Figure 4-1 shows the DWR groundwater basins within the JBWD service area.

4.2.1.1 Groundwater Basin Description – Copper Mountain

The Copper Mountain subbasin, within the Copper Mountain Valley Basin, is approximately 54 square miles (USGS 2004 pg. 3). The subbasin is bounded by the Giant Rock groundwater subbasin to the north, the Copper Mountain fault to the east and northeast, the Pinto Mountain fault to the south, and basement rock to the West (USGS 2004). The Copper Mountain subbasin is depicted in Figure 4-1. Widely varying estimates of the water volume within the saturated water-bearing sediments in the Copper Mountain subbasin since 1976 have ranged from 127,000 AF to over 940,000 AF (JBWD 2002 Master Plan; DWR 2004; Krieger and Stewart 1996; Dudek 2006). The USGS conducted the most recent and most extensive study of the Copper Mountain subbasin. A review of the 2004 USGS report indicates (page 14) that the water-bearing portion of the Copper Mountain subbasin is 13.4 square miles, with a thickness of the middle and upper aquifers of 600 feet. In January 2016 USGS and Dudek conferred on their estimates of water available in the aquifers. The USGS estimate of water available in the Copper Mountain subbasin ranges from 428,800 AF to 836,160 AF (David O'Leary, USGS, and personal communication January 11, 2016.). Using different modeling assumptions, Dudek estimated water available as 272,737 AF (Steven Stuart, Dudek, personal communication January 11, 2016).

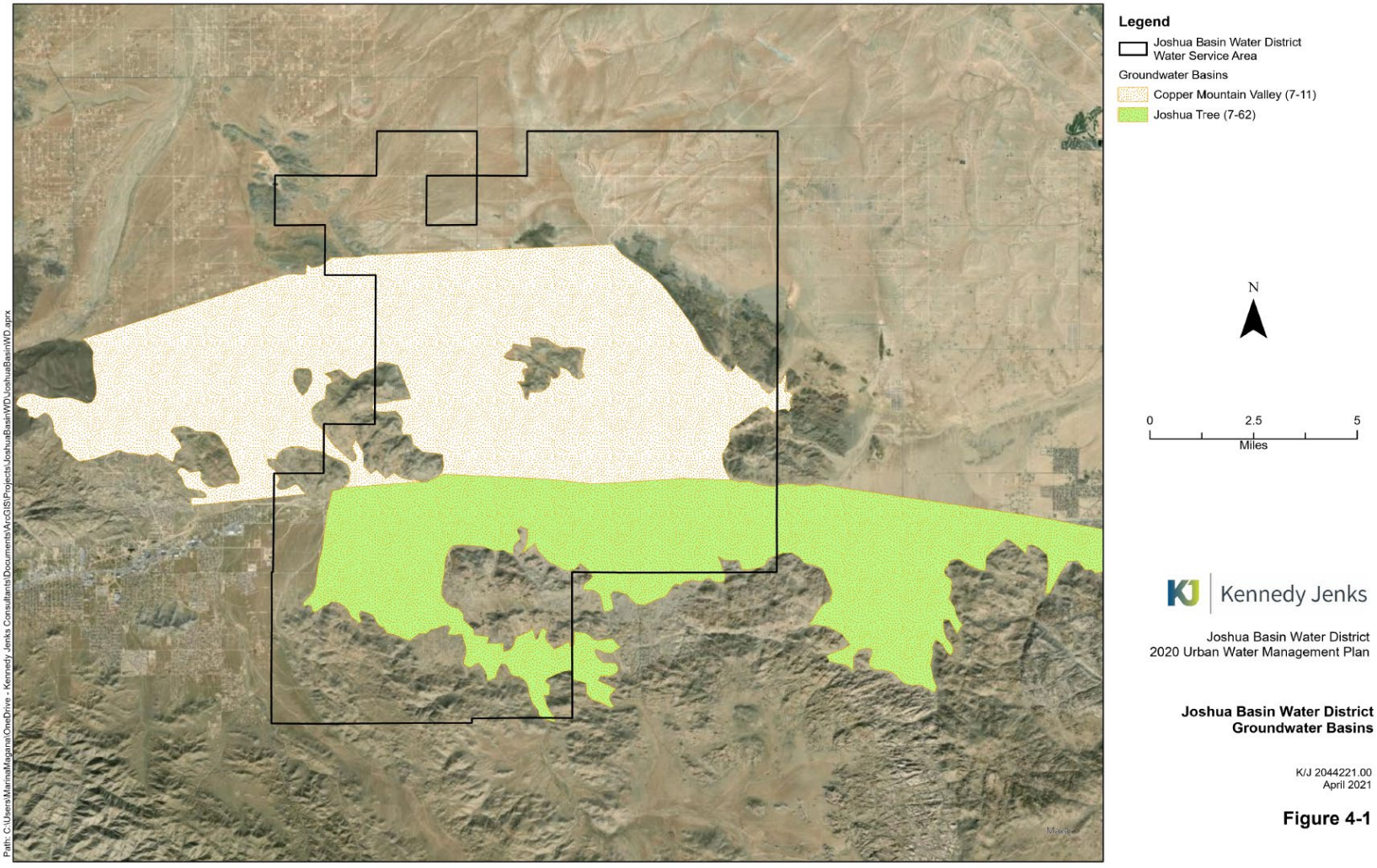
However, both estimates include water within the upper, middle and lower aquifer, and are based on drawing down the upper aquifer until it is dewatered, which is not an acceptable management practice. The conservative estimate of groundwater available for the purposes of this plan is estimated based only on water available in the upper aquifer. That estimate ranges from 257,280 AF (USGS 2016) to 271,579 AF (Dudek 2006). Therefore, for the purposes of this plan, we estimate groundwater available in the Copper Mountain subbasin at 264,000 AF.

Two JBWD wells pump from the Copper Mountain subbasin. Recent historical pumping from the Copper Mountain subbasin is shown in Table 4-1; during the period 2016 to 2020 pumping averaged 611 AF per year.

Table 4-1 Historical Pumping by JBWD for Copper Mountain Subbasin (AFY)

	2016	2017	2018	2019	2020	Average
Total	591	617	641	579	626	611

FIGURE 4-1 JBWD GROUNDWATER BASINS



Kennedy Jenks

Joshua Basin Water District
2020 Urban Water Management Plan

Joshua Basin Water District Groundwater Basins

K/J 2044221.00
April 2021

Figure 4-1

DWR Bulletin 118 does not list the Copper Mountain subbasin as being in overdraft. However, studies by USGS suggest declining groundwater levels, specifically due to groundwater extractions that are greater than recharge (USGS 2004 pg. 105).

Additionally, JBWD water level data for wells 15 and 16 indicate a 0.75-foot drop per year, on average, for the past 8 years.

4.2.1.2 Groundwater Basin Description – Joshua Tree

The Joshua Tree subbasin is approximately 18 square miles (USGS 2004 pg. 3). The subbasin is bounded by the Little San Bernardino Mountains to the south, the Yucca Barrier and the Warren groundwater subbasin to the west, the Pinto Mountain Fault and the Copper Mountain subbasin to the north, and the Twentynine Palms groundwater subbasin to the east (USGS 2004 pg. 3). The Joshua Tree subbasin is depicted in Figure 4-1. Estimates of the saturated water bearing sediments in the Joshua Tree subbasin has been estimated between 480,000 AF up to 3,200,000 AF (JBWD Master Plan 2002; DWR 2004; Krieger and Stewart 1996; Dudek 2006).

USGS conducted the most recent and most extensive study of the Joshua Tree subbasin. The water-bearing portion of the Joshua Tree subbasin is 12.4 square miles, with a thickness of the middle and upper aquifers of 600 feet.

In January 2016, USGS and Dudek conferred on their estimates of water available in the aquifers. The USGS estimate of water available in Joshua Tree subbasin ranges between 515,840 AF to 773,660 AF. The Dudek estimate of water available is 352,617 AF. However, both estimates of water available in the Joshua Tree subbasin are based on drawing down the upper aquifer until it is dewatered, which is not an acceptable management practice. The conservative estimate of groundwater available for the purposes of this plan is estimated based only on water available in the upper aquifer. That estimate ranges from 238,080 (USGS) to 348,594 (Dudek). Groundwater available in Joshua Tree subbasin, for the purposes of this plan, is estimated at 293,000 AF.

Groundwater production from the Joshua Tree subbasin, by JBWD, averaged 707 AFY during the period 2016 to 2020 (Table 4-2).

TABLE 4-2 HISTORICAL PUMPING BY JBWD FROM JOSHUA TREE SUBBASIN (AFY)

	2016	2017	2018	2019	2020	Average
Total	764	731	686	659	626	707

The Joshua Tree subbasin is in a condition of consistent overdraft (USGS 2004, pg. 14).

Additionally, JBWD water level data for Well 10 has indicated a 1 foot annual drop since the 1970's. Newer wells also indicate water level drops, Well 14 has experienced a 1 foot drop annually since 2007 and Well 17 has had more than a 9 inch drop every year since 2010. Data from USGS monitoring wells located at the cemetery confirm the groundwater level decline.

4.2.1.3 Estimate of Water Available Combined Copper Mountain and Joshua Tree Subbasins

A conservative estimate of groundwater available in storage for both subbasins in the upper aquifers is 557,000 AF.

4.2.1.4 Adopted Groundwater Management Plan

Neither the Joshua Tree nor the Copper Mountain groundwater subbasins are adjudicated and there are no deeded rights to withdraw water. Overall management of water resources is the responsibility of the District.

The California State Legislature passed Assembly Bill 3030 (AB 3030) during the 1992 legislative session allowing local agencies to develop Groundwater Management Plans (GWMPs). The legislation declares that groundwater is a valuable resource that should be carefully managed to ensure its safe production and quality. The legislation also encourages local agencies to work cooperatively to manage groundwater resources within their jurisdiction. Senate Bill 1938 (SB 1938) was passed by the Legislature September 16, 2002, which made changes and additions to sections of the Water Code created by AB 3030.

The District's 1996 GWMP, adopted on February 17, 1997 (JBWD Ordinance 97-1), serves as the GWMP for JBWD. The 1996 GWMP covers all groundwater basins in the JBWD service area and contains all of the relevant components related to Groundwater Management Plans required by California Water Code Sections 10750-10753.10, as well as the components recommended by DWR in California's Groundwater - Bulletin 118. The GWMP is attached as Appendix H.

In order to accomplish the overall objective of the GWMP, the District established a number of subsidiary objectives which, when realized, will enable the District to effectively manage groundwater supplies. The District's Groundwater Management Plan consisted of evaluating and (potentially) adopting a number of management activities, including water conservation measures, groundwater monitoring, groundwater production standards, water export prevention, conjunctive use, groundwater contamination prevention/response, planning agency coordination, and a replenishment assessment. An outgrowth of the GWMP was further study of groundwater availability in the JBWD service area.

The Sustainable Groundwater Management Act (SGMA) passed in 2014 and amended in 2015 creates a framework for sustainable, local groundwater management in California. SGMA directed the Department of Water Resources to identify priority groundwater basins for the purpose of implementing SGMA. SGMA requirements to create sustainable groundwater management agencies and sustainable groundwater management plans apply only to high and medium priority basins. JBWD's basins are currently rated as very low priority basins. However, JBWD intends to take actions to protect its groundwater supply and is currently considering formation of a Sustainable Groundwater Agency. The District will continue to cooperate with regional partners, including MWA, to manage the basins.

4.2.1.5 Water Available from Natural Recharge

As discussed previously, JBWD is reliant upon groundwater for all of its water supply requirements. While the District overlies a significant supply of high-quality groundwater, the region's arid environment limits the extent to which the groundwater supply is naturally recharged.

The USGS investigated natural recharge in the Joshua Tree and Copper Mountain subbasins using field investigations of recharge along Quail Wash, a regional watershed numerical model, and a groundwater numerical model. The USGS estimated natural recharge from rainfall to be approximately 123 AFY per year on average with an additional 84 AFY entering the subbasin as underflow from the adjacent Warren Basin, representing a total of 207 AFY in natural recharge to the Joshua Tree and Copper Mountain subbasins. USGS also estimated that on average about 200 AFY leaves the Joshua Tree and Copper Mountain subbasins by underflow to the Surprise Spring subbasin (USGS 2004 pg. 22, 105).

Due to similar estimates of water entering and leaving the subbasins as a result of natural recharge and underflow, it has been assumed that no water from natural groundwater recharge is available for the purposes of this UWMP.

4.2.1.6 Groundwater Supply Reliability

It is estimated that from 1958 to 2001 pumping from the Joshua Tree and Copper Mountain subbasins was 42,210 AF, with nearly all of that water coming from storage (41,930 AF) and explains an observed 35-foot decline in groundwater levels (USGS 2004 pg.113). This indicates that the amount of groundwater extracted has exceeded the estimated amount of water entering the aquifers from underflow, natural recharge, and artificial recharge. Overdrafting a groundwater basin is ultimately unsustainable, although given a large volume of water in storage and a relatively small overdraft, it can continue for a considerable time. Limited or short-term overdraft is not considered a significant negative impact; however, excessive overdraft can result in significant problems, such as a decrease in the amount of groundwater in storage, or a decline in water levels that induce the migration of poor quality water into productive areas of an aquifer.

Given the volume of water in storage, it is possible that JBWD could pump groundwater above natural recharge for more than the next 25 years given current population estimates. This supply would be available in normal hydrologic conditions, a single dry year, multiple dry years, and wet years. However, as described in section 3.3, JBWD is taking steps to reduce basin overdraft.

4.2.1.7 Available Groundwater Supplies

Projected groundwater pumping for the JBWD service area (including both the Cooper Mountain and Joshua Tree subbasins) is summarized in Table 4-3. In order to meet demands (see Chapter 2) JBWD will need to pump at the levels shown in Table 4-3. As shown in Tables 4-7, 4-8, and 4-9 (which appear later in this chapter) a portion of this recharge comes from recharge of imported water, a portion from return flow, and a portion is taken out of groundwater storage (overdraft). JBWD will need to purchase and recharge additional imported water; otherwise JBWD could exacerbate overdraft in the Joshua Basin and Copper Mountain subbasins. See

sections 4.3 and 4.5 for a discussion on existing and planned groundwater recharge using imported water.

TABLE 4-3 PROJECTED GROUNDWATER PUMPING BY JBWD (AFY)

	2025	2030	2035	2040	2045
Joshua Basin and Copper Mountain subbasins					
Normal Year	1,573	1,573	1,573	1,572	1,577
Single-Dry Year	1,254	1,256	1,255	1,253	1,264
Multiple Dry Year	1,254	1,256	1,255	1,253	1,264

4.3 Imported Water Supplies

In order to reduce overdraft to groundwater supplies, JBWD entered into the Improvement District Morongo (IDM) Agreement with MWA to provide recharge water to the Joshua Tree subbasin. Under this agreement JBWD is entitled to up to 1,959 AFY of SWP water until the year 2022. Water purchased from MWA is delivered to the Water Recharge Facility (WRF) which overlies the Joshua Tree subbasin. Water has been delivered to the WRF since 2014. The SWP water is brought to the area via the 71-mile-long Morongo Basin Pipeline (MBP), which conveys SWP water from the California Aqueduct in the Mojave River watershed to the Hi-Desert Water District (HDWD), Bighorn Desert View Water District and JBWD service areas. Voters approved the financing plan for the $54 million MBP project by more than a two-thirds vote in June 1990.

In 1991, when the IDM Agreement was signed by MWA and JBWD, MWA had a SWP amount of 50,800 AFY. Of this amount, one seventh (or 7,257 AFY) was assigned to Division 2 Improvement District Morongo, the designated service area for the MBP; JBWD was assigned 1,959 AFY. The agreement provides that MWA may deliver additional SWP water to MBP project participants when water is available, subject to pipeline capacity. The JBWD has a contract in place under the provisions of the IDM Agreement for delivery until 2022. After 2022, JBWD will rely on MWA to provide the necessary imported water (see Section 4.3.2).

Delivered SWP water provides some relief from groundwater overdraft. The infrastructure to deliver JBWD's full allocation of 1,959 AFY is in place. In fact, it is possible for the JBWD to receive more than its allocated 1,959 AF without the addition of any new infrastructure. In 2014 JBWD began purchasing an average of 500 AFY of imported water for groundwater recharge.

4.3.1 MWA Water Supply Reliability

DWR prepares a biennial report to assist SWP contractors (including MWA) and local planners in assessing the near and long-term availability of supplies from the SWP. DWR issued its most recent update, the 2019 DWR State Water Project DCR, in August 2020. In the 2019 update, DWR provides SWP supply estimates for SWP contractors to use in their planning efforts, including for use in their 2019 UWMPs. The 2019 DCR includes DWR's estimates of SWP water supply availability under both current and future conditions.

The DCR estimates that MWA, on average, will receive 58 percent of its Table A allocation (see Table 4-4). Therefore, it is assumed in a normal/average year that JBWD could receive 58

percent of its normal allocation or 1,959 AF (0.58 * 1,959 AFY). However, at the current time JBWD has chosen to purchase only 500 AFY. JBWD plans to purchase additional SWP water and this planned purchase will be affected by the SWP reliability. For planning purposes, it is assumed the current and planned purchase of SWP water from MWA will not exceed 1,097 AF in an average year.

TABLE 4-4 JBWD IMPORTED WATER SUPPLY RELIABILITY

Wholesaler	Normal Year[(a)]	Single Dry Year[(b)]	Multiple Dry Year
California State Water Project (SWP)			
% of Table A Amount Available (Existing)	58%	6%	31%
% of Table A Amount Available (Future)	56%	11%	28%
Anticipated Deliveries – Current Purchase (AFY)	1,136	118	607
Anticipated Deliveries – Planned Purchase (AFY)	1,097	215	549

Notes:

a. The percent of Table A available to MWA is taken from the 2019 SWP Delivery Capability Report, Table 29.

b. The percent of Table A available to MWA is based on the 2019 SWP Delivery Capability Report, Table 61.

The extremely dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in the historical record. Water year 2013 was a year with two hydrologic extremes.[3] October through December 2012 was one of the wettest fall periods on record but was followed by the driest consecutive 12 months on record. Accordingly, the 2013 SWP supply allocation was a low 35 percent of SWP Table A Amounts. The 2013 hydrology ended up being even drier than DWR's conservative hydrologic forecast, so the SWP began 2014 with reservoir storage lower than targeted levels and less stored water available for 2014 supplies. Compounding this low storage situation, 2014 also was an extremely dry year, with runoff for water year 2014 the fourth driest on record. Due to extraordinarily dry conditions in 2013 and 2014, the 2014 SWP water supply allocation was a historically low 5 percent of Table A Amounts. The dry hydrologic conditions that led to the low 2014 SWP water supply allocation were extremely unusual, and to date have not been included in the SWP delivery estimates presented in DWR's 2019 Delivery Capability Report.

The Delivery Capability Report modeling shows that the minimum dry-year for existing conditions would be 6 percent and 11 percent for future conditions. For the purposes of this UWMP, the critical single dry year allocation of SWP water to MWA is assumed to be 11%.

[3] A water year begins in October and runs through September. For example, water year 2018 is October 2017through September 2018.

Therefore, it is assumed in a single-dry year that JBWD could receive 89 percent of its normal allocation or 215 AF (0.11 * 1,959 AF). This is depicted in Table 4-4.

The Delivery Capability Report examined a range of multiple dry year scenarios. Under these scenarios, deliveries in a multiple-dry year range from 31 to 28 percent. For this UWMP the 5-year multiple-dry year scenario, assumes a repeat of years 1931 to 1934. Given a repeat of hydrologic conditions 1931 to 1934 the SWP is expected to deliver 28 percent of MWA's Table A allocation.

4.3.1.1 MWA Reduced Delta Reliance

MWA continues to demonstrate reduced reliance on water supplies derived from the Delta and regional self-sufficiency. The reduced reliance and regional self-sufficiency are attributable to significant advances in developing recycled and reusable water supplies combined with a region-wide emphasis on water use efficiency among MWA and the retail agencies. The MWA service area's reduced dDelta reliance and improved regional self-sufficiency are detailed in Appendix F.

4.3.2 MWA Continued Supply after IDM Agreement

The supply listed in Tables 4-1 and 4-4, assumes that MWA will continue to supply a percentage of the entitled 1,959 AFY to the Morongo Basin Pipeline after JBWD's existing contract with MWA expires in 2022. After the IDM Agreement has expired, MWA will allocate SWP water to meet customer demands in a manner consistent with its universally applied SWP allocation policies. It is reasonable to assume that policies will be similar to the allocation methods MWA has used during the last few years (i.e., shortages will be shared by all MWA customers during dry periods and SWP supplies will be allocated according to customers' proportional share of historic deliveries).

4.4 Return Flow

The USGS defines return flow as water that is applied to an area, which is not consumed in evaporation or transpiration and returns to a surface stream or aquifer (USGS 2015). Return flow becomes part of the available water supply. For example, some of the water applied to septic systems and irrigation percolates into the groundwater aquifer. The portion of the groundwater pumped that does not eventually return to the aquifer is referred to as consumptive use.

Based on discussions with MWA, the consumptive use onsite is assumed to be less than 50 percent, though this will vary from customer to customer. This means that 50 percent or more of the water delivered to customers could go to return flow.

In lightly populated areas the return flow volume may have only minor hydraulic head, and thus will travel more slowly to the aquifer. As is the case with the widely varying estimates of water volume in the subbasins, recharge from septic leachate has also varied:

- Early work by USGS (1995) in the Victorville area indicated that septage in the Joshua Tree area could reach groundwater within 1.4 to 20 years (USGS 2004 pg. 22).

- The 2004 USGS study indicated that there was potential for 660 AFY of return flow from septic systems to recharge the groundwater subbasins, but did not include it in the groundwater model that was prepared. The 2006 study prepared by Dudek utilized the VS2D model developed by USGS to estimate how long it would take septic tank leaching to reach the groundwater. The simulations estimated that return flow from the typical home in the JBWD service area would reach groundwater in 22.5 years (Dudek 2006, pg. 7). The results of the simulation were cross-checked against nitrate trends in JBWD wells. Nitrate is an indicator of septic discharge to groundwater. The nitrate trends at Well 10, near dense populations, indicates leachate has reached the aquifer. However, nitrate levels at the other 4 wells (with sparse population) are at background levels, indicating septage has not reached the aquifer.

- Further work funded by local water agencies (Izbicki et al. 2015) found that septage in lightly populated areas could take more than 100 years to reach groundwater in the Joshua Tree area; septage in more densely populated areas was estimated to take approximately 45 years.

- Both the 2004 and 2015 USGS reports state that while the rate of return is estimated to be delayed, the return flow will reach the aquifer.

Given the uncertainty related to estimates of non-consumptive use, and the travel time to the aquifer, JBWD is conservatively estimating that 50 percent of water delivered to customers that overlie groundwater recharge areas will eventually result in return flow. It is estimated that approximately 86 percent of JBWD customers overlie groundwater recharge areas; subsequently it is only these customers that generate return flow. Return flow estimates are shown in Table 4-5 and are calculated as follows:

(0.50) x (JBWD deliveries) x (0.86).

Based on demand estimates in Chapter 2, return flow is estimated as shown in Table 4-5.

TABLE 4-5 RETURN FLOW ESTIMATES (AFY)

	2025	2030	2035	2040	2045
Normal Year	476	476	476	475	480
Single Dry Year	476	476	476	475	480
Multiple Dry Year	476	476	476	475	480

4.5 Planned Wholesale Water Supplies

As described earlier, the infrastructure needed to transport, deliver, and recharge 1,959 AFY imported water within the Joshua Tree subbasin is already in place. For 2014 thru 2018 JBWD has limited its purchase of imported water to an average of 500 AFY. In the future JBWD plans to purchase an additional amount of water which will allow the District to continue to use groundwater while reducing the risk of overdraft. Without the additional purchase of imported water, overdraft of the Joshua Tree Basin will continue and grow.

The planned imported water supplies will have the same reliability as JBWD's existing imported supplies. Table 4-5 demonstrates that in a normal year JBWD could get as much as 1,097 AFY

imported water; meaning that in a normal year JBWD would get the 500 AFY imported water it currently purchases and an additional 611 AFY would be available. JBWD anticipates needing an additional 600 AF.

In a single-dry year it is possible the JBWD will only receive 215 AF of imported water. In a multiple-dry year period JBWD anticipates receiving 549 AFY imported water for future conditions. In order to avoid overdraft JBWD needs to recharge all the water available from MWA in dry years. In a single dry or multiple dry years JBWD will be pumping more water than is replenished to the groundwater. Short-term overdraft of the basin is unlikely to result in significant impacts but it is important that overdraft be limited and short-term.

4.6 Potential Supply Inconsistency

Because water use within the JBWD service area is supplied entirely by groundwater, JBWD does not have any inconsistent water sources that cause reduced deliveries to users within the service area. A potential exception is areas where water quality could limit use as a potable supply. Wellhead treatment or provision of an alternative supply would be planned for these areas. Please refer to Chapter 5 of this UWMP. While many of the sources that recharge the groundwater basin have high annual variability, including flows on the Mojave River and supplies from the State Water Project, the groundwater basins used within the JBWD service area are sufficiently large to allow for continued water use during dry periods without seriously hindering the water supply. In addition, MWA recharge of SWP supplies into the local groundwater basins will augment and maintain overall groundwater supplies.

4.7 Transfers, Exchanges, and Groundwater Banking Programs

In addition to SWP water supplies and groundwater, MWA is currently exploring opportunities to purchase water supplies from other water agencies and sources. Transfers, exchanges, and groundwater banking programs, such as those described below, are important elements to enhancing the long-term reliability of the total mix of supplies currently available to meet the needs.

4.7.1 Transfers and Exchanges

An opportunity available to JBWD to increase water supplies is to participate in voluntary water transfer programs. Since the drought of 1987-1992, the concept of water transfer has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the “Katz” Law (California Water Code, Sections 1810-1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483). These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

The most likely voluntary water transfer programs would probably involve the Sacramento or San Joaquin Valley areas. According to the California Water Plan Update 2019, up to 27 million AFY of water are delivered for agricultural use every year. More than half of this water use is in the Central Valley, and much of it is delivered by, or adjacent to, SWP and Central Valley

Project (CVP) conveyance facilities. This proximity to existing water conveyance facilities could allow for the voluntary transfer of water to many urban areas, including JBWD, via the MWA and the SWP system. Such water transfers can involve water sales, conjunctive use and groundwater substitution, and water sharing and usually occur as a form of spot, option, or core transfers agreement. The costs of a water transfer would vary depending on the type, term, and location of the transfer.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness in meeting resource needs. Through the resource planning process and ultimate implementation, several different types of water transfers could be undertaken.

4.7.2 Opportunities for Short and Long-Term Transfers and Exchanges

Since JBWD is a retailer within the MWA service area, its transfer and exchange opportunities are somewhat limited. However, MWA has, on behalf of all its retailers, including JBWD, participated in significant SWP Table A transfers and exchanges, thus augmenting local water supplies. It is assumed that MWA will continue to participate in such programs.

4.7.3 Groundwater Banking Programs

With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve water supply reliability for JBWD. Conjunctive use is the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive use concepts are based on storing groundwater supplies in times of surplus for use during dry periods and drought when surface water supplies would likely be reduced.

Groundwater banking programs often involve storing available SWP surface water supplies during wet years in groundwater basins in, for example, the San Joaquin Valley. Water would be stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers for their use in lieu of their intended groundwater pumping. During water shortages, the stored water could either be pumped out and conveyed through the California Aqueduct in MWA's capacity, to JBWD as the banking partner, or used by the San Joaquin valley farmers in exchange for their surface water allocations, which would be delivered to JBWD via MWA as the banking partner through the California Aqueduct. Several conjunctive use and groundwater banking opportunities may be available to JBWD.

MWA has its own conjunctive use program to take advantage of the fact that the available MWA SWP supply on average is still greater than the demand in the service area. MWA is able to store this water for future use when SWP supplies are not available. This activity also allows MWA to take advantage of wet year supplies because of the abundant groundwater storage available in the Basins. In 2006, MWA adopted a "Water Banking Policy" to guide the Agency in determining where water will be banked. Banking targets (maximums) were established for each groundwater basin where banking may occur under this Policy to prioritize where available water will be banked. The targets are generally based on the calculation of three times the non-agricultural water demand (production) within the Subarea.

Other local agencies, including HDWD bank excess SWP purchased from MWA. This is an option that is also available to JBWD now that the MBP and WRF are completed.

Additional local groundwater banking programs may be cooperatively developed in the desert region by various SWP contractors, including MWA, and such programs would be available to JBWD.

4.8 Development of Desalination

The UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). JBWD has evaluated opportunities for using desalinated water in future supply options. However, at this time, none of the opportunities are practical or economically feasible for JBWD, and JBWD has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan.

4.8.1 Opportunities for Brackish Water and/or Groundwater Desalination

The groundwater supplies in the JBWD service area are not considered brackish in nature, and desalination is not required.

4.8.2 Opportunities for Seawater Desalination

Because the District is not in a coastal area, it is neither practical nor economically feasible for JBWD to implement a seawater desalination program. However, JBWD and MWA could team up with other SWP contractors and provide financial assistance in construction of other regional seawater desalination facilities in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to JBWD/MWA from the SWP contractor.

4.9 Recycled Water

In 2006 JBWD requested that the Local Agency Formation Commission (LAFCO) authorize the District to have a wastewater function. In 2007 the Commission authorized JBWD to have a wastewater function, but limited the services of that function to operation of wastewater package treatment plants and planning and engineering related to regional wastewater service. LAFCO staff and the Commission did not believe that the wastewater function and service should include the ability to operate a regional wastewater facility at that time. Further consideration by the Commission is required for the District to expand the services to include the actual provision of collection, treatment and disposal of wastewater.

The Regional Board has adopted waste discharge requirements which have resulted in the requirement for installation of package treatment plants for developments approved within the District's boundaries and in other areas under its jurisdiction. In 2009 JBWD adopted a Wastewater Treatment Strategy in order to plan for a long-term and regional approach to protecting local groundwater. The District's wastewater strategy does not require any current

customers to connect to a wastewater system in the foreseeable future unless mandated by some other agency with authority, such as the State of California or the Regional Board.

The strategy does identify 7,000 parcels, mostly along Twentynine Palms Highway, where densities are currently zoned at levels that would require new development to provide wastewater treatment. However, most new construction in the JBWD service area is spread throughout the District and not concentrated in a way that would enable economical use of a central wastewater treatment plant. Recognizing this, the District's wastewater strategy is to require new development with more than 15 equivalent dwelling units within the wastewater zone to install package wastewater treatment plants that will be owned and operated by the District. The effluent from the package plants will be disposed of by percolation to the groundwater, similar to septic tanks. These package plants may be combined as newer ones are constructed. New development will also pay a capacity fee for a central wastewater treatment plant that will eventually be constructed when it is economically viable to do so. The wastewater zone comprises about 35 of the 96 square miles within the District boundaries.

Within the JBWD service area, there is currently no recycled water source. The only potential source for recycled water would be wastewater flow from any new development in the JBWD service area that could be treated to become recycled water if and when JBWD constructs a central wastewater treatment plant. This is not likely to occur in the near future. As there is no source of recycled water, JBWD has not developed any plans for serving recycled water. Potential recycled water demand has not yet been evaluated by JBWD at this time.

If and when JBWD develops a future recycled water delivery system, methods to encourage recycled water use, such as financial incentives, will be analyzed.

4.10 Embedded Energy Current Supply Portfolio

Water energy intensity is the amount of energy, calculated on a whole-system basis, required for use of water in a specific location, such as the JBWD service area. DWR provides guidance for calculating the operational energy intensity of water, defined as the total amount of energy expended by the urban water supplier on a per AF basis to take water from the location where the urban water supplier acquires the water to its point of delivery. DWR requires that urban water suppliers only report the energy intensity associated with water management processes occurring within their operational control and not include energy embedded in water supplies purchased from a wholesale water agency. Table 4-6 below provides an estimate, using the multiple water delivery approach, of the water energy intensity of JBWD's potable water system. DWR's Energy Intensity spreadsheet is provided in Appendix I.

TABLE 4-6 ENERGY INTENSITY REPORTING

Start Date for Reporting	01/01/2020	Sum of All Water Management Processes	Non-Consequential Hydropower	
End Date for Reporting	**12/31/2020**	***Total Utility***	***Hydropower***	***Net Utility***
Volume of Water Entering Process (AF)		1,333	N/A	N/A
Energy Consumed (kWh)		2,300,433	N/A	N/A
Energy Intensity (kWh/AF)		1726	N/A	N/A

Section 5: Water Quality

5.1 Overview

The quality of any natural water is dynamic in nature. This is true for the State Water Project (SWP) water brought into the Morongo area via the Morongo Basin Pipeline. During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All retail water purveyors are subject to drinking water standards set by the U.S. Environmental Protection Agency (EPA) and the California State Water Resources Control Board Division of Drinking Water (DDW).

This section provides a general description of the water quality of both imported water and existing groundwater supplies. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

5.2 Imported Water

JBWD purchases imported water from MWA. This imported water is transported via the Morongo Basin Pipeline and then delivered to recharge basins that overlay the Joshua Tree groundwater subbasin. The Joshua Tree subbasin is one of two subbasins from which JBWD pumps groundwater for delivery to customers.

The source of SWP water is rain and snow from the Sierra Nevada, Cascade, and Coastal mountain ranges. This water travels to the Sacramento-San Joaquin Delta, which is a network of natural and artificial channels and reclaimed islands at the confluence of the Sacramento and San Joaquin rivers. The Delta forms the eastern portion of the San Francisco estuary, receiving runoff from more than 40 percent of the state's land area. It is a low-lying region interlaced with hundreds of miles of waterways. From the Delta, the water is pumped into a series of canals and reservoirs, which provide water to urban and agricultural users throughout the San Francisco Bay Area and Central and Southern California. MWA receives SWP water at four locations off the aqueduct. The fourth and last turnout is known as the Morongo Siphon (or Antelope Siphon Turnout) and serves the Morongo Basin Pipeline which releases SWP water at Joshua Tree for recharge.

One important property of SWP water is the mineral content. SWP water is generally low in dissolved minerals, such as calcium, magnesium, sodium, potassium, iron, manganese, and sulfate. Most of these minerals do not have health-based concerns. Nitrate is the main

exception, as it has significant health effects for infants; however, the nitrate content of SWP water is well below any state standards averaging 2.5 mg/L as Nitrate.

Also of significance is the salinity content measured as total dissolved solids (TDS). Only at very high concentrations is TDS a health hazard, but TDS can be an aesthetic issue, can limit crop productivity, and can shorten the useful life of pipes and water-based appliances in homes and businesses. Although the quality of SWP water varies seasonally, the average TDS concentration for this supply is 250 milligrams per liter (mg/L).

5.3 Groundwater

5.3.1 Groundwater Protection

The general goal of groundwater protection activities is to maintain the groundwater and the aquifer to ensure a reliable high-quality supply. Activities to meet this goal include continued and increased monitoring, data sharing, education and coordination with other agencies that have local or regional authority or programs. As part of its protection activities, JBWD has been taking the following actions:

- Water quality monitoring
- Wellhead protection
- Participation in the regional salt and nutrient management plan
- Identification and destruction of abandoned wells

Other agencies assist with groundwater quality protection. For example, the San Bernardino County Division of Environmental Health oversees destruction of abandoned wells and the local Fire Department handles responses to hazardous materials incidents.

5.3.1.1 Water Quality Monitoring

JBWD monitors drinking water constituents consistent with federal and state laws. Since 1990, JBWD has been providing a state required Annual Water Quality Report to all its customers, also referred to as a Consumers Confidence Report. This report includes detailed information on all of the constituents detected in the District's water supply as a result of its water quality testing during the preceding year and characterizes any risks from exposure to contaminants detected in the drinking water.

5.3.1.2 Wellhead Protection

JBWD has performed drinking water source assessments for its five wells. These assessments involve delineating the area around the well through which contaminants might move and reach the well; preparing an inventory of possible contaminating activities that might lead to the release of microbiological or chemical contaminants within the delineated area; and a determination of the contamination to which the drinking water source is most vulnerable.

Annual reviews of the areas around the 5 wells are conducted to determine if any development represents potential contaminating activities.

5.3.1.3 Participation in the Mojave Salt and Nutrient Management Plan

In February 2009, the State Water Resources Control Board (SWRCB) adopted the Recycled Water Policy to encourage and provide guidance for the use of recycled water in California. The Recycled Water Policy also requires local water and wastewater entities, together with local salt and nutrient contributing stakeholders, to develop a Salt and Nutrient Management Plan (SNMP Plan) in a cooperative and collaborative manner for each groundwater basin in California, to manage salts, nutrients, and other significant chemical compounds on a watershed- wide or basin-wide basis. The SNMPs are intended to help streamline the permitting of new recycled water and stormwater projects while ensuring compliance with water quality objectives. MWA prepared a SNMP for its service area (which includes JBWD). As a stakeholder in the plan JBWD assisted with provision of water quality data for the plan, reviewed the modeling and other analyses of salt and nutrient assimilative capacity of local groundwater, and helped develop a plan to track the long-term impacts to groundwater quality resulting from past, current, and future land uses.

5.3.1.4 Identification and Destruction of Abandoned Wells

According to the San Bernardino County Environmental Health Services, an abandoned well is one that has been discontinued for a period of one year or which is in such a state of disrepair that that it cannot be made functional for its original purpose. The presence of abandoned groundwater wells represents a potential hazard to the quality of the groundwater basin. Abandoned and improperly destroyed wells can act as conduits for contaminants to reach drinking water supplies. It is vital for the long-term protection of the basin that abandoned wells be located and destroyed.

While it is the landowner's responsibility to destroy an abandoned well, the County of San Bernardino Department of Public Health handles permitting for construction and destruction of wells. The destruction of abandoned groundwater wells should be performed in accordance with state standards. California Water Code Section 13750.5 requires that those responsible for the destruction of water wells possess a C-57 Water Well Contractor's License. Whenever a water well is destroyed, a report of completion must be filed with the California DWR within 60 days of the completion of the work.

As part of the District's Groundwater Management Plan, the District adopted Ordinance 97-1 in order to further manage and protect the groundwater within the District. Applicable sections of the Water Well Standard: State of California, contained in DWR Bulletins 74-81 and 74-90, are incorporated into this ordinance.

5.4 Groundwater Quality

The District obtains its groundwater from three wells in the Joshua Tree subbasin and two wells in the Copper Mountain subbasin. Pumped groundwater meets current water quality standards with the exception of a new Hexavalent Chromium (also called Chromium-6) standard expected

to be re-released after previously being rescinded. Hexavalent Chromium is a metallic element that naturally occurs in the aquifers within the District's service area.

Hexavalent Chromium will be regulated by the State of California for potential health impacts after completing a financial impact study that considers the available treatment techniques. All five of the District's wells contain Hexavalent Chromium, with average cumulative testing levels ranging from 12 to 44 ppb. JBWD plans to address the expected Chromium standard through the following steps:

- Assess the Chromium-6 levels at all wells quarterly.
- Utilize previous study information on anion exchange and stannous chloride treatment techniques, or other best technologies to assess the most cost effective and long-term solution.
- Develop a compliance plan with the State Water Resources Control Board.
- Obtain funding through state grants or loans.
- Design and construct needed infrastructure.
- Implement Hexavalent Chromium treatment

5.5 Water Quality Impacts on Reliability

The quality of water dictates numerous management strategies a retail water purveyor will implement, including, but not limited to, the selection of raw water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. Maintaining and utilizing high quality sources of water simplifies management strategies by increasing water supply alternatives, water supply reliability, and decreasing the cost of treatment. The source water supplies are of generally good quality for JBWD. Maintaining high quality source water allows for efficient management of water resources by minimizing costs.

Maintaining the quality of water supplies increases the reliability of each source by ensuring that deliveries are not interrupted due to water quality concerns. A direct result from the degradation of a water supply source is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. Water may degrade in quality to the point that it is not economically feasible for treatment. In this scenario the degraded source water is taken off-line. This in turn can decrease water supply reliability by potentially decreasing the total supply and increasing demands on alternative water supplies.

5.5.1 Imported Water

The quality of imported water is not anticipated to affect water reliability. Water quality issues are constantly evolving and the District will continue to monitor and take action, if needed, to protect its water supplies. It's current imported water source from the State Water Project via Mojave Water Agency is utilized for groundwater recharge and maintains a TDS and regulated constituent concentration that are well below state standards.

5.5.2 Groundwater

As described above, JBWD is taking specific actions to deal with Hexavalent Chromium. Based on current conditions and the fact that treatment is available, Hexavalent Chromium is not anticipated to affect JBWD water supply. Water quality issues are constantly evolving and the District will continue to take action to protect and treat its water supplies when needed.

Section 6: Reliability Planning

6.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the next twenty years in five-year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for the JBWD service area. Table 6-1 shows JBWD water supplies in year 2020.

