K. Water Supply Assessment

This page intentionally left blank.

Water Supply Assessment

Hive Live Development

Developers: Legacy Partners, Foster City, CA
Invesco Atlanta, GA

July, 2024

WEST&ASSOCIATES
ENGINEERING, INC.

Water Supply Assessment
Hive Live Development

Mesa Water District
Engineering Department
1965 Placentia Avenue,
Costa Mesa, CA 92627
(949) 631-1200

Developers
Legacy Partners
950 Tower Lane, Suite 900
Foster City, CA 94404
(650) 571-2250

Invesco - Global Headquarters
1331 Spring Street NW, Suite 2500
Atlanta, GA 30309
(800) 241-5477

Prepared by:

West & Associates Engineering, Inc.
78 Anacapa Ct
Foothill Ranch, CA 92610

July, 2024

TABLE OF CONTENTS

Section 1: Executive Summary

Section 2: Proposed Development

Section 3: Water Supply

Section 4: Water Demand

Section 5: Water Supply vs. Demand Analysis

Section 6: Water-Use Efficiency Strategies

Section 7: Summary

Appendices

List of Tables

List of Tables (Cont.)

List of Figures

THIS PAGE LEFT BLANK INTENTIONALLY

Section 1: Executive Summary

The purpose of this report is to provide an evaluation of the adequacy of total existing and future water supplies available to serve the proposed Hive Live Development (Development). This Water Supply Assessment anticipates adequate water will be available to the Development during normal, single dry, and multiple dry water years during a 20-year projection. A Water Supply Assessment (WSA) is mandated by state law by Public Resource Code Section 21080, Senate Bill 610 (SB 610), Water Code Section 10910 et seq., and Senate Bill 221 (SB 221), Government Code Section 66473.7, for any project that falls within one of seven (7) categories of "projects" as defined under Water Code Section 10912. This code includes residential sites with more than 500 dwelling units, which applies to this Development.

1.1 SCOPE OF WATER SUPPLY ASSESSMENT

The Mesa Water District (Mesa Water) provides domestic water services to most of the City of Costa Mesa, portions of the City of Newport Beach and a small portion of unincorporated

Orange County, with a total water service area of 18 square miles. Mesa Water would provide water to all portions of the Development. This WSA documents sources of water supply, quantifies water demands, evaluates drought impacts, and provides a comparison of water supply and demand, and "will-serves" as the basis for Mesa Water to determine if adequate water will be available during normal, single dry, and multiple dry water years during a 20-year projection to meet the projected water demand associated with the Development. The Development is described in more detail later in this Section.

References used in this WSA include:

- *2020 Urban Water Management Plan*, Mesa Water, June 2021.
- *2015 Urban Water Management Plan*, Mesa Water District, June 2016.
- *One Metro West – Water Supply Assessment*, Mesa Water District, Oct. 2019.
- *Water Supply, Energy, and Supply Chain Reliability Assessment*, Mesa Water, Nov. 2020.
- *2022-2023 Engineer's Report on Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District*, OCWD, February 2024.
- *Hive Live - Project Summary and Conceptual Site Plan* AO, May 2024.
- *California State Water Resources Control Board – Drought Report (2023),* Mesa Water, May 2024.
- *California State Water Resources Control Board – electronic Annual Report (eAR) to the Division of Drinking Water (2016-2022),* Mesa Water District.
- *Basin 8-1 Alternative*, Orange County Water District, City of La Habra, Irvine Ranch Water District, January 2017.

In summary, this WSA was prepared for consideration by Mesa Water, as the lead agency under the California Environmental Quality Act (CEQA) for the environmental review of the Development. The WSA will be included in Mesa Water's Environmental Impact Report (EIR) for the Development to provide information regarding the impacts of supplying the Development with water, confirming the sufficiency and certainty of the water supply, and, if necessary, discussing alternative water sources.

Section 2: Proposed Development

The Hive Live Development (Development), is located within the City of Costa Mesa near the northwest corner of the City, near its border with the City of Santa Ana. The Development proposes a general plan amendment to rezone certain areas currently designated as industrial park to uses that are a mixture of high-density residential, commercial, and open space.

2.1 PROPOSED DEVELOPMENT

The Development site is comprised of **14.3 acres** of land within Mesa Water's Third (3rd) District, as shown in **Figure 1**. Although the Hive Live Specific Plan is currently unavailable and the Environmetal Impact Report (EIR) is currently underway, the Architect, AO, provided the *Hive Live - Project Summary and Conceptual Site Plan*. This document shows the Development establishes 1,050 units consisting of three (3) separate 5-story multifamily residential buildings, Buildings A, B, and C, with Building A containing a roof deck and a mixed-use component, including an art gallery, retail, and public plaza. Each Building also includes various amenities, a

leasing office, and a mail room, which for this WSA will be considered as commercial use, as well as numerous outdoor courtyards and plazas, which for this WSA will be considered as open space (irrigation) use. The total site coverage is 336,500 square feet (SF) and the total gross building area is 1,876,000 SF. The Development's total area of high-density residential use is 1,211,915 SF, 41,056 SF of commercial use, and 284,225 SF of open space (irrigation) use.

Building A contains 315 housing units with a total floor space of 383,000 SF, 22,500 SF of commercial (including 3,692 SF of retail), and approximately 94,700 SF of open space (irrigation). Building B contains 346 housing units with a total floor space of 388,300 SF, 9,300 SF of commercial, and approximately 94,700 SF of open space (irrigation). Building C contains 389 housing units with a total floor space of 441,000 SF, 9,300 SF of commercial, and approximately 94,700 SF of open space (irrigation).

2.2 DEVELOPMENT LOCATION

The Development is in Costa Mesa, Orange County, on approximately **14.3 acres** located north of Interstate 405 (I-405) and south of the border of Cities Costa Mesa and Santa Ana. The Development borders along Sunflower Avenue to the north, Susan Street to the east, South Coast Drive to the South, and an adjacent property to the west. One (1) of Mesa Water's groundwater wells is located along the northwestern corner of the Development, within the same parcel as the Development but will protected in place. A Location Map/Aerial Photo of the Development is included in **Figure 1**.

2.3 EXISTING LAND USE

The Development is proposed on the land that was previously identified as "The Hive", that has held the local operations for the Los Angeles Chargers along with other office tenants. The Development proposes to replaces these industrial park uses with high density residential, commercial, and open space uses.