TABLE 6-1 WATER SUPPLY CALENDAR YEAR (2020)

Existing Supplies	*Description of Source*	*Volume (AF)*	*Type*
Groundwater from Natural Recharge	*Joshua Tree and Copper Mountain subbasins*	0	**Drinking Water**
Groundwater from Storage	*Joshua Tree and Copper Mountain subbasins*	40	**Drinking Water**
Imported Water	*Groundwater Recharge, Purchased from MWA*	660	**Raw Water**
Return Flow		622	**Raw Water**
Total Existing Supplies		*1,322*	
Planned Supplies			
Additional Imported Water	*Groundwater Recharge, Purchased from MWA*	NA	**Raw Water**
Total Planned Supplies			
Total Supplies		**1,322**	

6.2 Normal Water Year

The Normal/Average year is a year in the historical sequence that most closely represents median runoff levels and patterns. This section summarizes JBWD's water supplies available to meet demands over the 25-year planning period during an average/normal year and compares them to demands for the same period. Assumptions about supplies and demands are provided in Chapters 2 and 3. Table 6-2 demonstrates the JBWD anticipates adequate supplies for years 2025 to 2045 under normal conditions.

TABLE 6-2 WATER SUPPLY RELIABILITY - NORMAL/AVERAGE YEAR (AFY)

	2025	2030	2035	2040	2045
Existing Supplies					
Groundwater from Natural Recharge	0	0	0	0	0
Groundwater from Storage	0	0	0	0	0
Imported Water	500	500	500	500	500
Return Flow	476	476	476	475	480
Total Existing Supplies	*976*	*976*	*976*	*976*	*980*
Planned Supplies					
Additional Imported Water	597	597	597	597	597
Total Planned Supplies	*597*	*597*	*597*	*597*	*597*
Total Supplies	***1,573***	***1,573***	***1,573***	***1,572***	***1,577***
Estimated Demands	**1,108**	**1,108**	**1,108**	**1,105**	**1,117**
Difference (Supply - Demand)	***465***	***465***	***465***	***467***	***460***

6.3 Single-Dry Year

The water supplies and demands for JBWD's service area over the 25-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 6-3 summarizes the existing and planned supplies available to meet demands during a single-dry year.

TABLE 6-3 WATER SUPPLY RELIABILITY - SINGLE-DRY YEAR (AFY)

	2025	2030	2035	2040	2045
Existing Supplies					
Groundwater from Natural Recharge	0	0	0	0	0
Groundwater from Storage	563	565	564	563	569
Imported Water	215	215	215	215	215
Return Flow	476	476	476	475	480
Total Existing Supplies	*691*	*691*	*691*	*690*	*695*
Planned Supplies					
Additional Imported Water	0	0	0	0	0
Total Planned Supplies	*0*	*0*	*0*	*0*	*0*
Total Supplies	***1,254***	***1,256***	***1,255***	***1,253***	***1,264***
Estimated Demands	**1,254**	**1,256**	**1,255**	**1,253**	**1,264**
Difference (Supply - Demand)	***0***	***0***	***0***	***0***	***0***

6.4 Multiple-Dry Year (5-Years)

The water supplies and demands for JBWD's service area over the 25-year planning period were analyzed in the event that a four-year multiple-dry year event occurs, similar to the drought that occurred during the years 1931 to 1934. Table 6-4 summarizes the existing and planned supplies available to meet demands during multiple-dry years.

TABLE 6-4 WATER SUPPLY RELIABILITY - MULTIPLE DRY YEARS (AFY)

	2025	2030	2035	2040	2045
Existing Supplies					
Groundwater Safe Yield	0	0	0	0	0
Groundwater from Storage	356	368	407	432	474
Imported Water	500	500	500	500	500
Return Flow	760	770	790	820	840
Total Existing Supplies	*1,616*	*1,638*	*1,697*	*1,752*	*1,814*
Planned Supplies					
Additional Imported Water	146	146	146	146	146
Total Planned Supplies	*146*	*146*	*146*	*146*	*146*
Total Supplies	**1,762**	**1,784**	**1,843**	**1,898**	**1,960**
Estimated Demands	**1,762**	**1,784**	**1,843**	**1,898**	**1,960**
Difference (Supply - Demand)	***0***	***0***	***0***	***0***	***0***

6.5 Drought Risk Assessment

The Water Code requires that every urban water supplier include in its UWMP, a drought risk assessment for its water service to its customers. This is to benefit and inform the demand management measures and water supply projections and programs to be included in the UWMP.

6.5.1 Data and Methodologies Used

6.5.1.1 Water Demands

The water demands for this UWMP utilize water demand forecast developed by MWA based on extensive data on existing land use and water demands and projected land uses. The water demand estimates changes in demand due to water conservation and codes and standards that have occurred over time. Using the anticipated land uses and associated water demand factors, JBWD has estimated water demands from 2021 through 2025, as shown in Table 6-4.

6.5.1.2 Water Supplies

This Drought Risk Assessment looks at all the water supplies anticipated to be available in a 5-year consecutive drought, from 2021 to 2025, including any limitations due to infrastructure and regulations.

Imported Water

JBWD is a retailer of MWA who is a direct contractor of the DWR. MWA's 2020 UWMP states that it will be able to meet all purveyor demands during normal, dry, and single-dry years.

Groundwater

JBWD pumps groundwater from the Joshua Tree and Copper Mountain subbasins. JBWD anticipates the ability to maximize groundwater extraction and will use water from storage, during a normal, single-dry, or multiple-dry year, if needed.

TABLE 6-1 FIVE-YEAR DROUGHT RISK TABLES *(DWR TABLE 7-5)*

2021	**Total**
Gross Water Use	1,174
Total Supplies	1,174
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	NA
2022	**Total**
Gross Water Use	1,304
Total Supplies	1,193
Surplus/Shortfall w/o WSCP Action	(111)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	9%
2023	**Total**
Gross Water Use	1,296
Total Supplies	1,211
Surplus/Shortfall w/o WSCP Action	(85)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	7%
2024	**Total**
Gross Water Use	1,287
Total Supplies	1,231
Surplus/Shortfall w/o WSCP Action	(56)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	4%

2025	Total
Gross Water Use	1,279
Total Supplies	1,254
Surplus/Shortfall w/o WSCP Action	(25)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	NA

6.6 Summary of Comparisons

As shown in the analyses above, JBWD has adequate supplies to meet demands during average, single-dry, and multiple-dry years throughout the 25-year planning period. While during dry years the groundwater basin will continue to be "over drafted" to meet the supplies due to the lack of imported supplies being available to recharge the basin, the planned imported SWP supply will lessen and offset the "overdraft" as much as possible

Section 7: Demand Management Measures

7.1 Demand Management

The purpose of the Demand Management Measures (DMM) section of this UWMP is to (a) provide a description of the past water conservation programs that JBWD has implemented since 2015 to meet its urban water use reduction targets and (b) describe the activities and actions JBWD plans to use in the future to meet its urban water use reduction targets. DMMs that the UWMP Act and Water Code specifically mention:

a. Water waste prevention ordinances

b. Metering

c. Conservation pricing

d. Public education and outreach

e. Programs to assess and manage distribution system real loss

f. Water conservation program coordination and staffing support

7.1.1.1 Water Waste Prevention Ordinance

Joshua Basin prohibits water waste through Ordinance 15-9, which superseded Ordinance 14-8. The water waste ordinances currently in effect from are summarized in Table 7-1.

TABLE 7-1 SUMMARY OF WATER WASTE PROHIBITIONS

Prohibition	Ordinance 15-9	Ordinance 14-8
Application of potable water to landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures	X	X
Application of potable water to landscapes during and within 48 hours of measurable rainfall	X	
Irrigation with potable water of ornamental turf on public street medians	X	
Irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulation or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development	X	
Use of a hose that dispenses potable water to wash a motor vehicle except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use	X	X

Application of potable water to driveways and sidewalks	X	X
Use of potable water in decorative water feature except where the water recirculated	X	X
Leaks from any water line, faucet or other facility. Any leak shall be repaired in a timely manner	X	X
Use of conventional overhead spray irrigation outside of the hours of 9 pm and 9 am	X	X
Use of potable water to irrigate grass, lawns, groundcover, shrubbery, crops, vegetation or trees between the hours of 9:00 a.m. and 5 p.m. during the high use season (June 1 to Sept. 30). During this season watering shall not exceed three days a week.	X	
The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased	X	X
Water for construction purposes be used in an efficient manner	X	X
All new construction shall be equipped with low flow toilets and fixtures	X	X
All new model homes and commercial and industrial development, when landscaped, shall include low water use, drought tolerant or native plant material, and drip irrigation systems. Irrigation systems shall include a smart irrigation controller or equivalent technology	X	X
Dedicated (separate) landscape water meters shall be installed for all irrigated landscape areas in excess of 2500 square feet except for single family residences	X	X
Water used for cooling systems must be recycled to the extent possible	X	X
Evaporation resistant covers are required for all new swimming pools and hot tubs and are encouraged on existing pools	X	X
To promote water conservation operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language	X	X

7.1.1.2 Metering

There are approximately 755 Services Connections that were considered “inactive accounts” until June 2022. These accounts were either “pulled meters” with no meter connected to the service line, “inactive” with a meter in place but not taking water, or “transitional accounts” where water service was turned off when properties became vacant.

Meter testing had historically been performed in response to customer request. The District is currently replacing its older meters with new more accurate devices. It is expected that the meter replacement program will impact the District’s water loss figure of 13 percent.

The district is retrofitting commercial accounts with dedicated landscape water meters. Dedicated landscape water meters have been required by the county Ordinance for all new projects with a landscape area equal to or greater than 5,000 square feet. Single family residential connections and certain commercial agricultural properties are exempt.

7.1.1.3 Conservation Pricing

The District has meters for each customer and charges a volumetric rate for water use. The District's rates include a 4-tiered inclining rate structure that charges customers an increased price as water usage increases. The first block (up to 5 hundred cubic feet) is charged at the lowest rate, with progressively more expensive rates for water use in each subsequent tier. The District's tiered rates reflect the escalating cost of providing water in each tier and provide financial incentive for customers to conserve water.

7.1.1.4 Public Education and Outreach

The District recognizes the continued need for a public information program to maintain and increase the public's awareness of water and the need to use it wisely. The District promotes water conservation to the public through its monthly *Tier Drop Report*, through water conservation tips on the JBWD website, (http://www.jbwd.com/), the District's Water Wise Demonstration Gardens, Water Wise Landscape design templates, an Annual Water Education Day, staffing the weekly Farmers Market in Joshua Tree, and a variety of brochures, public workshops and speaking engagements. The District uses a contracted Public Affairs Officer for these programs.

The District initiated a School Education Program developed by the Resource Action Program in 2009. The program was offered to fifth and sixth-grade instructors at Joshua Tree's two elementary schools, Joshua Tree and Friendly Hills, and targeted approximately 100 students a year. The program provided tools for children to reduce the use of water (plus gas and electricity) at their homes and to measure the savings. Children in the 5th grade received a kit containing a high-efficiency showerhead, kitchen aerator, bathroom aerator, drip gauge, flow-rate test bag, and similar materials. Results were determined from survey forms and standard water savings estimates.

Since 2016, JBWD has been working with adjacent water districts and AWAC to focus on 8th-grade students in the greater Morongo Unified School District. Approximately 400 students have been reached each year to provide water related education.

Beginning in 2014, the District shifted its emphasis to educating Commercial, Institutional, and top-tier residential users, conducting water surveys and water audits for these customers. These services are still currently available upon request. The budget for Public Education and Outreach is, over and above staff time, $45,000 annually.

7.1.1.5 Programs to Assess and Manage Distribution System Real Loss

As required by DWR, as part of this UWMP, JBWD performed a water loss audit (see output provided in Appendix E). As estimated by that audit, over the last four years, (2014-2018) unaccounted for water has been approximately 16 percent of produced water within JBWD's system. Apparent loss (loss due to meter reading inaccuracies) is estimated to be 2 percent while real loss (actual leaks) is estimated to be approximately 14 percent. A review of the audit is currently being conducted to better understand sources of measurement error and true water loss. JBWD is conducting this investigation into measurement error as the District suspects the water loss audit is overestimating loss and needs to be refined. For this reason, it is assumed that water loss will remain the same over time.

Consistent with Senate Bill 555, JBWD conducts a water loss audit each year and reports water loss to DWR annually.

System leaks are repaired as soon as they are located. The District conducted a three-day training class in the fall of 2015, providing leak detection training to all field staff. The District is one of 24 small community water systems included in MWA's Leak Detection Services Grant. In partnership with MWA, JBWD will conduct leak detection services throughout their existing distribution system. California Rural Water Association staff will conduct water system leak surveys, with estimated leakage rates, locations, remediation strategies, and costs. Work will include mapping the system to locate lines, valves, and other potential leak sources, locate distribution pipes in the field and record coordinates of pipe locations, installation of data loggers on system valves in areas of concern, and a leak survey acoustic correlation analysis to get specific information about leak locations.

7.1.1.5.1 Consistency with State Water Loss Standards

At the current time a water loss standard has not been adopted by the State of California. Future UWMPs prepared by JBWD will report on compliance with any State water loss standards.

7.1.1.6 Water Conservation Program Coordination and Staffing Support

The District implemented water conservation efforts beginning in 2007. Together, the General Manager, staff, and the public outreach Consultant have worked to develop and implement conservation programs as well as communicate and promote water conservation issues to the District Board, Institutional and Commercial customers and the community at large. Budget for water conservation program staff time is $15,000.

7.1.2 Other

7.1.2.1 Wholesale Agency Assistance Programs

The District will continue to work cooperatively with MWA to participate in regional DMM programs, informational groups and projects, determination of the most cost-effective DMMs, and tailoring programs specific to the District. Historically, those programs have included a Water Conservation Incentive Program offering rebates and vouchers for ultra-low flow toilets and washing machines, provision of low-flow nozzles and showerheads, public education workshops and informational brochures. Many of these services are described in the Alliance for Water Awareness and Conservation website (http://www.hdawac.org/).

TABLE 7-2 JBWD PARTICIPATION IN WHOLESALE AGENCY PROGRAMS

Description	Qty 2016	Qty 2017	Qty 2018	Qty 2018	Qty 2020
High Efficiency Toilet Vouchers/Rebates $165 voucher/rebate provided by AWAC (Exchange program in 2011)	300	0	0	0	33
Weather Based Irrigation Controller (WBIC) Program provided by MWA and AWAC	0	0	0	0	0

7.1.2.2 Residential Surveys

District staff regularly performed Residential Surveys in response to high water bill notices, investigating properties and providing educational assistance and information. A Residential Assistance Checklist was developed and piloted in 2009 to customers who reported high water bills. This on-going program includes on-site interior and exterior leak detection, a landscape water survey, and provision of low flow showerheads, aerators and information as appropriate. Additionally, survey forms are routinely distributed at public workshops and as part of the District's school education program to obtain current end-user information and facilitate water conservation planning. Table 7-3 summarizes the number of surveys completed by JBWD during the period 2016 to 2020.

TABLE 7-3 OTHER JBWD DEMAND MANAGEMENT MEASURES

Description	Qty 2016	Qty 2017	Qty 2018	Qty 2019	Qty 2020
Residential Surveys	33	42	43	37	25
Residential Plumbing Retrofits (Showerhead, kitchen aerator, and bathroom aerator)	15	27	40	37	25
Large Landscape Audits	0	0	0	0	4
CII Survey	5	9	14	33	8
CII Programs – Commercial Audits	1	0	0	0	7

7.1.2.3 Large Landscape Conservation Programs and Incentives

JBWD staff participated in the development of a regional Model Landscape Ordinance as part of the AWAC landscape committee. The Ordinance includes water waste prevention provisions for existing landscapes as well as prohibited water uses and water waste. While many provisions are intended to be applied to new development, JBWD is reliant on San Bernardino County to enforce the landscape ordinance through their permitting process. The San Bernardino County Landscape Ordinance went into effect February 2011..

Large conventionally landscaped facilities within the District's sphere of influence are limited to 51 institutional properties and a local cemetery. The District sent each of these facilities a

personalized letter offering them a free irrigation audit and created a simple online audit request form for them to complete. District management followed up with phone calls. In addition to the four irrigation audits shown in Table 7-2, five landscape irrigation audits were completed in conjunction with CII Audits. All audits were performed by Certified Irrigation Auditors in conformance with Irrigation Association standards.

The audits were also extended to owners of large residential acreages. While these properties did not include turfgrass, the large number of ornamental trees and fruit trees used similar quantities of water on the landscape. Weather Based Irrigation Controllers were offered to all qualified customers. The District also prepared two Irrigation Auditing Tool Kits with instructions for customers to complete their own irrigation assessment.

In the fall of 2011 JBWD teamed with Copper Mountain College, MWA, Bollinger Consulting Group, and the Rainbird Corporation to install a California Irrigation Management Information System (CIMIS) station (Station #233) that provides local weather for the purpose of developing landscape water budgets and irrigation scheduling information. Before this station was installed the nearest CIMIS station was approximately 60 miles away.

TABLE 7-4
SAN BERNARDINO COUNTYWIDE MODEL EFFICIENT LANDSCAPE ORDINANCE

Landscapes are assigned a water budget. All new or rehabilitated landscapes larger than 2,500 square feet (if developer installed) and 5,000 square feet (if homeowner installed) must prepare a landscape demonstration package and are assigned a water budget.
Plant material varieties. Plant materials shall include water-conserving trees (Deciduous and Evergreen), shrubs, and groundcover that are attractive and useful for erosion control. The use of one predominant species shall be avoided to prevent spread of disease and pests.
Native and drought-tolerant plant materials. Native and drought-tolerant plant materials capable of surviving with a minimal amount of supplemental water shall be utilized.
Shade trees. Shade trees, a mixture of deciduous and evergreen, shall be provided for residential, commercial, institutional, and industrial buildings, parking lots, open space areas, etc. The trees shall be incorporated to provide natural cooling opportunities and water conservation.
Invasive plants. The use of invasive plant materials shall be avoided in areas near parks, buffers, greenbelts, water bodies, conservation areas/reserves, and other open space areas because of the potential to cause harm to environmentally sensitive areas.
Edible plants. If edible plant material is proposed as part of the landscape design, it shall be clearly defined and kept separate from all other plant material. Non-potable/recycled water shall *not* be used to irrigate edible plant material areas.
Plant solar orientation. Plant materials shall be planted in a manner considerate of solar orientation to help maximize summer shade and water conservation.
Turf. Turf areas shall be used in response to functional needs of the project, not solely for aesthetic purposes, and shall be in compliance with the project's water budget calculations (MAWA).
Mulch. All non-turf planting areas (except those areas that have been hydro- seeded) shall be mulched to help in the retention of moisture, suppress weeds, to help moderate damage to trees and shrubs, and help moderate soil temperature.
Efficiency. Irrigation systems shall be designed, installed, maintained, and managed to achieve the highest efficiency rate as possible, and shall meet and maintain an average efficiency rate of 0.71, as defined by State law.
Runoff and overspray. Soil types and infiltration rates shall be taken into account when irrigation systems are designed and installed. Irrigation systems shall be designed and installed to prevent runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, sidewalks, roadways, or structures.
Meters. For irrigated landscape areas in excess of 2,500 square feet, separate water meters shall be installed for landscaping, which will help facilitate water management.
Smart" irrigation controller. All irrigation systems shall be equipped with a smart irrigation control, which automatically adjusts the frequency and/or duration of irrigation events in response to changing environmental conditions.

7.1.2.4 Commercial, Industrial and Institutional (CII) Programs

The District's service area historically is a residential community with very few commercial and institutional customers. Recent residential and supporting commercial growth is very slowly changing the customer makeup and the District initiated an audit program of its high-water use CII customers.

The District has retained the services of a water efficiency consultant, The Bollinger Consulting Group, to assist in the development and implementation of these programs. Currently, commercial/industrial/institutional programs have been limited to incentive programs to retrofit with ultra low-flow toilets. Additionally the District is working with a local hospital to reduce water use through its cooling towers, and additional programs will be added as survey information is analyzed.

7.2 Planned DMMs to Meet Water Use Targets

JBWD is currently exceeding water use targets set by SBX7-7. JBWD intends to keep water use low by continuing to implement these DMMs, continuing to provide residential surveys, and programs specific to high water use CII customers. CII programs will include distribution of pre-rinse spray valves and water brooms and incentives for water-efficient ice machines. These programs, taken together, will assist the District in helping to maintain the conservation levels to allow it to meet current and future water use reduction targets pursuant to *Making California Conservation a California Way of Life*.

7.3 Water Use Objectives

The Water Code requires that urban suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Once the first reporting period is due, JBWD will explain how the DMMs identified in this section of the UWMP will be implemented to meet those objectives.

Section 8: Seismic Risk Assessment

Per the Water Code Section 10632.5, Suppliers are required to assess seismic risk to water supplies as part of their WSCP. The plan also must include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

Pursuant to Water Code, the seismic risk assessment must include a description of the vulnerability of each of its water system(s) facilities. Suppliers are encouraged to assess the vulnerability of external facilities or components that extend outside the Supplier's service distribution area (e.g., transmission pipes, delivery canals, surface water diversion pumps) since failure of them would still ultimately disrupt the Supplier's ability to serve their customers.

The Local Hazard Mitigation Plan (LHMP) for the District was developed and adopted in 2018 to identify potential hazards and formulate mitigation measures for future protection of the District's critical infrastructure and the community's safety with respect to the District's facilities and services. The LHMP was completed with the coordination and involvement of the Twentynine Palms Water District staff and representatives from the local community. The Planning Team reviewed FEMA's "Hazard Mitigation Plan Crosswalk", and San Bernardino County Office of Emergency Services supplied information on past events that affected the service area.

The District has identified hazards in the community, assessed those hazards that pose the most significant risk, and identified projects to help reduce and/or eliminate those risks. After the hazards were identified, mitigation goals are set. Global measures that apply across all hazards include:

- Continually improve the community's understanding of potential impacts due to hazards and the measures needed to protect lives and critical infrastructure;
- Continually provide State and Local Agencies with updated information about hazards, vulnerabilities, and mitigation measures at the District;
- Review local codes and standards to verify that they protect human life and the District's facilities;
- Review and verify that the District's owned and operated infrastructure meet minimum standards for safety;
- Review the District facilities and developments in high-risk areas to verify that these areas are appropriately protects for potential hazards; and
- Identify and mitigate imminent threats to life, safety and facility damage.

In addition to the 2018 LHMP, a desktop assessment of the District's pipelines and storage tanks was performed based on available information. The purpose of the desktop assessment was to perform a risk assessment and to develop a prioritized pipeline replacement program and capital improvement program.

following were evaluated and recommended for the District's pipeline and storage tanks:

- Storage tanks to comply with seismic freeboard requirements
- Modify the discharge elevation of the overflow pipe in the storage tanks
- Modify the storage tank roof to facilitate water drainage to prevent ponding from rain events
- Site drainage modifications to reduce erosion damage to the storage tank ring road
- Replace and upsize existing pipelines, of any size, that are hydraulically deficient
- Replace existing pipelines, of any size, that have a significant leak occurrence
- Replace or modify existing pipelines that have a high-probability and high-consequence of failure based on its condition assessment analysis
- Replace or modify existing pipelines that have a high-probability and low-consequence of failure based on its condition assessment analysis

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Joshua Basin Water District

2020 Urban Water Management Plan

Appendices

Kennedy Jenks

Appendix A: DWR Checklist

DWR Checklist for 2020 UWMP
Checklist Arranged by Subject

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location *(e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply)*
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5	Section 3, pages 3-1 to 3-4
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Section 3.1.2, page 3-3
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	Section 3.13, pages 3-3 to 3-4
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the	Baselines and Targets	Sections 5.2 and 5.5.7	Not applicable; no adjustments were applied.
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use	Baselines and Targets	Section 5.1	Not applicable; JBWD is a retail supplier.
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Section 3.1, pages 3-1 to 3-4 Tables 3-1 to 3-4 Appendix G: SBx7-7 Verification Tables and DWR Population Tool Output
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Demand Management Measures	Sections 9.2 and 9.3	Section 4.1: pages 4-1 to 4-13 Tables 4-1 to 4-9
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	Not applicable; JBWD is a retail supplier.
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	Appendix D
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Appendix D
10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	JBWD is not in compliance with this provision.
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	Appendix B, Table 1-10
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Section 1.5.1, page 1-6; Tables 1-4. Appendix D Appendix D: Outreach Materials

10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2	Section 1.4; page 1-4 to 1-6; Table 1-6.
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Section 1.4; pages 1-4 to 1-6; Table 1-4. Appendix C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State	Plan Adoption, Submittal, and Implementation	Section 10.5	Appendix D
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 1.5.1, page 1-6; Tables 1-4. Appendix D
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Appendix D
10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 1.4; pages 1-4 to 1-6; Tables 1-5 and 1-6. Appendix C: Outreach Materials
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	JBWD complies with this provision
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6	Section 1.4; pages 1-4 to 1-6; Tables 1-5 and 1-6 Appendix D: Outreach Materials
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Summary	Chapter 1	Section 1; Pages 1-1 to 1-12.
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 1.5; pages 1-6 to 1-7. Figure 1-1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 1.9; pages 1-9 to 1-10. Table 1-8
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	Section 1.6; page 1-8. Table 1-7
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 1.7; pages 1-8 to 1-9.
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	Section 1.8; page 1-9.
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 1.6; page 1-8. Table 1-7
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	Section 4, pages 4-1 to 4-17
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Section 4.5, page 4-11

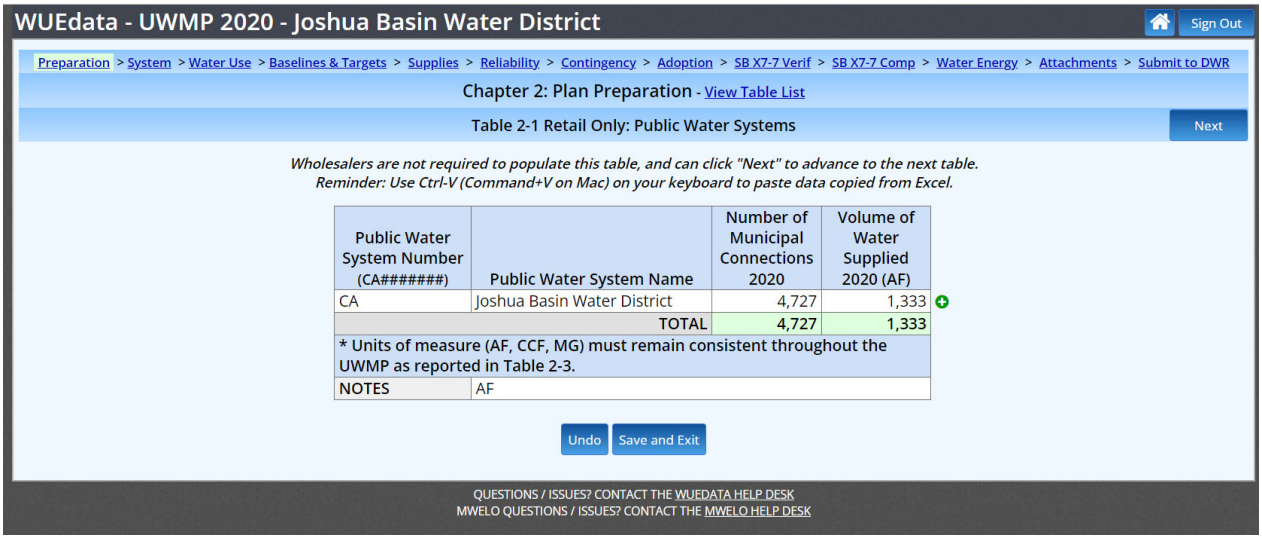
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 6.2	Section 4.11, pages 4-15 to 4-17
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1	Sections 4.2 and 4.3, pages 4-2 to 4-9
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	Section 4.5, page 4-11
10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	Secton 4.2.1.4, page 4-5
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	Section 4.2.1, pages 4-2 to 4-4
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	Not applicable; The local groundwater basin (the Gillibrand Basin) is not adjudicated
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater	System Supplies	Section 6.2.3	Secton 4.2.1.4, page 4-5
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	Section 4.2.1, pages 4-2 to 4-4
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2	Section 4.2, Table 4-3
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	Section 4.7, pages 4-11 to 4-12
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single- dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8	Section 4.11, pages 4-15 to 4-17
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 4.8, page 4-13
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1	Appendix D
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	Not applicable; JBWD is a retail supplier.
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14

10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 4.9, page 4-14
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 2.3, pages 2-2 to 2-7
10631(d)(3)(A)	Report the distribution system water loss for for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	Appendix E
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	N/A
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	Section 2.4, page 2-8, Table 2-13
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Chapter 7	Chapter 6, pages 6-1 to 6-4
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	Section 6; pages 6-1 to 6-4. Tables 6-1 to 6-4.
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3	Section 6.5; pages 6-3 to 6-4. Table 6-4.
10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3	Section 6.5.1, page 6-3
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3	Section 4.2.1 pages 4-2 to 4-6; Section 4.3, pages 4-7 to 4-9
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3	Section 6; pages 6-1 to 6-4. Tables 6-1 to 6-4.
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	Section 6.5.12, page 6-3; Section 1.1, pages 1-10 to 1-11
10631.2(a)	The UWMP must include energy intensity information as stated in the code.	System Suppliers, Energy Intensity	Section 6.4 and Appendix O	Appendix I

Appendix B: DWR Standard Tables

APPENDIX B

Joshua Basin Water District
2020 Urban Water Management Plan
DWR Standard Tables



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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 2: Plan Preparation - View Table List

Table 2-1 Retail Only: Public Water Systems

Next

Wholesalers are not required to populate this table, and can click "Next" to advance to the next table.
Reminder: Use Ctrl-V (Command+V on Mac) on your keyboard to paste data copied from Excel.

Public Water System Number (CA#######)	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (AF)
CA	Joshua Basin Water District	4,727	1,333
	TOTAL	4,727	1,333
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES	AF		

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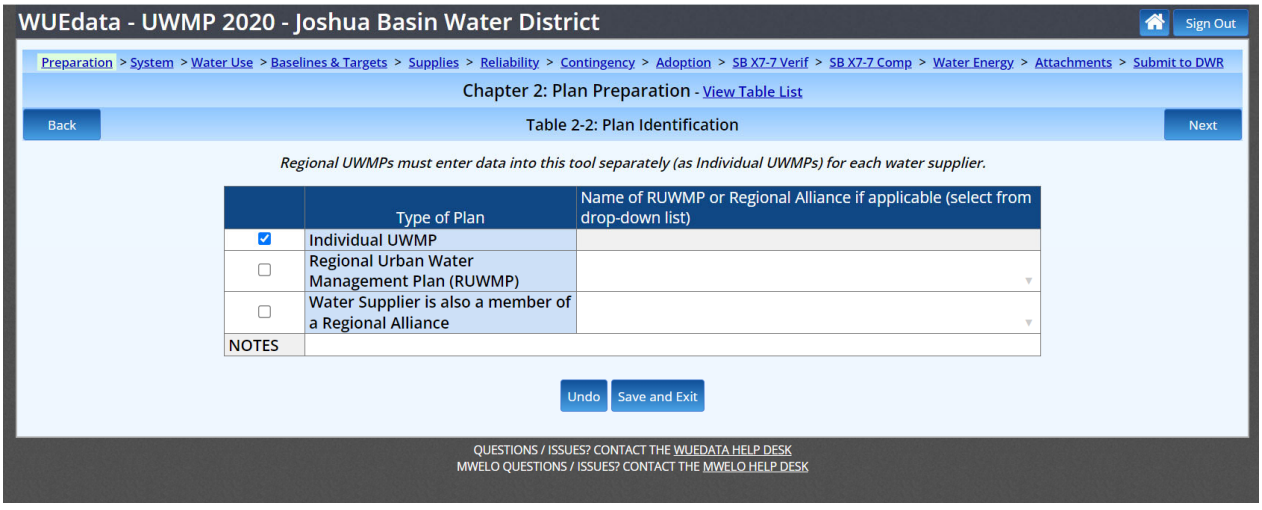

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Chapter 2: Plan Preparation - View Table List

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Table 2-2: Plan Identification

Next

Regional UWMPs must enter data into this tool separately (as Individual UWMPs) for each water supplier.

	Type of Plan	Name of RUWMP or Regional Alliance if applicable (select from drop-down list)
☑	Individual UWMP	
☐	Regional Urban Water Management Plan (RUWMP)	
☐	Water Supplier is also a member of a Regional Alliance	
NOTES		

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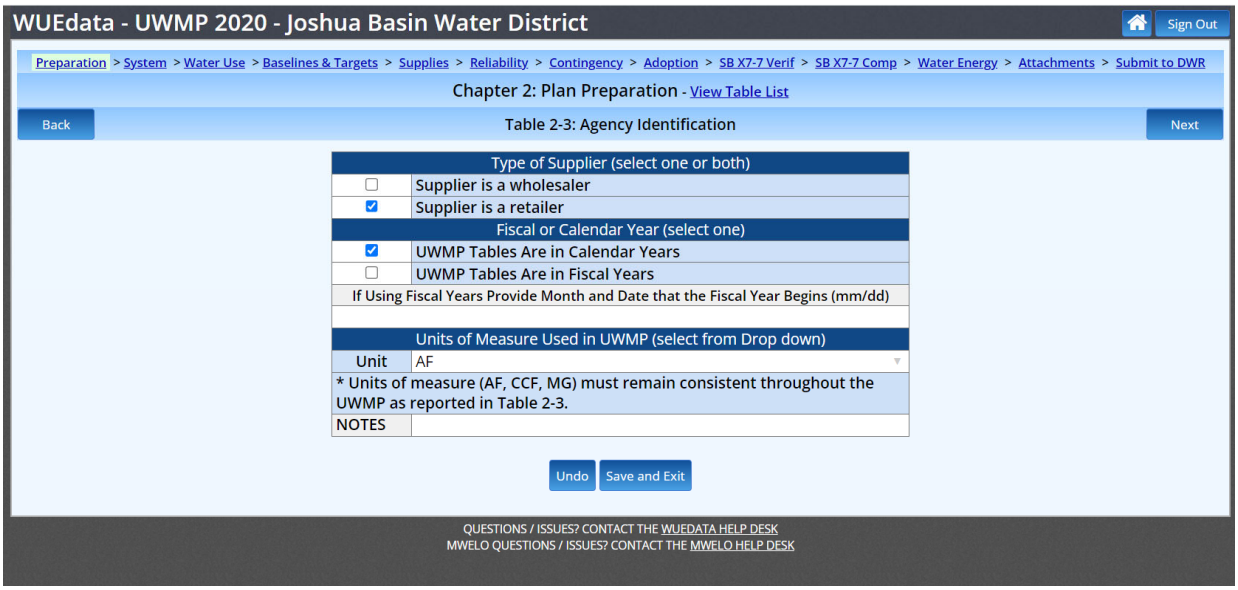
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Chapter 2: Plan Preparation - View Table List
Back
Table 2-3: Agency Identification
Next
Type of Supplier (select one or both)
Supplier is a wholesaler
Supplier is a retailer
Fiscal or Calendar Year (select one)
UWMP Tables Are in Calendar Years
UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)
Units of Measure Used in UWMP (select from Drop down)
Unit
AF
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.
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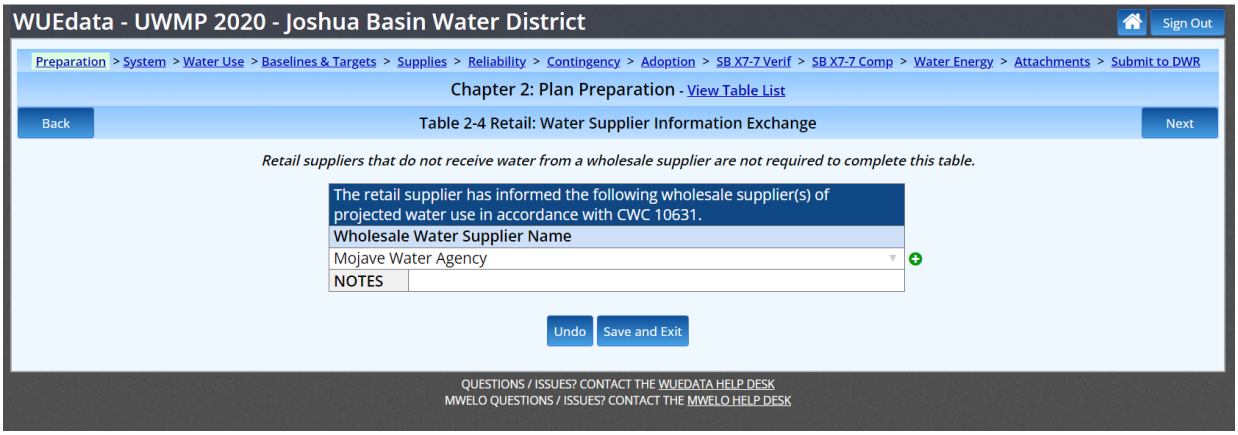
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Chapter 2: Plan Preparation - View Table List
Back
Table 2-4 Retail: Water Supplier Information Exchange
Next
Retail suppliers that do not receive water from a wholesale supplier are not required to complete this table.
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
Mojave Water Agency
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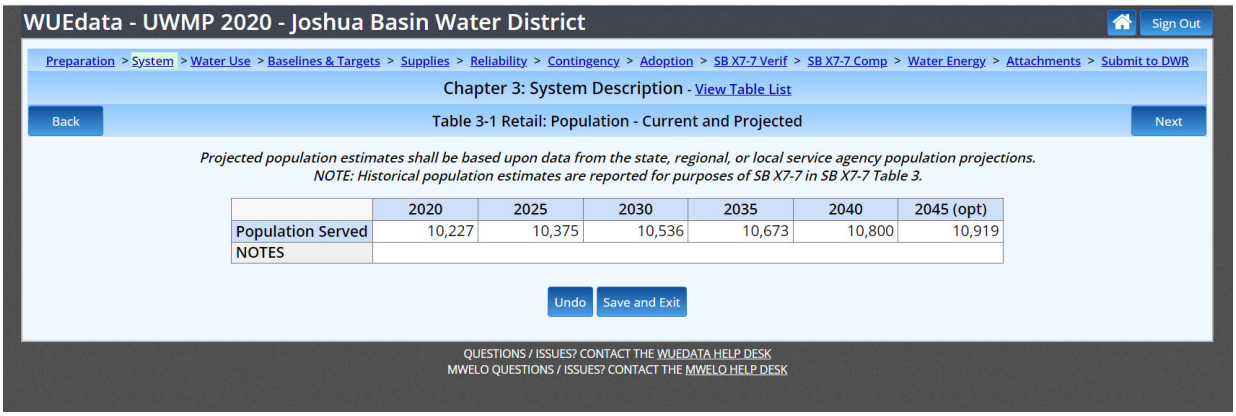
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Chapter 3: System Description - View Table List
Back
Table 3-1 Retail: Population - Current and Projected
Next
Projected population estimates shall be based upon data from the state, regional, or local service agency population projections.
NOTE: Historical population estimates are reported for purposes of SB X7-7 in SB X7-7 Table 3.
2020
2025
2030
2035
2040
2045 (opt)
Population Served
10,227
10,375
10,536
10,673
10,800
10,919
NOTES
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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 4: System Water Use - View Table List

Back | Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual | Next

Use Type	2020 Actual		
	Additional Description (as needed)	Level of Treatment When Delivered	Volume* (AF)
Single Family		Drinking Water	791
Multi-Family		Drinking Water	91
Commercial		Drinking Water	43
Industrial		Drinking Water	94
Landscape		Drinking Water	3
TOTAL			1,022
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES			

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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 4: System Water Use - View Table List

Back | Table 4-2 Retail: Demands for Potable and Non-Potable Water - Projected | Next

Use Type	Additional Description (as needed)	Projected Water Use Report to the Extent that Records are Available				
		2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045-opt (AF)
Single Family		854	856	857	857	867
Multi-Family		88	88	88	88	89
Commercial		61	60	60	59	59
Industrial		104	103	102	100	101
Landscape		1	1	1	1	1
TOTAL		1,108	1,108	1,108	1,105	1,117
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES						

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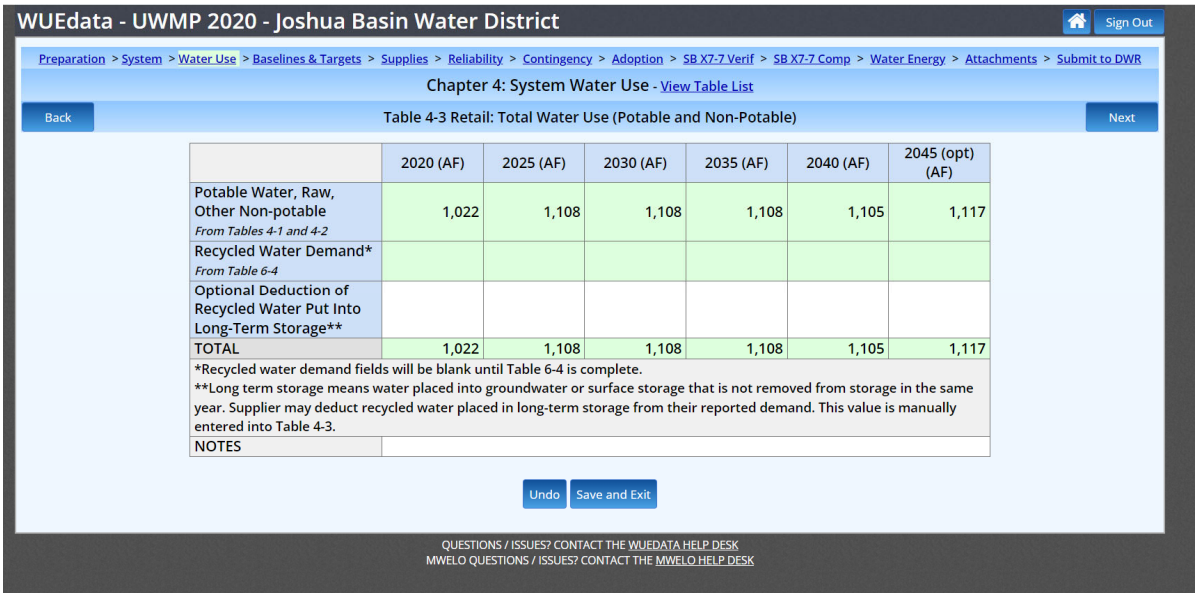

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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 4: System Water Use - View Table List

Back | Table 4-3 Retail: Total Water Use (Potable and Non-Potable) | Next

	2020 (AF)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (opt) (AF)
Potable Water, Raw, Other Non-potable *From Tables 4-1 and 4-2*	1,022	1,108	1,108	1,108	1,105	1,117
Recycled Water Demand* *From Table 6-4*						
Optional Deduction of Recycled Water Put Into Long-Term Storage**						
TOTAL	1,022	1,108	1,108	1,108	1,105	1,117
*Recycled water demand fields will be blank until Table 6-4 is complete. **Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier may deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.						
NOTES						

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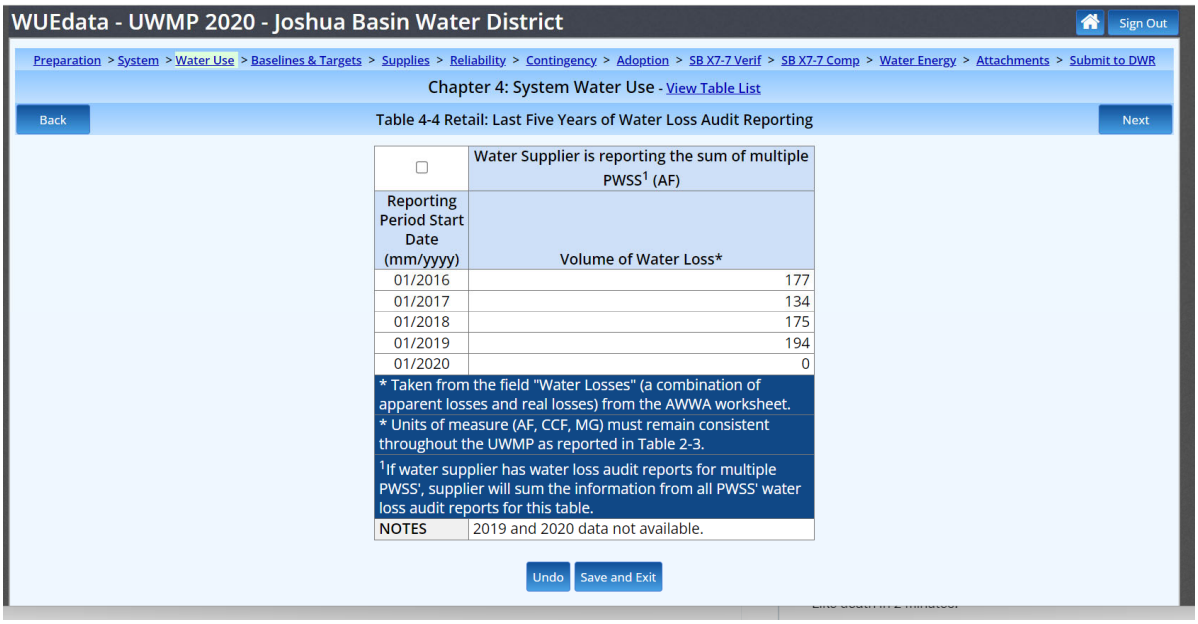

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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 4: System Water Use - View Table List

Back | Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting | Next

☐	Water Supplier is reporting the sum of multiple PWSS[1] (AF)
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2016	177
01/2017	134
01/2018	175
01/2019	194
01/2020	0
* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.	
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.	
[1]If water supplier has water loss audit reports for multiple PWSS', supplier will sum the information from all PWSS' water loss audit reports for this table.	
NOTES	2019 and 2020 data not available.

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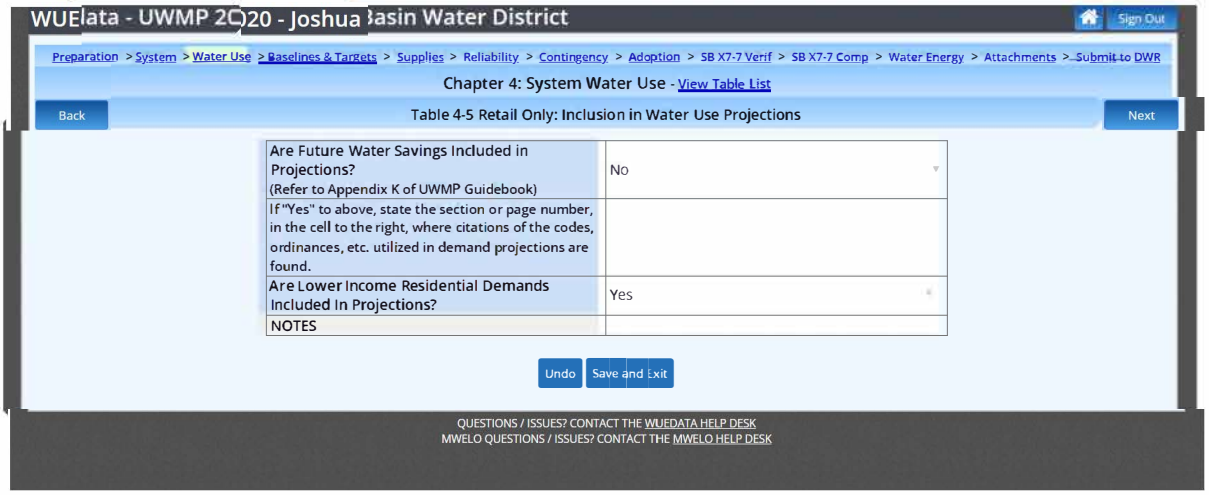
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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 4: System Water Use - View Table List
Back
Table 4-5 Retail Only: Inclusion in Water Use Projections
Next
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)
No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc. utilized in demand projections are found.
Are Lower Income Residential Demands Included In Projections?
Yes
NOTES
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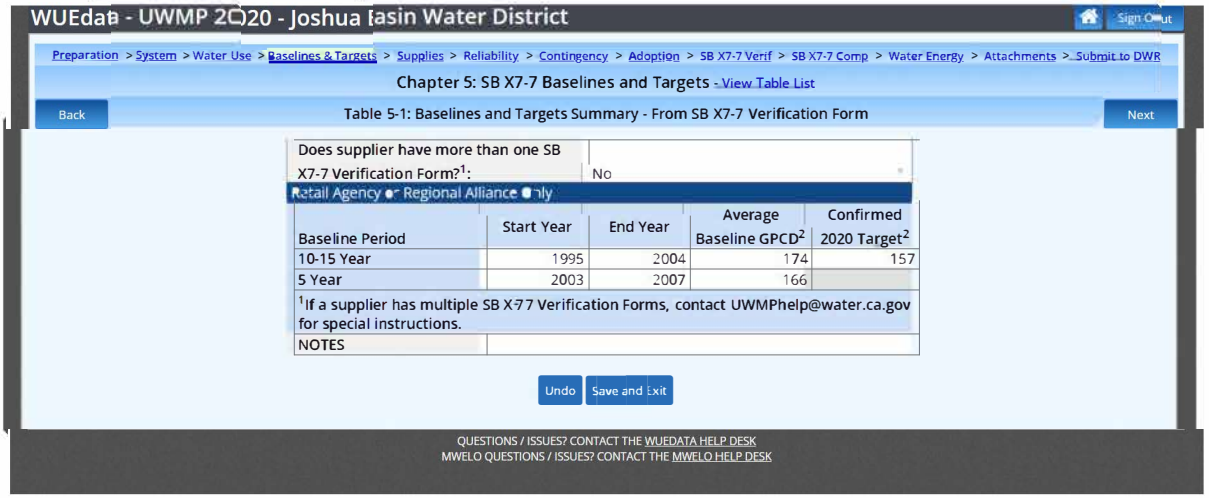
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Chapter 5: SB X7-7 Baselines and Targets - View Table List
Back
Table 5-1: Baselines and Targets Summary - From SB X7-7 Verification Form
Next
Does supplier have more than one SB X7-7 Verification Form?[1]:
No
Retail Agency or Regional Alliance only
Baseline Period
Start Year
End Year
Average Baseline GPCD[2]
Confirmed 2020 Target[2]
10-15 Year
1995
2004
174
157
5 Year
2003
2007
166
[1]If a supplier has multiple SB X7-7 Verification Forms, contact UWMPhelp@water.ca.gov for special instructions.
NOTES
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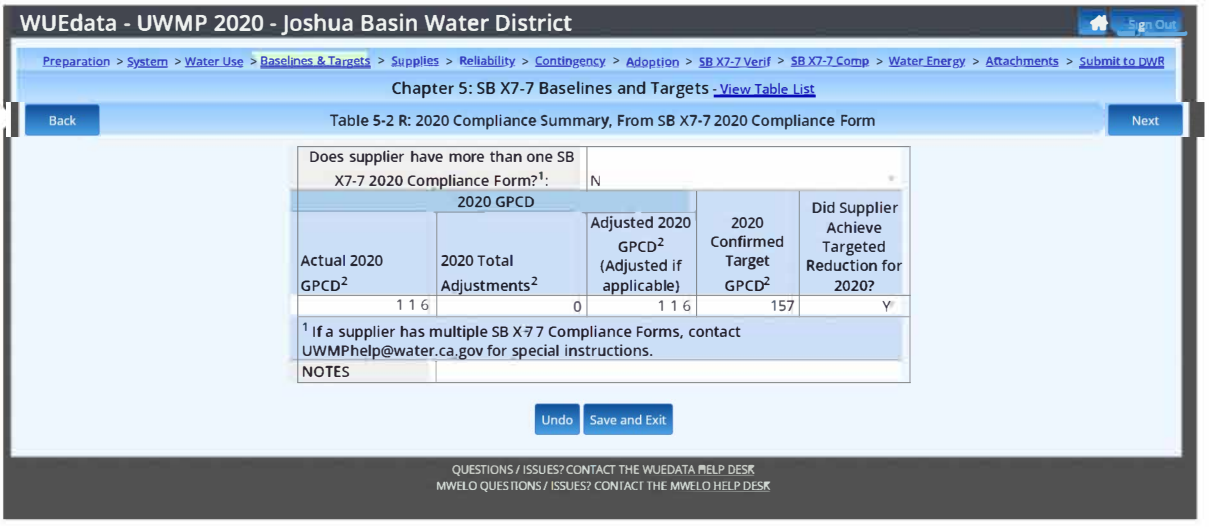
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK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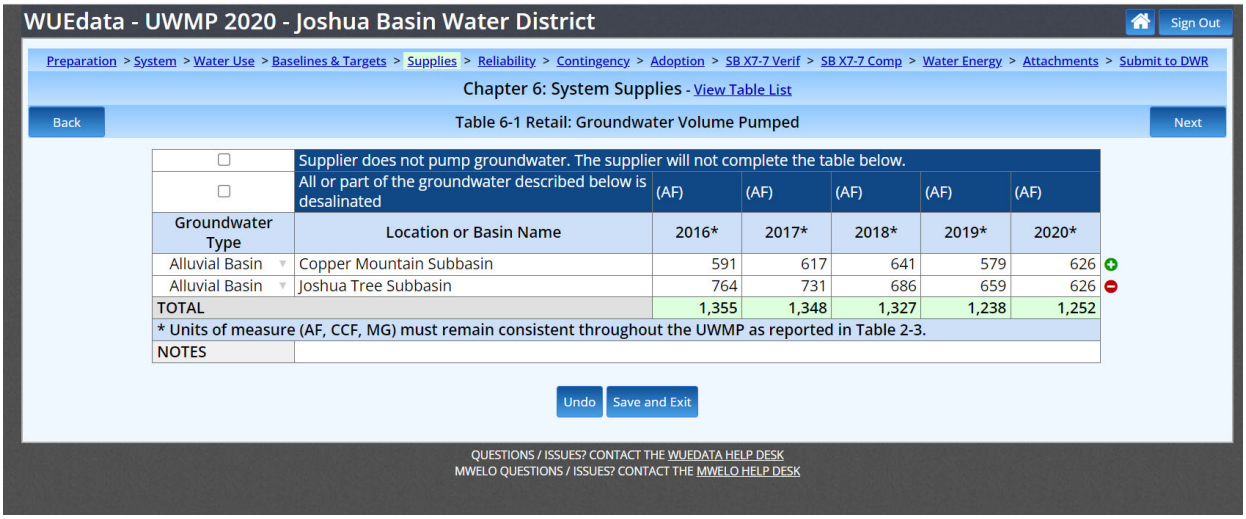
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 5: SB X7-7 Baselines and Targets - View Table List
Back
Table 5-2 R: 2020 Compliance Summary, From SB X7-7 2020 Compliance Form
Next
Does supplier have more than one SB X7-7 2020 Compliance Form?[1]:
N
2020 GPCD
Actual 2020 GPCD[2]
2020 Total Adjustments[2]
Adjusted 2020 GPCD[2] (Adjusted if applicable)
2020 Confirmed Target GPCD[2]
Did Supplier Achieve Targeted Reduction for 2020?
116
0
116
157
Y
[1] If a supplier has multiple SB X7-7 Compliance Forms, contact UWMPhelp@water.ca.gov for special instructions.
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

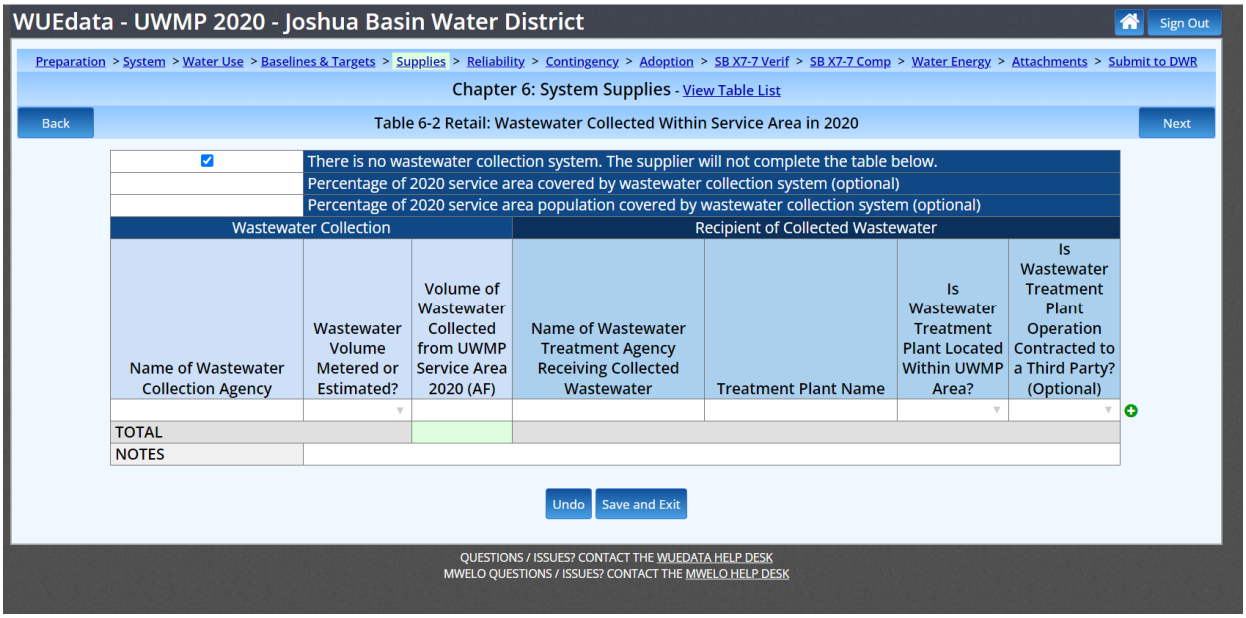
Chapter 6: System Supplies - View Table List

Back | Table 6-1 Retail: Groundwater Volume Pumped | Next

☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated	(AF)	(AF)	(AF)	(AF)	(AF)
Groundwater Type	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Alluvial Basin	Copper Mountain Subbasin	591	617	641	579	626
Alluvial Basin	Joshua Tree Subbasin	764	731	686	659	626
TOTAL		1,355	1,348	1,327	1,238	1,252
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES						

Undo | Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



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Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 6: System Supplies - View Table List

Back | Table 6-2 Retail: Wastewater Collected Within Service Area in 2020 | Next

☑	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system (optional)
	Percentage of 2020 service area population covered by wastewater collection system (optional)

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020 (AF)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is Wastewater Treatment Plant Located Within UWMP Area?	Is Wastewater Treatment Plant Operation Contracted to a Third Party? (Optional)
TOTAL						
NOTES						

Undo | Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

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Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 6: System Supplies - View Table List

Back | Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020 | Next

☑ No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional)*	Method of Disposal	Does this Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 Volumes (AF) Wastewater Treated	Discharge Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
TOTAL											

* If this information is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at: https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES

Undo | Save and Exit

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MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 6: System Supplies - View Table List

Back | Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area | Next

Add Table → | Table 1

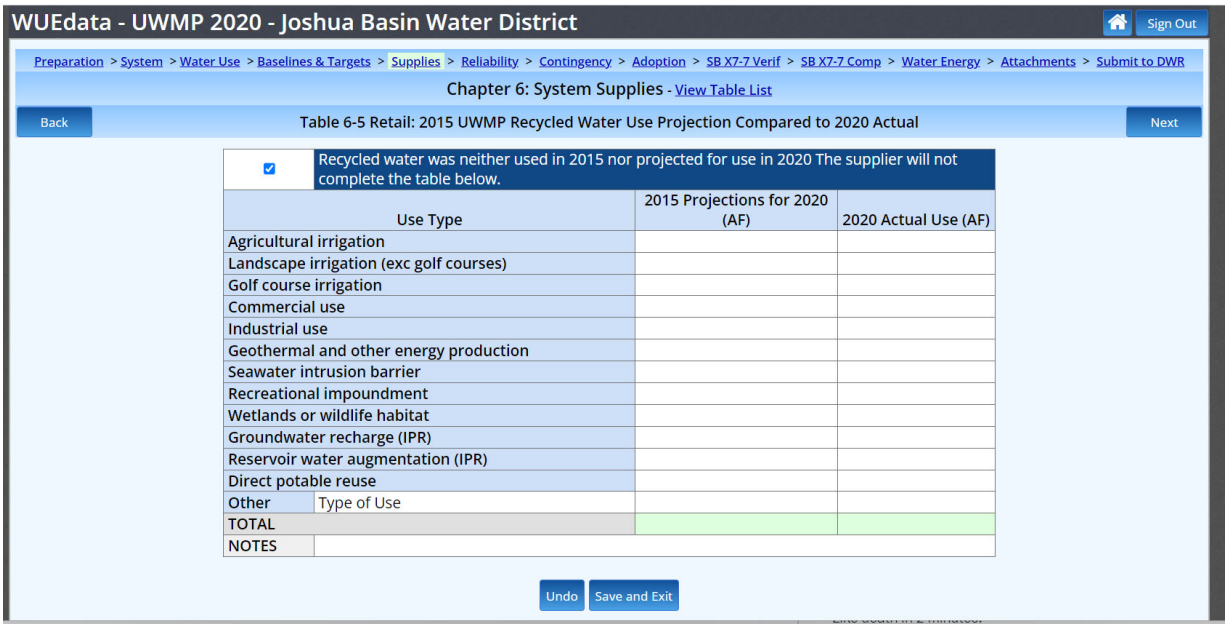
☑ Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Agency Producing (Treating) the Recycled Water:	
Name of Agency Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2020 (AF)	
Source of 2020 Supplemental Water	

Beneficial Use Type	Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity) (AF)	General Description of 2020 Uses	Level of Treatment	2020 (AF)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (opt) (AF)
Agricultural irrigation										
Landscape irrigation (excludes golf courses)										
Golf course irrigation										
Commercial use										
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										
Groundwater recharge (IPR*)										
Reservoir water augmentation (IPR*)										
Direct potable reuse										
Other (provide general description)										
TOTAL										
				2020 Internal Reuse						

*IPR - Indirect Potable Reuse

NOTES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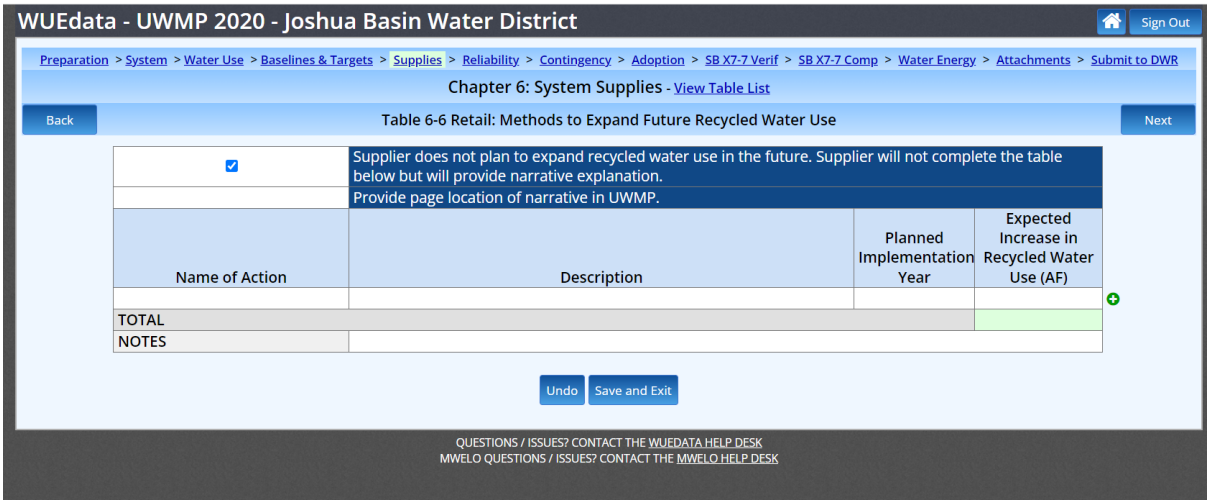
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 6: System Supplies - View Table List
Back
Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual
Next
Recycled water was neither used in 2015 nor projected for use in 2020 The supplier will not complete the table below.
Use Type
2015 Projections for 2020 (AF)
2020 Actual Use (AF)
Agricultural irrigation
Landscape irrigation (exc golf courses)
Golf course irrigation
Commercial use
Industrial use
Geothermal and other energy production
Seawater intrusion barrier
Recreational impoundment
Wetlands or wildlife habitat
Groundwater recharge (IPR)
Reservoir water augmentation (IPR)
Direct potable reuse
Other
Type of Use
TOTAL
NOTES
Undo
Save and Exit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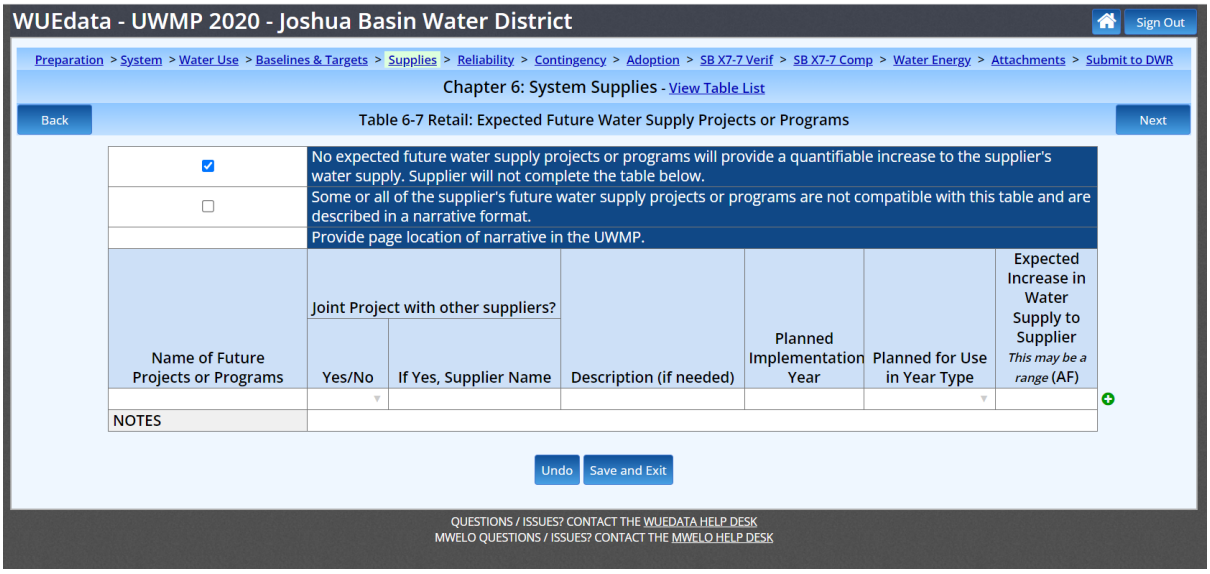
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 6: System Supplies - View Table List
Back
Table 6-6 Retail: Methods to Expand Future Recycled Water Use
Next
Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
Provide page location of narrative in UWMP.
Name of Action
Description
Planned Implementation Year
Expected Increase in Recycled Water Use (AF)
TOTAL
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK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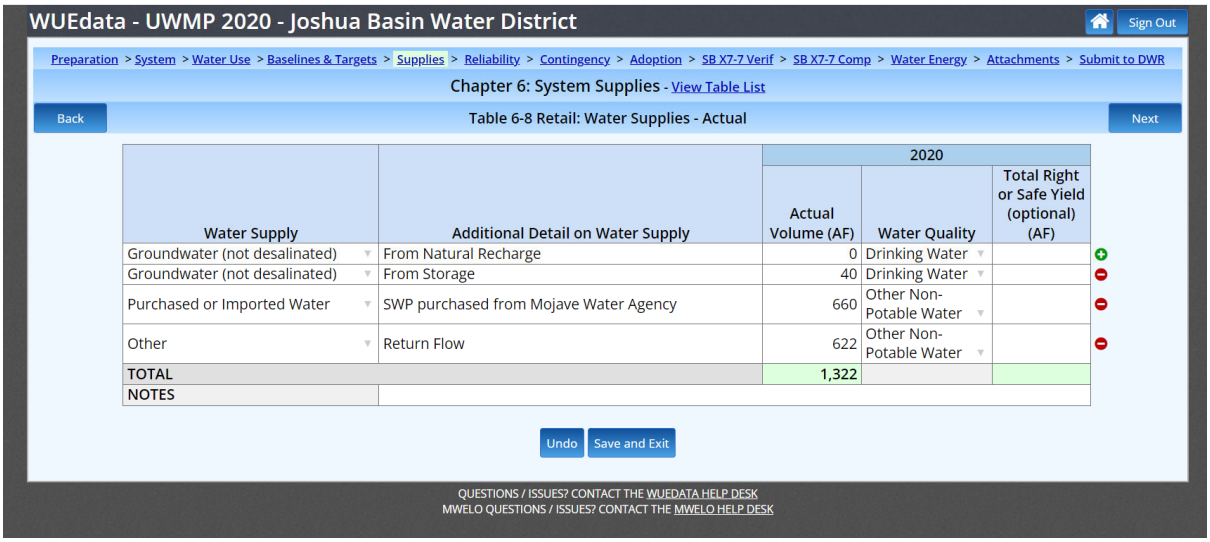
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 6: System Supplies - View Table List
Back
Table 6-7 Retail: Expected Future Water Supply Projects or Programs
Next
No expected future water supply projects or programs will provide a quantifiable increase to the supplier's water supply. Supplier will not complete the table below.
Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
Provide page location of narrative in the UWMP.
Name of Future Projects or Programs
Joint Project with other suppliers?
Yes/No
If Yes, Supplier Name
Description (if needed)
Planned Implementation Year
Planned for Use in Year Type
Expected Increase in Water Supply to Supplier This may be a range (AF)
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK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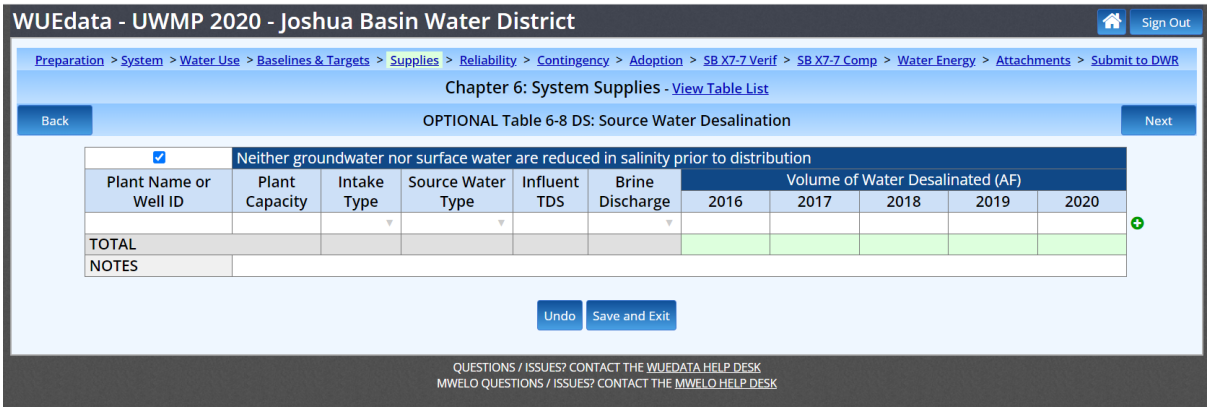
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 6: System Supplies - View Table List
Back
Table 6-8 Retail: Water Supplies - Actual
Next
Water Supply
Additional Detail on Water Supply
2020
Actual Volume (AF)
Water Quality
Total Right or Safe Yield (optional) (AF)
Groundwater (not desalinated) From Natural Recharge 0 Drinking Water
Groundwater (not desalinated) From Storage 40 Drinking Water
Purchased or Imported Water SWP purchased from Mojave Water Agency 660 Other Non-Potable Water
Other Return Flow 622 Other Non-Potable Water
TOTAL 1,322
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK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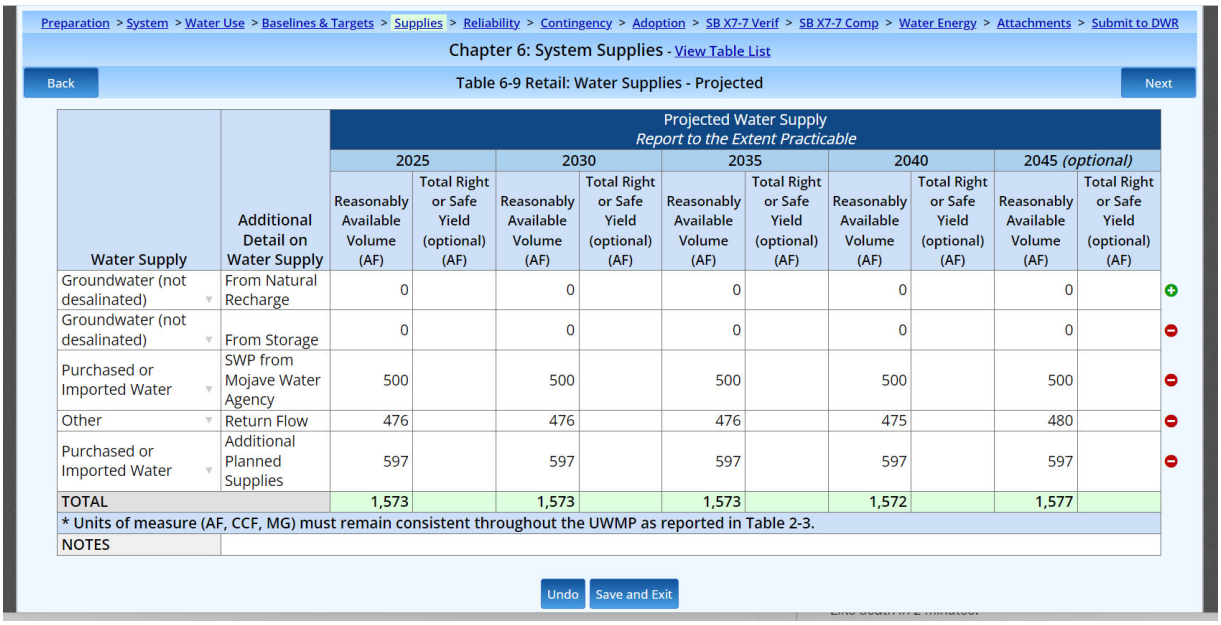
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 6: System Supplies - View Table List
Back
OPTIONAL Table 6-8 DS: Source Water Desalination
Next
Neither groundwater nor surface water are reduced in salinity prior to distribution
Plant Name or Well ID
Plant Capacity
Intake Type
Source Water Type
Influent TDS
Brine Discharge
Volume of Water Desalinated (AF)
2016
2017
2018
2019
2020
TOTAL
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



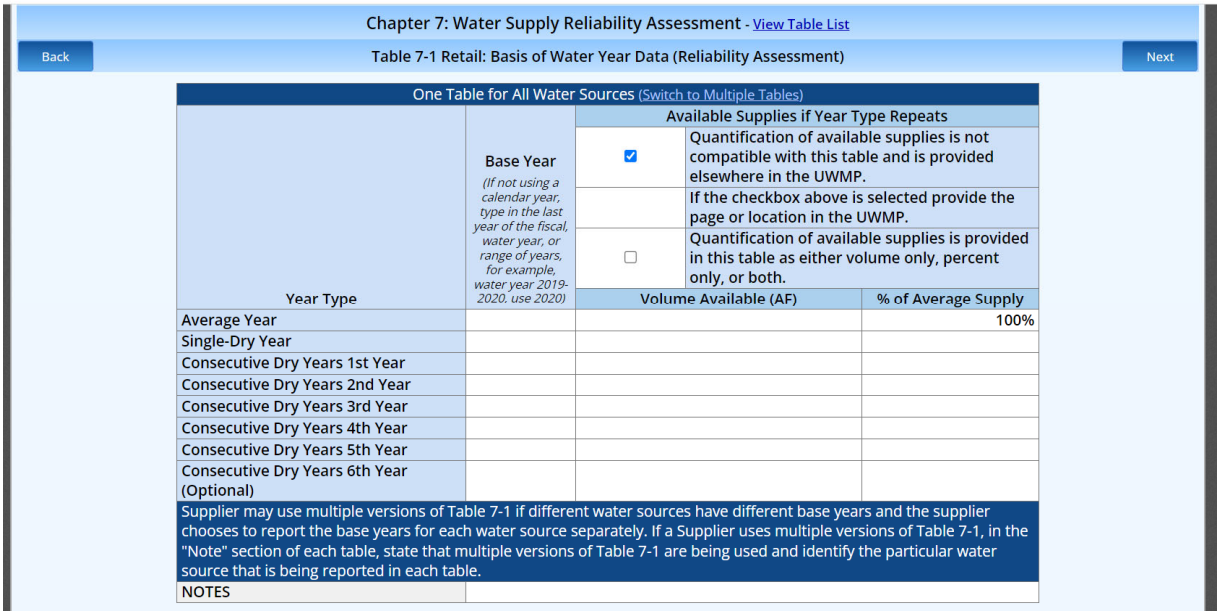
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 6: System Supplies - View Table List

Back | Table 6-9 Retail: Water Supplies - Projected | Next

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report to the Extent Practicable*									
		2025		2030		2035		2040		2045 *(optional)*	
		Reasonably Available Volume (AF)	Total Right or Safe Yield (optional) (AF)	Reasonably Available Volume (AF)	Total Right or Safe Yield (optional) (AF)	Reasonably Available Volume (AF)	Total Right or Safe Yield (optional) (AF)	Reasonably Available Volume (AF)	Total Right or Safe Yield (optional) (AF)	Reasonably Available Volume (AF)	Total Right or Safe Yield (optional) (AF)
Groundwater (not desalinated)	From Natural Recharge	0		0		0		0		0	
Groundwater (not desalinated)	From Storage	0		0		0		0		0	
Purchased or Imported Water	SWP from Mojave Water Agency	500		500		500		500		500	
Other	Return Flow	476		476		476		475		480	
Purchased or Imported Water	Additional Planned Supplies	597		597		597		597		597	
TOTAL		1,573		1,573		1,573		1,572		1,577	
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.											
NOTES											

Undo | Save and Exit

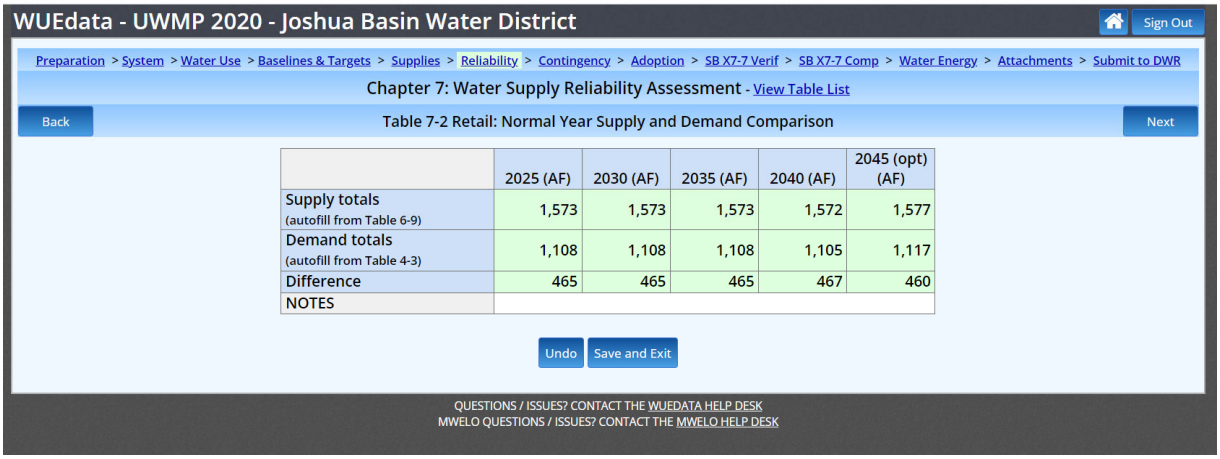


Chapter 7: Water Supply Reliability Assessment - View Table List

Back | Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment) | Next

One Table for All Water Sources (Switch to Multiple Tables)

Year Type	Base Year *(If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020)*	Available Supplies if Year Type Repeats	
		☑	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
			If the checkbox above is selected provide the page or location in the UWMP.
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available (AF)	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
Consecutive Dry Years 6th Year (Optional)			
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			
NOTES			



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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 7: Water Supply Reliability Assessment - View Table List