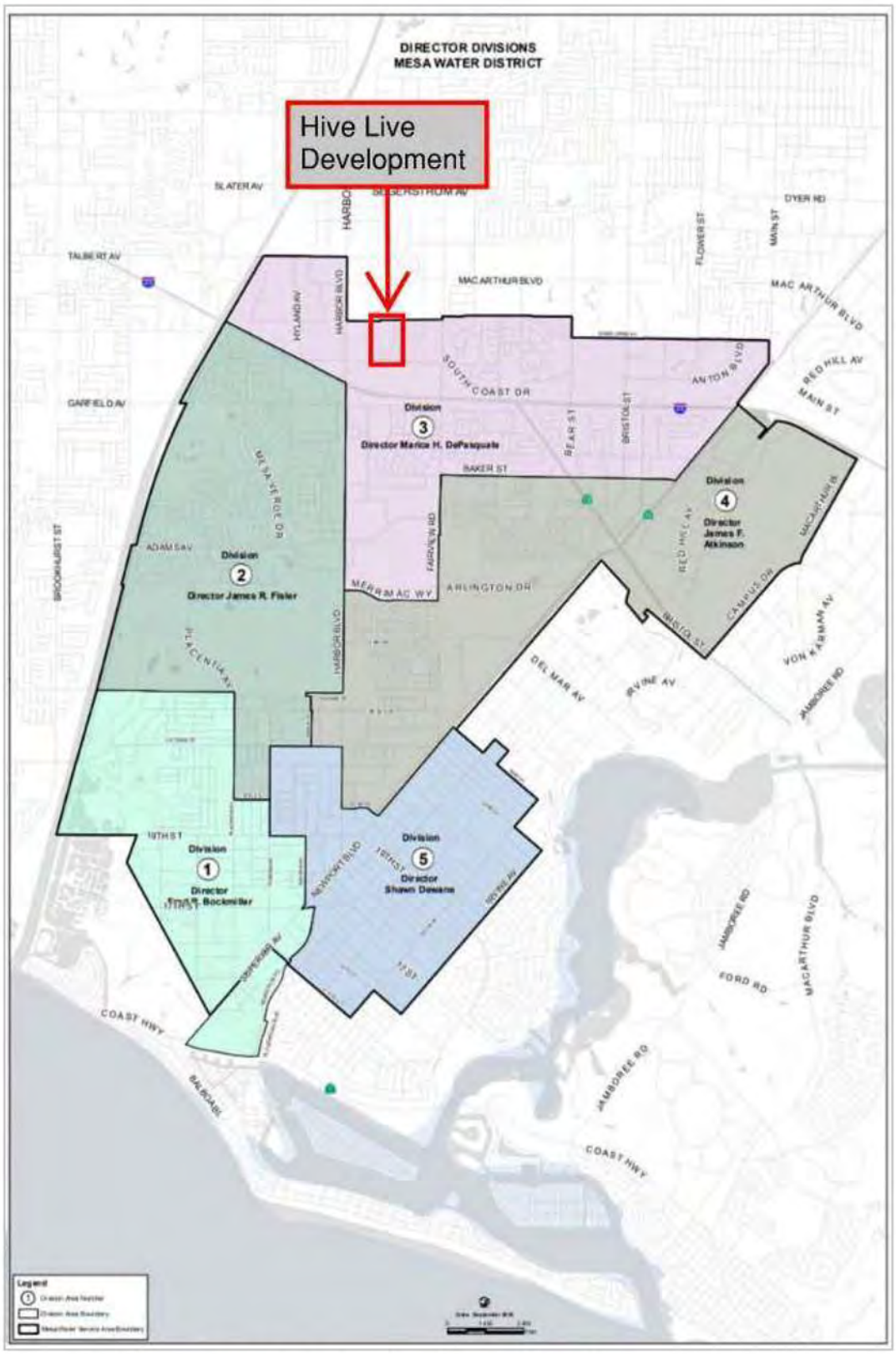


Figure 1: Mesa Water - Water Service Area and Development Site

The 2020 UWMP projected Mesa Water's water use for 2025-2045 broken down by sector based on MWDOC and OCWD led efforts to update water demand projections originally done as part of the 2021 OC Water Demand Forecast for MWDOC and OCWD. The updated demand projections, prepared by CDM Smith, were for the Orange County region as a whole, and provided retail agency specific demands. The projections span the years of 2025-2050 and are based upon information surveyed from each Orange County water agency. The MWDOC regional water demand projection was collaboratively developed between MWDOC and its member agencies. MWDOC's projections were built upon the same model developed by CDM Smith, and took into consideration specific assumptions and projections provided to MWDOC by its member agencies.

2.4 DEVELOPMENT WATER DEMANDS

Mesa Water's 2020 Urban Water Management Plan (2020 UWMP) did not consider the Development. The 2020 UWMP determined "Mesa Water is projected to meet full-service demands through 2045 for the same scenarios." However, because the Development's water demand was not included in the 2020 UWMP, further analysis would be required to determine if Mesa Water would have adequate water supply in future years to accommodate the Development. As such, average day water demand (ADD) for the Development was determined in this WSA as **233 AFY,** for all proposed uses shown below:

- General Commercial Water Demand of **3 AFY**
- Open Space (Irrigation) Water Demand of **18 AFY**
- High-Density Residential Water Demand of **212 AFY**

2.5 EXISTING WATER DEMANDS

The Developments proposed land usage within the Development area differs from the land usage outlined in the City of Costa Mesa's General Plan **(Figure 2)**, which will require City Council adoption of a General Plan Amendment. The biggest difference being residential uses. The City of Costa Mesa's General Plan identifies industrial park uses, whereas the Development proposes a mix of high-density residential, commercial, and open space uses. Since this Development will introduce additional housing that weren't otherwise identified, California

Government Code Section 65583.2 (No Net Loss Law) requirements regarding no net loss of allowable residential capacity will not be adhered to. Furthermore, in order to provide a more conservative analysis and due to the lack of existing water demand data for the existing site, this WSA **will not** consider the existing demand for the 14.3 acres of industrial park that will no longer be used. This demand was quantified as **48 AFY**.

2.6 PROJECTED DEMANDS

Projected water demands for the proposed Development include general commercial, open space (irrigation), and high-density residential. In order to compare the Development's water demand to the projected supply and demands, the *Hive Live - Project Summary and Conceptual Site Plan* was used to determine the acres per land use and housing units multiplied by a water demand factor (WDF) to determine the total projected water demand. WDF is defined as the estimated amount of water usage per area for a certain land-use type. WDFs are typically expressed in **gallons per day per acre (gpd/ac)**. These factors are used to estimate the Average Day Demand (ADD) for potential development areas by multiplying the WDF with the total number of acres for each land-use category. The maximum day water demand (MDD) can then be determined by multiplying the ADD by 1.5, and peak hour demand (PHD) by further multiplying the MDD by 1.5. These values are shown in **Tables 1** and **2.**

As shown in as shown in **Tables 1** and **2**, the *One Metro West – Water Supply Assessment* determined a water demand factor of 3,000 gallons per day per acre (gpd/acre) for the existing industrial sector, 2,400 gpd/acre for the open space (irrigation) sector, 2,500 gpd/acre for the general commercial sector, and 180 gpd/DU for the high-density Residential sector. According to the *One Metro West – Water Supply Assessment*, these values were based on demand factors and peaking factors established in Mesa Water's *2014 Water Master Plan,* except for open space (irrigation) and high-density residential. Michael Baker estimated a separate irrigation demand factor for the One Metro West development based off industry standards in similarly developed cities. Using the published demand factor would result in demands being artificially lower than can generally be expected from a development of this size. Michael Baker developed a modified demand factor to account for the discrepancy between the land use density and the actual development density.