Back

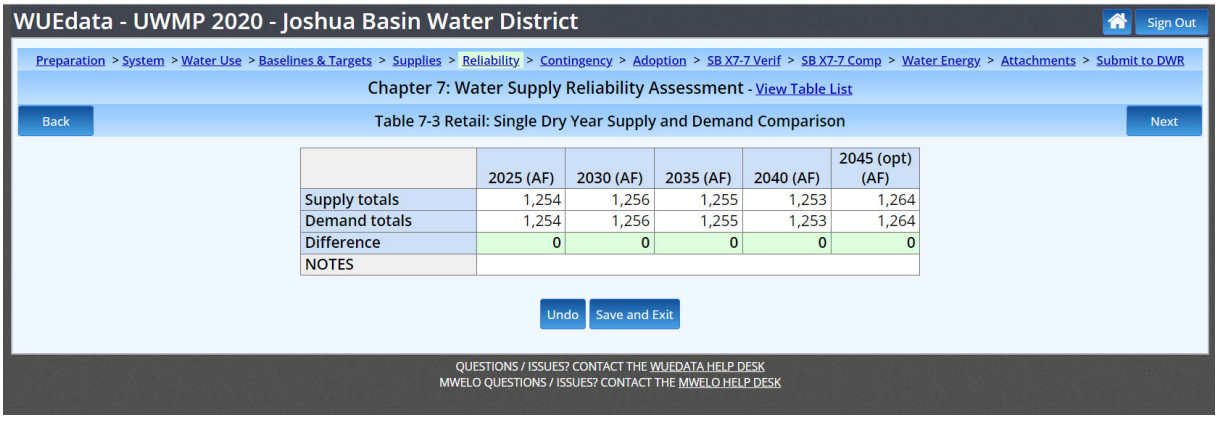
Table 7-2 Retail: Normal Year Supply and Demand Comparison

Next

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (opt) (AF)
Supply totals (autofill from Table 6-9)	1,573	1,573	1,573	1,572	1,577
Demand totals (autofill from Table 4-3)	1,108	1,108	1,108	1,105	1,117
Difference	465	465	465	467	460
NOTES					

Undo Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



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Chapter 7: Water Supply Reliability Assessment - View Table List

Back

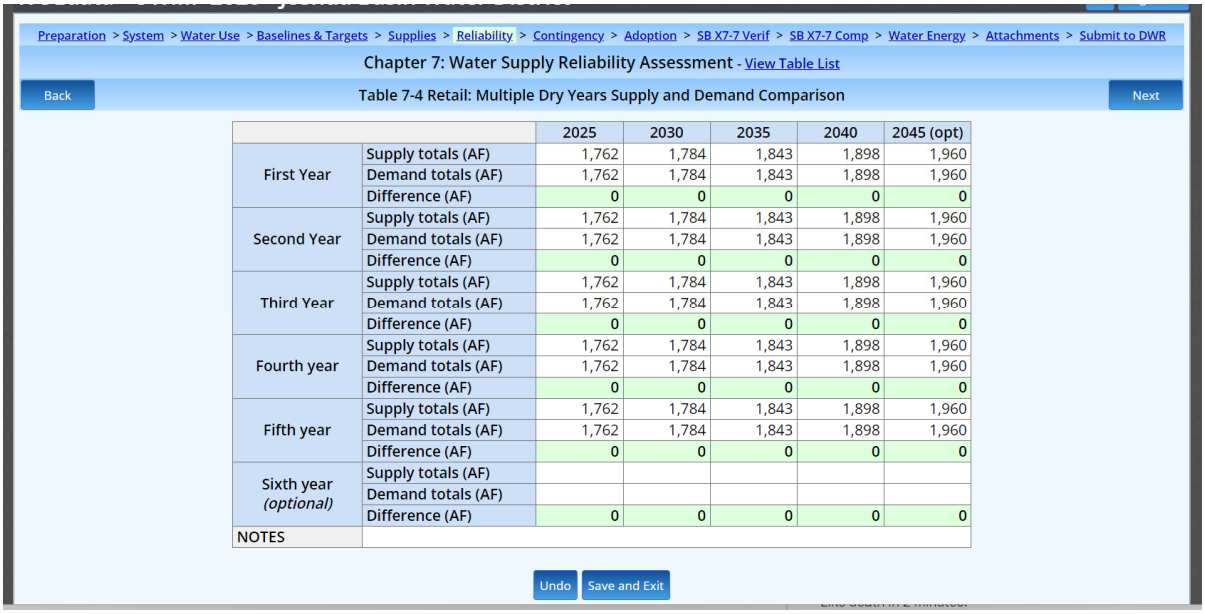
Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

Next

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (opt) (AF)
Supply totals	1,254	1,256	1,255	1,253	1,264
Demand totals	1,254	1,256	1,255	1,253	1,264
Difference	0	0	0	0	0
NOTES					

Undo Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 7: Water Supply Reliability Assessment - View Table List

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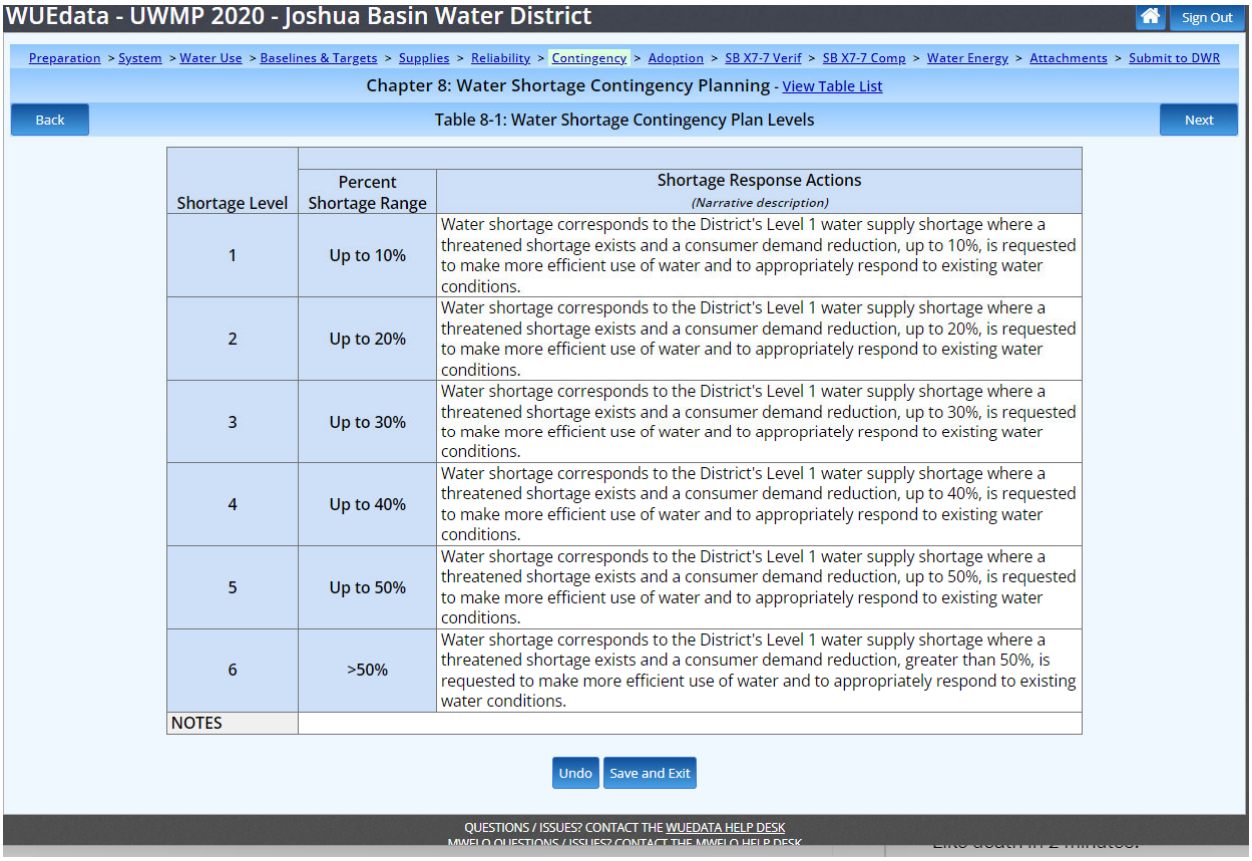
Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

Next

		2025	2030	2035	2040	2045 (opt)
First Year	Supply totals (AF)	1,762	1,784	1,843	1,898	1,960
	Demand totals (AF)	1,762	1,784	1,843	1,898	1,960
	Difference (AF)	0	0	0	0	0
Second Year	Supply totals (AF)	1,762	1,784	1,843	1,898	1,960
	Demand totals (AF)	1,762	1,784	1,843	1,898	1,960
	Difference (AF)	0	0	0	0	0
Third Year	Supply totals (AF)	1,762	1,784	1,843	1,898	1,960
	Demand totals (AF)	1,762	1,784	1,843	1,898	1,960
	Difference (AF)	0	0	0	0	0
Fourth year	Supply totals (AF)	1,762	1,784	1,843	1,898	1,960
	Demand totals (AF)	1,762	1,784	1,843	1,898	1,960
	Difference (AF)	0	0	0	0	0
Fifth year	Supply totals (AF)	1,762	1,784	1,843	1,898	1,960
	Demand totals (AF)	1,762	1,784	1,843	1,898	1,960
	Difference (AF)	0	0	0	0	0
Sixth year *(optional)*	Supply totals (AF)					
	Demand totals (AF)					
	Difference (AF)	0	0	0	0	0
NOTES						

Undo Save and Exit

2021	Total
Total Water Use	1,174
Total Supplies	1,174
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Action (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	1,304
Total Supplies	1,193
Surplus/Shortfall w/o WSCP Action	-111
Planned WSCP Action (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-111
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	1,296
Total Supplies	1,211
Surplus/Shortfall w/o WSCP Action	-85
Planned WSCP Action (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-85
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	1,287
Total Supplies	1,231
Surplus/Shortfall w/o WSCP Action	-56
Planned WSCP Action (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-56
Resulting % Use Reduction from WSCP action	0%
2025	**Total**
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Action (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	1,279
WSCP - use reduction savings benefit	1,254
Revised Surplus/(shortfall)	2,533
Resulting % Use Reduction from WSCP action	0%
NOTES	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Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
Chapter 8: Water Shortage Contingency Planning - View Table List
Back
Table 8-1: Water Shortage Contingency Plan Levels
Next
Shortage Level
Percent Shortage Range
Shortage Response Actions
(Narrative description)
1
Up to 10%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, up to 10%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
2
Up to 20%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, up to 20%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
3
Up to 30%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, up to 30%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
4
Up to 40%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, up to 40%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
5
Up to 50%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, up to 50%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
6
>50%
Water shortage corresponds to the District's Level 1 water supply shortage where a threatened shortage exists and a consumer demand reduction, greater than 50%, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK

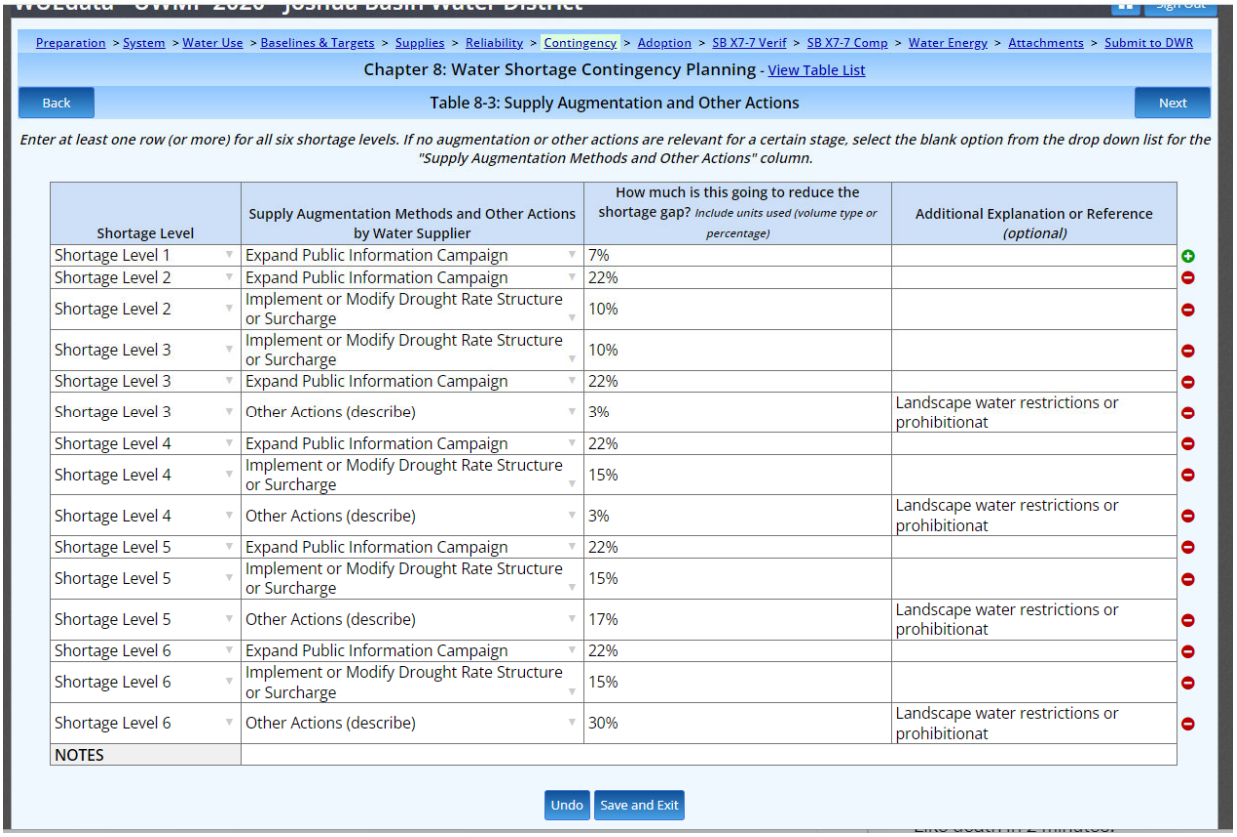
Chapter 8: Water Shortage Contingency Planning - View Table List

Back | Table 8-2: Demand Reduction Actions | Next

Enter at least one row (or more) for each of the six shortage levels. If no demand-related actions are relevant for a certain stage, select the blank option from the drop down list for the "Demand Reduction Actions" column.

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap Include units used (volume type or percentage)	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *For Retail Suppliers Only*
Shortage Level 1	Expand Public Information Campaign	7%	Based on AWWA 2008 assumes savings of 7%	No
Shortage Level 2	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
Shortage Level 3	Implement or Modify Drought Rate Structure or Surcharge	10%	Based on AWWA 2008 assumes savings of 10% with enforcement	Yes
Shortage Level 3	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
Shortage Level 3	Landscape - Other landscape restriction or prohibition	3%	Outdoor water limited to 3 days a week. Based on AWWA 2011	Yes
Shortage Level 4	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
Shortage Level 4	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2008 assumes savings of 15% with enforcement	Yes
Shortage Level 4	Landscape - Other landscape restriction or prohibition	10%	Outdoor water limited to 2 days a week. Based on AWWA 2011	Yes
Shortage Level 5	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
Shortage Level 5	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2008 assumes savings of 15% with enforcement	Yes
Shortage Level 5	Landscape - Other landscape restriction or prohibition	17%	Outdoor water limited to 1 day a week. Based on AWWA 2011	Yes
Shortage Level 6	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
Shortage Level 6	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2008 assumes savings of 15% with enforcement	Yes
Shortage Level 6	Landscape - Other landscape restriction or prohibition	30%	Outdoor water use prohibited	Yes
Shortage Level 2	Implement or Modify Drought Rate Structure or Surcharge	10%	Based on AWWA 2008 assumes savings of 10% with enforcement	Yes
NOTES				

Undo | Save and Exit



Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

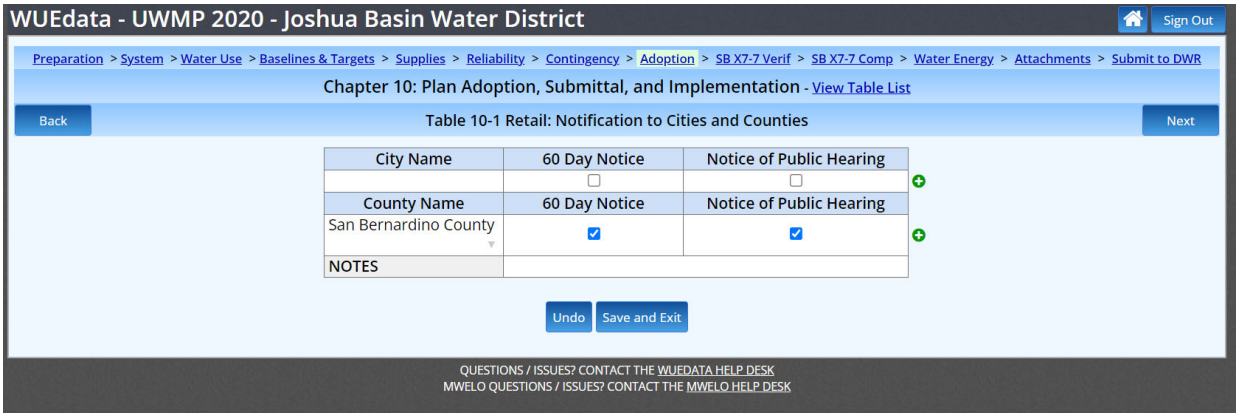
Chapter 8: Water Shortage Contingency Planning - View Table List

Back | Table 8-3: Supply Augmentation and Other Actions | Next

Enter at least one row (or more) for all six shortage levels. If no augmentation or other actions are relevant for a certain stage, select the blank option from the drop down list for the "Supply Augmentation Methods and Other Actions" column.

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Shortage Level 1	Expand Public Information Campaign	7%	
Shortage Level 2	Expand Public Information Campaign	22%	
Shortage Level 2	Implement or Modify Drought Rate Structure or Surcharge	10%	
Shortage Level 3	Implement or Modify Drought Rate Structure or Surcharge	10%	
Shortage Level 3	Expand Public Information Campaign	22%	
Shortage Level 3	Other Actions (describe)	3%	Landscape water restrictions or prohibitionat
Shortage Level 4	Expand Public Information Campaign	22%	
Shortage Level 4	Implement or Modify Drought Rate Structure or Surcharge	15%	
Shortage Level 4	Other Actions (describe)	3%	Landscape water restrictions or prohibitionat
Shortage Level 5	Expand Public Information Campaign	22%	
Shortage Level 5	Implement or Modify Drought Rate Structure or Surcharge	15%	
Shortage Level 5	Other Actions (describe)	17%	Landscape water restrictions or prohibitionat
Shortage Level 6	Expand Public Information Campaign	22%	
Shortage Level 6	Implement or Modify Drought Rate Structure or Surcharge	15%	
Shortage Level 6	Other Actions (describe)	30%	Landscape water restrictions or prohibitionat
NOTES			

Undo | Save and Exit



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Chapter 10: Plan Adoption, Submittal, and Implementation - View Table List

Back | Table 10-1 Retail: Notification to Cities and Counties | Next

City Name	60 Day Notice	Notice of Public Hearing
	☐	☐
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Bernardino County	☑	☑
NOTES		

Undo | Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

Appendix C: Public Outreach

Final UWMP to included all public outreach materials.

PUBLIC NOTICE

Joshua Basin Water District is undertaking a review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is located in unincorporated San Bernardino County and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt a UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

On August 17, 2022, at 5:30 PM, in the meeting room of the Board of Directors of Joshua Basin Water District, the Board of Directors will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider and receive comments and input on the 2020 Urban Water Management Plan for Joshua Basin Water District, including the updated WSCP, to allow community input regarding the District's implementation plan for complying with Part 2.55 of the Water Code and to consider the potential economic impacts of the implementation plan, and to provide information on their baseline water use, water use targets, and implementation plan required by the Water Conservation Act of 2009 (Water Code section 10608.20(b)).

A copy of the Draft 2020 Urban Water Management Plan for Joshua Basin Water District, including the WSCP, is available for public review on or before August 1, 2022, Monday through Thursday, during normal business hours at Joshua Basin Water District Administrative Office located at 61750 Chollita Road, Joshua Tree CA 92252. In addition, an electronic version of the plan is accessible at www.jbwd.com.

The 2020 Urban Water Management Plan for Joshua Basin Water District and the WSCP have been developed for implementation in accordance with the requirements of the California Urban Water Management Planning Act, Water Code sections 350 through 359 and 10610 through 10657, and the Water Conservation Act of 2009, Water Code sections 10608 through 10608.64.

(Pub: S. 08/03, 08/10/2022)

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COPY

August 1, 2022

David Doublet, Director of Land Use Services
County of San Bernardino
385 North Arrowhead
San Bernardino, CA 92415-0187

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Director Doublet,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

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Questions regarding the public hearing or the *2020 Urban Water Management Plan for Joshua Basin Water District,* including the WSCP, should be directed to **Sarah Johnson** at **760.974.0055.**

Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Heidi Duron, Desert Supervisor
San Bernardino County Land Use Services
385 N. Arrowhead Ave.
San Bernardino, CA 92415

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Ms. Duron,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

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Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Chris Elliott, Water Resources Manager
MAGTFTC MCAGCC NREA
Box 788110, Building 1451
Twentynine Palms, CA 92278-8110

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Mr. Elliott,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

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Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Allison Febo, General Manager
Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear General Manager Febo,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

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Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Darrell Mike, Tribal Chairman
Twenty-nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Tribal Chairman Mike,

Joshua Basin Water District is undertaking review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is located in San Bernardino County and serves the residents of Twentynine Palms and areas of unincorporated San Bernardino County. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Joshua Basin Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

The 2020 UWMP will include an update of anticipated water demands in the Joshua Basin Water District service area. Concurrent with the UWMP Update, Joshua Basin District will revise its Water Shortage Contingency Plan (WSCP). Joshua Basin District is encouraging participation by land use agencies, water use agencies, and other interested parties in the UWMP and WSCP. Joshua Basin Water District would like to extend to your agency an opportunity to meet with us to go over the various elements of the UWMP and WSCP, including assumptions about future population, future water demand, future water supplies, and upcoming water conservation programs.

We anticipate that a draft UWMP and WSCP will be available for public review starting August 1, 2022, and the District will hold a public hearing on August 17, 2022, prior to adoption of the UWMP and WSCP. Hence, we would like to solicit your input soon.

If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact Sarah Johnson, General Manager, 760.974.0055, sjohnson@jbwd.com, no later than August 12, 2022.

Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Paul Peschel, General Manager
Hi-Desert Water District
55439 Twentynine Palms Highway
Yucca Valley, CA 92284

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear General Manager Peschel,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

On **August 17, 2022** at **5:30PM,** in the boardroom of the Board of Directors of the Joshua Basin Water District, the Board of Directors will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider and receive comments and input on the *2020 Urban Water Management Plan for Joshua Basin Water District,* including the updated WSCP, to allow community input regarding the District's implementation plan for complying with Part 2.55 of the Water Code and to consider the potential economic impacts of the implementation plan, and to provide information on their baseline water use, water use targets, and implementation plan required by the Water Conservation Act of 2009 (Water Code section 10608.20(b)).

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Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Matthew Shragge, General Manager
Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, CA 92277

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear General Manager Shragge,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

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Sincerely,

Sarah Johnson
General Manager

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August 1, 2022

Marina West, General Manager
Bighorn-Desert View Water Agency
622 South Jemez Trail
Yucca Valley, CA 92284

RE: Notice of Public Hearing, 2020 Urban Water Management Plan for Joshua Basin Water District

Dear General Manager West,

Joshua Basin Water District has undertaken the review, update, and revision of its Urban Water Management Plan (UWMP). Joshua Basin Water District is in the unincorporated San Bernardino County area and serves more than 5,600 connections in a 100-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. Concurrent with its revision of the UWMP Joshua Basin Water District will update its Water Shortage Contingency Plan (WSCP).

On **August 17, 2022** at **5:30PM,** in the boardroom of the Board of Directors of the Joshua Basin Water District, the Board of Directors will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider and receive comments and input on the *2020 Urban Water Management Plan for Joshua Basin Water District,* including the updated WSCP, to allow community input regarding the District's implementation plan for complying with Part 2.55 of the Water Code and to consider the potential economic impacts of the implementation plan, and to provide information on their baseline water use, water use targets, and implementation plan required by the Water Conservation Act of 2009 (Water Code section 10608.20(b)).

A copy of the *Draft 2020 Urban Water Management Plan for Joshua Basin Water District,* including the WSCP, will be available for public review on or before August 1, 2022, Monday through Friday, during normal business hours at Joshua Basin Water District Administrative Office located at 61750 Chollita Road, Joshua Tree CA 92252. In addition, an electronic version of the plan will be accessible at www.jbwd.com.

The *2020 Urban Water Management Plan for Joshua Basin Water District* and the WSCP have been developed for implementation in accordance with the requirements of the California Urban Water Management Planning Act, Water Code sections 350 through 359 and 10610 through 10657, and the Water Conservation Act of 2009, Water Code sections 10608 through 10608.64. Public input from diverse social, cultural, and economic elements of the population is encouraged and will be considered as part of the urban water management planning and water shortage contingency planning process. Input from and coordination with the County of San Bernardino and other public agencies is also encouraged and will be considered (Water Code§§ 10620(d)(2); 10621(b); 10642.). Any written comments regarding the *Draft 2020 Urban Water Management Plan for Joshua Basin Water District* including the WSCP, should be submitted by the close of business on **August 11, 2022,** to the address set forth above, attention **Sarah Johnson.** Comments can also be made at the public hearing at the time and place first set forth above. Upon conclusion of the public hearing, the Board of Directors of Joshua Basin Water District may revise, change, modify, and/or adopt the UWMP and WSCP.

Questions regarding the public hearing or the *2020 Urban Water Management Plan for Joshua Basin Water District,* including the WSCP, should be directed to **Sarah Johnson** at **760.974.0055.**

Sincerely,

Sarah Johnson
General Manager

JOSHUA BASIN WATER DISTRICT
Proudly providing water from an ancient source...well into the future

PO BOX 675
61750 CHOLLITA ROAD
JOSHUA TREE CA 92252
PHONE: 760.366.8438
FAX: 760.366.9528
JBWD@JBWD.COM

October 19, 2020

Kathy Cortner, General Manager
Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

RE: 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Ms. Cortner,

Joshua Basin Water District is undertaking review, update, and revision of its Urban Water Management Plan. Joshua Basin Water District is located in unincorporated San Bernardino County and serves more than 4,400 connections in a 98-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five (5) years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Joshua Basin Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact Mark Ban, General Manager, 760.974.0051, mban@jbwd.com, no later than November 16, 2020.

Sincerely,

Mark Ban
General Manager

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October 19, 2020

Marina West, General Manager
Bighorn-Desert View Water Agency
622 South Jemez Trail
Yucca Valley, CA 92284-1440

RE: 2020 Urban Water Management Plan for Joshua Basin Water District

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October 19, 2020

Ed Muzik, General Manager
Hi-Desert Water District
55439 29 Palms Highway
Yucca Valley, CA 92284

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Dear Mr. Muzik,

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October 19, 2020

Ray Kolisz, General Manager
Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, CA 92277

RE: 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Mr. Kolisz,

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October 19, 2020

Chris Elliott, Water Resources Manager
MAGTFTC MCAGCC NREA
Box 788110 Building 1451
Twentynine Palms, CA 92278-8110

RE: 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Mr. Elliot,

Joshua Basin Water District is undertaking review, update, and revision of its Urban Water Management Plan. Joshua Basin Water District is located in unincorporated San Bernardino County and serves more than 4,400 connections in a 98-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five (5) years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Joshua Basin Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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October 19, 2020

Terri Rahhal, Director of Land Use Services
County of San Bernardino
385 North Arrowhead
San Bernardino, CA 92415-0187

RE: 2020 Urban Water Management Plan for Joshua Basin Water District

Dear Ms. Kelly,

Joshua Basin Water District is undertaking review, update, and revision of its Urban Water Management Plan. Joshua Basin Water District is located in unincorporated San Bernardino County and serves more than 4,400 connections in a 98-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park, and the Twentynine Palms Marine Corps Base. The Urban Water Management Planning Act requires every "urban water supplier" to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five (5) years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Joshua Basin Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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October 19, 2020

Kathy Cortner, General Manager
Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

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October 19, 2020

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Bighorn-Desert View Water Agency
622 South Jemez Trail
Yucca Valley, CA 92284-1440

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Hi-Desert Water District
55439 29 Palms Highway
Yucca Valley, CA 92284

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October 19, 2020

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Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, CA 92277

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MAGTFTC MCAGCC NREA
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October 19, 2020

Terri Rahhal, Director of Land Use Services
County of San Bernardino
385 North Arrowhead
San Bernardino, CA 92415-0187

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Appendix D: Adoption Resolution

RESOLUTION NO. 22-1044

RESOLUTION OF THE BOARD OF DIRECTORS ADOPTING, DIRECTING FILING OF, AND IMPLEMENTING THE JOSHUA BASIN WATER DISTRICT 2020 URBAN WATER MANAGEMENT PLAN AND 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature, creating Part 2.6 (commencing with Section 10610) of Division 6 of the California Water Code, known as the Urban Water Management Plan Act (the "Act");

WHEREAS, the Act mandates that every urban water supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare, and every five (5) years thereafter update, its Urban Water Management Plan, (the "UWMP" or "Plan"), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the Joshua Basin Water District ("JBWD") is an urban water supplier as defined by the Act as it is a publicly owned supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers; and

WHEREAS, JBWD prepared and filed a UWMP with the California Department of Water Resources in 2015; and

WHEREAS, JBWD has now prepared its 2020 Urban Water Management Plan ("2020 UWMP") and 2020 Water Shortage Contingency Plan ("2020 WSCP"), as required by the Act, each of which is hereby incorporated herein by this reference; and

WHEREAS, on or about October 19, 2020, JBWD provided notice to the County of San Bernardino, Mojave Water Agency, Bighorn Desert View Water Agency, Hi-Desert Water District, Twentynine Palms Water District, and the Marine Air Ground Task Force Training Command ("MAGTFTC") that JBWD was in the process of preparing the 2020 UWMP and 2020 WSCP, and invited their consultation and comment on such documents; and

WHEREAS, JBWD made the 2020 UWMP and 2020 WSCP available for public inspection, commencing on or about August 1, 2022, both by posting on its website (jbwd.com) and sending out public notices to the County of San Bernardino, Mojave Water Agency, Bighorn Desert View Water Agency, Hi-Desert Water District, Twentynine Palms Water District, and the Marine Air Ground Task Force Training Command ("MAGTFTC"); and

WHEREAS, on August 3, 2022, and August 10, 2022, JBWD published notice in the *High Desert News* of both (1) the availability of the 2020 UWMP and 2020 WSCP for public inspection, and (2) a public hearing to be held at the JBWD Board of Directors ("Board") meeting on August 17, 2022, to be held at 5:30 p.m. or as soon thereafter as reasonably possible ("Public Hearing"); and

WHEREAS, on August 17, 2022, the Board held a noticed public hearing to receive public comment on the 2020 UWMP and 2020 WSCP; and

WHEREAS, the Board has received and had an opportunity to review the 2020 UWMP and 2020 WSCP, along with any and all public comments received; and

WHEREAS, the 2020 UWMP and 2020 WSCP have been prepared in accordance with the requirements of the Act; and

WHEREAS, the 2020 UWMP and 2020 WSCP are general information documents that are intended to provide an analysis of the current and alternative water demand and supplies and conservation activities of JBWD, including effects and measures of coping with short-term and chronic water shortages within the JBWD boundaries.

NOW, THEREFORE, BE IT RESOLVED by the Board of the Directors of the Joshua basin Water District as follows:

1. The recitals set forth herein are true and correct and shall hereinafter constitute findings of the Board.

2. The 2020 UWMP and 2020 WSCP, as presented to the Board, are hereby approved and adopted by JBWD.

3. The General Manager, or her designee, is directed to: (1) submit copies of the 2020 UWMP and 2020 WSCP to the Department of Water Resources as soon as practical, and to the California State Library and the County of San Bernardino, by no later than September 16, 2022; and (2) makes copies of the 2020 UWMP and 2020 WSCP available for public review during normal business hours no later than September 16, 2022.

4. The General Manager, or her designee, are further authorized to take any action reasonably necessary to effectuate the purpose or intent of this Resolution, to implement the 2020 UWMP and/or 2020 WSCP, or otherwise comply with the Act, including, when required by conditions contained within the 2020 UWMP and/or 2020 WSCP, declare a Water Shortage Emergency and to implement water conservation programs as detailed in the 2020 UWMP or 2020 WSCP, including recommendations to the Board of Directors regarding necessary procedures, rules and regulations to carry out effective and equitable water conservation programs.

5. This Resolution shall take effect immediately upon adoption by the Board.

PASSED AND ADOPTED this 17th day of August, 2022, pursuant to the following votes:

AYES:	Delph, Doolittle, Floen, and Jarlsberg
NOES:	_____
ABSENT:	_____
ABSTAIN:	_____

By: _____
Thomas Floen, President, Board of Directors

Respectfully submitted,

_____
Sarah Johnsen, General Manager & Board Secretary

Appendix E: Water Loss Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Joshua Basin Water District (3610025)
Reporting Year: 2015 | 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> | Pcnt: | Value:

Volume from own sources:	+ ?	5	1,358.000	acre-ft/yr	+ ?	3	6.00%		acre-ft/yr
Water imported:	+ ?	n/a		acre-ft/yr	+ ?				acre-ft/yr
Water exported:	+ ?	n/a		acre-ft/yr	+ ?				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 1,281.132 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:	
Billed metered:	+ ?	7	1,099.723	acre-ft/yr			
Billed unmetered:	+ ?	n/a		acre-ft/yr			
Unbilled metered:	+ ?	5	1.487	acre-ft/yr			
Unbilled unmetered:	+ ?	5	3.203	acre-ft/yr		3.203	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 1,104.413 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

176.719 acre-ft/yr

Apparent Losses

					Pcnt:	Value:	
Unauthorized consumption:	+ ?		3.203	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	3	16.770	acre-ft/yr	1.50%		acre-ft/yr
Systematic data handling errors:	+ ?	5	2.749	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 22.722 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 153.997 acre-ft/yr

WATER LOSSES: 176.719 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 181.409 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	5	261.8	miles
Number of active AND inactive service connections:	+ ?	7	5,804	
Service connection density:	?		22	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 3 86.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$5,837,495	$/Year	
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	$2.95	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	+ ?	5	$933.36	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 58 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Unbilled metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Joshua Basin Water District (3610025)
Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> Pcnt: Value:

Volume from own sources:	+ ?	5	1,354.981	acre-ft/yr	+ ?	3			acre-ft/yr
Water imported:	+ ?	n/a		acre-ft/yr	+ ?				acre-ft/yr
Water exported:	+ ?	n/a		acre-ft/yr	+ ?				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 1,354.981 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:	
Billed metered:	+ ?	5	1,190.100	acre-ft/yr			
Billed unmetered:	+ ?	n/a		acre-ft/yr			
Unbilled metered:	+ ?	9	1.600	acre-ft/yr			
Unbilled unmetered:	+ ?	5	3.387	acre-ft/yr		3.387	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 1,195.087 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

159.894 acre-ft/yr

Apparent Losses

					Pcnt:	Value:	
Unauthorized consumption:	+ ?		3.387	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	3	18.148	acre-ft/yr	1.50%		acre-ft/yr
Systematic data handling errors:	+ ?	5	2.975	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 24.510 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 135.383 acre-ft/yr

WATER LOSSES: 159.894 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 164.881 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	5	261.8	miles
Number of active AND inactive service connections:	+ ?	7	6,230	
Service connection density:	?		24	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 3 86.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$6,082,532	$/Year	
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	$3.26	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	+ ?	7	$863.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 61 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Joshua Basin Water District (3610025)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

	Grading	Volume		Master Meter and Supply Error Adjustments: Pcnt	Value	
Volume from own sources:	8	1,348.539	acre-ft/yr		-10.800	acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr			acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr			acre-ft/yr
WATER SUPPLIED:		**1,359.339**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

	Grading	Volume		Pcnt	Value	
Billed metered:	7	1,184.430	acre-ft/yr			
Billed unmetered:	n/a		acre-ft/yr			
Unbilled metered:	9	1.740	acre-ft/yr			
Unbilled unmetered:	5	3.398	acre-ft/yr		3.398	acre-ft/yr
AUTHORIZED CONSUMPTION:		**1,189.568**	acre-ft/yr			

Use buttons to select percentage of water supplied OR value

WATER LOSSES (Water Supplied - Authorized Consumption)

169.771 acre-ft/yr

Apparent Losses

	Volume		Pcnt	Value	
Unauthorized consumption:	3.398	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

	Grading	Volume		Pcnt	Value	
Customer metering inaccuracies:	3	18.064	acre-ft/yr	1.50%		acre-ft/yr
Systematic data handling errors:	5	2.961	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **24.423** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **145.348** acre-ft/yr

WATER LOSSES: **169.771** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **174.909** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grading		
Length of mains:	8	261.8	miles
Number of active AND inactive service connections:	5	5,619	
Service connection density:		21	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

	Grading		
Average operating pressure:	5	83.0	psi

COST DATA

	Grading			
Total annual cost of operating water system:	10	$6,217,560	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$3.60	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	7	$1,090.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 73 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Joshua Basin Water District (3610025)
Reporting Year: 2018 | 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> | Pcnt: | Value:

Volume from own sources:	+ ?	8	1,342.454	acre-ft/yr	+ ?	3		-11.543	acre-ft/yr
Water imported:	+ ?	n/a	0.000	acre-ft/yr	+ ?				acre-ft/yr
Water exported:	+ ?	n/a	0.000	acre-ft/yr	+ ?				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 1,353.997 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

Pcnt: | Value:

Billed metered:	+ ?	7	1,159.520	acre-ft/yr			
Billed unmetered:	+ ?	n/a		acre-ft/yr			
Unbilled metered:	+ ?	9	1.820	acre-ft/yr			
Unbilled unmetered:	+ ?	5	3.385	acre-ft/yr		3.385	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 1,164.725 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 189.272 acre-ft/yr

Apparent Losses

Pcnt: | Value:

Unauthorized consumption:	+ ?		3.385	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	3	17.685	acre-ft/yr	1.50%		acre-ft/yr
Systematic data handling errors:	+ ?	5	2.899	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 23.969 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 165.303 acre-ft/yr

WATER LOSSES: 189.272 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 194.477 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	9	261.8	miles
Number of active AND inactive service connections:	+ ?	6	5,644	
Service connection density:	?		22	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 5 83.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$6,610,101	$/Year	
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	$4.33	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	+ ?	7	$1,166.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 74 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

Appendix F: Reducing Reliance on the Delta

Appendix A
MWA Delta Reliance

This Appendix provides the Delta Reliance assessment for the Mojave Water Agency (MWA) and the retail water service agencies located within MWA's service area boundary. These retail agencies in MWA's service area boundary covered by this assessment include: 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 subject to the UWMP Act in the future and that rely upon water supplies derived from MWA's and the retail agencies' management are also considered in this assessment. Last, this assessment is consistent with all applicable water management activities within the 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.[66] 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.[67] The submitted certification of consistency may be appealed by any person and the Delta Stewardship Council may grant the appeal to address contested issues.[68] In short, water suppliers that anticipate participating in a proposed covered action must comply with the requirements of the Delta Reform Act.

Proposed covered actions may include a conveyance facility or a new diversion that involves transferring water through, exporting water from, or using water in the Delta. For urban purveyors that may participate in a proposed covered action, should provide information in their Urban Water Management Plans (UWMP) that can be used to demonstrate consistency with the Delta Plan. Specifically, the urban purveyors need to demonstrate consistency with Delta Plan Policy WR P1 –

[66] California Water Code section 85057.5.
[67] California Water Code section 85225.
[68] California Water Code section 85225.10-85225.25.

Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[69] WR P1 subsection (a) states that:

> Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:
>
> (1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);
>
> (2) That failure has significantly caused the need for the export, transfer, or use; and
>
> (3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above. WR P1 subsection (c)(1) states:

> Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:
>
> (A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;
>
> (B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and
>
> (C) Included in the Plan, commencing with 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).

The analysis in this Appendix includes all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future proposed covered action.

[69] Cal. Code Regs., tit. 23 section 5003.

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

The expected outcomes for this Delta reliance and improved regional self-reliance assessment were developed using guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 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%

The methodology for demonstrating reduced reliance on the Delta is consistent with DWR's Guidebook 2020. MWA calculated its expected outcomes for reduced Delta reliance by measuring its current and anticipated water use against a baseline condition. MWA chose 2010 normal water year as its baseline. Data for the 2010 baseline were taken from relevant regional planning documents. MWA then assessed its Delta Reliance against the 2010 baseline for years 2015 through 2045.

The analysis uses normal water year demands to assess the supplies that would be used in the future. In addition, because WR P1 considers water use efficiency savings as a source of supply, the UWMP Act 20% water conservation mandates and the rules governing quantification help support water use efficiency quantification in the MWA service area. Table A-2 shows the MWA service area demands without water use efficiency and the reported water use efficiency.

Table A-2: Demands Without Water Use Efficiency

Total Service Area Water Demands (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045
Water Demands with Water Use Efficiency	145,066	138,009	129,595	130,043	134,326	136,679	139,045	141,772
Reported Water Use Efficiency	-	17,735	33,701	46,803	54,025	59,962	64,920	68,828
Water Demands without Water Use Efficiency	145,066	155,744	163,296	176,846	188,351	196,641	203,965	210,600

MWA must also report the expected outcomes for measurable improvement in regional self-reliance. Table A-3 shows the expected outcomes for supplies contributing to regional self-reliance.

Table A-3: Supplies Contributing to Regional Self-Reliance

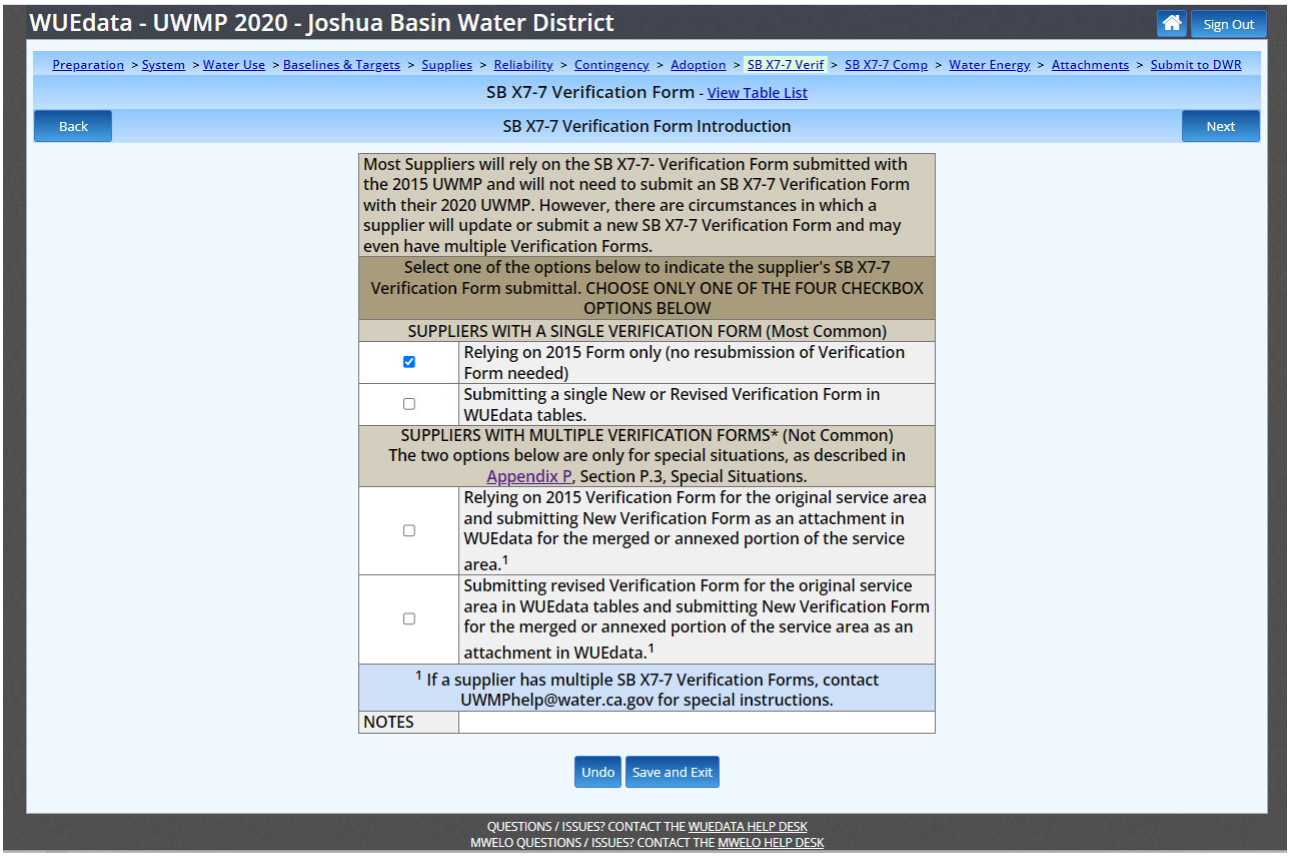
Water Supplies Contributing to Regional Self-Reliance	2010	2015	2020	2025	2030	2035	2040	2045
Water Use Efficiency	-	17,735	33,701	46,803	54,025	59,962	64,920	68,828
Water Recycling	62,000	47,825	52,536	47,495	49,699	50,930	52,172	53,559
Conjunctive Use Projects	54,045	57,349	57,349	57,349	57,349	57,349	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 MWA's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) as well as an addendum to participating retail agencies as desired. The information has been noticed and presented in accordance with applicable law.

Appendix G: DWR SBX7-7 Tables

APPENDIX G

Joshua Basin Water District
2020 Urban Water Management Plan
SBX7-7 DWR Tables



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

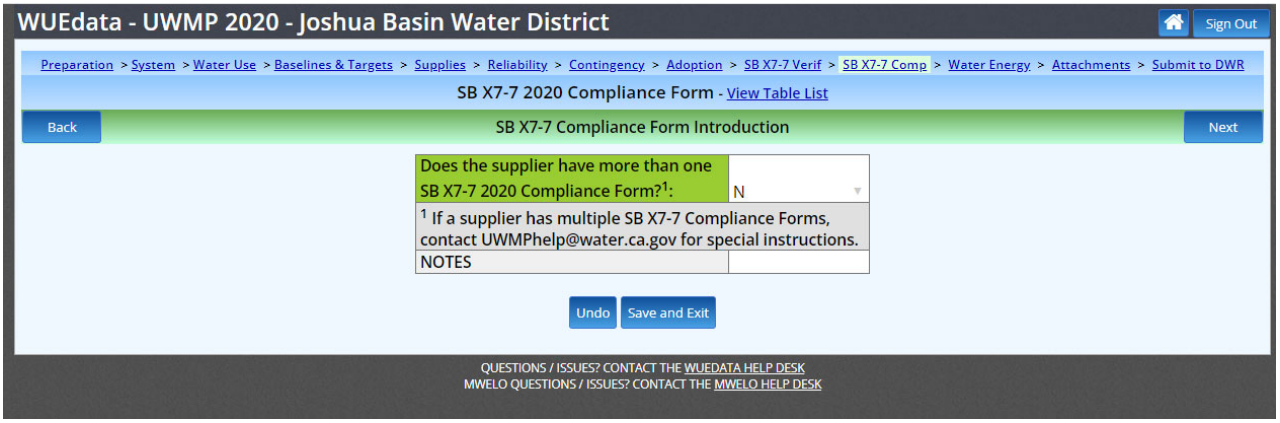
SB X7-7 Verification Form - View Table List

Back | SB X7-7 Verification Form Introduction | Next

Most Suppliers will rely on the SB X7-7- Verification Form submitted with the 2015 UWMP and will not need to submit an SB X7-7 Verification Form with their 2020 UWMP. However, there are circumstances in which a supplier will update or submit a new SB X7-7 Verification Form and may even have multiple Verification Forms.	
Select one of the options below to indicate the supplier's SB X7-7 Verification Form submittal. CHOOSE ONLY ONE OF THE FOUR CHECKBOX OPTIONS BELOW	
SUPPLIERS WITH A SINGLE VERIFICATION FORM (Most Common)	
☑	Relying on 2015 Form only (no resubmission of Verification Form needed)
☐	Submitting a single New or Revised Verification Form in WUEdata tables.
SUPPLIERS WITH MULTIPLE VERIFICATION FORMS* (Not Common) The two options below are only for special situations, as described in Appendix P, Section P.3, Special Situations.	
☐	Relying on 2015 Verification Form for the original service area and submitting New Verification Form as an attachment in WUEdata for the merged or annexed portion of the service area.[1]
☐	Submitting revised Verification Form for the original service area in WUEdata tables and submitting New Verification Form for the merged or annexed portion of the service area as an attachment in WUEdata.[1]
[1] If a supplier has multiple SB X7-7 Verification Forms, contact UWMPhelp@water.ca.gov for special instructions.	
NOTES	

Undo | Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

SB X7-7 2020 Compliance Form - View Table List

Back | SB X7-7 Compliance Form Introduction | Next

Does the supplier have more than one SB X7-7 2020 Compliance Form?[1]:	N
[1] If a supplier has multiple SB X7-7 Compliance Forms, contact UWMPhelp@water.ca.gov for special instructions.	
NOTES	

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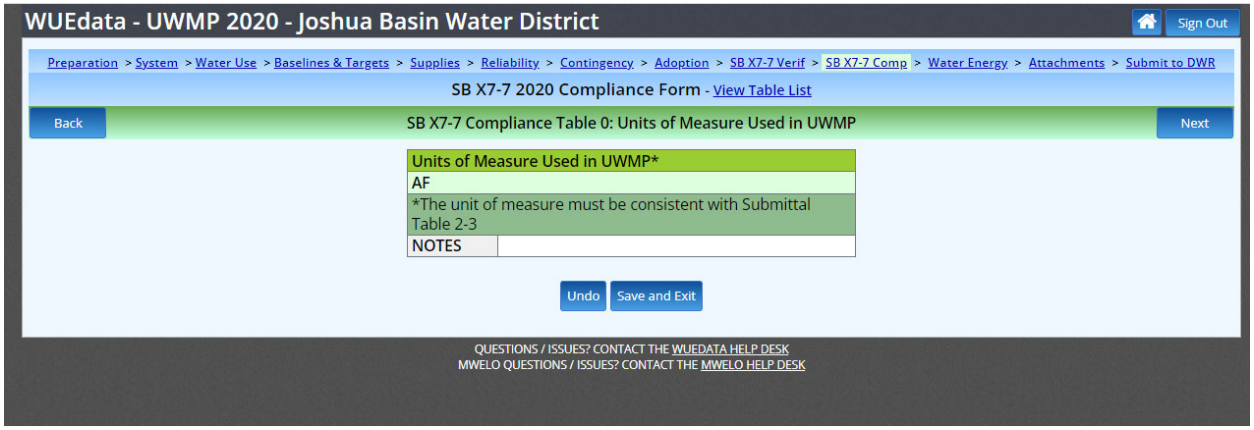
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK


WUEdata - UWMP 2020 - Joshua Basin Water District
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
SB X7-7 2020 Compliance Form - View Table List
Back
SB X7-7 Compliance Table 0: Units of Measure Used in UWMP
Next
Units of Measure Used in UWMP*
AF
*The unit of measure must be consistent with Submittal Table 2-3
NOTES
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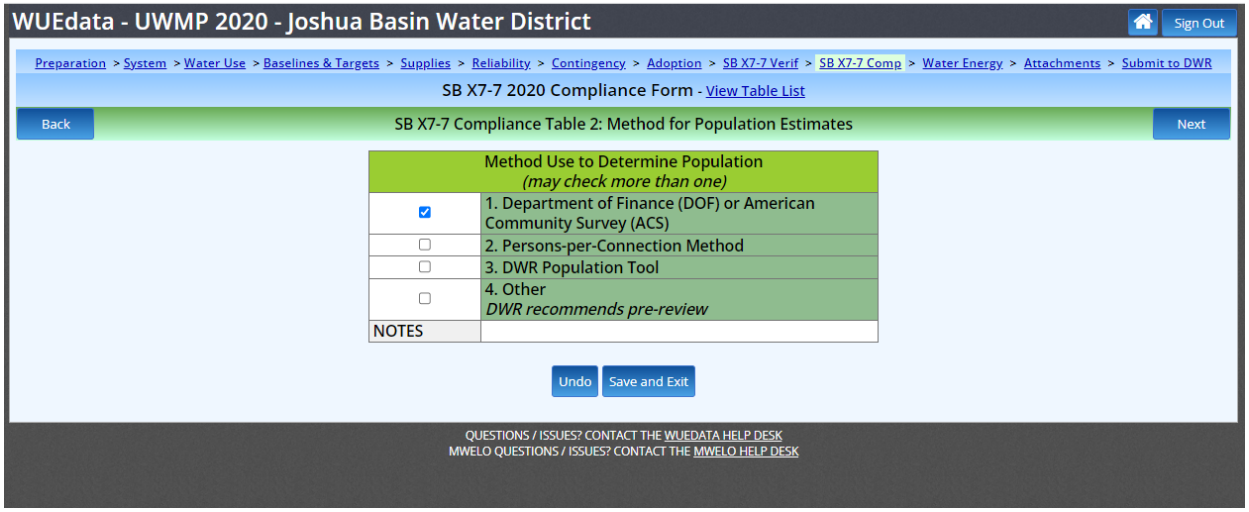
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK


WUEdata - UWMP 2020 - Joshua Basin Water District
Sign Out
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SB X7-7 2020 Compliance Form - View Table List
Back
SB X7-7 Compliance Table 2: Method for Population Estimates
Next
Method Use to Determine Population
(may check more than one)
1. Department of Finance (DOF) or American Community Survey (ACS)
2. Persons-per-Connection Method
3. DWR Population Tool
4. Other
DWR recommends pre-review
NOTES
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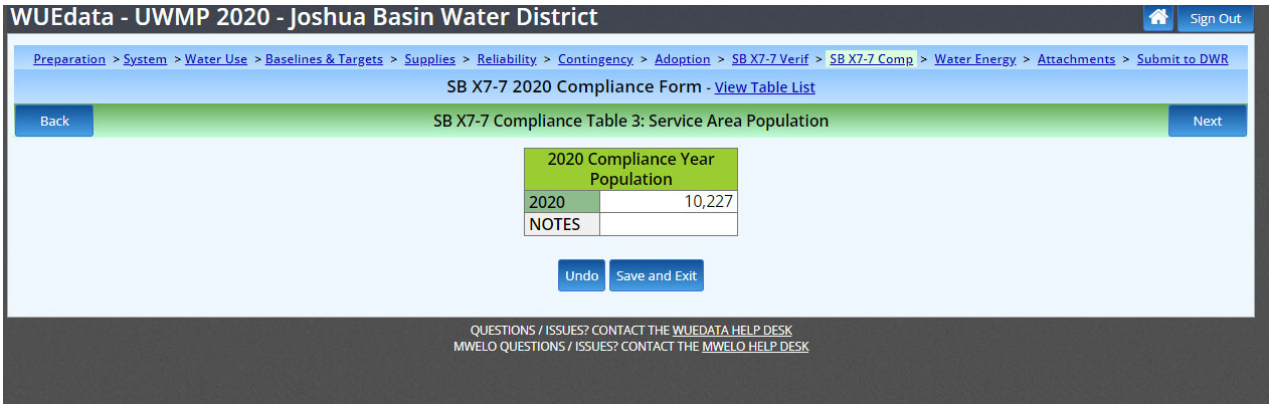
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK


WUEdata - UWMP 2020 - Joshua Basin Water District
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
SB X7-7 2020 Compliance Form - View Table List
Back
SB X7-7 Compliance Table 3: Service Area Population
Next
2020 Compliance Year Population
2020
10,227
NOTES
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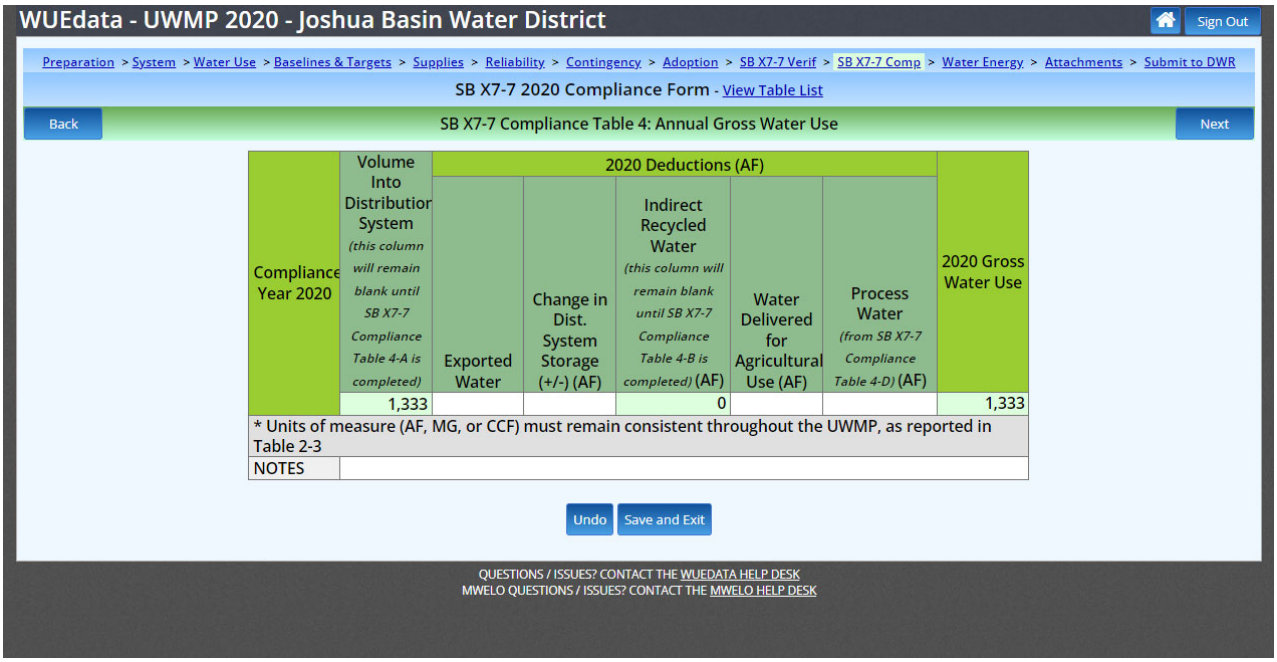
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

SB X7-7 2020 Compliance Form - View Table List

Back | SB X7-7 Compliance Table 4: Annual Gross Water Use | Next

Compliance Year 2020	Volume Into Distribution System *(this column will remain blank until SB X7-7 Compliance Table 4-A is completed)*	2020 Deductions (AF)					2020 Gross Water Use
		Exported Water	Change in Dist. System Storage (+/-) (AF)	Indirect Recycled Water *(this column will remain blank until SB X7-7 Compliance Table 4-B is completed)* (AF)	Water Delivered for Agricultural Use (AF)	Process Water *(from SB X7-7 Compliance Table 4-D)* (AF)	
	1,333			0			1,333
* Units of measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3							
NOTES							

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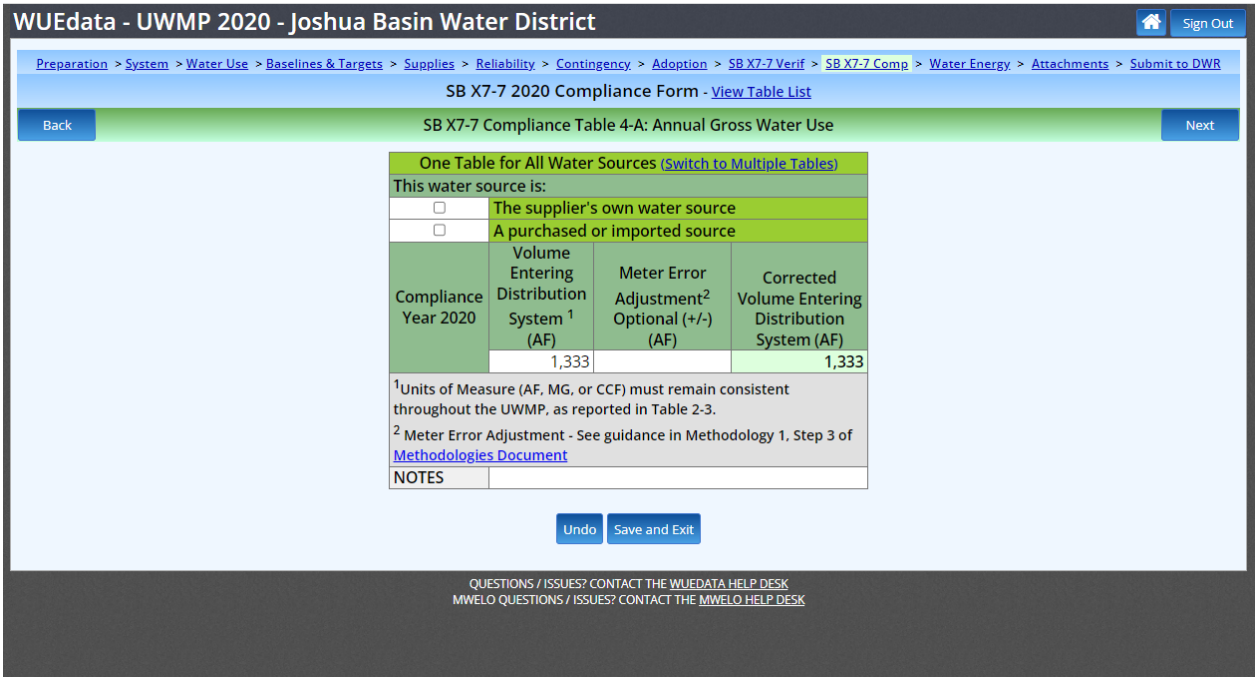
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

SB X7-7 2020 Compliance Form - View Table List

Back | SB X7-7 Compliance Table 4-A: Annual Gross Water Use | Next

One Table for All Water Sources (Switch to Multiple Tables)

This water source is:

☐ The supplier's own water source

☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1] (AF)	Meter Error Adjustment[2] Optional (+/-) (AF)	Corrected Volume Entering Distribution System (AF)
	1,333		1,333

[1] Units of Measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3.

[2] Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document

NOTES

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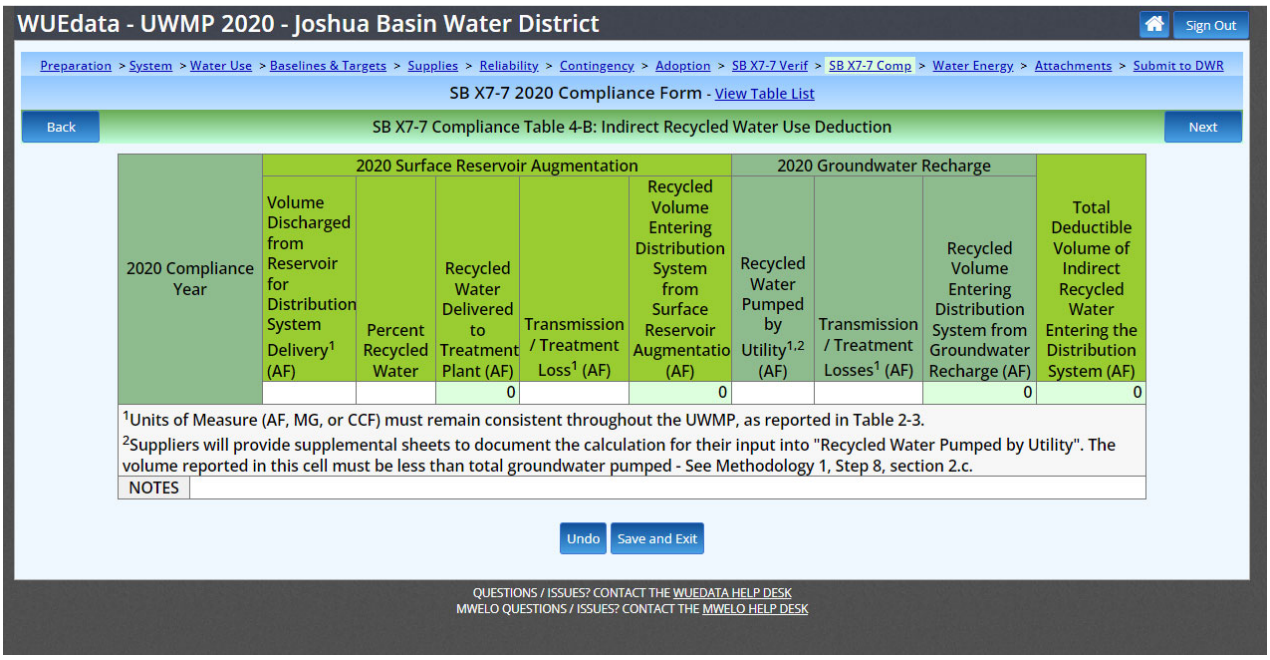
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

SB X7-7 2020 Compliance Form - View Table List

Back | SB X7-7 Compliance Table 4-B: Indirect Recycled Water Use Deduction | Next

2020 Compliance Year	2020 Surface Reservoir Augmentation					2020 Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System (AF)
	Volume Discharged from Reservoir for Distribution System Delivery[1] (AF)	Percent Recycled Water	Recycled Water Delivered to Treatment Plant (AF)	Transmission / Treatment Loss[1] (AF)	Recycled Volume Entering Distribution System from Surface Reservoir Augmentatio (AF)	Recycled Water Pumped by Utility[1,2] (AF)	Transmission / Treatment Losses[1] (AF)	Recycled Volume Entering Distribution System from Groundwater Recharge (AF)	
			0		0			0	0

[1]Units of Measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3.

[2]Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.

NOTES

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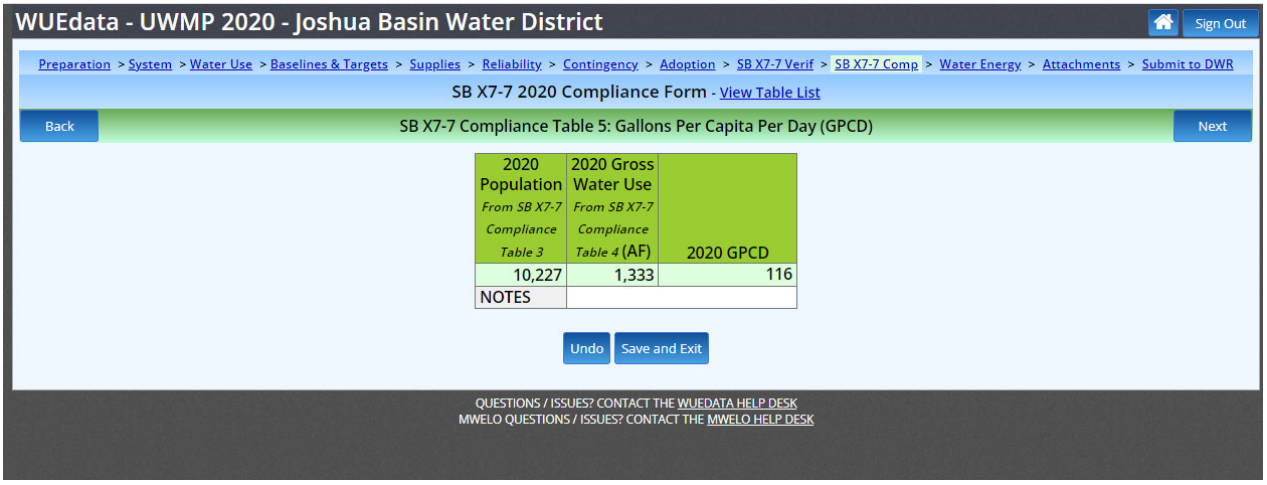
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

SB X7-7 2020 Compliance Form - View Table List

Back | SB X7-7 Compliance Table 5: Gallons Per Capita Per Day (GPCD) | Next

2020 Population *From SB X7-7 Compliance Table 3*	2020 Gross Water Use *From SB X7-7 Compliance Table 4* (AF)	2020 GPCD
10,227	1,333	116
NOTES		

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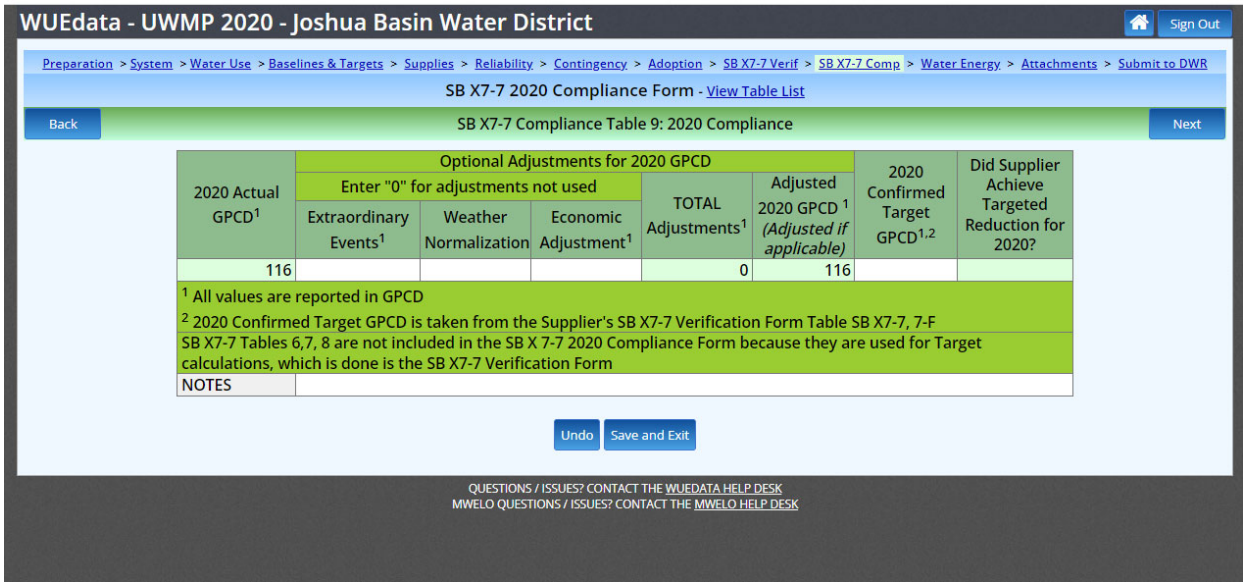
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK


WUEdata - UWMP 2020 - Joshua Basin Water District
Sign Out
Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR
SB X7-7 2020 Compliance Form - View Table List
Back
SB X7-7 Compliance Table 9: 2020 Compliance
Next
2020 Actual GPCD[1]
Optional Adjustments for 2020 GPCD
Enter "0" for adjustments not used
Extraordinary Events[1]
Weather Normalization
Economic Adjustment[1]
TOTAL Adjustments[1]
Adjusted 2020 GPCD [1] (Adjusted if applicable)
2020 Confirmed Target GPCD[1,2]
Did Supplier Achieve Targeted Reduction for 2020?
116
0
116
[1] All values are reported in GPCD
[2] 2020 Confirmed Target GPCD is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F
SB X7-7 Tables 6,7, 8 are not included in the SB X 7-7 2020 Compliance Form because they are used for Target calculations, which is done is the SB X7-7 Verification Form
NOTES
Undo
Save and Exit
QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

Appendix H: Groundwater Management Plan

JOSHUA BASIN WATER DISTRICT
61750 CHOLLITA ROAD
POST OFFICE BOX 675
JOSHUA TREE, CALIFORNIA 92252
(619) 366-8438

JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

MARCH 1996

Prepared by

KRIEGER & STEWART, INCORPORATED
ENGINEERING CONSULTANTS
3602 UNIVERSITY AVENUE
RIVERSIDE, CALIFORNIA 92501
(909) 684-6900

SIGNATURE M E Messersmith

DATE 3-12-96

106-73
(73-GMP)
RDF/kdc

NOTICE OF PREPARATION OF A
GROUND WATER MANAGEMENT PLAN

JOSHUA BASIN WATER DISTRICT

Notice is hereby given that the Joshua Basin Water District has completed a Ground Water Management Plan in accordance with California Water Code Section 10750 et seq., sometimes referred to as Assembly Bill 3030 or the Ground Water Management Planning Act. The Ground Water Management Plan, if adopted, is intended to enable the District to improve the management of ground water resources within its jurisdiction. Copies of the Ground Water Management Plan are on file at the District office, 61750 Chollita Road, Joshua Tree, CA, 92252 and can be obtained for the District's reproduction costs.

The District's Ground Water Management Plan consists of five sections, as well as an Executive Summary and an Appendix. The sections are entitled Introduction, Objectives, Existing Conditions, Anticipated Water Demands, and Management Plan. The Introduction describes the District's service area, existing and proposed water system, and authority. The Objectives section describes the District's ground water management objectives, which include greater water conservation, improved ground water monitoring and production, the prevention of water exports, the introduction of conjunctive use, and the protection of recharge areas. The Existing Conditions section describes the amount of ground water in storage, the safe yield of ground water bodies within the District's boundaries, the water quality characteristics of area ground water, and the quantity and distribution of ground water production within the District. The Anticipated Demands section describes projected growth rates and the potential level of future ground water production and overdraft. The Management Plan section describes the actions that the District may take to manage ground water resources within its boundaries; actions to be considered include water conservation efforts, improvements in ground water monitoring and production, preventing exports of water from the District's jurisdiction, introducing conjunctive use (using imported water and/or reclaimed water in conjunction with ground water), preventing and responding to ground water contamination, coordinating activities with planning agencies, and establishing a replenishment assessment regarding ground water producers.

At its meeting on April 3, 1996 at 7:00 PM, the Board of Directors of the Joshua Basin Water District will hold a public hearing regarding the Ground Water Management Plan, after which it may adopt the Plan. Any person wishing to either comment on or submit a protest regarding this matter must provide such comments or protest in writing to the District by the end of the April 3, 1996 public hearing.

DATED: MARCH 11, 1996

Robert D. Field
KRIEGER & STEWART
District Engineer
JOSHUA BASIN WATER DISTRICT

106-73
73-GMP

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FIGURES

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APPENDICES

EXECUTIVE SUMMARY

The following represents a summary of the Joshua Basin Water District's (District) Ground Water Management Plan (Plan). The summary's format approximates that of the general text, and emphasizes the most important elements of each section of the Plan.

I. INTRODUCTION

The District is presently reliant upon ground water for all of its water supply requirements. While the District overlies a significant supply of high quality ground water, the region's arid environment limits the extent to which the ground water supply is recharged. Since about 1980, the amount of ground water extracted has exceeded the estimated amount recharged, leading to a condition known as overdraft. Limited or short term overdraft is not considered a significant threat; however, excessive overdraft can result in significant problems, such as storage capacity reduction, ground water quality reductions, and even ground surface subsidence. The purpose of the Plan is to enable the District to manage the area's ground water supply in a manner that avoids excessive overdraft while simultaneously continuing to provide the present and future residents of its service area with a safe and reliable water supply.

The District is the primary water purveyor in the Joshua Tree area, and has an area of approximately 96 square miles within its boundaries. The District's service area population is relatively small and widely dispersed; recent estimates indicate that said service area has a population of about 12,000 people living in 4,400± dwelling units. The District's domestic water system consists of four water supply wells, ten booster pumping plants, 13 water storage reservoirs, and over 100 miles of transmission and distribution pipelines, and is divided into 11 separate pressure zones.

II. OBJECTIVES

In order to accomplish the overall objective of the Plan, the District has established a number of subsidiary objectives which, when realized, will enable the District to effectively manage ground water supplies. The subsidiary objectives include:

- Water Conservation - reducing water use on a per capita basis by encouraging District customers to keep water use to a minimum, and reducing water losses by replacing damaged or deteriorated pipelines.

- Ground Water Monitoring - keeping track of the quantity and quality of the area's ground water by measuring water levels and collecting water samples at a number of locations; requires the construction of monitoring wells and/or the use of existing wells (either active or inactive).

- Ground Water Production - modifying production practices by dispersing production facilities (i.e. wells) so that localized pumping depressions don't become too severe; includes restrictions on the construction of new wells by the District or any other entity.

- Water Export Prevention - prohibiting the export of water produced within the District to areas outside the District, unless such exports are expressly authorized by the District.

- Conjunctive Use - making use of surface water supplies that are newly available to the District in conjunction with ground water supplies; the surface water, which will be conveyed by the Morongo Basin Pipeline Project, will enable the District to balance the use of ground water and partially or completely eliminate the condition of overdraft.

- Recharge Area Production - preventing any type of land use that would have the potential to degrade water quality within the ground water basins through contamination; examples of potential threats include large unsewered high-density (more than two units per acre) residential developments, landfills, and improperly designed or operated manufacturing facilities.

III. EXISTING CONDITIONS

Ground water conditions in the Joshua Tree area have not been the subject of a significant Federal or State investigation for over two decades, and all descriptions of existing conditions are therefore based on old information. However, available information does allow conservative estimates to be made of the amount of ground water in storage, particularly with regard to two

specific areas, the Joshua Tree Subbasin and the Copper Mountain Subbasin. Said subbasins are the two that are currently used for essentially all water supplies in the Joshua Tree area.

According to said estimates, there is at least 300,000 acre feet (AF) of water in storage in the Joshua Tree Subbasin, and may be as much as 480,000 AF in storage. The Copper Mountain Subbasin is estimated to have about 67,000 AF in storage. Combined totals for the two subbasins therefore range between 367,000 AF and 587,000 AF.

For the purposes of ground water management, the District has identified the maximum level of cumulative overdraft as 10% of the minimum estimated amount of water in storage in the two subbasins, which is approximately 36,700 AF. As noted above, overdraft occurs when annual extractions exceed annual recharge. The estimated annual recharge of the Joshua Tree Subbasin is about 1,000 AF, and that of the Copper Mountain Subbasin is less than 800 AF.

Through the end of 1995, the Joshua Tree Subbasin had been overdrafted by at least 7,100 AF and overdraft is currently occurring therein at an estimated rate of about 600 AF/Yr. Production figures and estimated rates of overdraft are not currently available for the Copper Mountain Subbasin.

IV. ANTICIPATED WATER DEMANDS

Although it is difficult to accurately predict future water demands, the District anticipates that demands will at least remain constant, and may increase by rates as high as 4% per year, depending on the type and extent of future development. Depending on the actual extent of development, and assuming that production continues to be concentrated within the Joshua Tree Subbasin, the annual rate of overdraft would range between 590 AF and 3,240 AF in the year 2020; cumulative overdraft of said subbasin would then range between 22,440 AF and 50,970 AF through 2020.

V. MANAGEMENT PLAN

The District's Management Plan consists of evaluating and (potentially) adopting a number of management activities, including water conservation measures, ground water monitoring, ground water production standards, water export prevention, conjunctive use, ground water

contamination prevention/response, planning agency coordination, and a replenishment assessment. Each is described briefly below:

- Water Conservation - potential measures include educational pamphlets, construction of a demonstration garden, a toilet and shower head retrofit program, and continuation of the District's pipeline replacement program.

- Ground Water Monitoring - potential elements include using existing wells (both active and inactive) for monitoring water levels and quality, constructing dedicated monitoring wells, and preparing a monitoring map that would give a visual representation of current and past conditions.

- Ground Water Production - potential components include expanding District production into additional areas (particularly the Copper Mountain Subbasin) and adopting ordinances requiring that any new production well constructed by an entity be located at least 1/2 mile from any existing well (to prevent excessive localized pumping depressions).

- Water Export Prevention - potential actions consist of adopting ordinances and regulations requiring District authorization of any water export from within its boundaries, and of using any available method (e.g. legislative initiatives, litigation) to resist proposed exports.

- Conjunctive Use - potential sources would include State Water Project water imported through the Morongo Basin Pipeline Project and used for either direct water service (following treatment) and/or artificial recharge, and reclaimed water used for irrigation and industrial purposes.

- Ground Water Contamination Prevention/Response - potential measures would include adopting and enforcing well construction and abandonment standards, protecting recharge areas from potential sources of contamination, monitoring (through the ground water monitoring system) for contamination, and responding rapidly and actively to any actual or threatened contamination.

- Planning Agency Coordination - potential actions would include establishing close working relationships with planning agency personnel (San Bernardino County and U.S. Bureau of Land Management and reviewing all development proposals to ensure that they do not represent a threat to ground water quantity or quality.

- Replenishment Assessment - potential action consists of establishing an assessment that would be levied against all ground water producers; the assessment, which would be based on a unit charge for each AF produced, would have to be approved by voters, and revenues would be used to fund the Plan's management activities.

SECTION I

SECTION I
INTRODUCTION

As the primary extractor and purveyor of water in the Joshua Tree area of San Bernardino County, the Joshua Basin Water District (District), a public agency, has the greatest responsibility for managing the area's limited water supply. In order to effectively and efficiently accomplish the management of water supplies, the District has prepared this Ground Water Management Plan, which includes background information regarding ground water supply and historic water use within the District's service area, as well as measures which will enable the District and area residents to make maximum use of the limited available resources. The Ground Water Management Plan is intended to protect ground water quantity and quality from threats related to both excessive use and contaminant introduction.

Ground water management plans are a relatively recent development, having been authorized in 1992 pursuant to California Assembly Bill 3030 (AB 3030) which was authored by Assemblyman Jim Costa. AB 3030 was added to the California Water Code as Section 10750 (§10750) et seq. and lists 12 specific components that may be included in a ground water management plan. Copies of AB 3030 and §10750 et seq. are included as Appendix A.

The District has long been reliant upon ground water as its sole source of water supply for serving the needs of its customers. As explained in Section III, the District's service area overlies a large supply of high quality ground water; however, the region's arid environment limits the extent to which the ground water basin is recharged. In recent years, the annual quantity of water extracted from the ground water basin has exceeded the estimated amount of recharge, leading to a condition known as ground water overdraft. Although limited overdraft is not considered a significant threat to ground water availability or quality, long term and/or excessive overdraft can lead to significant problems, including ground surface subsidence, aquifer compaction, storage reduction, and reduced water quality. Overdraft also leads to greater depth to ground water, thus resulting in increased ground water production costs and related water service rate increases. A properly structured and implemented Ground Water Management Plan will enable the District to avoid the numerous problems associated with ground water overdraft, and will also help prevent ground water contamination by protecting ground water recharge areas.