When the WDF is multiplied by the area of each respective sector shown in **Tables 1** and **2**, the MDD for the existing industrial sector is therefore 64,100 gpd or 72 AFY (This WSA will not consider the existing demand), 39,150 gpd or 44 AFY for the open space (irrigation) sector, 3,500 gpd or 4 AFY for the general commercial sector, 283,500 gpd or 318 AFY for the high-density Residential sector.

Table 1 - Existing Water Demand

Land Use Type	WDF [1] (gpd/acre)	DU [2]	Area [2] (acre)	ADD		MDD		Peak Hour Demand (gpm)
				(gpd)	(AFY)	(gpd)	(AFY)	
Industrial (Existing)	3,000		14.3	42,800	48	64,100	72	66.8

WDF: Water Demand Factor ADD: Average Day Water Demand MDD: Maximum Day Water Demand

(1) Source: One Metro West – Water Supply Assessment.

(2) Source: Hive Live - Project Summary and Conceptual Site Plan.

Table 2 - Development Water Demand

Land Use Type	WDF [1] (gpd/acre) or (gpd/ DU)	DU [2]	Area [2] (acre)	ADD		MDD		Peak Hour Demand (gpm)
				(gpd)	(AFY)	(gpd)	(AFY)	
Open Space Irrigation	2,400		6.5	15,700	18	39,150	44	72.6
General Commercial	2,500		0.9	2,400	3	3,500	4	3.7
High-Density Residential	180	1,050	-	189,000	212	283,500	318	295.3
Total (Development)[3,4]	-	**1,050**	**7.44**	**207,000**	**233**	**326,200**	**366**	**371.6**

WDF: Water Demand Factor ADD: Average Day Water Demand MDD: Maximum Day Water Demand

(1) Source: One Metro West – Water Supply Assessment.

(2) Source: Hive Live - Project Summary and Conceptual Site Plan.

(3) This WSA will not consider the existing demand.

Using the WDF method the overall on-site Development MDD is estimated to be **366 AFY** as shown in **Table 2**. This value will be used later in the WSA to conservatively analyze water supply capacities for normal, single-dry, and multiple dry water years (**Tables 20 through 26**).

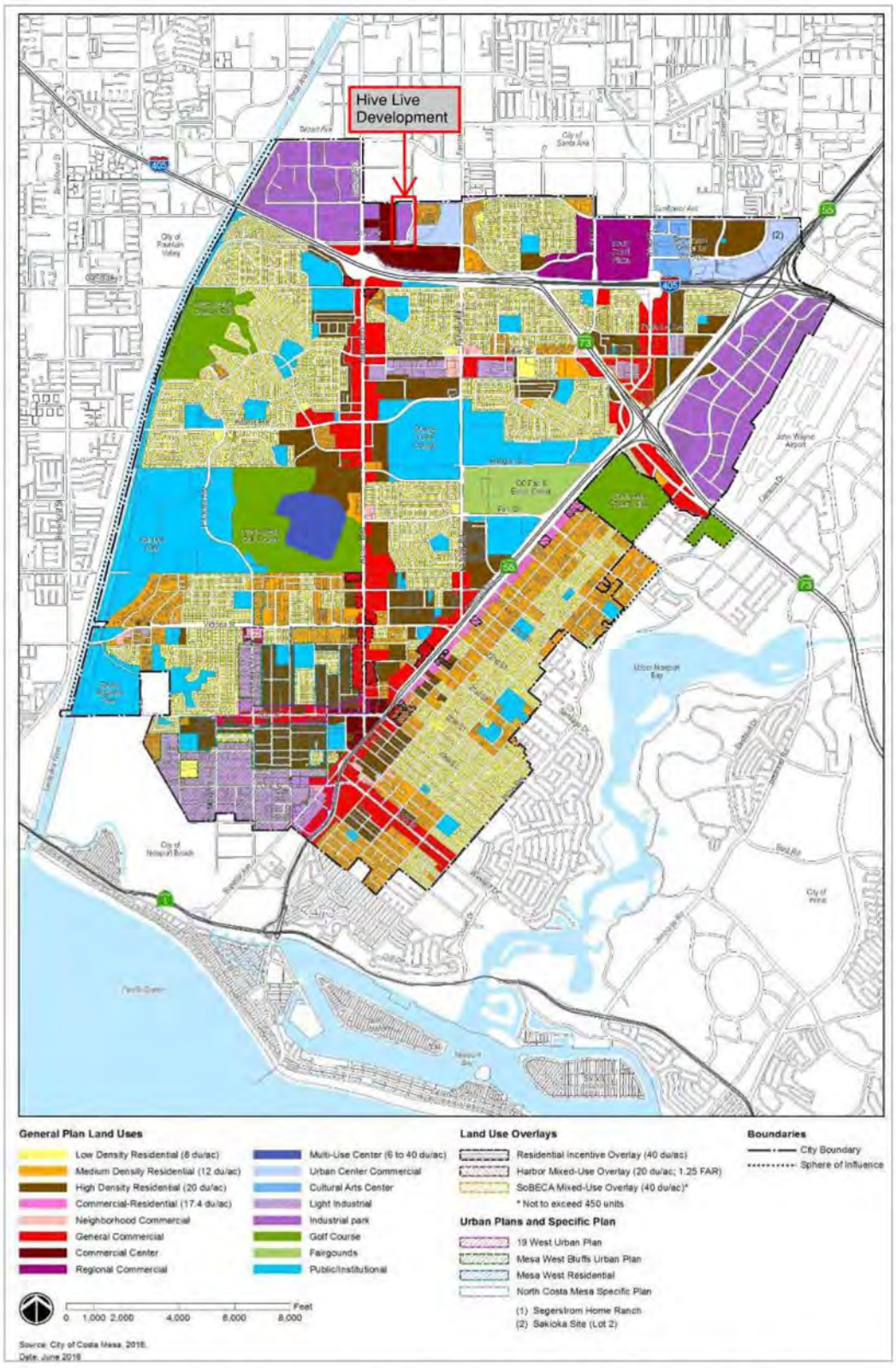


Figure 2: Existing General Plan Land Use Designations

Figure 3. Proposed Site Plan

Section 3: Water Supply

Mesa Water's water supply is obtained entirely from local groundwater from the Orange County Groundwater Basin (OC Basin), and recycled water from the Orange County Water District (OCWD), with the imported potable water supply obtained from its regional wholesaler, Municipal Water District of Orange County (MWDOC) as an emergency backup. Groundwater is pumped through seven (7) clear wells with a combined capacity of 15,200 gpm or 24, 500 AFY and two (2) amber-tinted wells with a combined capacity of 6,000 gpm or 9, 700 AFY through the Mesa Water Reliability Facility (MWRF). The OC Basin is recharged through Santa Ana River stormflow, natural incidental recharge, Santa Ana River baseflow, Groundwater Replenishment System (GWRS) supplies, and other supplies such as imported water and recycled water purchased for the Alamitos Barrier. This Section describes in further detail the current and projected water resources available to Mesa Water for this WSA.

3.1 WATER SUPPLY SOURCES

Mesa Water is within the boundaries of the OC Basin, which has been subdivided by OCWD into three major aquifer systems, the shallow aquifer system, the principal aquifer system, and the deep aquifer system, within which Mesa Water is located (**Figure 5**). Mesa Water pumps and treats groundwater from both the principal and deep aquifer, which makes Mesa Water one of the few agencies to do so (**Figure 4**). The OC Basin, managed by OCWD, covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The OC Basin boundary extends to the Orange County-Los Angeles Line to the northwest, where groundwater flows across the county line into the Central Groundwater Basin of Los Angeles County. The total thickness of sedimentary rocks in the OC Basin is over 20,000 feet, with only the upper 2,000 to 4,000 feet containing fresh water. The OC Basin's full volume is approximately 66 MAF.

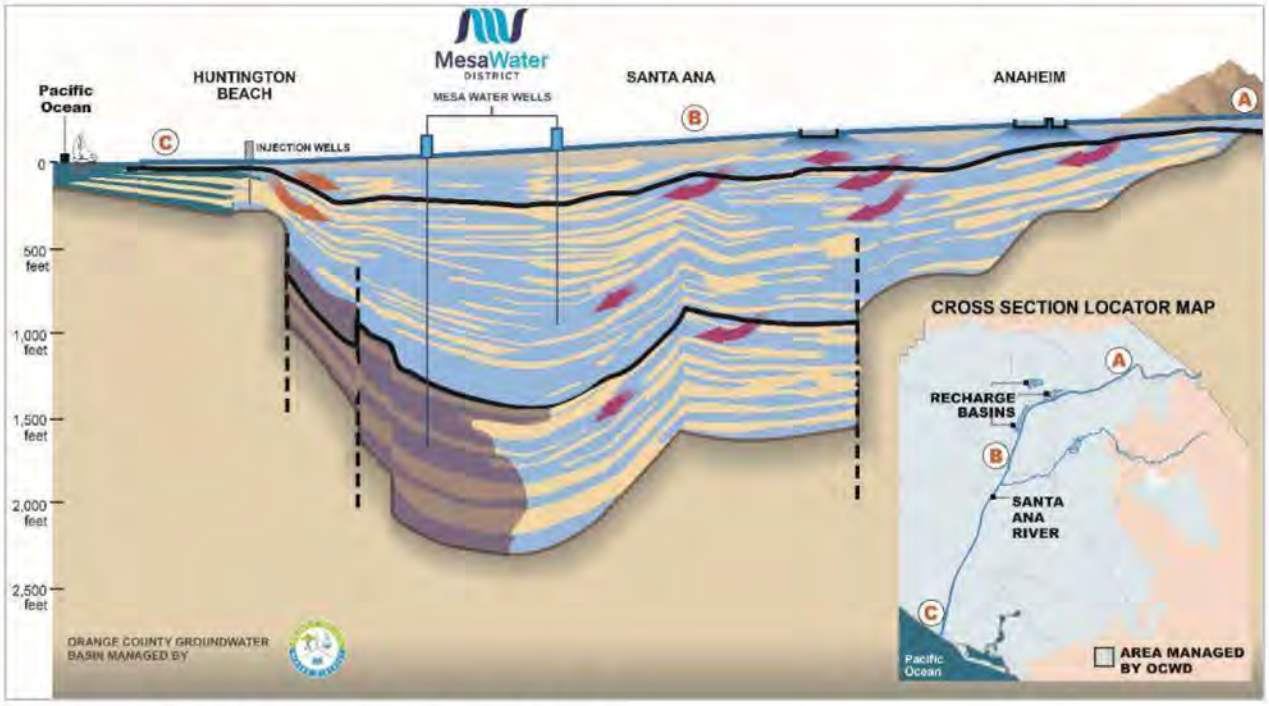


Figure 4. Orange County Groundwater Basin

3.2 GROUNDWATER PRODUCTION

As mentioned previously, Mesa Water's water is obtained entirely from the OC Basin through seven (7) clear wells (Well 1, Well 3, Well 5, Well 7, Well 9, Well 12, and Well 14) with the ability to pump from the principal aquifer system and two (2) amber-tinted water wells (Well 6 and Well 11) that pump from the deep aquifer system. The combined pumping capacity of all groundwater wells is **21,200 gpm or 34,200 AFY**. The ground water production for the previous 8-years (2016 to 2023) is contained in **Table 3**.

Table 3: Historic Groundwater Production (AFY) [(1) (2)]

Basin Name	2016	2017	2018	2019	2020	2021	2022	2023
Orange County Groundwater Basin (OC Basin)	15,208	11,706	13,120	13,289	16,251	16,192	15,999	14,776
Average (2008-2015): 14,568 AFY								

Source (1): Mesa Water's California State Water Resources Control Board – Drought Report (2023)
Source (2): Mesa Water's California State Water Resources Control Board – electronic Annual Report (eAR) to the Division of Drinking Water (2016-2022).

3.3 PROJECTED GROUNDWATER SUPPLY

As stated previously in this chapter, due to its reliance on local groundwater and recycled water sources, Mesa Water has not experienced any actual supply deficiencies, even during multiple drought years. According to the 2020 UWMP, *"Mesa Water is confident that water supplies are adequate to meet demands for all weather conditions through 2045."* With the local groundwater reserves available to Mesa Water **during the development of the 2020 UWMP**, Mesa Water did not anticipate any water shortages. However, this WSA must account for the Development's estimated demand data over the next 20 years (through 2045). **Table 4** below shows Mesa Water's projected water supplies and available volumes, based off the values reflected in *2020 UWMP DWR Submittal Table 6.*

Table 4: Projected Water Supply Availability (AF)

Water Supply	Year				
	2025	2030	2035	2040	2045
Groundwater (OC Basin)	16,354	18,009	19,001	19,376	19,751
Recycled Water (GAP)	1,100	1,100	1,100	1,100	1,100
Purchased Water (MWDOC)	0	0	0	0	0
Total Available Supply	**17,454**	**19,109**	**20,101**	**20,476**	**20,851**

3.4 GROUNDWATER MANAGEMENT

The Sustainable Groundwater Management Act (SGMA), passed by the California Legislature in 2014, is an effort to regulate the use of groundwater in the state so that it is sustainable into the distant future. The Act requires all medium and high priority basins (the OC Basin is a medium priority basin) to develop a Groundwater Sustainability Plan by January 2022. The contents of this plan are prescriptive and well defined by the Act. Major components of each plan are a water budget for the subbasin, a hydrogeological conceptual model of the subbasin, and a stakeholder outreach plan.