The Ground Water Management Plan places an emphasis on reducing ground water extractions by encouraging the implementation of conservation measures, monitoring ground water conditions (both quantity and quality) to ensure that any problems therein are identified as early as possible, promoting interaction between the District and local planning entities in encouraging responsible patterns of

development, and making the most efficient possible use of existing supplies. The Ground Water Management Plan also addresses the use of newly available supplies of surface water that will soon be imported by the District via the recently completed Morongo Basin Pipeline Project. In addition, the Ground Water Management Plan includes provisions for limiting or eliminating ground water contamination by preventing pollution of ground water recharge areas and by ensuring that wells don't become conduits for contaminants. The latter measure includes implementing well construction and abandonment procedures which will prevent the inadvertent introduction of contaminants to ground water through improperly constructed or abandoned wells.

The following sections explain the District's ground water management objectives, existing conditions within the two ground water subbasins that lie within the District's boundaries, future water supply demands that the District anticipates, and details regarding the various ground water management activities that the District intends to implement. The information is supported by tables and figures which further illustrate existing conditions and the District's objectives and proposed management activities.

Once the various management activities that the District decides upon are initiated, the Ground Water Management Plan will become an ongoing Ground Water Management Program which will provide for long-term management of ground water resources. The Program will be constantly evolving in response to newly discovered opportunities, problems, solutions, and legislation; and, considering the importance of ground water to the Joshua Tree area, it will be in effect through the foreseeable future.

A. SERVICE AREA

The District's boundaries incorporate an area of approximately 96 square miles located near the southerly edge of Southern California's upper Mojave Desert region (see Figure I-1, the Vicinity Map). The District's service area includes a number of small unincorporated communities, all of which are within the County of San Bernardino. The current resident population of the District's service area is estimated to be approximately 12,000 people residing in about 4,400 dwelling units.

The environment within the District's boundaries is typical of that of the upper Mojave Desert. Temperature extremes vary between lows below 20°F during winter months to highs in excess of 110°F during summer months. Rainfall averages approximately five inches per year, with

most precipitation occurring between November and April; in addition, short duration, high intensity thunder showers occur periodically during late spring and summer months.

Development within the District's boundaries is sporadic and primarily residential, although the community of Joshua Tree has experienced a moderate level of commercial and light industrial development. Most of the area within the District's boundaries is undeveloped, and many of the area's residents must access their homes via graded dirt roads rather than improved streets.

B. WATER SYSTEM

In order to serve its widely dispersed customers, the District has constructed an expansive water supply, storage, and distribution system. The District's system currently includes four water supply wells, ten booster pumping plants, 13 water storage reservoirs, and over 100 miles of water transmission and distribution pipelines. The District currently has about 4,250 service connections, of which 3,650 are active and 600 inactive. The widely varying elevations within the District's service area have resulted in the creation of 11 separate pressure zones, an unusual number of zones for a water purveyor of the District's size.

The District's current water well production capacity is approximately 5,000 gallons per minute (gpm), which is sufficient to meet existing peak service area demands. The District's ten booster pumping plants are equipped with 23 pumping units which vary widely in capacity; the largest pumping unit can pump up to 1,025 gallons per minute (gpm), while the smallest pumping unit pumps 130 gpm. Finally, the District's current water storage capacity is approximately 5.25 million gallons (MG), which increases periodically as the District replaces small bolted steel reservoirs with larger welded steel reservoirs or adds new reservoirs to enhance its system's capabilities. The dimensions and capacities of each of the District's existing supply, boosting, and storage facilities are reflected on Table I-1.

To ensure that its customers continue to receive water service of the highest standards, the District is engaged in an ongoing program designed to upgrade its facilities in accordance with current water system standards. Each fiscal year the District identifies existing facilities that are in need of augmentation or replacement; for instance, the District has long had an annual pipeline replacement program through which it abandons undersized or dilapidated pipelines and replaces them with new pipelines that both improve service and reduce water losses from leaks.

In addition, the District is in the midst of planning a significant extension of its water system to enable it to serve the residents of the Copper Mountain Mesa area, which is not currently served by a domestic water system. Facilities to be constructed include a 0.25 MG reservoir, a 300 gpm booster pumping station, and approximately 302,000 lineal feet (L.F.) of transmission and distribution pipeline. In addition, the District's existing D1-1 Booster Pumping Plant will be modified to serve portions of the new service area. Completion of the proposed facilities will provide a safe and reliable domestic water supply to residents of an area that has never had such service, and which currently relies upon small private wells or water delivered by truck.

C. AUTHORITY

The District was organized in accordance with State of California County Water District Law (Water Code Section 30000 et seq.) for the purpose of providing domestic water supplies. The District is empowered to manage ground water resources and to construct, operate, maintain, repair, and replace water system facilities as needed to provide water service in compliance with applicable standards and regulations. The District routinely constructs new facilities, maintains them, and replaces them as necessary to maintain adequate, reliable, and safe water service to its customers.

The District's Ground Water Management Plan is authorized pursuant to Water Code §10750 et seq., which states in part that "...this part [§10570 et seq.] applies to all ground water basins in the state". Ground water basins are defined [§10752(b)] as "...any basin identified in the department's [California Department of Water Resources] Bulletin No. 118, dated September 1975 [Bulletin 118-75], and any amendments to that bulletin..."; the Copper Mountain Valley Ground Water Basin, which the District overlies and from which it produces all of its ground water, is identified on Page 85 of Bulletin 118-75. The Copper Mountain Valley Ground Water Basin is part of the area within the Colorado Desert Hydrologic Study.

D. ABBREVIATIONS AND DEFINITIONS

Since the District's Ground Water Management Plan incorporates a number of abbreviations and terms which may be unfamiliar, the following explanations are set forth for the reader's convenience.

1. Abbreviations

a.	AF	Acre Foot or Feet
b.	AF/Yr	Acre Feet per Year
c.	CDHS	Department of Health Services (California)
d.	CDWR	Department of Water Resources (California)
e.	gpm	Gallons Per Minute
f.	LF	Linear Foot or Feet
g.	MG	Million Gallons
h.	MWD	Metropolitan Water District of Southern California
i.	RWQCB	Regional Water Quality Control Board(s) (California)
j.	SWRCB	State Water Resources Control Board (California)
k.	SWTR	Surface Water Treatment Regulations
l.	TDS	Total Dissolved Solids
m.	ULF	Ultra Low Flow
n.	U.S. BLM	United States Bureau of Land Management
o.	U.S. EPA	United States Environmental Protection Agency
p.	USGS	United States Geological Survey
q.	VOC	Volatile Organic Constituent

2. Definitions

a. Acre Foot

When discussing water quantities, an acre foot is the quantity of water required to cover one acre (43,560 square feet) to a depth of one foot. An acre foot contains 43,560 cubic feet, or 325,850 gallons, of water.

b. Artificial Ground Water Recharge (also Artificial Recharge)

The intentional use of imported water or reclaimed water to recharge/replenish ground water supplies. Artificial ground water recharge is usually accomplished by the construction of either infiltration/percolation basins or injection wells; the former accomplish recharge by allowing water to infiltrate

and percolate to ground water, while the latter directly inject water into the ground water body. Artificial recharge is depicted on Figure I-3.

c. Basin Safe Yield (also Safe Yield)

The quantity of water that can be extracted from a ground water basin/subbasin that does not exceed average net annual recharge and thus does not lead to depletion of ground water in storage. For example, if a ground water subbasin's average net annual recharge is 1,000 acre feet per year, that subbasin's maximum safe yield is 1,000 acre feet per year. Exceeding safe yield over the long term leads to ground water overdraft.

d. Conjunctive Water Use (also Conjunctive Use)

The use of two or more water sources in conjunction with each other. Generally, conjunctive use consists of the use of ground water supplies together with surface water supplies, the latter consisting of either local water (i.e. from streams or lakes), imported water, or reclaimed water. Conjunctive use can take many forms; for instance, ground water can be used for domestic supply at the same time that reclaimed water is used for irrigation purposes. The intent of conjunctive use is to ensure balanced use (thereby maintaining ground water levels) over the long term, with surface water supplies used during periods of increased precipitation, and ground water supplies used during periods of limited precipitation (e.g. critically dry or drought years).

e. Consumptive Water Use/Nonconsumptive Water Return (also Consumptive Use/Nonconsumptive Return)

Consumptive water use is that portion of each unit of water that is actually used by the consuming organism (e.g. animal or plant). The portion that is unused and is returned to the ground water body is referred to as nonconsumptive water return. Consumptive use is the water that is subsequently carried away (usually in the atmosphere) following mechanisms such as evapotranspiration and evaporation. Both are usually expressed as a percentage, and represent an estimate only. For example, if 1,000 gallons of water were applied to turf in an

area with 60% consumptive use and 40% nonconsumptive return, 600 gallons would be considered consumed and therefore unavailable for ground water recharge, while the remaining 400 gallons would be considered recharge to the ground water body.

f. Ground Water Basin (also Basin)

An underground water body that is confined by various types of impermeable geologic structures, such as significant upthrusts of subterranean bedrock (known as barriers) or mountain ranges. The District's boundaries overlie portions of four separate ground water basins, the Warren Valley Basin, the Means Valley Basin, the Deadman Valley Basin, and the Copper Mountain Valley Basin (see Figure I-2); however, the District produces water only from the Copper Mountain Valley Basin.

g. Ground Water Overdraft (also Overdraft)

A phenomenon that results from producing more water from a ground water basin/subbasin than is recharged (in net terms) over the long term. For example, producing 1,500 acre feet per year from a basin (e.g. Joshua Tree Subbasin) that is only recharged with 1,000 acre feet per year results in annual ground water overdraft (hereafter referred to as overdraft) of 500 acre feet. Ground water overdraft is also considered to be ground water mining.

h. Ground Water Subbasin (also Subbasin)

A subdivision of the larger Ground Water Basin, often delineated by major fault lines. The District currently produces water from the Joshua Tree Subbasin of the Copper Mountain Valley Basin; said Subbasin is separated from the other two subbasins of the Copper Mountain Valley Basin, the Giant Rock Subbasin and the Coyote Lake/Copper Mountain Subbasin, by the Pinto Mountain fault (see Figure I-2).

i. Imported Water

Water that is brought into an area from an external source. One of the primary sources of imported water in Southern California is the State Water Project, which conveys water to the region from Northern California through the California Aqueduct; said Aqueduct consists of storage reservoirs, generating stations, pumping stations, canals, and pipelines.

j. In-Lieu Ground Water Recharge (also In-Lieu Recharge)

A method for decreasing the rate of ground water extractions. In-lieu ground water recharge (hereafter referred to as in-lieu recharge) consists of substituting other sources of water supply (such as imported water or reclaimed water) for ground water.

k. Natural Ground Water Outflow (also Natural Outflow)

The process by which ground water basins/subbasins are naturally depleted. Generally, natural ground water outflow (hereafter referred to as natural outflow) consists of seepage from one basin to an adjacent basin, the latter of which has a lower water level. Natural outflow also occurs when ground water reaches ground surface and evaporates, a common phenomena at dry lake beds in California deserts.

l. Natural Ground Water Recharge (also Natural Recharge)

The process by which ground water supplies are naturally replenished. Natural ground water recharge (hereafter referred to as natural recharge) consists of water infiltrating the ground surface and percolating to ground water. There are several sources of natural recharge, such as precipitation, rivers, and lakes. Natural recharge is depicted on Figure I-3.

m. Pumping Depression

A localized reduction in ground water levels that results from ground water extraction. A pumping depression is depicted on Figure I-4.

n. Reclaimed Water

Treated water that is then filtered and disinfected (to remove disease-causing organisms such as bacteria, viruses, *cryptosporidium*, and *giardia lamblia*) to an extent that allows it to be used for any purpose other than domestic consumption, such as irrigation of food crops, golf courses, or greenbelts.

o. Safe Yield

See Section I.D.2.c, Basin Safe Yield, above.

p. Specific Yield

That portion of the water bearing geologic structure (referred to as the saturated zone) of a ground water basin or subbasin that consists of extractable water; usually expressed as a percentage. For example, if the saturated zone of a ground water subbasin consists of 1,000,000 acre feet of saturated geologic deposits (e.g. sands, gravels, boulders) and the estimated specific yield is 15%, the quantity of extractable ground water is estimated to be 150,000 acre feet (1,000,000 x .15 = 150,000). It should be noted that specific yield is always expressed as an average (since geologic conditions can vary considerably within basins and subbasins), and represents an estimate only.

TABLE I-1

JOSHUA BASIN WATER DISTRICT

EXISTING WATER SUPPLY, BOOSTING, AND STORAGE FACILITIES

I. WELL PUMPING PLANTS

WELL NO.	DEPTH (FEET)	DIAMETER (INCHES)	HORSEPOWER	PUMPING CAPACITY (GPM)
2	500	12	75	480
10	704	16	150	1,240
11	740	16	300 – 400 *	1,200 – 2,000 ±
14	740	20	450	2,000

* WELL 11 IS EQUIPPED WITH A NATURAL GAS ENGINE DRIVE; ALL OTHERS EQUIPPED WITH ELECTRIC MOTOR DRIVES.

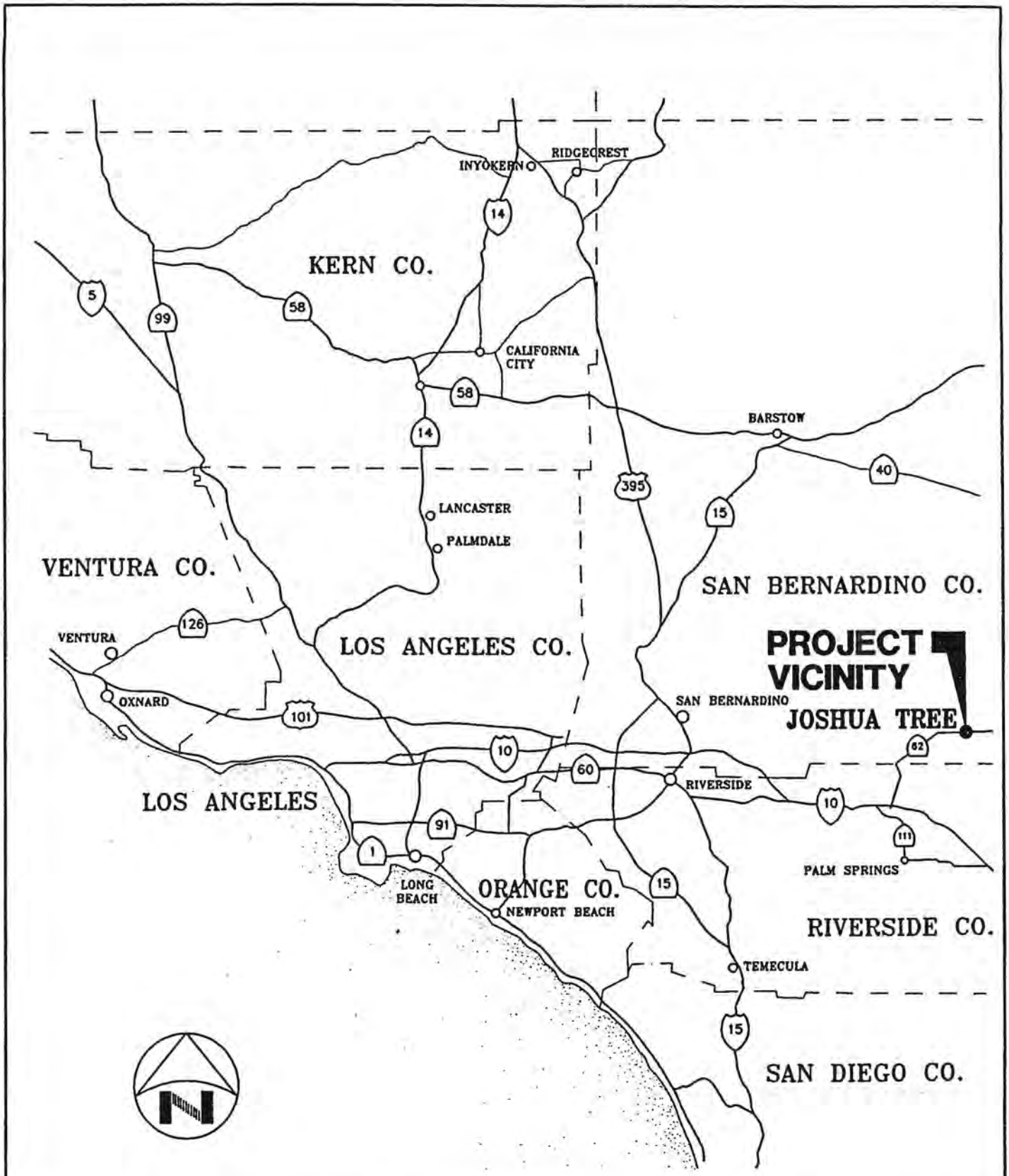
II. BOOSTER PUMPING PLANTS

BOOSTER NO.	NO. OF PUMPING UNITS	HORSEPOWER EACH UNIT	PUMPING CAPACITY EACH UNIT (GPM)
C-1	3	40	550 ±
	1	75	1,025 ±
D1-1	2	15	130 ±
D2-1	2	25	450
E-1	2	20	265
F-2	1	30	350
	1	20	250
G-1	2	20	270
H-1	2	15	180
I-1	2	20	285
J-1	2	15	180
NAVAJO TRAIL	2	20	150
HYDROPNEUMATIC SYSTEM	1	75	1,000

III. STORAGE RESERVOIRS

RESERVOIR NO.	TYPE	HEIGHT (FEET)	DIAMETER (FEET)	STORAGE CAPACITY (GALLONS)
A-1	WELDED STEEL	24	44	250,000
PARK RESERVOIR	WELDED STEEL	16	54	250,000
C-1	WELDED STEEL	24	98	1,250,000
C-2	BOLTED STEEL	24	55	400,000
C-3	WELDED STEEL	24	56	400,000
D2-1	WELDED STEEL	24	63	500,000
D1-1	WELDED STEEL	24	56	400,000
E-1	WELDED STEEL	40	36	300,000
F-2	WELDED STEEL	24	56	400,000
G-1	WELDED STEEL	32	37	250,000
H-1	WELDED STEEL	24	40	200,000
I-1	WELDED STEEL	32	30	150,000
J-1	WELDED STEEL	24	63	500,000

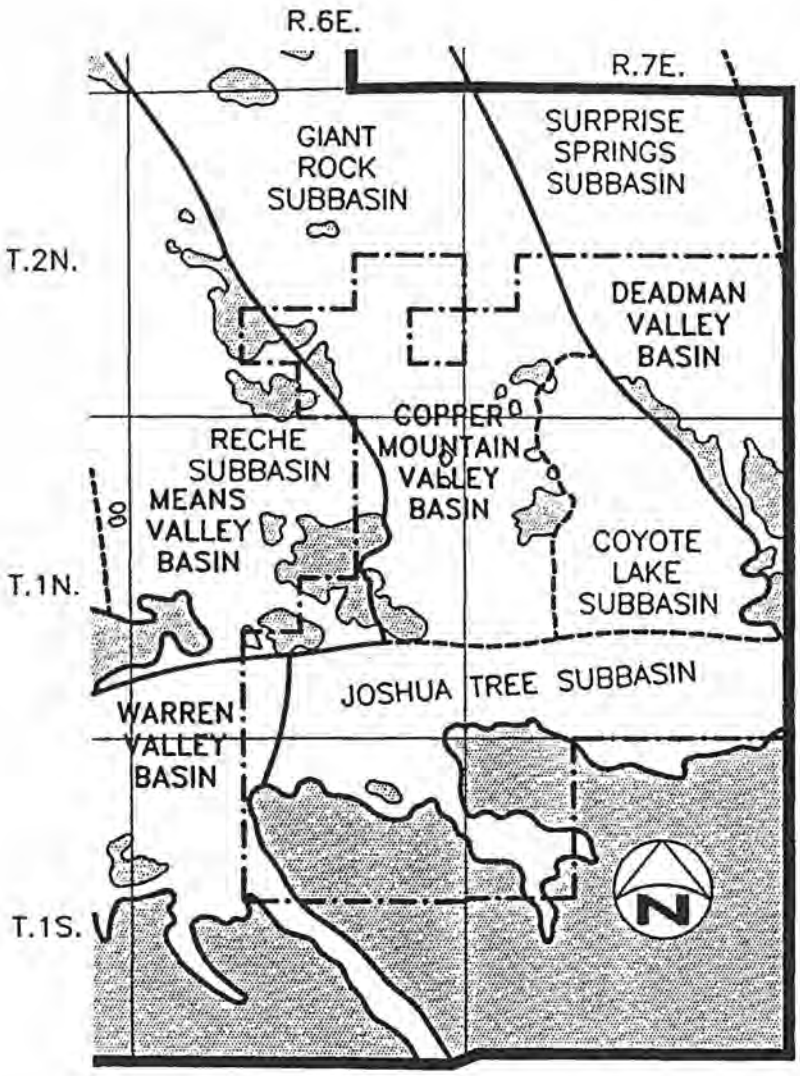
RDF/kdc
C106/10673TI1



KRIEGER & STEWART INCORPORATED 3602 University Ave. • Riverside, CA. 92501 • 909-684-6900	JOSHUA BASIN WATER DISTRICT GROUND WATER MANAGEMENT PLAN VICINITY MAP	FIGURE I-1

SCALE: N.T.S. DATE: 4/21/95 DRAWN BY: TMW CHECKED BY: MEM W.O.: 106-73

73F6



0 4 MILES

LEGEND

- UNCONSOLIDATED DEPOSITS
- CONSOLIDATED DEPOSITS
- GROUND WATER BASIN BOUNDARY
- GROUND WATER SUBBASIN BOUNDARY
- DISTRICT BOUNDARY
- MOJAVE WATER AGENCY BOUNDARY

NOTE:

THE COYOTE LAKE SUBBASIN IS REFERRED TO LOCALLY AS THE THE COPPER MOUNTAIN SUBBASIN.

BASE MAP SOURCE:

UNITED STATES GEOLOGICAL SURVEY

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JOSHUA BASIN WATER DISTRICT

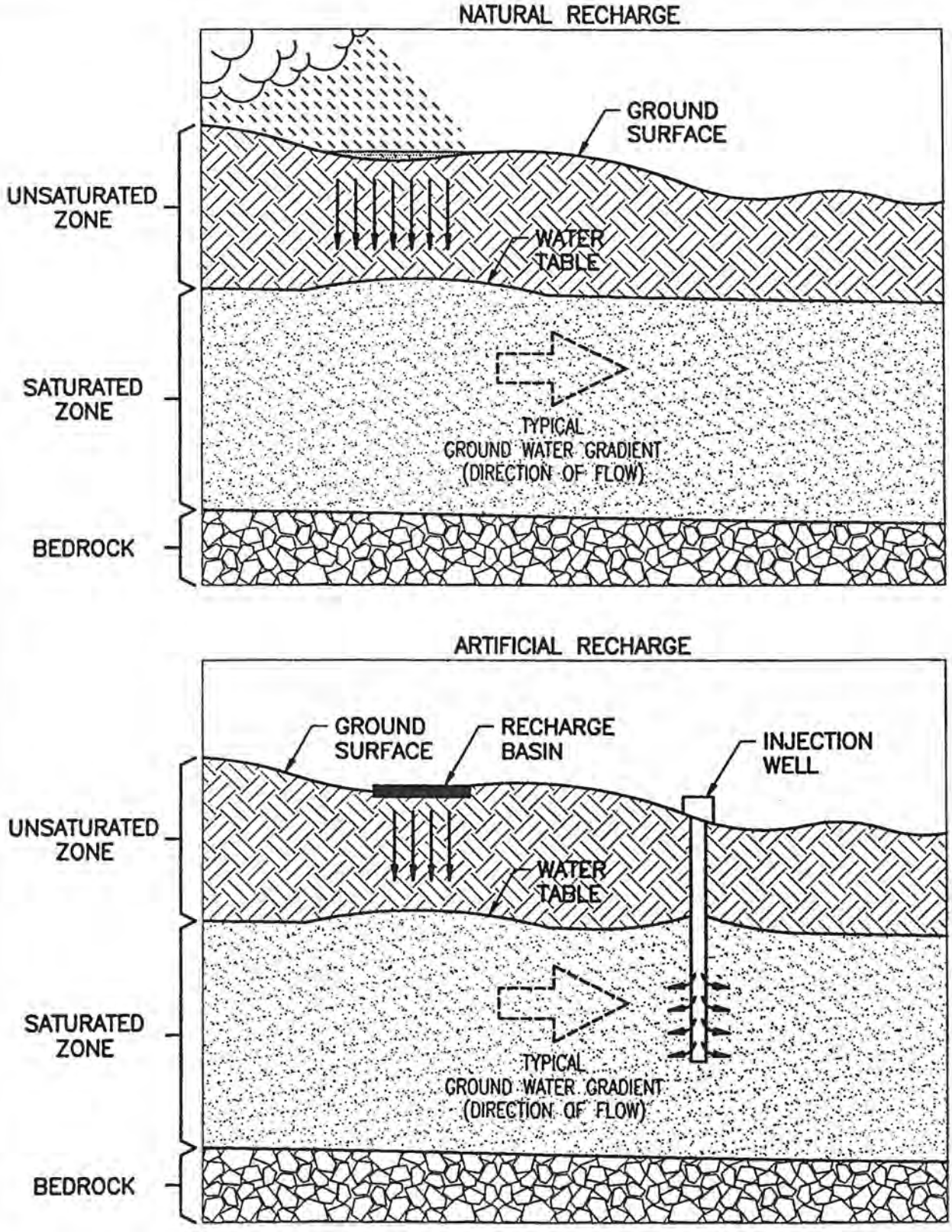
GROUND WATER MANAGEMENT PLAN

DISTRICT BOUNDARY MAP
(SUPERIMPOSED ON GROUND WATER SUBBASIN MAP)

FIGURE I-2

SCALE: 1"=20,000'± DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F2



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JOSHUA BASIN WATER DISTRICT

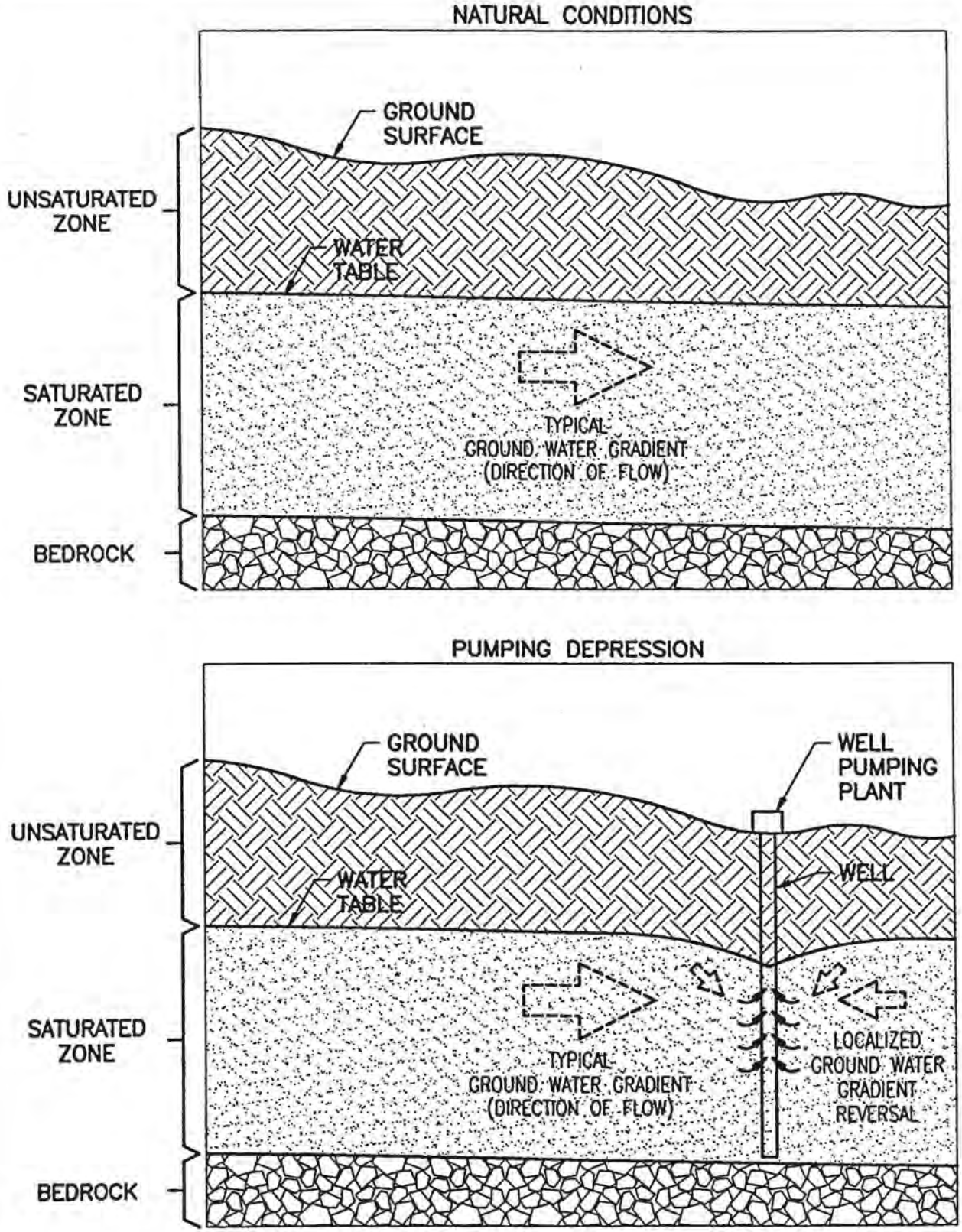
GROUND WATER MANAGEMENT PLAN

NATURAL AND ARTIFICIAL GROUND WATER RECHARGE

FIGURE I-3

SCALE: N.T.S. DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F4



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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

GROUND WATER CONDITIONS AND EFFECTS OF PUMPING DEPRESSIONS

FIGURE I-4

SCALE: N.T.S. DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F3

SECTION II

SECTION II
OBJECTIVES

The overall objective of the District's Ground Water Management Plan is to protect ground water quantity and quality from degradation resulting from excessive ground water production and/or ground water contamination, and to limit or eliminate ground water overdraft. As a result of the arid, desert environment of the District's service area, the only locally available source of water supply is ground water.

There are portions of four ground water basins within the District's boundaries, the Copper Mountain Valley Basin, the Warren Valley Basin, the Means Valley Basin, and the Deadman Valley Basin, most of which are further divided into smaller subbasins. The objectives of the Ground Water Management Plan apply to and will affect all ground water resources within the District's boundaries.

In order to realize the Ground Water Management Plan's overall objective, there are a number of subsidiary objectives which must first be accomplished. These subsidiary objectives are water conservation, ground water monitoring, improved ground water production, water export prevention, and recharge area protection, and are addressed individually in the following paragraphs.

A. WATER CONSERVATION

Conservation of available resources is an extremely effective management tool, and is therefore a key objective of the District's Ground Water Management Plan. Conserving water dramatically increases the number of options available for management and simultaneously allows considerable cost savings; production facilities that might otherwise have to be constructed in the near term can be deferred or delayed, monitoring facility requirements are reduced, and some threats to ground water quality are mitigated.

A number of measures are available to encourage water conservation. Conservation education, which represents an inexpensive and effective means of encouraging water consumers to keep water use to a minimum, is an essential and fundamental element of any conservation program. Reducing leakage from damaged or deteriorated pipelines by engaging in an ongoing pipeline replacement program is another significant water conservation measure; although the District has been replacing existing pipelines for some time, the continuation of such efforts remains an important objective of the Ground Water Management Plan.

Replacing existing shower heads and toilets with ultra low flow (ULF) facilities can result in significant savings; although it is not always possible to compel people to replace their existing facilities, certain government-sponsored retrofit programs which provide funding are available periodically. Modifying and modernizing irrigation systems using new technology can also result in significant savings; for instance, new controllers and drip systems can increase irrigation efficiency. The District will evaluate various conservation measures as part of its Ground Water Management Plan and implement those that it finds economically, institutionally, and technically feasible.

B. GROUND WATER MONITORING

Monitoring the condition of the ground water body is one of the most important elements in effective ground water management, as it allows the managing agency to track the quantity and quality of the resource and thereby determine the relative success of management efforts. Monitoring also enables the managing agency to identify potential problems caused by various factors, such as excessive production from a localized area or contamination of a particular portion of the ground water body. As such, the implementation of an extensive ground water monitoring program is one of the main objectives of the Ground Water Management Plan.

There are a number of means available to provide for effective monitoring of ground water quantity and quality. The preferred method is to construct numerous dedicated monitoring wells in strategic locations to measure water levels and obtain quality samples; however, such a system is extremely costly, and not always necessary in the absence of an identified problem. A compromise method is to use information collected from existing production wells, and supplement same with dedicated monitoring wells in areas of particular concern.

C. GROUND WATER PRODUCTION

One of the most effective means for managing ground water resources is the adoption of ground water production practices that encourage the most efficient possible use of available supplies. As a result, one of the primary objectives of the Ground Water Management Plan is to improve the District's ground water production efficiency through the modification of existing production practices.

It has long been recognized that concentrating ground water production within a specific area tends to result in localized pumping depressions in ground water tables; these depressions result from the relatively rapid localized movement of ground water that is caused by significant ground water extractions, as opposed to the generally slow movement of ground water within water-bearing geologic structures. A typical pumping depression is shown on Figure I-3 in the preceding section.

Pumping depressions can lead to a number of potentially damaging effects, such as ground water gradient reversals and even (in extreme cases) localized ground surface subsidence. In order to avoid such circumstances, it is necessary to spread ground water production over a relatively wide area, and to limit production in any specific area to within reasonable limits. In addition, it is advisable to vary the locations and timing of ground water production to allow local recovery of ground water levels. The District may consider adopting an ordinance and regulations that prohibits the construction of wells in close proximity to existing wells, or that might otherwise cause significant pumping depressions.

The most reliable method of avoiding severe pumping depressions is to space water supply wells sufficiently distant from one another to cause ground water levels to decline uniformly; as a result, one of the primary objectives of the Ground Water Management Plan is to continue to locate new District wells at least 1/2 mile apart (older wells are as close as 1/8 mile to one another, while newer wells are at least 1/2 mile apart). In addition, the District may eventually construct at least one new water supply well within the limits of the Copper Mountain Subbasin, since the District does not currently produce any ground water from said subbasin.

D. WATER EXPORT PREVENTION

Since the District overlies and produces its ground water supplies from an overdrafted ground water body (the Joshua Tree Subbasin), it must do its utmost to ensure that ground water is not produced therefrom for export to areas outside its boundaries unless they are authorized by the District. Export of water from the District's boundaries would have a number of adverse effects, the most important of which would be the increased level of production (and overdraft) and reduced nonconsumptive water return. Owing to its high quality, ground water from the Joshua Tree Subbasin might be attractive to neighboring water purveyors as a supplemental supply; and owing to the potentially significant problems that would likely result from the export

of ground water therefrom, preventing exports that have not been authorized by the District is one of the most important objectives of the Plan.

E. CONJUNCTIVE USE

Conjunctive use essentially consists of making simultaneous use of two or more sources of water supply. Aside from ground water, sources of supply can include naturally occurring surface water (e.g. streams or lakes), imported surface water, and/or reclaimed water. Since the District has not had a source of surface water available to it until quite recently, conjunctive use has been impossible. However, as noted in Section I, the recently completed Morongo Basin Pipeline Project will soon enable the District to actively engage in conjunctive use of multiple water supply sources, and taking advantage of the benefits available from conjunctive use is one of the Ground Water Management Plan's prime objectives. In addition, the District may eventually determine that water reclamation is a cost effective means of ensuring that ground water quality is protected against degradation caused by discharges from septic systems while simultaneously making maximum use of available sources of supply.

The District has essentially two options for making use of its supply of imported water; it can either use the water for artificial recharge, or it can treat the water to comply with Federal and State drinking water standards and distribute the water directly to its customers. The latter alternative would require the construction of a surface water treatment facility incorporating filtration and disinfection equipment meeting the requirements of the State of California's recently adopted Surface Water Treatment Regulations (SWTR), which are highly specific and restrictive. An additional (although considerably more expensive) alternative would be to use the water for both purposes. The District is in the process of evaluating the available alternatives, and recently received a report regarding same; said report, which is entitled Imported Water Delivery Investigation (Memorandum Report), is attached as Appendix B.

In the event that the District decides to activate its latent powers to provide sewage service to portions of its service area and to construct the necessary wastewater collection and treatment facilities, it will help to accomplish two important goals of the Ground Water Management Plan: ground water quality will be protected, and reliance on ground water will be reduced. Although reclaimed water can only be used for irrigation or industrial supply purposes, its availability would have the potential to significantly reduce ground water production requirements for those purposes, and would also give the District even greater flexibility with regard to managing water

resources within its service area. The greatest drawback associated with water reclamation is cost; sewage collection, wastewater treatment, and reclaimed water distribution facilities are expensive, and a means for affordably financing same would have to be found. Nevertheless, the benefits of water reclamation are so significant that the matter warrants additional evaluation.

F. RECHARGE AREA PROTECTION

Although the District has not experienced any significant difficulties with ground water contamination to date, the prevention of same is of vital importance, especially in an area which relies upon ground water as its principal source of domestic water supply. In addition, since ground water contamination often takes many years to be detected, there is at least some chance that localized ground water contamination may have already occurred. Protection of recharge areas can take several forms, most of which are related to land use. Well construction and destruction practices or standards also have a direct effect, since wells can constitute (depending upon construction methods) a direct conduit from the surface to ground water. Protecting recharge areas and ensuring that wells are properly constructed and destroyed therefore become vital objectives of the District's Ground Water Management Plan, and the District has the authority to adopt ordinances and regulations that protect recharge areas within its jurisdiction.

It is important to ensure that all land uses within areas that either lie within tributary drainage areas or overlie significant quantities of ground water are compatible with maintaining ground water quality and preventing contamination. This goal is best accomplished by communicating with local and regional planning agencies, particularly the County of San Bernardino and the U.S. Bureau of Land Management (U.S. BLM). Examples of developments which can threaten ground water quality include certain types of manufacturing facilities (particularly those that use large quantities of heavy metals, solvents, or petroleum products), gasoline service stations, car washes, and landfills. Excessive or poorly planned residential development can also cause a number of ill effects, particularly if they lead to increased levels of ground water overdraft or result in significant increases in wastewater disposal through septic systems. Table II-1 indicates some of the numerous potential sources of ground water contamination.

Since confining the construction of the aforementioned or similar developments to areas that do not either lie within tributary drainage areas or overlie ground water bodies would be unnecessarily restrictive, and might actually prevent their construction altogether, standards of

construction for said facilities have been established that can considerably reduce the potential for ground water contamination when implemented. In addition, it may be possible to limit the construction of potentially threatening facilities to areas that are less likely to allow contaminants to infiltrate and percolate to ground water. Likewise, standards have been established for the construction and destruction of wells that dramatically reduce or eliminate the possibility that poorly constructed or abandoned wells will result in the direct transmission of contaminants to the ground water body. Said standards are included in California Department of Water Resources (CDWR) Bulletins 74-81 and 74-90, Water Well Standards: State of California.

TABLE II-1

JOSHUA BASIN WATER DISTRICT
COMMON SOURCES OF GROUND WATER CONTAMINATION*

Category	Contaminant Source	
Agricultural	Animal burial areas	Irrigation sites
	Animal feedlots	Manure spreading areas/pits
	Fertilizer storage/use	Pesticide storage/use
Commercial	Airports	Hotels/motels
	Animal shelters	Jewelry/metal plating
	Auto repair shops	Laundromats
	Boatyards	Medical institutions, including hospitals
	Construction areas	Paint shops
	Car washes	Photography establishments
	Cemeteries	Railroad tracks and yards
	Convention/meeting facilities (public and private)	Research laboratories
	Dry cleaners	Scrap and junkyards
	Gas stations	Storage tanks
	Golf courses	
Industrial	Asphalt and concrete plants	Petroleum production/ storage
	Chemical manufacture/ storage	Pipelines
	Electronics manufacture	Septage lagoons and sludge
	Electroplaters	Storage tanks
	Foundries/metal fabricators	Toxic and hazardous spills
	Machine/metal working shops	Wells (operating/abandoned)
	Mining and mine drainage	Wood preserving facilities
Residential	Apartment/condominium developments	Septic systems, cesspools
	Fuel oil	Sewer lines
	Furniture stripping/ refinishing	Swimming pools (chemicals)
	Household hazardous products	Unsewered high-density (i.e. more than two units per acre) residential development
	Household lawns	
Other	Hazardous waste landfills	Recycling/reduction facilities
	Municipal incinerators	Road deicing operations
	Municipal landfills	Road maintenance depots
	Municipal sewer lines	Storm water drains/basins
	Open burning sites	Transfer stations

*Source: U.S. Environmental Protection Agency

SECTION III

SECTION III
EXISTING CONDITIONS

Ground water conditions in the Joshua Tree/Yucca Valley area have not been the subject of a significant Federal or State investigation for at least two decades, which gives rise to a number of difficulties when attempting to describe ground water conditions. For instance, ground water conditions are constantly fluctuating as a result of changes in water use and disposal practices, changes in geologic structure (such as those caused by major earthquakes), and variations in rates of precipitation. In addition, numerous technological advances have been made in the last 20 years which have significantly increased the accuracy of ground water related research by engineers and scientists, principally hydrogeologists.