Specifically, if a proposed development/project and/or subdivision will obtain water from a basin that is designated as medium- or high-priority under Act, the following must be included in the Water Supply Assessment:

- Information as to whether the Department of Water Resources has identified the basin as being subject to critical conditions of overdraft; and
- A copy of the Groundwater Sustainability Plan or Alternative Plan if a Groundwater Sustainability Agency has adopted such a plan.

According to the Department of Water Resources, the OC Basin is not identified as being subject to conditions of critical overdraft. The OC Basin has three Groundwater Sustainability Agencies (Orange County Water District, City of La Habra, Irvine Ranch Water District) and all three

worked together to produce one Alternative Plan that satisfies the objectives of SGMA and does not require a Groundwater Sustainability Plan. An analysis of basin conditions demonstrated that the OC Basin has operated within its sustainable yield over a period of at least 10 years from the date it was submitted on December 2016. The various water agencies that overlie the OC Basin include the following ten Divisions of OCWD:

Table 5: Orange County Water District Divisions

Division Number	City
1	Garden Grove, Stanton, Westminster
2	Orange, Villa Park, and parts of Tustin
3	Buena Park, La Palma, Placentia, Yorba Linda, and parts of Cypress
4	Los Alamitos, Seal Beach, and parts of Buena Park, Cypress, Garden Grove, Huntington Beach, Stanton, and Westminster
5	Parts of Irvine and Newport Beach
6	Parts of Fountain Valley and Huntington Beach
7	Costa Mesa and parts of Fountain Valley, Irvine, Newport Beach and Tustin
8	Santa Ana
9	Anaheim
10	Fullerton

Source: Orange County Water District, City of La Habra, Irvine Ranch Water District - Basin 8-1 Alternative

3.5 IMPORTED WATER

Mesa Water is able to purchase State Water Project (SWP), Colorado River, and in-region storage water from MET / MWDOC, one of 29 state water agencies with a SWP Water Supply Contract with the State Department of Water Resources (DWR). However, Mesa Water maximizes local water supply use first, as outlined in this Section. Quantities of water obtained from MET / MWDOC for 2016-2023 are set forth in **Table 6**.

Table 6: Historic MET / MWDOC Water Purchases (AF)

Year	Purchases (AF) [1] [2]
2016	270
2017	5,095
2018	3,910
2019	2,453
2020	29
2021	67
2022	13
2023	0
Average (2008-2015):	**1,480**

(1) Source: Mesa Water's California State Water Resources Control Board – Drought Report (2023)
(2) Source: Mesa Water's California State Water Resources Control Board – electronic Annual Report (eAR) to the Division of Drinking Water (2016-2022).

Over the next 20 years it is projected that Mesa Water will continue to be 100% reliable on local supplies, instead of imported water. The projected 2045 water supply portfolio is 95% groundwater and 5% recycled water (**Table 4**). Note that these representations of supply match the projected demand. However, though not expected, Mesa Water can purchase MET water through MWDOC should the need arise.

Table 7: Projected MET / MWDOC Water Purchases (AF)

Year	Purchases (AF)
2025	0
2030	0
2035	0
2040	0
2045	0

Source: Mesa Water 2020 UWMP

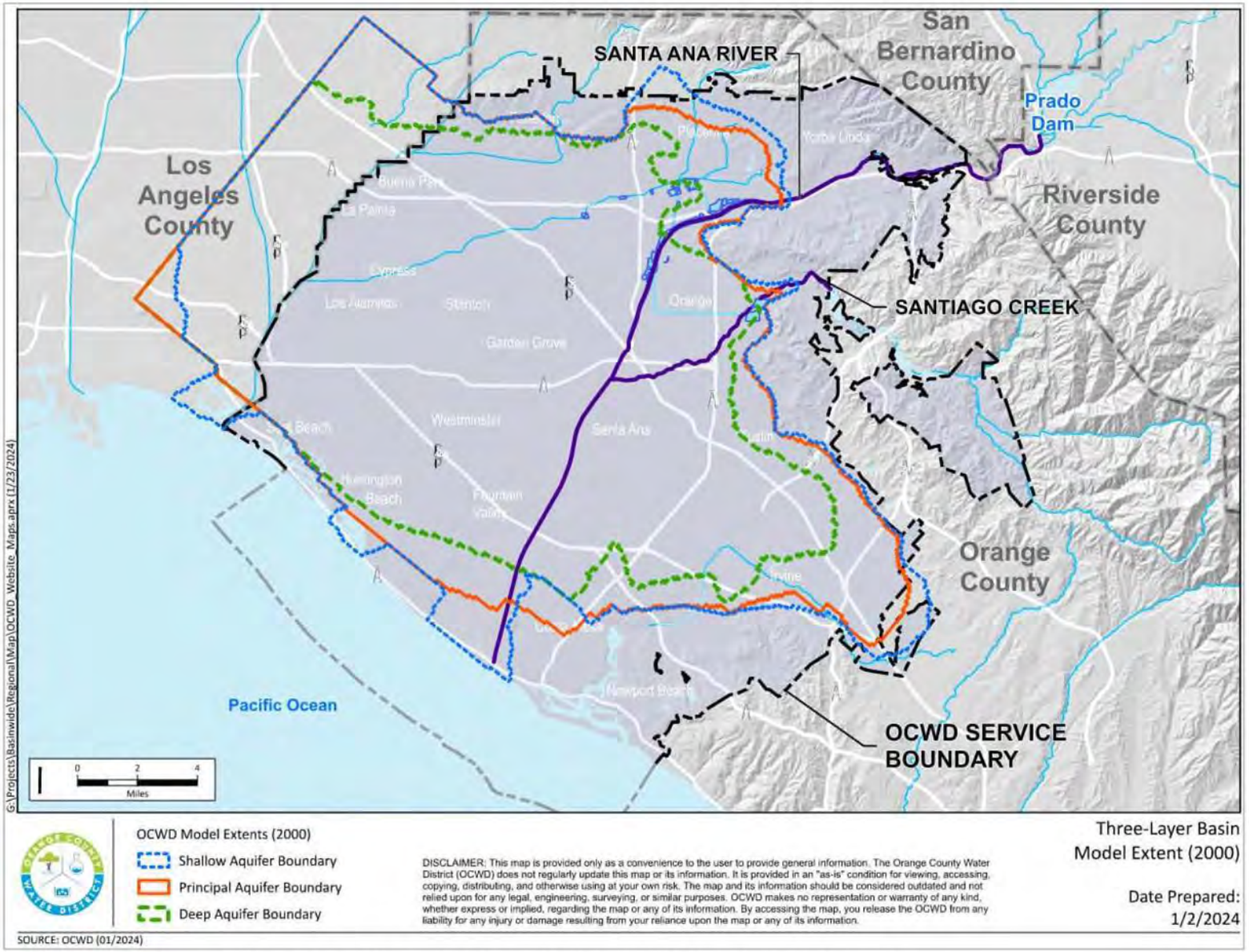


Figure 5: Regional Location of Mesa Water and Other MWDOC Member Agencies

THIS PAGE LEFT BLANK INTENTIONALLY

3.6 RECYCLED/NON-POTABLE WATER

Mesa Water is indirectly involved in recycled water production, through its supply of wastewater for Indirect Potable Reuse (IPR) to the Orange County Sanitation District (OCSD). OCSD then provides advanced treated wastewater to OCWD that, along with imported water and stormwater, is replenished through the OC Basin. OCWD and OCSD have jointly constructed and expanded two water recycling projects including: 1) OCWD GAP, and 2) OCWD Groundwater Replenishment System (GWRS). OCWD's Green Acres Project (GAP) produces recycled water for direct non-potable reuses such as landscape irrigation, with a total capacity of 8,400 AFY. OCWD's GWRS produces recycled water for IPR through the replenishment of the OC Basin.

Mesa Water has forty-three (43) recycled water service connections currently using recycled water from OCWD's GAP. Recycled water customers include the City of Costa Mesa, the County of Orange, Cal Trans, Costa Mesa Country Club, Orange Coast Community College, and several shopping and business centers. Recycled water use accounts for about 6% of annual demand. The recycled water supply for the previous 8-years (2016 to 2023) is contained in **Table 8**.

Table 8: Recent Recycled Water Supply/Use (AFY)

Basin Name	2016	2017	2018	2019	2020	2021	2022	2023
Recycled Water (OCWD GAP)	1,121	1,097	1,080	895	979	980	1,061	790
Average (2016-2023): 1,000 AFY								

Source (1): Mesa Water's California State Water Resources Control Board – Drought Report (2023)
Source (2): Mesa Water's California State Water Resources Control Board – electronic Annual Report (eAR) to the Division of Drinking Water (2016-2022)
Source (3): Mesa Water's Internal Reporting (2017)

3.7 DEVELOPMENT RECYCLED WATER USE

This WSA is not identifying recycled water for use on the Development site, or as a potential supply source during the life of the Development. This is primarily due to the lack of information regarding any potential recycled water use, as well as providing a more conservative analysis. Although, existing recycled water infrastructure does exist along the streets bordering the Development (**Figure 6**). This assumption is further verified by the location of OCWD's GAP recycled water main locations (**Figure 7**). Mesa Water's use of recycled water at the Development would however decrease the demand for potable water used in some irrigation.

Figure 6. Existing Recycled Water Infrastructure

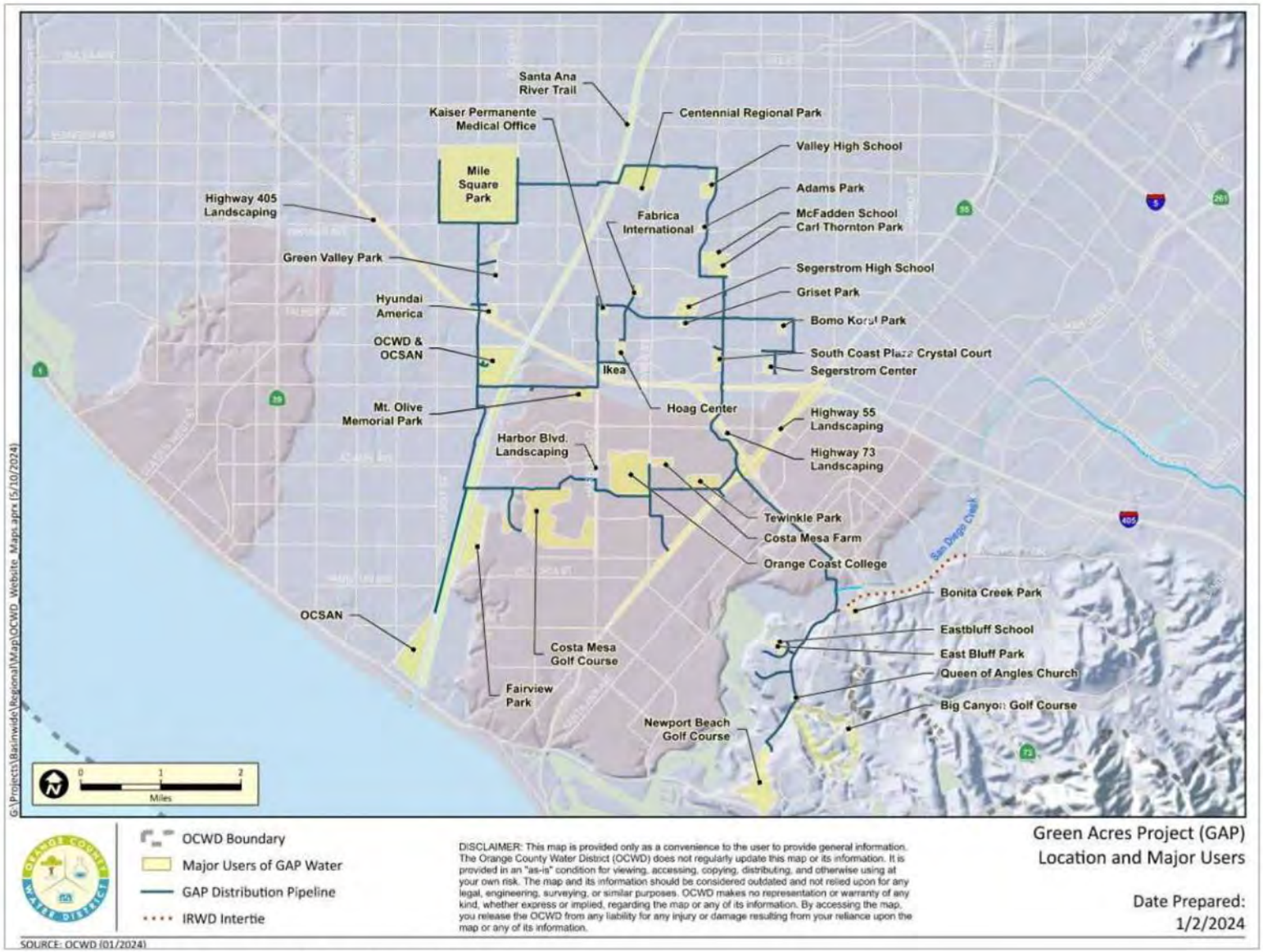


Figure 7: OCWD Green Acres Project (GAP)

THIS PAGE LEFT BLANK INTENTIONALLY

Section 4: Water Demand

4.1 RECENT WATER USE

As a fully developed water service area, water consumption is not subject to significant growth from year to year. However, water use within Mesa Water's service area is variable over the course of a given month or climate conditions. This section explores the water usage trends within and quantifies total usage per customer type.

Overall water use characteristics within Mesa Water's service area reflect slightly lower than average regional water use characteristics within Southern California. Annual water consumption from 2016 to 2023 is listed in **Table 9** on the following page. Water consumption since 2016 has been consistent, as shown. As indicated by **Table 9**, Mesa Water's per capita water use has decreased since the 2020 UWMP due to water conservation.