Nevertheless, the District does have a reasonably good grasp of the characteristics of the area's ground water, most of which are described in the District's 1972 General Plan and 1984 General Plan Update. The information included below is largely extracted from those two documents, supplemented by ground water production records maintained by the District. The descriptions of the area's two primary ground water subbasins are considered to be reasonably accurate, perhaps erring on the conservative side (as is appropriate given the area's reliance on ground water). The ground water production records for the District are quite accurate, and represent virtually all ground water extraction within the District's boundaries; although a number of private wells exist in the area, their production is minimal by comparison.

A. GROUND WATER IN STORAGE

Ground water subdivisions of the Joshua Tree area are shown on Figure III-1; it should be noted that the Copper Mountain Subbasin is referred to in Federal and State government reports as the Coyote Lake Subbasin. All of the water supply wells presently maintained by the District are located within the Joshua Tree Subbasin, and ground water production within the remainder of the District is currently limited to a number of private water supply wells. Estimates of the quantity of water in storage, and of each subbasin's storage capacity, are based upon information derived from well driller's logs for various wells in each subbasin and upon characteristics noted in investigations conducted by the United States Geological Survey (USGS) and CDWR.

Using data from District water supply wells located in the westerly portion (Wells 1, 2, 3, and 10) and central portion (Wells 11 and 14) of the Joshua Tree Subbasin, as well as a USGS test

bore (No. 1N/7E 34B1) located in the easterly portion of said subbasin, cross sections based on USGS topographic maps were prepared throughout the subbasin. No wells have been drilled to bedrock within the Joshua Tree Subbasin, and the bedrock profile has therefore never been mapped. Using well depth data and the best possible estimates of bedrock depth, along with reasonable estimates of average surface area (6,000± acres) and average elevation (2,290± feet) of the underground water body, an estimate of the gross volume of water bearing deposits has been established for the purpose of estimating a reasonable minimum-maximum storage volume range. The estimated minimum bedrock depth for the subbasin is based upon the elevation of the bottom of existing major water supply wells; the estimated maximum bedrock depth is derived by establishing said depth approximately 200 feet below the bottom of the same wells. The volume range thus defined is believed to provide a reasonable basis for minimum-maximum estimates of water in storage. Please note that there is no reliable data currently available to firmly establish the maximum volume estimate.

Based upon the estimate of the range of total volume of saturated water bearing deposits within the Joshua Tree Subbasin (2,000,000 AF estimated minimum, 3,200,000 AF estimated maximum), an estimate of the range of total theoretically available water in storage was prepared by applying an estimate of the average "specific yield". Specific yield is that percentage of the total volume of the saturated water bearing deposits which is water that can theoretically be extracted by pumping. Based upon information available from operational experience with existing District water supply wells, the District estimates that the specific yield of the Joshua Tree Subbasin is approximately 15%; although this estimate may be somewhat conservative, it is appropriate for management purposes. For the sake of comparison, the USGS estimates that the Joshua Tree Subbasin has an average specific yield of approximately 15%.

Applying the 15% specific yield estimate to the 2,000,000 AF minimum estimate of gross saturated water bearing deposit volume within the Joshua Tree Subbasin results in an estimated minimum of 300,000 AF of water in storage. Applying the 15% average specific yield estimate to the 3,200,000 AF maximum estimate of gross saturated water bearing deposit volume within said subbasin results in an estimated maximum of 480,000 AF of water in storage.

Performing similar evaluations of the Copper Mountain Subbasin results in an estimated total volume of water bearing deposits of about 670,000 AF; because far less well data is available regarding said Subbasin, only one estimate (rather than minimum and maximum estimates) has

been derived from the available information. Based on production information gathered from existing private water supply wells, the District estimates that the Copper Mountain Subbasin has a specific yield of approximately 10%; for the sake of comparison, the USGS estimates that the Copper Mountain Subbasin has an average specific yield of about 14%. Applying the 10% average specific yield estimate to the 670,000 AF estimate of gross saturated water bearing volume within said subbasin results in an estimated quantity of 67,000 AF of water in storage.

Combining the estimates of water in storage in the Joshua Tree Subbasin and the Copper Mountain Subbasin results in an estimated total storage for both subbasins of between 367,000 AF and 547,000 AF. Future hydrogeological and geophysical studies will undoubtedly dictate revisions of these storage estimates; however, the minimum storage estimates are considered somewhat conservative, and more definitive studies are likely to determine that a greater quantity of water is in storage.

The following is the conclusion to the section on water in storage from the District's 1972 General Plan:

> In the case of the Joshua Tree area, it would seem prudent to attempt to operate within an overdraft limitation of 10% to 20% of the calculated volume in storage. With prudent management, the Joshua Tree Subbasin can be overdrafted, within reasonable limits, to provide a water supply for the area as it develops, but it should not be assumed that the overdrafting can be continued indefinitely. This generation must plan for an imported water supply in order that future generations may have an adequate supply to meet their needs. Careful attention should be given to all of the factors which govern the proper conjunctive use of local supplies and imported supplies.

Based on the estimates of total water in storage noted above, the District can establish a reasonable cumulative overdraft limit of 10%, or approximately 37,000 AF, for the two subbasins. Since the resources of both subbasins are readily available to the District for supply purposes, the cumulative overdraft limit can be applied to said subbasins jointly, and they can be managed and utilized in unison to provide the greatest level of benefit available given the area's arid nature.

Estimates of total water in storage and reasonable cumulative overdraft limits, while a useful benchmark for water supply planning, must be used with a great deal of caution. As a matter of necessity, the assumptions used in arriving at the estimated volume in storage and overdraft limits are very approximate. In addition, it is not reasonable to assume that all of the ground water in storage can actually be withdrawn. As mentioned previously, significant ground water overdraft has the potential to result in several adverse impacts: ground surface subsidence may occur; ground water quality can be degraded; shallow wells may go dry; and pump lifts for all wells are increased, requiring pumping unit modifications and increased energy use to enable continued ground water production.

B. BASIN SAFE YIELD AND OVERDRAFT

The term "basin safe yield" (hereafter referred to as safe yield) refers to the amount of water which can be pumped from a ground water basin or subbasin annually over a long period of time without depleting the total volume of ground water in storage. A ground water basin's maximum annual safe yield is therefore approximately equivalent to that basin's annual net ground water recharge (natural recharge less natural outflow).

Table III-1 shows the volume of water produced by the District from the Joshua Tree and Copper Mountain Subbasins for the period 1967 through 1994; it should be noted that the District has not produced any ground water from the Copper Mountain Subbasin since 1982, when it ceased operation of its only water supply well (District Well 12) producing water therefrom. Production by others is considered negligible during this period, over which the District produced a total of about 30,023 AF, an average of about 1,070 AF/Yr; production over the last five years (1990-1994) has averaged about 1,540 AF/Yr. As indicated by Table III-1, the District's ground water production dropped somewhat starting in 1990, which coincides with the start of a significant downturn in California's economy. The reduced water demands from 1990 through 1994 likely represent reduced construction and commercial deliveries, as well as reduced deliveries to recreational and seasonal residents.

A certain percentage of the ground water produced and delivered returns to the subbasin through infiltration and percolation of irrigation water and percolation of septic tank discharges. It is impossible to accurately determine the quantities of water (referred to as nonconsumptive return) which return to the underlying ground water subbasin, but it may be as little as 25% to 35% within the District's service area. In addition, ground water recharge resulting from

nonconsumptive return has the potential to gradually degrade water quality; for example, septic tank return flows contain elevated concentrations of total dissolved solids (TDS) and septic tank and fertilized irrigation water return flows have increased nitrate concentrations, which in turn increase TDS and nitrate concentrations in ground water.

As noted in the District's 1972 General Plan, the net annual recharge/safe yield of the Joshua Tree and Copper Mountain Subbasins is difficult to determine using available information; to date, neither subbasin has been investigated sufficiently to allow an accurate determination to be made. Such investigations require testing and monitoring resources that are beyond the District's capability, and are generally conducted by the USGS, CDWR, the U.S. Bureau of Reclamation, or large well funded water districts. Nevertheless, conservative and very approximate estimates of net annual recharge can be derived from available information. The estimates included in the 1972 General Plan (and repeated in the 1984 General Plan) indicate that the maximum safe yield of the Joshua Tree Subbasin is less than 1,000 AF/Yr, and that of the Copper Mountain Subbasin is less than 800 AF/Yr.

Table III-2 indicates the estimated past and current rate of overdraft of the Joshua Tree Subbasin, as well as the estimated cumulative overdraft of said subbasin. It should again be noted that the District's production is currently concentrated entirely within the Joshua Tree Subbasin, primarily as a result of development patterns and resultant distribution of demands. The amounts of annual and cumulative overdraft of the Joshua Tree Subbasin are based upon the aforementioned estimate of its safe yield, rounded to 1,000 AF/Yr.

C. GROUND WATER QUALITY

Ground water produced from the Joshua Tree and Copper Mountain Subbasins is of relatively high quality, and meets all Federal and State standards for drinking water. As shown by Table III-3, a comparison of water quality analyses for samples collected from District wells with Federal and State standards indicates that the District's wells produce water that is superior by a considerable margin when compared with virtually all standards.

In addition, it appears that the amount of ground water overdraft experienced in the Joshua Tree Subbasin to date has not had a significant adverse impact upon water quality; water quality analyses from 1983 are essentially the same as those from 1993. The consistently high quality of the ground water extracted should not be taken as an indication that continued overdraft is

advisable, but rather that ground water therein appears to be of almost uniformly high quality; the greatest threat to said water quality would come from either significant and excessive ground water overdraft, or contamination by various introduced constituents such as petroleum products, heavy metals, or volatile organic constituents (VOCs).

D. GROUND WATER PRODUCTION

The District currently produces ground water from four water supply wells, all of which extract water from the Joshua Tree Subbasin. Two of the wells, Well 2 and Well 10, are located in the westerly portion of the District and produce only limited quantities of water. The District's other two active wells, Well 11 and Well 14, are located in the central portion of the District and produce the bulk of the water served within the District's service area. Production figures for each of the four active water supply wells from 1983 through 1994 are noted on Table III-4.

As a brief review of Table III-4 will indicate, the District has produced and served ground water primarily from Well 14 since 1986. Like the remainder of the wells in the District's system, Well 14 produces water of relatively high quality. In addition, Well 14 is the District's most modern and efficient production facility.

There are some concerns associated with the District's reliance on Well 14, most of which relate to concentrating such a significant percentage (over 70% in 1994, down from a high of over 98% in 1991) of the District's production at one site. Of particular concern is the likelihood that a pumping depression is being created around Well 14, giving rise to potential problems such as progressively increased pump lifts and energy requirements for said well. In addition, large pumping depressions can (under certain circumstances) result in localized ground water gradient reversals which in turn can draw contaminants into the portion of the aquifer from which the water supply well is producing water; a typical pumping depression and local ground water gradient reversal is depicted on Figure I-3 (see Section I). As noted in Section II.C. above, the District intends to introduce production practices which will reduce its reliance upon Well 14 and allow local ground water levels to recover periodically.

TABLE III–1

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION
1967–1994

YEAR	TOTAL WATER PRODUCED (AF)
1967	370
1968	416
1969	409
1970	424
1971	493
1972	607
1973	655
1974	703
1975	719
1976	788
1977	1,144
1978	900
1979	891
1980	1,054
1981	1,211
1982	1,126
1983	1,198
1984	1,325
1985	1,415
1986	1,500
1987	1,576
1988	1,652
1989	1,740
1990	1,616
1991	1,509
1992	1,488
1993	1,508
1994	1,586
TOTAL	30,023

C100/10673T31
1/26/96

TABLE III–2

JOSHUA BASIN WATER DISTRICT
ESTIMATED JOSHUA TREE SUBBASIN OVERDRAFT
1980–1995 (IN AF)

YEAR	PRODUCTION	ANNUAL OVERDRAFT*	CUMULATIVE OVERDRAFT
1980	1,054	54	54
1981	1,211	211	265
1982	1,126	126	391
1983	1,198	198	589
1984	1,325	325	914
1985	1,415	415	1,329
1986	1,500	500	1,829
1987	1,576	576	2,405
1988	1,652	652	3,057
1989	1,740	740	3,797
1990	1,616	616	4,413
1991	1,509	509	4,922
1992	1,488	488	5,410
1993	1,508	508	5,918
1994	1,586	586	6,504
1995	1,590	590	7,094

* BASED ON NET ANNUAL RECHARGE/MAXIMUM SAFE YIELD ESTIMATE OF 1,000 AF/YR

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2/15/96

TABLE III-3

JOSHUA BASIN WATER DISTRICT
WATER QUALITY ANALYSES FOR DISTRICT PRODUCTION WELLS

CONSTITUENTS	MAXIMUM CONTAMINANT LEVELS MG/L OR AS NOTED			WELL 2			WELL 10			WELL 11			WELL 12*		WELL 14**
	RECOM-MENDED	UPPER	SHORT TERM	11/24/65	9/01/82	3/21/94	8/19/66	9/01/82	7/11/94	10/06/76	9/01/82	7/11/94	8/09/76	9/01/82	7/11/94
Total Hardness, CaCO3	N/A	N/A	N/A	80	69	55	54	64	52	51	58	52	46	59	56
Calcium, Ca	N/A	N/A	N/A	19	16	16	17	14	16	15	13	14	16	15	16
Magnesium, Mg	N/A	N/A	N/A	3	7	4	3	7	4	3	6	3	1	5	3
Sodium, Na	N/A	N/A	N/A	26	30	32	29	33	31	34	34	32	41	38	40
Potassium, K	N/A	N/A	N/A	1	2	2	2	2	2	3	2	2	5	2	2
Total Alkalinity, CaCO3	N/A	N/A	N/A	-	90	94	-	88	84	-	88	80	90	88	88
Hydroxide, OH	N/A	N/A	N/A	0	0	<4	-	0	0	0	0	1	0	0	<1
Carbonate, CO3	N/A	N/A	N/A	0	0	0	0	0	0	0	0	<1	0	0	<1
Bicarbonate, HCO3	N/A	N/A	N/A	113	110	115	116	107	103	110	107	96	110	107	107
Sulfate, SO4	250	500	600	8	9	11	8	12	14	11	9	13	23	21	22
Chloride, CL	250	500	600	14	12	10	12	16	12	11	14	13	11	11	17
Nitrate, NO3	N/A	N/A	45	8	11	10	7	14	11	17	14	14	15	11	12
Elect. Conductivity (Micromhos)	900	1,600	2,200	215	240	250	240	250	250	250	250	260	260	260	310
pH	N/A	N/A	N/A	7.5	8.2	8.1	7.3	8.0	8.1	7.5	8.0	8.1	8.0	8.1	8.2
Color	N/A	N/A	15 Units	0	<5	-	0	<5	-	0	<5	-	0	<5	-
Odor	N/A	N/A	3 Units	0	0	-	0	0	-	1	0	-	1	0	-
Turbidity	N/A	N/A	5 Units	0	0.25	-	0	0.5	-	0	0.15	-	0	0.10	-
Total Solids, TDS	500	1,000	1,500	178	150	142	198	155	139	160	145	140	150	160	164
Arsenic, As	N/A	N/A	<0.05	-	<0.01	-	-	<0.01	<0.002	-	<0.01	<0.002	0	<0.01	<0.02
Barium, Ba	N/A	N/A	1.	-	<0.5	-	-	<0.5	<0.1	-	<0.5	<0.1	0	<0.5	<0.1
Boron, B	N/A	N/A	N/A	-	-	-	-	-	-	0.3	-	-	-	-	-
Cadmium, Cd	N/A	N/A	0.01	-	<0.005	-	-	<0.005	<0.001	-	<0.005	<0.001	0	<0.005	<0.001
Chromium, Cr	N/A	N/A	0.05	-	<0.01	-	-	0.01	<0.01	-	0.02	<0.01	0.05	0.04	<0.01
Copper, Cu	N/A	N/A	1.0	-	<0.01	-	-	<0.01	<0.05	-	<0.01	<0.01	0	<0.01	<0.05
Flouride, F	N/A	1.0	N/A	0.6	0.8	0.6	0.8	0.6	0.5	0.6	0.6	0.5	0.6	0.7	0.5
Iron, Fe	N/A	N/A	0.3	0.12	0.03	-	0.9	0.09	<0.1	0.12	0.02	<0.1	0.07	0.04	<0.1
Lead, Pb	N/A	N/A	0.05	-	<0.01	-	-	<0.01	<0.005	-	<0.01	<0.005	0	<0.01	<0.005
Manganese, Mn	N/A	N/A	0.05	0.0	<0.01	-	0	<0.01	<0.03	0	<0.01	<0.03	0	<0.01	<0.03
Mercury, Hg	N/A	N/A	0.002	-	<0.001	-	-	<0.001	<0.001	-	<0.001	<0.001	0	<0.001	<0.001
MBAS	N/A	N/A	0.5	-	<0.1	<0.02	-	<0.1	<0.02	-	<0.1	<0.02	-	<0.1	<0.02
Selenium, Se	N/A	N/A	0.01	-	<0.01	-	-	<0.01	<0.005	-	<0.01	<0.005	0	<0.01	<0.005
Silver, Ag	N/A	N/A	0.05	-	<0.01	-	-	<0.01	<0.01	-	<0.01	<0.01	0	<0.01	<0.01
Zinc, Zn	N/A	N/A	5.0	-	<0.01	-	-	<0.01	<0.05	-	<0.01	<0.05	0.01	<0.01	<0.05

* District Well No. 12 overlies the Coyote Lake/Copper Mountain Subbasin and is no longer in service.
** District Well No. 14 was not placed into operation until 1984.

TABLE III–4

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1983			
WELL 2	5,168,000	16	1.3
WELL 10	79,197,000	243	20.3
WELL 11	305,900,000	939	78.4
TOTALS	390,265,000	1,198	100.0
1984			
WELL 2	8,819,000	27	2.0
WELL 10	51,340,000	158	11.9
WELL 11	265,945,000	816	61.6
WELL 14	105,624,000	324	24.5
TOTALS	431,728,000	1,325	100.0
1985			
WELL 2	64,461,000	198	14.0
WELL 10	293,974,000	902	63.8
WELL 11	73,050,000	224	15.8
WELL 14	29,449,000	90	6.4
TOTALS	460,934,000	1,414	100.0
1986			
WELL 2	1,754,000	5	0.3
WELL 10	14,702,000	45	3.0
WELL 11	21,343,000	66	4.4
WELL 14	450,969,000	1,384	92.3
TOTALS	488,768,000	1,500	100.0
1987			
WELL 2	1,502,000	4	0.3
WELL 10	28,676,000	88	5.6
WELL 11	70,973,000	217	13.8
WELL 14	412,448,000	1,265	80.3
TOTALS	513,599,000	1,574	100.0

TABLE III–4 (Cont'd)

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1988			
WELL 2	2,548,000	8	0.5
WELL 10	19,633,000	60	3.6
WELL 11	26,833,000	82	5.0
WELL 14	489,188,000	1,502	90.9
TOTALS	538,202,000	1,652	100.0
1989			
WELL 2	1,034,000	3	0.2
WELL 10	6,120,000	19	1.1
WELL 11	3,682,000	11	0.6
WELL 14	556,244,000	1,707	98.1
TOTALS	567,080,000	1,740	100.0
1990			
WELL 2	807,000	2	0.1
WELL 10	9,796,000	30	1.9
WELL 11	5,104,000	16	1.0
WELL 14	510,649,000	1,567	97.0
TOTALS	526,356,000	1,615	100.0
1991			
WELL 2	,649,000	2	0.1
WELL 10	6,824,000	21	1.4
WELL 11	296,000	1	0.1
WELL 14	483,784,000	1,485	98.4
TOTALS	491,553,000	1,509	100.0
1992			
WELL 2	6,343,000	20	1.3
WELL 10	23,842,000	73	4.9
WELL 11	32,986,000	101	6.8
WELL 14	421,630,000	1,294	87.0
TOTALS	484,801,000	1,488	100.0

TABLE III–4 (Cont'd)

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1993			
WELL 2	7,301,000	22	1.5
WELL 10	36,129,000	111	7.4
WELL 11	102,216,000	314	20.8
WELL 14	345,871,000	1,061	70.3
TOTALS	491,517,000	1,508	100.0
1994			
WELL 2	24,775,000	76	4.8
WELL 10	62,522,000	192	12.1
WELL 11	67,214,000	206	13.0
WELL 14	362,386,000	1,112	70.1
TOTALS	516,897,000	1,586	100.0

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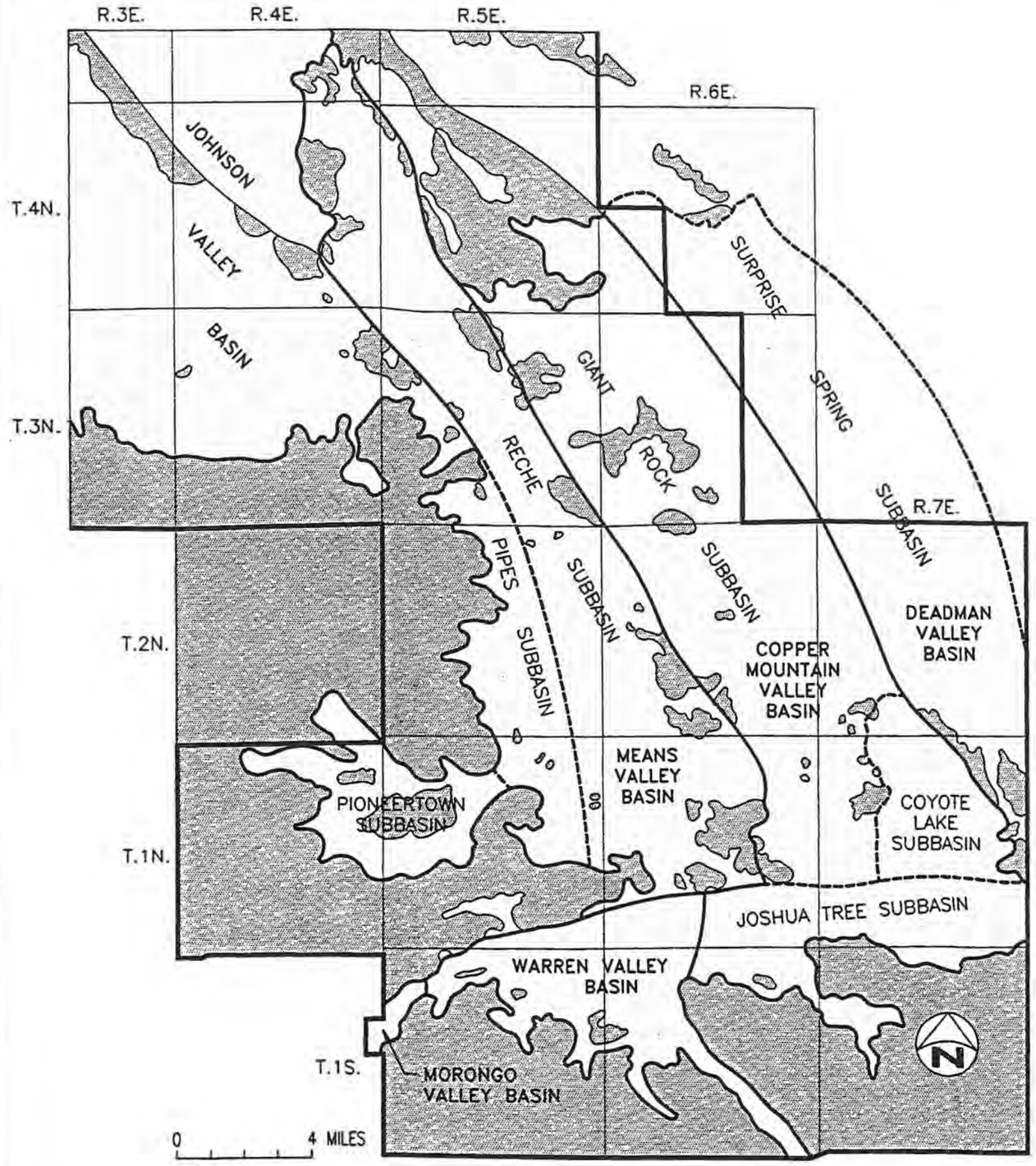

LEGEND

- UNCONSOLIDATED DEPOSITS
- CONSOLIDATED DEPOSITS
- GROUND WATER BASIN BOUNDARY
- GROUND WATER SUBBASIN BOUNDARY

NOTE:

THE COYOTE LAKE SUBBASIN IS REFERRED TO LOCALLY AS THE THE COPPER MOUNTAIN SUBBASIN.

BASE MAP SOURCE:

UNITED STATES GEOLOGICAL SURVEY

KRIEGER & STEWART INCORPORATED
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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

GROUND WATER BASIN AND SUBBASIN BOUNDARIES

FIGURE III-1

SCALE: 1"=20,000'± DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F1

DEPTH TO WATER (NOTE: SURFACE ELEVATIONS VARY BY WELL; SEE LEGEND)

400
410
420
430
440
450

1941 (408')
1947 (407')
1948 (412')
1950 (408')
1951 (414')
1952 (418')
1953 (410')
1956 (406')
1958 (408')
1962 (409')
1962 (419')
1963 (422')
1966 (421')
1967 (422')
1973 (423')
1976 (428')
1978 (424')
1979 (428')
1981 (428')
1982 (428')
1983 (429')
1984 (430')
1985 (432')
1986 (432')
1987 (433')
1988 (434')
1990 (421')
1991 (422')
1992 (423')
1993 (423')
1994 (424')
1995 (424')
1978 (407')
1979 (408')
1983 (412')
1984 (413')
1986 (416')
1987 (418')
1988 (419')
1992 (438')
1993 (439')
1994 (440')
1995 (441')
1978 (431')
1979 (436')
1981 (433')
1982 (435')
1983 (436')
1984 (436')
1986 (439')
1987 (441')
1988 (441')
1992 (448')
1993 (449')
1994 (450')
1995 (450')

1940 1 2 3 4 5 6 7 8 9 1950 1 2 3 4 5 6 7 8 9 1960 1 2 3 4 5 6 7 8 9 1970 1 2 3 4 5 6 7 8 9 1980 1 2 3 4 5 6 7 8 9 1990 1 2 3 4 5 6 7 8 9 2000

YEAR

LEGEND

——— DISTRICT WELL 1* (GROUND SURFACE ELEVATION=2,714')

—·—·— DISTRICT WELL 2 (GROUND SURFACE ELEVATION=2,722')

—·—·— DISTRICT WELL 10 (GROUND SURFACE ELEVATION=2,713')

------ DISTRICT WELL 11 (GROUND SURFACE ELEVATION=2,698')

* DISTRICT WELL 1 REMOVED FROM SERVICE IN 1962.

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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

DEPTH TO WATER IN WELLS
LOCATED WITHIN SECTION 25, T.1N., R.6E., SBM

FIGURE
III-2

73F7

SECTION IV

SECTION IV
ANTICIPATED WATER DEMANDS

Fluctuations in water requirements are linked to increases or decreases in population, the extent of commercial activity (including recreational uses), and the level of construction activity. Although recent trends within the District's boundaries have indicated limited increases in both population and water requirements, this phenomenon is considered an aberration related primarily to the recent economic recession, and growth is expected to resume at moderate rates in the near future.

A. PROJECTED GROWTH

For purposes of estimating future water requirements, the District anticipates an annual growth rate of between 0% and 4%. Please note that estimated growth rates and related water requirement projections are inherently ambiguous; the projections are considered somewhat conservative, and are meant to ensure that management planning is effective in protecting ground water resources.

As indicated on Tables IV-1 through IV-5, the annual water requirement within the District's service area is expected to increase to a level as high as 4,200 AF/Yr by the year 2020 given a 4% annual increase in population, or will continue to be at least 1,590 AF/Yr given no increase in the area's population. Production at this level in the absence of additional water supplies could result in significant and excessive overdraft, particularly if the District's ground water production continues to be concentrated within the Joshua Tree Subbasin.

B. GROUND WATER OVERDRAFT

Based on the information included in Section III regarding estimated ground water recharge, maximum safe yield, and annual water production, it becomes apparent that the Joshua Tree Subbasin has been in a state of light overdraft since about 1980. The extent of said overdraft, which is noted in Table III-2, is currently estimated to total about 7,100 AF, or about 19% of the recommended maximum allowable level of cumulative overdraft, which is approximately 37,000 AF. Overdraft is currently occurring at a rate of about 600 AF/Yr, or about 1.6% of the maximum allowable cumulative overdraft. As shown on Figure III-2, ground water levels measured at various District production wells have been declining steadily for a number of years; the decline has averaged about one foot per year since at least 1978.

California's economic recovery is expected to result in some additional demands in the area, which will only serve to exacerbate the problem. As shown on Table IV-5, overdraft could become as great as 3,200 AF/Yr by 2020 given a growth rate of about 4% per year. These estimates emphasize the urgency of adopting and implementing appropriate management actions at the earliest opportunity.

TABLE IV–1

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 0%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,590	8,000	22
2000	1,590	10,000	27
2005	1,590	13,000	35
2010	1,590	16,000	43
2015	1,590	19,000	51
2020	1,590	22,000	59

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–2

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 1%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,610	8,000	22
2000	1,670	10,000	27
2005	1,760	14,000	38
2010	1,850	18,000	49
2015	1,940	22,000	59
2020	2,040	27,000	73

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–3

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 2%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,620	8,000	22
2000	1,760	11,000	30
2005	1,940	15,000	41
2010	2,140	20,000	54
2015	2,360	27,000	73
2020	2,610	34,000	92

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV-4

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 3%/YR INCREASE)
1996-2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,640	8,000	22
2000	1,840	11,000	30
2005	2,140	16,000	43
2010	2,450	23,000	62
2015	2,870	31,000	84
2020	3,330	42,000	114

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV-5

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 4%/YR INCREASE)
1996-2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,650	8,000	22
2000	1,930	11,000	30
2005	2,350	17,000	46
2010	2,860	25,000	68
2015	3,480	36,000	98
2020	4,240	51,000	138

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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SECTION V

SECTION V
MANAGEMENT PLAN

In order to be successful, a ground water management plan must include a number of different components that account for the full spectrum of potential concerns related to overproduction and/or contamination of ground water resources. The various components outlined below would have some beneficial effect if implemented on their own; however, implementing all of them would have significantly greater cumulative effects than simply implementing one or two. Regardless, in light of the information outlined in the preceding sections, it is important that the District introduce as many ground water management practices as its technical and financial resources allow.

The following components of the District's Ground Water Management Plan vary considerably in their complexity and the ease with which they can be implemented. Certain of the components (e.g. those related to water conservation) can be implemented in relatively short order, while those requiring the construction of significant capital improvements (e.g. those related to changes in production practices) will have to be implemented over a period of several years.

A. WATER CONSERVATION

One of the least expensive, simplest, and most cost effective means for managing ground water is to reduce water use. Of the numerous means available to encourage water conservation by residents of the District's service area, several are outlined below.

When implementing water conservation measures, it is important to establish specific goals. Said goals are best established in terms of reducing water use per capita or per dwelling unit to a specified level. Establishing water conservation goals will enable the District to evaluate the success of water conservation efforts, and will allow it to enhance existing measures and/or introduce new measures to increase the water conservation program's effectiveness. Water conservation goals should be reasonable in terms of both extent and schedule in order to avoid placing undue hardships upon District customers. A timetable reflecting the District's water conservation goals is attached as Table V-1. The District will evaluate a variety of education programs, a toilet and shower head retrofit program, and a pipeline replacement program; each potential program is discussed separately below.

1. Education

An extremely effective method for encouraging people to conserve water is to educate them as to both the importance of conserving water and the numerous methods available to accomplish water conservation. The District will therefore implement a program designed to alert its customers to the potentially significant adverse effects associated with excessive water use and explain methods available to them to reduce water use.

The element of the education program intended to warn District customers about overuse will emphasize items of particular concern to individual customers, such as increased water rates and decreased water quality that will result from excessive use of the resource. This portion of the education program will include exhibits which provide details regarding the effects of ground water overdraft and the projected extent of overdraft within the District.

The element of the education program concerned with educating the District's customers about means for reducing water use will incorporate a number of suggestions relating to virtually every type of water use that the average customer may engage in. Components may include:

a. A demonstration garden which displays various types of water efficient irrigation systems and drought tolerant plant species.

b. Educational pamphlets which explain various household practices that will reduce water use, such as minimizing household uses and scheduling irrigation for night time hours when evaporation rates are reduced. The latter element will include suggestions such as taking shorter showers, ensuring that laundry and dishwasher loads are made as large and water efficient as possible, and installing modern, water efficient appliances.

2. Toilet and Shower Head Retrofit Program

A toilet and shower head retrofit program will be evaluated and (if found to be cost-effective) implemented to encourage District customers to replace inefficient toilets and shower heads with ULF facilities; said facilities have been demonstrated to result in

significant cumulative water savings. A similar ongoing program sponsored by the Metropolitan Water District of Southern California (MWD) has resulted in the replacement of tens of thousands of inefficient toilets and shower heads.

According to the Water Education Foundation, the amount of water conserved is quite dramatic; for instance, ULF toilets discharge just 1.6 gallons per flush, as opposed to the 6 gallons or more expended per flush by conventional toilets and 3 gallons per flush for low flush toilets. ULF shower heads reduce water use by 50% or more, which equates to about 3 gallons per minute per shower.

3. Pipeline Replacement Program

In order to reduce water losses through the District's water conveyance and Distribution system, the District has implemented a pipeline replacement program designed to replace as much aging and deteriorated pipeline as possible. No changes to said program are included as part of this program; rather, the existing pipeline replacement program is incorporated herein, and will be continued as funds allow.

B. GROUND WATER MONITORING

A soundly designed, constructed, and operated system of monitoring wells is necessary to determine and monitor ground water quantity and quality conditions within ground water basins and subbasins; however, there is currently no monitoring well system available in either the Joshua Tree or Copper Mountain Subbasins. Instead, existing water wells are used to monitor ground water levels and ground water quality. As such, improving the current level of ground water monitoring is one of the key components of the Plan.

To fully determine the quantity and quality of ground water in the subbasins, the ground water monitoring system should ultimately consist of a series of monitoring wells constructed within strategically selected areas of each subbasin. The monitoring wells (one piezometer per aquifer zone for separate measurements and samples) should be constructed to bedrock in order to provide information about the region's bedrock profile.

Since the costs and technical demands associated with designing, constructing, and operating a monitoring system of the magnitude necessary to obtain complete information about the Joshua

Tree and Copper Mountain Subbasins would be substantial, the District will solicit financial and technical assistance from both USGS and CDWR in the event that it decides to proceed with same; each agency has considerable experience in ground water monitoring programs, and may wish to participate in the development and expansion of a ground water monitoring system for the area.

To provide potential cost savings and allow some additional monitoring to begin within one to two years, the District may decide to examine some existing wells which are no longer in operation and determine their suitability to serve as interim monitoring wells. A number of wells lying within the District's boundaries have been abandoned (but probably not destroyed) over the years, and some may be useful in determining water levels and water quality in various areas. In the event that an area of particular concern is identified by the monitoring of such wells, additional steps (such as constructing a dedicated monitoring well) can be implemented.

1. Scheduling

Although it would be desirable to construct a complete monitoring well system immediately, fiscal constraints prevent construction on so large a scale. In recognition of same, the District will use existing wells for monitoring purposes until funds are available for constructing dedicated monitoring wells. An implementation schedule for the monitoring system has been prepared which is arranged by priority; the first wells to be monitored will be concentrated within areas of significant ground water production in the Joshua Tree Subbasin. Subsequent wells will be located in other areas at later dates as finances allow. A recommended implementation timetable is reflected by Table V-2.

In order to ensure that useful information is gathered, it will be necessary to measure ground water levels and collect water quality samples on a regular basis, and the District will have to establish a monitoring schedule that can be strictly adhered to on a continual basis. The recommended schedule consists of measuring ground water levels quarterly, and collecting and analyzing water quality samples annually; however, the schedule may need to be modified based upon observations as the monitoring system is developed and expanded.

2. Mapping

To provide a visual representation of the information gathered by the monitoring wells, a District-wide ground water monitoring program map will be created which will indicate the location of each well from which water level data and water quality samples are collected. The map may be prepared using AutoCAD software, which would enable it to be kept current as new information is gathered over the course of the monitoring program.

The map will indicate the following: the ground surface elevation of each well, referenced to mean sea level; the depth to ground water at each well and the date of measurement; and certain key ground water quality indicators (such as total dissolved solids and nitrates) and the date of sample collection. The ground water monitoring program map will enable interested parties to determine current ground water conditions within the District's boundaries, and to compare same with past conditions to determine whether or not there have been any notable changes in ground water quantities or quality.

C. GROUND WATER PRODUCTION

As noted in Section II.C., spreading ground water production over as wide an area as possible can have significant beneficial effects upon ground water bodies; instead of creating pumping depressions, ground water levels decline more uniformly, resulting in a lesser but widespread lowering of the water table rather than a greater but localized lowering of same. The District's existing ground water production facilities are relatively widespread, with the largest water supply wells located at least 1/2 mile from each other, although its two smallest wells are only 1/8 mile apart. At its current production capacity, the District is spreading ground water production over a reasonably large area. Regardless, the construction of additional water supply wells at distances of at least 1/2 mile from any existing wells is a significant component of the Ground Water Management Plan.

1. Production Areas

While it is important to spread production facilities over as great an area as possible, it is also important to keep capital and operations costs as low as practicable; therefore,

new production facilities are proposed to be constructed as near as possible to existing conveyance facilities and within appropriate pressure zones in order to limit costs. In addition, at least one water supply well is proposed for construction within the Copper Mountain Subbasin in order to make use of resources that are currently unused.

The water supply well(s) to be constructed within the Copper Mountain Subbasin will be used to serve District customers residing within portions of the District's service area that overlie said Subbasin. Although most residents of the area currently secure their own supplies (primarily from bulk water haulers), the District is in the process of extending service to approximately 1,250 parcels in the area as part of its Copper Mountain Mesa Water Facilities project. A connection with the District's existing system will be constructed to provide service until the District constructs production facilities within the Copper Mountain Subbasin's boundaries.

2. Water Supply Well Locations

To ensure that water supply wells are far enough apart to prevent them from creating excessive and undesirable overlapping pumping depressions, the District will not construct or permit the construction of any new wells that are not at least 1/2 mile (and preferably one mile) from existing wells. At the same time, the District will attempt to keep associated conveyance costs as low as possible by constructing new water supply wells in reasonable proximity to existing conveyance and storage facilities.

D. WATER EXPORT PREVENTION

As noted in Section II.D., the District considers it necessary to prevent unauthorized exports of water from within its boundaries, particularly if the exported water is to be used in areas where the nonconsumptive return will not recharge the District's ground water supply. The District will therefore pursue all available means of preventing any party (private or public) from exporting ground water from anywhere within its boundaries, unless such exports are authorized by the District. It will be the District's policy to regard any effort to export ground water from within its boundaries as a potential threat to the ground water resources it has the responsibility of managing, and to resist any such efforts on that basis. Specific means of resisting exports will be developed over the life of the Plan, and will include litigation and legislative initiatives.

E. CONJUNCTIVE USE (IMPORTED WATER)

As noted in previous sections, conjunctive use consists of using ground water in conjunction with surface water to meet service area water requirements. In the District's case, conjunctive use has historically been impossible due to the complete lack of surface water within the District; however, the recent completion of the Morongo Basin Pipeline Project has finally made surface water available and will enable the District to initiate a conjunctive use program. The benefits of conjunctive use to the District are significant, in that they will enable the District to reduce its reliance upon ground water and thus arrest or reduce the current overdraft of the Joshua Tree Subbasin.