Table 9: Recent Water Use

Year	Total Consumption (AF)	Population	Per Capita (GPCD)
2016	15,479	113,723	130
2017	16,801	113,640	132
2018	17,030	113,535	134
2019	15,742	114,075	123
2020	16,281	112,635	129
2021	16,258	112,966	128
2022	16,012	113,296	126
2023	14,776	113,627	116
		Average	**127**
		1995-2005 SBx7-7 Baseline Avg. (2020 UWMP)	**179**

4.2 RECENT WATER USE BY SECTOR

Mesa Water records water use per service connection only and bills customers based on a rate structure for commodity charges. Water sales data is compiled by Mesas Water staff and recorded on the DWR Form No. 38 (Public Water System Statistics) and submitted to DWR annually. The total water consumption by customer type since 2016 is shown on **Table 10**.

As noted by **Table 10**, Single-Family and Multi-Family Residential accounts are the highest consuming sectors in Mesa Water since most of Mesa Water is zoned for residential accounts. **Figure 8** also shows the Current Water Demand by Sector (2023). As indicated by **Table 10**, Mesa Water's unaccounted for water averaged 491 AF, which is close to the average real loss from AWWA Water Audit Reports for the same years (446 AFY), and is about 3 percent of the total water supply into Mesa Water's distribution system. Unaccounted for water consists of routine flushing, unmetered use, and water losses. Although water losses have cost impacts on water agencies, they cannot be prevented entirely. Instead, effort is given to controlling the quantity of water losses (to a cost-effective extent) in order to reduce the cost impact of water losses on water operations. For this reason, Mesa Water has prepared water loss audits using AWWA software. The water audits for 2016 to 2019 are provided in the Appendix of the 2020 UWMP. The 2019 Audit shows that Mesa Water's Leakage Index (the ratio of real loss to unavoidable loss) was 0.69, which is an excellent score for water agencies.

Table 10: Recent Water Use by Sector (AF)

Sector	2016	2017	2018	2019	2020	2021	2022	2023
Single Family Residential	4,459	4,688	5,003	4,581	4,868	4,851	4,650	4,223
Multi-Family Residential	4,727	4,773	4,859	4,650	4,932	4,835	4,751	5,041
Commercial/Institutional	3,857	3,913	4,115	3,752	3,170	3,471	3,758	3,408
Industrial	247	271	282	248	242	244	238	224
Landscape Irrigation	1,797	1,549	2,777	1,521	2,589	2,684	2,782	1,252
Other	27	32	14	10	16	31	26	12
Total Water Sales:	**15,113**	**15,226**	**17,049**	**14,763**	**15,816**	**16,116**	**16,205**	**14,159**
Agricultural	0.0	0.0	0.0	3.5	61.9	20.9	3.2	0.7
Unaccounted for Water*	366	1,575	-19	979	464	142	-193	617
Total Water Consumption (Total Supply into System):	**15,479**	**16,801**	**17,030**	**15,742**	**16,281**	**16,258**	**16,012**	**14,776**

**Difference between total supply into system and metered/measured volumes. May not match official AWWA Water Audit Reports as those were done in Fiscal Year, which shows only positive values.*

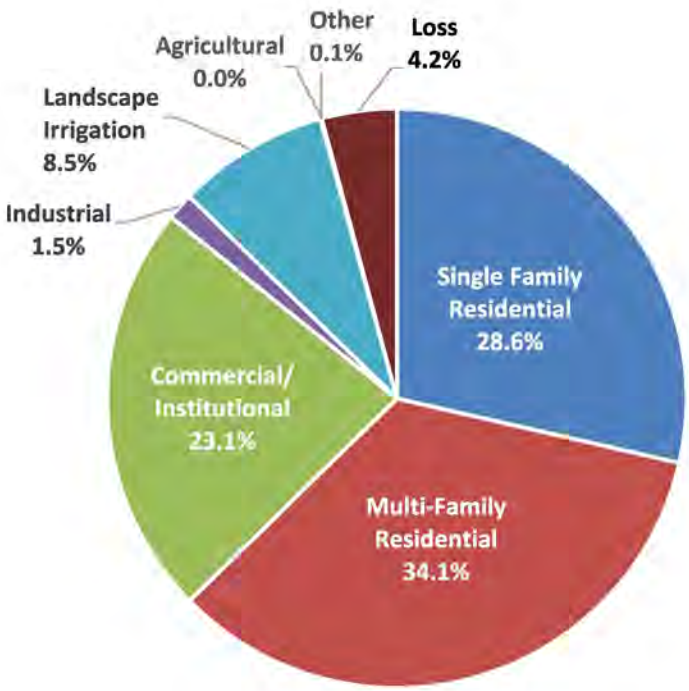


Figure 8: Current Water Demand by Sector (2023)

4.3 WATER DEMAND PROJECTIONS

For planning purposes, Mesa Water's projected water use for 2025-2045 without the Development is broken down by sector in **Table 11,** while **Table 12** includes the Development**.** The estimates per sector are based on the projections the from the 2020 UWMP shown in **Table 10** and **Figure 8**. **Figure 9** also shows the Projected Water Demand by Sector (in 2045) without the Development, while **Figure 10** includes the Development**.** As indicated by **Table 12**, the projected multi-family, commercial, and landscape sector water demand will be much larger due to the projected water demand of the Development. Although not utilized in calculation of demand projections, a constant consumption rate provides a more conservative approach, the decreasing consumption rate scenario provides a more realistic picture for planning purposes as it considers gradual improvements in water-use efficiency and in the case of a multiple year event includes mandatory conservation measures that would not be in effect in a single year event.

Table 11
Projected Water Use by Sector – Without Development

Sector	2025	2030	2035	2040	2045
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1.0% Annual Passive Savings*	125	119	113	108	103
Demands					
Single Family Residential	5,154	5,554	5,854	5,953	6,084
Multi-Family Residential	5,139	5,648	6,061	6,301	6,645
Institutional/Governmental	871	1,027	1,074	1,084	1,064
Commercial	2,632	3,102	3,244	3,275	3,213
Industrial	248	292	305	308	303
Landscape Irrigation	1,563	1,564	1,595	1,571	1,541
Total Water Sales:	**15,608**	**17,187**	**18,134**	**18,492**	**18,850**
Unaccounted for Water	746	822	867	884	901
Total Water Consumption (Total Supply into System):	**16,354**	**18,009**	**19,001**	**19,376**	**19,751**

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP. Some projected landscape irrigation demands may be supplemented by recycled water in the future.