The Morongo Basin Pipeline Project is being constructed, operated, and maintained by the Mojave Water Agency, and will benefit five Morongo Basin water purveyors, including the District, the Hi-Desert Water District, the Bighorn/Desert View Water Agency, County Service Area No. 70/Improvement Zone W-1, and County Service Area No. 70/Improvement Zone W-4. The Morongo Basin Pipeline Project consists of a connection to the California Aqueduct, approximately 7 miles of 54" pipeline, approximately 63 miles of 30" pipeline, two booster pumping plants, and a 5 MG water storage reservoir located approximately 5 miles west of the District's westerly boundary.

The District will take delivery of State Water Project water through the Hi-Desert Extension, which consists of a connection to the aforementioned 5 MG reservoir and approximately 44,500 L.F. of 24" pipeline, connecting to the Hi-Desert Project recharge basins. The Hi-Desert Extension includes a 24" outlet which is dedicated to District use and is located approximately 1/3 mile west of the District's westerly boundary, 500 feet south of the intersection of Linda Lee Drive and Nelson Avenue.

The Mojave Water Agency has allocated 7,257 AF/Yr to the five Morongo Basin water purveyors mentioned above. Of that quantity, the District's share is 1,959 AF/Yr, or 27% of the total. Assuming that the full amount is delivered each year, the imported water will increase annual recharge of the Joshua Tree Subbasin by between 100% and 200%, thereby alleviating concerns regarding ground water overdraft in the near term; however, as noted in Section IV.A., excessive reliance upon State Water Project water is not advisable owing to the uncertain regulatory and legislative environment. Nevertheless, the availability of imported water

represents a significant opportunity for the District, and greatly enhances the flexibility of the District's Ground Water Management Plan.

1. Conveyance Facility Requirements

In order to take delivery of imported water supplies, the District will have to construct conveyance facilities from the Hi-Desert Extension to the proposed location of use. Based on the alternatives evaluated to date, the District will have to construct a transmission pipeline to the point of delivery, which will be to either the District's system or to recharge basins. In addition, should the District decide to treat the imported water to drinking water standards and distribute same to its service area for domestic consumption, a surface water treatment facility will have to be constructed. Flows to the District will be by gravity, and no booster pumping facilities are expected to be required to deliver imported water to a surface water treatment facility or recharge basins.

2. Alternatives

As noted above, the District has essentially two alternatives for conjunctive use: it can treat the imported water to within drinking water standards and distribute same to its customers, thereby reducing the need to produce ground water; or it can construct recharge basins within the Joshua Tree subbasin and use the imported water for artificial recharge, thereby increasing overall recharge by the amount of water delivered (less losses to evaporation, which would be expected to be at least 5% but not more than 10%).

The first alternative consists of the construction of a surface water treatment plant, which would probably be constructed adjacent to one of the District's existing or proposed water storage reservoirs. The surface water treatment facility would have to be constructed in order to filter and disinfect the water prior to distribution, as specified in the State of California's Surface Water Treatment Regulations (SWTR).

The second alternative consists of the construction of recharge basins capable of recharging the Joshua Tree Subbasin. This alternative would require construction of a transmission pipeline, and of construction of approximately 5-1/2 acres of recharge

basins. The system would function by flowing water into the recharge basins by gravity, from which the water would percolate to ground water.

Adoption of either of the alternatives will result in immediate and direct benefits to the Joshua Tree Subbasin. It should be noted that the Copper Mountain Subbasin will only be indirectly affected by either alternative, since it is separated from the Joshua Tree Subbasin by geologic barriers; the only potential benefit to the Copper Mountain Subbasin would be a reduction of demands upon said subbasin, resulting in in-lieu recharge.

3. Constraints on Availability

In considering the potential associated with conjunctive use, one should keep in mind that deliveries of State Water Project water may fluctuate depending on a number of factors. For instance, recent legislative and regulatory changes have periodically resulted in significantly reduced State Water Project deliveries. In addition, the State Water Project is still essentially incomplete, and can only deliver approximately 50% of the supply originally anticipated when the Project was initiated; the conveyance facilities have a capacity of about 4.4 million AF/Yr, but the supply facilities can only provide about 2.2 million AF/Yr.

The water supply limitation will be rectified when the San Francisco Bay/Sacramento Delta system is appropriately modified to allow maximum utilization of available supplies while simultaneously protecting the Bay/Delta's fragile environment. "Fixing" the Delta will require the construction of Delta conveyance facilities; one alternative for the construction of said facilities is known as the Peripheral Canal, construction of which was defeated by California voters in 1982. Until regulatory actions become consistent and Delta conveyance facilities are constructed, State Water Project supplies will never be continuously available, and strict reliance upon same is not advisable.

F. CONJUNCTIVE USE (RECLAIMED WATER)

As noted in Section V.E. above, conjunctive use affords a number of benefits and advantages with regard to managing water resources and reducing reliance upon ground water. While the District will soon implement a conjunctive use program following completion of the facilities

necessary to import State Water Project water to its service area, another source of supply for conjunctive use (one that is currently unused by the District) is available in the form of reclaimed water.

As matters currently stand, there are no facilities available within the District for the collection and treatment of wastewater; all wastewater is currently processed by individual disposal systems (e.g. septic tanks) and discharged to seepage lines or pits and allowed to percolate to ground water. This method of disposal may result in a slow but steady degradation in ground water quality; however, the impacts on water quality to date have been slight because of the area's limited and dispersed development.

In order to determine the extent of the benefits that might be derived from water reclamation and to establish the costs associated therewith, it would be necessary to conduct an extensive study that is beyond the scope of this Ground Water Management Plan; however, the commissioning of such a study is of considerable importance, and is related directly to the District's ground water management efforts. The District may have an evaluation of the potential benefits and costs of initiating a reclaimed water program prepared and, based on the results and recommendations of the evaluation, may in turn determine that the construction of the required facilities would represent a good investment in the protection of the area's ground water supplies.

G. GROUND WATER CONTAMINATION PREVENTION/RESPONSE

The threatened or potential contamination of ground water is a matter of considerable concern in all areas of the country, but particularly so in areas like that served by the District. Contamination can take many forms and be caused by numerous factors; for instance, it can result from various types of pollution, such as disposal of petroleum products, or from the migration or percolation of physical materials such as total dissolved solids and nitrates. Should ground water in the Joshua Tree area become contaminated, the area's sole reliable local source of domestic water would be threatened. It is therefore important that ground water resources in the area be protected from contamination to the greatest extent possible. Although contaminated ground water can be treated sufficiently to allow domestic consumption, the costs and operational difficulties associated with same are considerable. In order to prevent ground water contamination, the District has incorporated within its Ground Water Management Plan a number of measures designed to help prevent ground water contamination from occurring.

As indicated by Table III-4, the water quality of water produced by District wells remains excellent. The actions proposed below are intended to help ensure that: a) the possibility of ground water contamination is limited to the greatest practicable extent, and b) the District is prepared to respond to any contamination that may occur. Owing to the area's limited development (particularly commercial and industrial development), it is unlikely that contamination has occurred; however, the importance of ground water to the area dictates that the potential threat of contamination be addressed.

1. Well Construction and Abandonment Standards

Since wells are direct conduits to and from ground water, they represent a significant potential means for transmitting contaminants (particularly pollutants) directly into ground water. In recognition of this potential, CDWR has prepared a highly specific and lengthy set of standards for the construction and abandonment of water wells. Said standards, which are included in CDWR Bulletins 74-81 and 74-90, Water Well Standards: State of California, contain rigidly defined specifications; for example, said Bulletins require that all wells to be abandoned be pressure grouted with cement grout throughout the perforated portions of the well casing to ensure that they are incapable of transmitting contaminants. Although CDWR's well construction and abandonment standards are theoretically in force state-wide, the District is incorporating same in the Ground Water Management Plan in order to ensure that they are enforced during the construction or abandonment of any well within the District's boundaries.

The District is also incorporating a program for the location and proper destruction of area wells that have either been incorrectly constructed or inadequately abandoned. In order to accomplish same, the District will secure well driller's logs from CDWR for all wells constructed within the District's boundaries. In addition, the District may solicit the participation and cooperation of individual well owners within its boundaries, and will request that any individuals with knowledge of wells that may have been inadequately abandoned alert the District regarding same so that they can be properly destroyed.

2. Recharge Area Protection

Recharge area protection essentially consists of ensuring that land uses within watersheds or areas overlying ground water bodies do not pose a threat of ground water contamination. As noted in Section II.E., there are numerous types of developments and land uses which, if not constructed in compliance with applicable standards, pose direct and significant threats to ground water quality. In addition, unlawful activities (e.g. illegal garbage dumping, disposal of hazardous wastes, disposal of dead animals) can also result in ground water contamination.

The most effective means of preventing contamination is to interact and cooperate with agencies that have responsibility for land use planning and/or standards enforcement. As such, it will be necessary for the District to establish a good working relationship with responsible staff members from various federal, state, and county agencies that have jurisdiction over areas of potential concern; indeed, the following subsection of the Ground Water Management Plan is largely concerned with coordinating with planning agencies to ensure that future land uses do not threaten ground water supplies. The list of agencies that the District will involve includes, but is not limited to, the following: the U.S. Bureau of Land Management (U.S. BLM), the California Integrated Waste Management Board (CIWMB), the California Regional Water Quality Control Board (RWQCB)-Colorado River Basin Region, the State Water Resources Control Board (SWRCB), the County of San Bernardino Planning Department, and the County of San Bernardino Public Health Department.

3. Monitoring for Contamination

As noted in Section V.B. above, the District intends to ultimately establish a ground water monitoring system that will enable it to monitor ground water levels and quality within its boundaries. One of the reasons that monitoring is important is that, in the absence of a carefully planned monitoring well grid, contamination could easily occur within a ground water body as large as the Joshua Tree Subbasin and not be detected for a number of months or years. Failure to detect contamination could result in a significant and widespread contaminant plume, which would have the potential to rob the area of at least a portion of its ground water supply. The District intends to monitor for ground water quality on an annual basis, although the frequency of said monitoring

may be increased, particularly in areas that are considered likely to be contaminated owing to overlying land uses.

4. Responses to Contamination

In the event that ground water contamination is detected, the District will immediately assess the severity of the contamination and confer with various regulatory and enforcement agencies (e.g. U.S. EPA, SWRCB, RWQCB, etc.), and develop and implement a response plan. The response to any contamination that may be detected in the future will be dictated by its severity, and may range from blending the contaminated supply with untainted supplies to bring the product water to within federal and state drinking water standards, to constructing well head treatment facilities. Owing to the significant numbers of contaminated sites around the United States, a number of technologies have been developed that enable agencies to react rapidly to episodes of contamination in order to protect public health, and the District will make use of same should the need arise.

Since remediation of ground water contamination is usually quite expensive, the District will emphasize working with the aforementioned regulatory agencies in identifying the party(ies) responsible for any contamination that may be detected in the future, and will take any steps necessary to ensure that cleanup activities are performed at no cost to the District or its customers. There are a number of laws available to help ensure that responsible party(ies) are held accountable, particularly the Federal Comprehensive Environmental Response, Compensation, and Liability Act (better known as Superfund) and the Resource Conservation and Recovery Act, as well as the California Superfund. These laws are designed to ensure that contaminated environments are restored, and that those responsible for the contamination are held responsible and liable for cleanup activities.

H. PLANNING AGENCY COORDINATION

In order to ensure that land uses within the District's boundaries are consistent with the protection of both ground water quantity and quality, it will be necessary to coordinate with those agencies that have planning authority over lands within said boundaries. It has long been the practice of planning agencies in various areas of California to make land use decisions with

little or no regard for the needs and requirements of the local water purveyor, a circumstance which has lead in some cases to significant difficulties for local purveyors; for instance, water agencies have been left to develop additional sources of supply to serve areas that have experienced growth that has in turn caused water requirements to exceed available supplies.

To prevent significant adverse impacts upon ground water resources within its boundaries as a result of poorly planned or excessive development, it will be necessary for the District to participate in the planning activities of those agencies which have planning authority over lands in the Joshua Tree area. The two agencies with primary responsibility for land use planning in the area are the County of San Bernardino Planning Department and the U.S. Bureau of Land Management. Specific details regarding the District's planned future relationship with each agency are outlined below.

1. County of San Bernardino Planning Department

Since the area within the District's boundaries is unincorporated, the San Bernardino County Planning Department makes most of the land use decisions that are likely to affect development (and therefore water resources) in the Joshua Tree area. It is important for the District to establish a direct relationship with members of the County Planning Department's staff who have responsibility for reviewing and making recommendations regarding proposed land uses and development within the District's boundaries. Examples of land use decisions that might affect the District include the size and location of residential subdivisions, the locations of certain types of commercial facilities (particularly those dealing in petroleum products, such as gasoline service stations, or those that require large quantities of water, such as car washes and commercial laundries), and the types and locations of industrial facilities.

Establishing a close working relationship with County staff will enable the District to provide comments early in the planning process rather than having to respond after a project has already reached the approval stage. Ideally, the District will be notified any time a development proposal is submitted to the County Planning Department and will be afforded the opportunity to participate in the review and approval process. In addition, the District will seek the opportunity to comment upon any future amendments to the portions of the County's General Plan which are concerned with development in the Joshua Tree area. Based upon estimates of available water supply and ground water

conditions, the District will prepare and provide to the County Planning Department a projection of the maximum supportable build-out population for the Joshua Tree area. Specific District interests and concerns regarding residential, commercial, and industrial developments are outlined below.

a. Residential Development

The area within the District's boundaries has only experienced sporadic residential development to date, with most housing consisting of single family residences located on large lots that are widely dispersed. An indication of the area's limited development is the density of dwelling units; there are only 4,400 units within the 96 square mile District, or one unit for every 14 acres. While it is difficult to accurately predict future development (in terms of both quantity and location), past growth patterns indicate that it will probably be limited in scope and widely dispersed, although it is possible that large-lot/low-density tract development could occur, particularly in areas near Highway 62.

The principal concerns with future residential development have to do with ensuring that water supplies are available to serve existing and future residents without creating significant overdraft. Residential development proposals will be reviewed with regard to the anticipated size of the development, water use associated with both construction and occupancy, and incorporation of water-conserving features. The latter concern will call for ensuring that development proposals include water-efficient landscaping and irrigation, ULF toilets and shower heads, and water-efficient appliances such as dishwashers.

Residential developments will also be reviewed to ensure that they won't cause water quality degradation. Large unsewered residential areas may concentrate septic tank discharges, which can in turn lead to increased concentrations of various contaminants in ground water. In addition, large scale residential developments often lead to large quantities of contaminant-bearing stormwater runoff, which can in turn lead to ground water contamination after the stormwater infiltrates and percolates to ground water. The District will carefully review large residential development proposals to ensure that these

types of concerns are appropriately addressed in advance to prevent the necessity of costly remediation measures.

b. Commercial Development

As is the case with residential development, the Joshua Tree area has experienced only limited commercial development, most of which has occurred along Highway 62. Most existing commercial development consists of small businesses serving the needs of area residents, travelers of Highway 62, and users of the Hi-Desert Airport. Institutional developments, including the Hi-Desert Medical Center and various government offices (e.g. California Highway Patrol office, post office, fire station), also serve the area. Again, it is difficult to predict future commercial and institutional development; however, any such development that does occur will probably be located either along Highway 62 or near the Airport.

There are numerous types of commercial development, any of which can result in ground water related problems if not properly constructed or operated. For instance, gasoline service stations can cause ground water contamination through leaks in gasoline storage tanks or through improper waste oil disposal. Golf courses can lead to ground water overdraft, since they consume significant quantities of water for landscaping. Car washes can cause both quantity and quality problems; they use large quantities of water, and generate significant quantities of wastewater containing petroleum contaminants that may then find their way to the ground water body as the wastewater recharges the ground water body. Owing to the wide variety of potential concerns, the District will continue to review any proposed commercial developments on a case-by-case basis.

c. Industrial Development

The Joshua Tree area has experienced virtually no industrial development to date, which is likely a result of its relative isolation; however, the burgeoning growth in Yucca Valley and the relatively low cost of land in Joshua Tree both make limited industrial growth (particularly light industry) a possibility. The

area around the Hi-Desert Airport in particular would appear to lend itself to some industrial development (e.g. through the construction of an industrial park), and supports the area's only significant industrial enterprise, a concrete plant which is located on Two Mile Drive.

Concerns regarding industrial developments are similar to those associated with commercial development, although concerns regarding potential contamination are enhanced by some of the processes used during certain types of manufacturing. Some types of industry rely heavily upon petroleum based solvents or heavy metals, both of which have significant potential to contaminate ground water if mishandled, poorly stored, or improperly/illegally disposed of. The District will therefore carefully review any proposed industrial development to ensure that adequate safeguards are incorporated in the proposed design and that the site is not inappropriate (e.g. located in a primary ground water recharge area).

2. U.S. Bureau of Land Management

Significant tracts of land within the District's boundaries are owned by the U.S. Government and managed by the U.S. BLM. Private entities and government organizations periodically make application to the U.S. BLM to use Federal lands for a variety of purposes, some of which may ultimately represent a threat to ground water resources. Examples of types of facilities which are sometimes sited upon Federal land include landfills, military facilities, hazardous waste disposal areas, and mining operations, to name but a few.

While proposals to use Federal lands are generally subjected to review and comment by both other governmental agencies and the general public, formal opportunities for comment are often somewhat limited, and it will serve the District's best interests to establish a working relationship with appropriate U.S. BLM representatives to ensure that the District is involved early on in the application review process. Becoming involved in the process will enable the District to ensure that proposed uses that are incompatible with the objectives of the Ground Water Management Plan are not approved unless sufficiently modified to remove potential threats to ground water quantity or quality.

I. REPLENISHMENT ASSESSMENT

Preparation of a Ground Water Management Plan and subsequent implementation of a Ground Water Management Program are important concepts, but their components can neither be implemented nor their objectives realized unless funds are available therefor. To ensure that funding is available, the District will consider implementing a Replenishment Assessment Program that will permit the collection of funds from ground water producers sufficient to pay for the various components of the Ground Water Management Plan that the District implements.

Replenishment assessment programs have been used by a number of other special districts throughout California with considerable success; indeed, two of the District's neighbors to the south, the Coachella Valley Water District (CVWD) and the Desert Water Agency (DWA), have had replenishment assessment programs in place for more than 15 years, and have used the funds to pay for a highly successful artificial ground water recharge program (recharging the Upper Coachella Valley Ground Water Basin with imported water).

In order to implement the Replenishment Assessment Program, the District will have to either submit the matter to registered voters for approval or have a replenishment assessment approved by the California Legislature and the Governor. The election requirement (§10754.3 of the California Water Code) specifies that the District receive the authorization of a simple majority (50% + 1) of voters residing in the area affected by the assessment, which in this case includes the entire area within the District's boundaries. §10754.3 requires that the issue be submitted to the voters in a general election following adoption of the Ground Water Management Plan. Alternatively, the District could request that the legislature adopt legislation allowing it to levy the replenishment assessment; it was this course that CVWD and DWA followed when they decided to institute their replenishment assessment programs.

1. Purpose

The purpose of a replenishment assessment is to collect funds directly from ground water producers to pay for programs that result in ground water replenishment that arrests or reduces ground water overdraft, and preserves the ground water supply; replenishment assessments can therefore be used to pay for many of the components of the District's Ground Water Management Plan. Generally, ground water producers are

assessed for the specific quantities (units) of ground water produced (e.g. $/AF). Each producer's assessment is based on the assessment rate and the units of ground water produced.

Depending on the specific replenishment assessment program established, the District would be able to set the replenishment rate at a level sufficient to pay for water secured from MWA through the Morongo Basin Pipeline Project, as well as spreading basin operations (direct recharge) and/or imported water treatment (indirect or in lieu recharge). The replenishment assessment would be levied against all purveyors, including the District, and all replenishment assessments collected would be placed in a replenishment program account or fund dedicated to ground water management activities.

As the primary ground water producer within its boundaries, the District would have to pay most of the replenishment assessment, and would therefore have to secure funds for payment of the assessment from sources such as water rates and charges or water availability or standby assessments. Secondary producers within the District would have to pay their proportionate shares of the total replenishment assessment. Regardless, ground water producers would be paying for ground water replenishment.

The Replenishment Assessment Program would allow the District to account for the money spent on Ground Water Management Plan/Program activities, and would also enable the District to closely monitor the quantities of ground water produced from areas within its jurisdiction, since most (if not all) area ground water producers would be required to report their annual ground water production.

2. Applicability

The Replenishment Assessment Program would apply to all ground water producers (including the District) lying within the District's boundaries. The only exception would be minimal pumpers, which for the purposes of this Program are preliminarily defined as producers who extract less than 2 AF/Yr. In order to determine which well owners qualify as minimal pumpers, it would be necessary for the District to identify area well owners and confer with them to determine (and to subsequently confirm through various verification techniques) their annual water production.

3. Replenishment Assessment Rate Determination

In order to establish the replenishment assessment rate each year, the District would prepare an engineer's report on the Replenishment Assessment Program. The engineer's report would detail the anticipated costs associated with the program, as well as the anticipated replenishment assessment rate necessary to recover said costs. The engineer's report would explain each of the factors involved in determining the replenishment assessment rate, and would also include estimates of the Replenishment Assessment Program's effectiveness and the condition of ground water within the subbasins underlying the District's boundaries. The engineer's report would therefore provide the District with an annual review of ground water conditions within the District and describe the basis for the replenishment assessment rate.

TABLE V-I

JOSHUA BASIN WATER DISTRICT
WATER CONSERVATION OBJECTIVES TIME TABLE

	Program Study and Development Fiscal Year	Pilot Program Fiscal Year*	Program Implementation Fiscal Year*
1. Education Programs			
a. Demonstration Garden	1996/97	1996/97	1997/98
b. Pamphlets	1996/97	1996/97	1997/98
2. Toilet and Shower Head Retrofit Program	1997/98	N/A	1998/99
3. Pipeline Replacement Program	Ongoing	N/A	Ongoing

*If the program is adopted.

TABLE V-2

JOSHUA BASIN WATER DISTRICT
MONITORING SYSTEM IMPLEMENTATION TIME TABLE

	Fiscal Year
1. Identification/Evaluation of Existing Wells (Operational and Inoperative/Abandoned) for Use as Monitoring Wells	1997/98
2. Commence Monitoring	1998/99
3. Ground Water Monitoring Program Map	1998/99

TABLE V-3

JOSHUA BASIN WATER DISTRICT
REVISED PRODUCTION PRACTICES CONSTRUCTION AND OPERATION TIME TABLE

	Fiscal Year
1. Identify Potential Well Sites - Joshua Tree Subbasin	1996/97
2. Identify Potential Well Sites - Copper Mountain Subbasin	1997/98
3. Construct Well in Joshua Tree Subbasin to Supplement Existing Water Production Facilities	1997/98
4. Construct Well in Copper Mountain Subbasin to Supplement Existing Water Production Facilities	1998/99
5. Construct Additional Wells in Joshua Tree and Copper Mountain Subbasins	As Required to Meet Additional Water Requirements

APPENDIX A

CALIFORNIA WATER CODE SECTION 10750 ET SEQ.

§ 10717. Termination of local agency's powers upon implementation of municipal central water system

A local agency shall no longer be authorized to exercise the powers conferred by this part upon the completion and implementation of a municipal central water system supplying water to the inhabitants within the boundaries of the local agency.

Added Stats 1987 ch 472 § 1.

PART 2.75

Groundwater Management

[Added Stats 1992 ch 947 § 2 (AB 3030). Former Part 2.75, entitled "Groundwater Resources," consisting of §§ 10750–10767, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).]

Chapter

Note—Stats 1992 ch 947 provides:

SEC. 3. The Department of Water Resources shall, on or before January 1, 1998, prepare and publish, in a bulletin of the department published pursuant to Section 130 of the Water Code, a report on the status of groundwater management plans adopted and implemented pursuant to Part 2.75 (commencing with Section 10750) of Division 6 of the Water Code.

NOTES OF DECISIONS

State statutes relating to water use, taken collectively, do not occupy the field of groundwater regulation, and thus did not invalidate a county ordinance regulating the pumping practices and uses of groundwater. The test of occupation is whether the nature and extent of the coverage of a field is such that it could be said to display a patterned approach to the subject. No such pattern exists. No implication can be drawn that the Legislature intended to impair the constitutional exercise of the police power over groundwater because it has granted limited authority over groundwater to local agencies that draw their power solely from state legislation, and no pattern of regulation can be seen in the restrictions of Wat. Code, § 1220, on the export of water from the Sacramento Basin. The converse implication is more naturally made. There is a common thread in these statutes suggesting that problems of groundwater management should be addressed on the local level. Baldwin v County of Tehama (1994, 3rd Dist) 31 Cal App 4th 166, 36 Cal Rptr 2d 886.

CHAPTER 1

General Provisions

Section

§ 10750. Legislative fi

The Legislature finds resource in California, tion and its quality. It cies to work cooperat jurisdictions.

Added Stats 1992 ch 947 § 2 (

Former Sections:

Former § 10750, similar to pres 1992 ch 947 § 1 (AB 3030).

§ 10750.2. Application

(a) Subject to subdivisi state.

(b) This part does no subject to groundwat pursuant to other pro unless the local agenc

Added Stats 1992 ch 947 § 2 (

Historical Derivation:

Former §§ 10750, 10765, as a

§ 10750.4. Effect of p

Nothing in this part r adopt or implement a agement program pur

Added Stats 1992 ch 947 § 2 (

§ 10750.6. Effect of p

Nothing in this part a to manage groundwat judgment, or decree.

Added Stats 1992 ch 947 § 2

§ 10750.7. Manageme not critically overdra

(a) A local agency ma the service area of an Public Utilities Comr ment of that other en

(b) This section appl overdrafted.

Added Stats 1992 ch 947 § 2

Historical Derivation:

Former § 10762, as added St

§ 10750.8. Managem agency; Basin critica

(a) A local agency ma

upon implementation of

er se the powers conferred
t .. of a municipal central
rmin the boundaries of the

.75, entitled "Groundwater
19?1 ch 903 § 1 (AB 255) and
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is more naturally made. There
in these statutes suggesting that
undwater management should be
al level. Baldwin v County of
Dist) 31 Cal App 4th 166, 36

ıdwater basin
ıtermaster
other entity; Basin not

of another local agency;

ıreıit of groundwater man-

issions.

§ 10750. Legislative findings and declarations

The Legislature finds and declares that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10750, similar to present § 10750.2, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

§ 10750.2. Application of part

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former §§ 10750, 10765, as added Stats 1991 ch 903 § 1 (AB 255).

§ 10750.4. Effect of part on local agency overlying groundwater basin

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10750.6. Effect of part on authority of local agency or watermaster

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10750.7. Management of groundwater in service area of other entity; Basin not critically overdrafted

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10762, as added Stats 1991 ch 903 § 1.

§ 10750.8. Management of groundwater in service area of another local agency; Basin critically overdrafted

(a) A local agency may not manage groundwater pursuant to this part within

the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10762, as added Stats 1991 ch 903 § 1.

§ 10750.9. Adoption of ordinance or resolution; Amendment of groundwater management program

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 1 (AB 1152).

Amendments:

1993 Amendment: (1) Designated the former section to be subd (a); (2) deleted "that" before "Part 2.75," the second time it appears in subd (a); and (3) added subd (b).

§ 10750.10. Cumulative nature of part

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10766, as added Stats 1991 ch 903 § 1.

§ 10751. [Section repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). See § 10752.

CHAPTER 2

Definitions

Section

§ 10752. Definitions governing construction of part

Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin,

but does not include a
gallons per minute.

(c) "Groundwater extr
extraction of groundwa

(d) "Groundwater mar
describes the activities i
program.

(e) "Groundwater mana
and ongoing activity un
portion of a groundwate
adopted pursuant to thi

(f) "Groundwater rech
natural or artificial mea

(g) "Local agency" mea
to all or a portion of it
formed by local public

***(h) "Recharge area" m
groundwater basin and***

***(i) "Watermaster" mea
other provisions of law.***

***(j) "Wellhead protectio
rounding a water well o
which contaminants ar
well field.***

Added Stats 1992 ch 947 § 2 (A

Former Sections:

Former § 10752, similar to prese
1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: Added (1) ",
provided water service" in subd

Historical Derivation:

Former § 10751, as added Stats

Section

§ 10753. Authorization

(a) Any local agency, v

but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, *and includes a joint powers authority formed by local public agencies that provide water service.*

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 2 (AB 1152).

Former Sections:

Former § 10752, similar to present § 10753, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: Added (1) ", and includes a joint powers authority formed by local public agencies that provided water service" in subd (g); and (2) subds (h)—(j).

Historical Derivation:

Former § 10751, as added Stats 1991 ch 903 § 1.

CHAPTER 3

Groundwater Management Plans

Section

§ 10753. Authorization to adopt and implement plan

(a) Any local agency, whose service area includes a groundwater basin, or a

portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, *that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service,* may exercise the authority of this part within a groundwater basin *that is located within its boundaries within areas that are either* of the following:

(1) *Not served* by a local agency.

(2) *Served by a local agency whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8.*

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 3 (AB 1152).

Former Sections:

Former § 10753, similar to present § 10753.2, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: (1) Amended the introductory clause of subd (b) by (a) adding "that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service,"; and (b) substituting "that is located within its boundaries within areas that are either" for "if both" near the end of the clause; and (2) substituted subds (b)(1) and (b)(2) for former subds (b)(1) and (b)(2) which read: "(1) Water service is not provided by a local agency.

"(2) The local public agency provides flood control, groundwater quality management, or groundwater replenishment."

Historical Derivation:

Former § 10752, as added Stats 1991 ch 903 § 1.

§ 10753.2. Hearing on adoption of resolution of intention

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10753, as added Stats 1991 ch 903 § 1.

§ 10753.3. Publication of resolution of intention; Copy

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request,
with a copy of the resolu
Added Stats 1992 ch 947 § 2 (AB
Historical Derivation:
Former § 10754, as added Stats 19

§ 10753.4. Preparation ar

The local agency shall pr
years of the date of the a
not adopted within two y
may be adopted except p
accordance with this cha
Added Stats 1992 ch 947 § 2 (AB

§ 10753.5. Hearing on ad

(a) After a groundwater r
hold a second hearing to
hearing shall be given pur
notice shall include a sun
plan may be obtained for
agency.

(b) At the second hearin
adoption of the plan. At a
ing, any landowner with
withdraw a protest previo
Added Stats 1992 ch 947 § 2 (AB
Historical Derivation:
Former § 10755, as added Stats 19

§ 10753.6. Protest by lan

(a) A written protest file
signature and a descriptio
A public agency owning l
making a written protest.

(b) The secretary of the l
descriptions on the prote
county assessors.

(c)(1) A majority protest
of the local agency finds t
conclusion of the second
sessed value of the land
management pursuant to

(2) If the local agency det
water plan may not be ad
ing a plan for the area p
period of one year after th

(3) If a majority protest h
after the conclusion of t
management plan.

Added Stats 1992 ch 947 § 2 (AB
Historical Derivation:
Former §§ 10756, 10757, as added

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10754, as added Stats 1991 ch 903 § 1.

§ 10753.4. Preparation and adoption of plan

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.5. Hearing on adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10755, as added Stats 1991 ch 903 § 1.

§ 10753.6. Protest by landowner

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c)(1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former §§ 10756, 10757, as added Stats 1991 ch 903 § 1.

§ 10753.7. Components of plan

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.8. Adoption of rules and regulations

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.9. Consideration of impact of rules and regulations on business activities

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

Added Stats 1992 ch 947 § 2 (AB 3030).

CHAPTER 4

Finances

Section

§ 10754. Authority ; assessments

For purposes of gı groundwater manag water replenishmen 60220) of Division groundwater manag tion 60300) of Divis

Added Stats 1992 ch 947 §

Former Sections:

Former § 10754, similar to 1992 ch 947 § 1 (AB 3030)

Historical Derivation:

Former § 10760, as added

§ 10754.2. Fees and

(a) Subject to Sectic agency that adopts may impose equitab ment based on the basin within the arc for costs incurred b ing, but not limited ment water, admini capital facilities nec

(b) The local agenc and replacement ol program required by *with the local agenc*

Added Stats 1992 ch 947 §

Amendments:

1993 Amendment: Added " (b).

Historical Derivation:

Former § 10759, as added

§ 10754.3. Election

Before a local agenc Section 10754.2 or extraction of grounc an election on the authorized to levy a fees for the replenis shall be so authorizc of the proposition. T by the laws applicabl then as prescribed b conducted only wit subject to groundwa

Added Stats 1992 ch 947 §

Historical Derivation:

Former § 10761, as added S

§ 10754. Authority as water replenishment district to fix and collect fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10754, similar to present § 10753.3, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Historical Derivation:

Former § 10760, as added Stats 1991 ch 903 § 1.

§ 10754.2. Fees and assessments based on amount of groundwater extracted

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law *or a groundwater storage contract with the local agency.*

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 4 (AB 1152).

Amendments:

1993 Amendment: Added "or a groundwater storage contract with the local agency" at the end of subd (b).

Historical Derivation:

Former § 10759, as added Stats 1991 ch 903 § 1.

§ 10754.3. Election granting authorization

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10761, as added Stats 1991 ch 903 § 1.

CHAPTER 5

Miscellaneous

Section

§ 10755. Annexation of land subject to plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10755, similar to present § 10753.5, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Historical Derivation:

Former § 10764, as added Stats 1991 ch 903 § 1.

§ 10755.2. Coordinated plan; Joint powers agreement; Agreement with public or private entities

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with *public entities or* private parties for the purpose of implementing a coordinated groundwater management plan.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 5 (AB 1152).

Amendments:

1993 Amendment: Added "public entities or" in subd (a).

Historical Derivation:

Former § 10758, as added Stats 1991 ch 903 § 1.

§ 10755.3. Meetings

Local agencies with programs within tha *either manage grou to groundwater with* those programs.

Added Stats 1992 ch 947 §

Historical Derivation:

Former § 10763, as added S

§ 10755.4. Exceptio

Except in those gro groundwater overdr revised on Decembe ment plan that is i extraction of ground is used to provide w if applicable, any dw tion 65852.1 or 6585

Added Stats 1992 ch 947 § :

§§ 10756–10766. [Se

Added Stats 1991 ch 903 § 1 10750.8, 10750.10, 10753.6,

§ 10767. [Section rep

Added Stats 1991 ch 903 § related to effect of part on s

Agric

[Added

Chapter

Section

§ 10800. (Operative te

This part shall be k Management Planning

Added Stats 1986 ch 954 § 1.

§ 10755.3. Meetings to coordinate programs

Local agencies within the same groundwater basin that conduct groundwater programs within that basin pursuant to this part, *and cities and counties that either manage groundwater pursuant to this part or have ordinances relating to groundwater within that basin,* shall, at least annually, meet to coordinate those programs.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1995 ch 833 § 2 (SB 1305).

Historical Derivation:

Former § 10763, as added Stats 1991 ch 903 § 1.

§ 10755.4. Exception to application of requirements of plan

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118-80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

Added Stats 1992 ch 947 § 2 (AB 3030).

§§ 10756–10766. [Sections repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). See §§ 10750.2, 10750.7, 10750.8, 10750.10, 10753.6, 10754, 10754.2, 10754.3, 10755, 10755.2, 10755.3.

§ 10767. [Section repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). The repealed section related to effect of part on specified duties of local agencies.

PART 2.8

Agricultural Water Management Planning

[Added Stats 1986 ch 954 § 1, operative term contingent.]

Chapter

CHAPTER 1

General Declarations and Policy

Section

§ 10800. (Operative term contingent) Citation of part

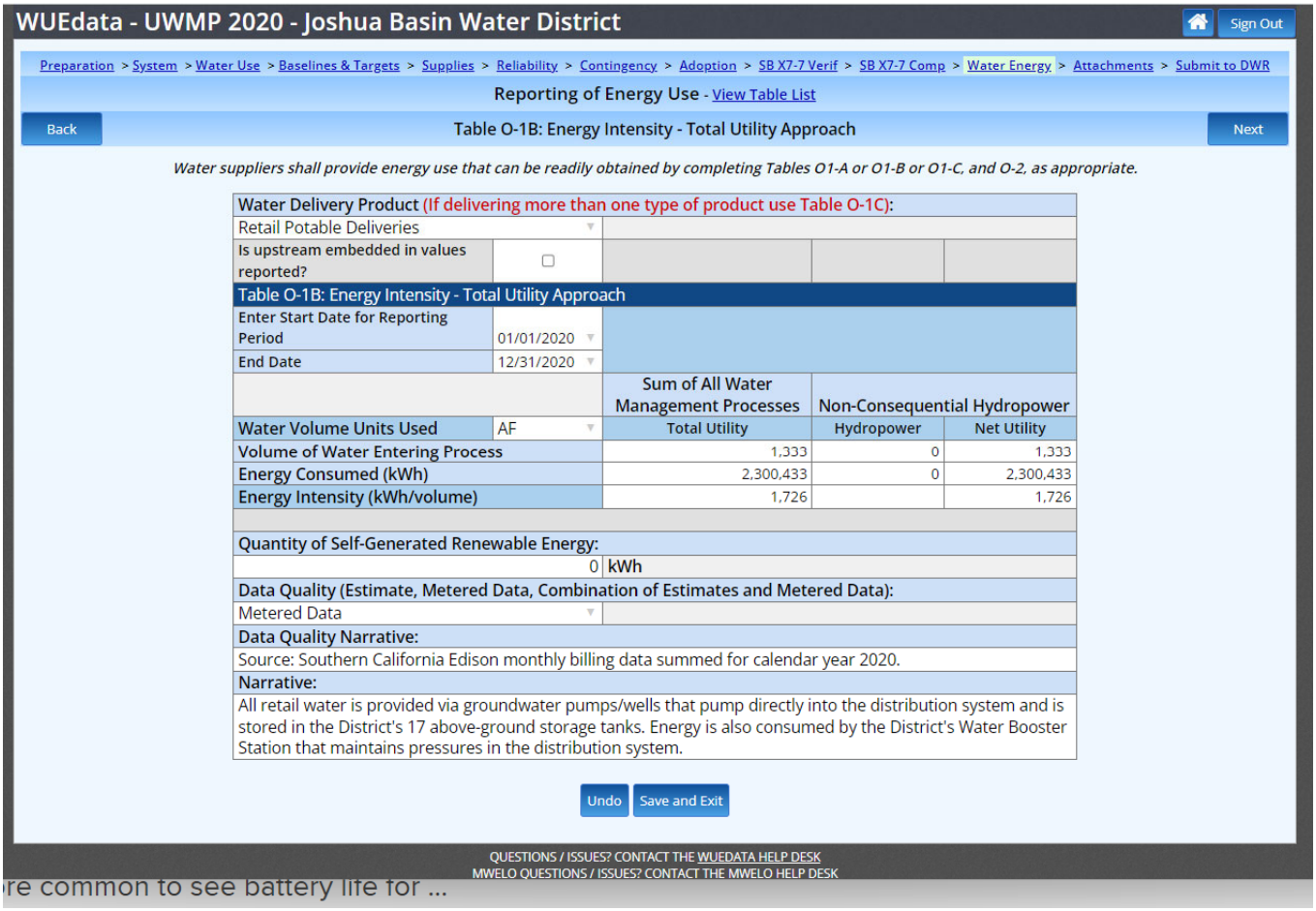
This part shall be known and may be cited as the Agricultural Water Management Planning Act.

Added Stats 1986 ch 954 § 1, operative term contingent.

Appendix I: Energy Reporting

APPENDIX I

Joshua Basin Water District
2020 Urban Water Management Plan
Energy Intensity Reporting



WUEdata - UWMP 2020 - Joshua Basin Water District

Sign Out

Preparation > System > Water Use > Baselines & Targets > Supplies > Reliability > Contingency > Adoption > SB X7-7 Verif > SB X7-7 Comp > Water Energy > Attachments > Submit to DWR

Reporting of Energy Use - View Table List

Back | Table O-1B: Energy Intensity - Total Utility Approach | Next

Water suppliers shall provide energy use that can be readily obtained by completing Tables O1-A or O1-B or O1-C, and O-2, as appropriate.

Water Delivery Product (If delivering more than one type of product use Table O-1C):				
Retail Potable Deliveries				
Is upstream embedded in values reported?	☐			
Table O-1B: Energy Intensity - Total Utility Approach				
Enter Start Date for Reporting Period	01/01/2020			
End Date	12/31/2020			
		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process		1,333	0	1,333
Energy Consumed (kWh)		2,300,433	0	2,300,433
Energy Intensity (kWh/volume)		1,726		1,726
Quantity of Self-Generated Renewable Energy:				
0	kWh			
Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data):				
Metered Data				
Data Quality Narrative:				
Source: Southern California Edison monthly billing data summed for calendar year 2020.				
Narrative:				
All retail water is provided via groundwater pumps/wells that pump directly into the distribution system and is stored in the District's 17 above-ground storage tanks. Energy is also consumed by the District's Water Booster Station that maintains pressures in the distribution system.				

Undo | Save and Exit

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

re common to see battery life for ...