Footnotes (see number references in table above):

1. Projections shown above for per capita consumption rates (GPCD) are slightly higher than the projections shown in Table C-1 of the Reduced Delta Reliance Reporting, due to recent higher water consumption rates (since the 2020 UWMP). The only exception is for 2040 & 2045 , which Table C-1 projected would remain constant after 2035.

a. Avg. consumption rate of last 8 years = 127 gpcd.
b. Consumption rate in 2016 = 122 gpcd.
c. Consumption rate in 2023 = 115 gpcd.
d. Projected "passive" savings = 1 gpcd per year
e. Projected consumption rate in 2024 = 126 gpcd

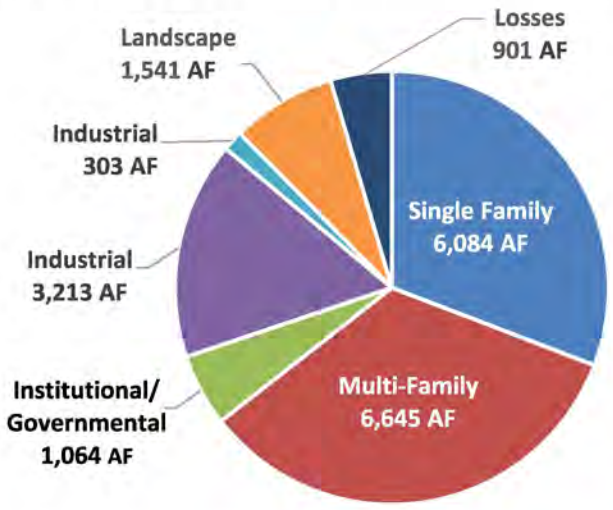


Figure 9: Projected Water Demand by Sector – Without Development (in 2045)

Table 12
Projected Water Use by Sector – With Development (MDD)

Sector	2025	2030	2035	2040	2045
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1.0% Annual Passive Savings*	125	119	113	108	103
Demands					
Single Family Residential	5,154	5,554	5,854	5,953	6,084
Multi-Family Residential	5,139	5,966	6,379	6,619	6,963
Institutional/Governmental	871	1,027	1,074	1,084	1,064
Commercial	2,632	3,106	3,248	3,279	3,217
Industrial	248	292	305	308	303
Landscape Irrigation	1,563	1,608	1,639	1,615	1,585
Total Water Sales:	**15,608**	**17,553**	**18,499**	**18,858**	**19,216**
Unaccounted for Water	746	822	867	884	901
Total Water Consumption (Total Supply into System):	**16,354**	**18,375**	**19,366**	**19,742**	**20,117**

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030. Notwithstanding, the projected multi-family, commercial, and landscape sector water demands are greater than the projections shown in the 2020 UWMP. Some projected landscape irrigation demands may be supplemented by recycled water in the future.

Footnotes (see number references in table above):
1. See previous Table.

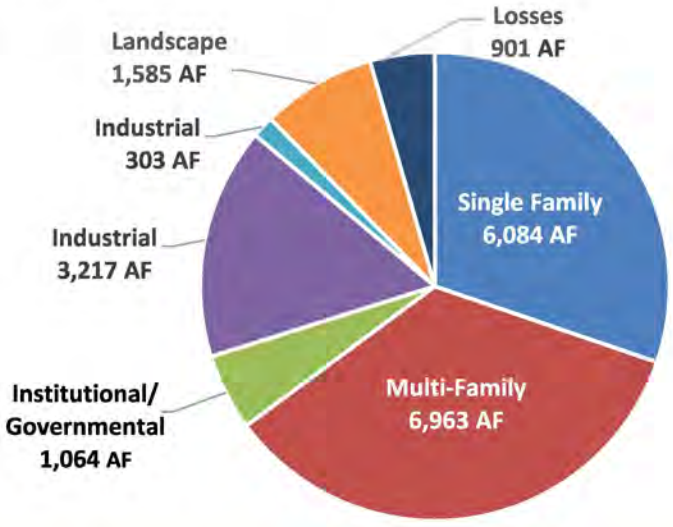


Figure 10: Projected Water Demand by Sector – With Development (in 2045)

Section 5: Water Supply vs. Demand Analysis

5.1 MESA WATER SUPPLY RELIABILITY

Mesa Water's water supply is obtained entirely from local groundwater from the Orange County Groundwater Basin (OC Basin), and recycled water from the Orange County Water District (OCWD), with the imported potable water supply obtained from its regional wholesaler, Municipal Water District of Orange County (MWDOC) as an emergency backup. The OC Basin is not subject to short-term water shortages resulting from temporary dry weather conditions as it is recharged both naturally and artificially, as descried in **Section 3**. Furthermore, as the OC Basin is not adjudicated, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. Pumping limitations set by the OCWD Basin Production Percentage (BPP) and the pumping capacity of the wells are the only constraints affecting the groundwater supply to Mesa Water. Groundwater stored in the basin increased by 69,000 AF for the 2022-23 water year.

5.2 DROUGHT RISK ASSESSMENT

The drought risk assessment is an assessment of the reliability of Mesa Water's water supplies by comparing projected future water demands with expected available water supplies under three different hydrologic conditions: normal year; a single dry year; and multiple dry years. Future supply and demand conditions can be determined from population forecasts, capacity of water supply facilities (wells), and recent water use trends.

Basis for Projected Demands

To project future demands, this WSA will utilize the water demand and supply projections determined by the 2020 UWMP. It will be assumed that total demand will change annually based on changes in population multiplied by the individual demand per-person (also known as the "per-capita" consumption rate. The per-capita rates used in the future projections will be based on actual water use data from the recent past. In particular, Mesa Water's averages for the last eight (8) years will be compared to the 2020 UWMP projections through the year 2045. However, the "per-capita" consumption rates shown in the following tables will not be used to determine the projections, due to the lower, but were determined by the following:

- Starting consumption rate of **127** gallons per capita per day (**GPCD**). This is based on the average consumption of Mesa Water in the last 8 years.

- *Decreasing* consumption rate from the average consumption beginning in 2024 and onward, with a passive savings of 1.0% annually (i.e. **126 GPCD** in 2024).

Although a constant consumption rate provides a more conservative approach, the decreasing consumption rate scenario provides a more realistic picture for planning purposes since it considers gradual improvements in water-use efficiency. Projections shown for per capita consumption rates (GPCD) are slightly higher than the projections shown in Table C-1 of the *Reduced Delta Reliance Reporting* found in the 2020 UWMP, due to recent higher water consumption rates since the 2020 UWMP. The only exception is for 2040 & 2045 , which Table C-1 projected would remain constant after 2035. For drought-time demands, it is expected that there will be a small degree of increase due to the lack of rainfall on landscapes. To project

demands during single and multiple (five) year drought periods, the following increase factors were assumed:

- Dry Year and Multiple Dry Years: 6%

The 2020 UWMP assumed an increases of 6% above average year demands in dry and multiple dry years based on the *Demand Forecast TM* (CDM Smith, 2021). 106% represents the percent of average supply needed to meet demands of a single-dry and multiple-dry years.

Basis for Projected Supplies

Since Mesa Water can purchase imported water from MWDOC/MET in addition to already meeting demands with local groundwater and recycled water, the percent of average supply value reported is equivalent to the percent of average demand under the corresponding hydrologic condition.

To project future Minimum Available Supply, a conservative OCWD BPP of 70% will be assumed through 2045, as determined by the *One Metro West – Water Supply Assessment*, combined with a minimum imported supplies available to each of MWDOC's retail agencies for 2015-2018 of 18,526 AF (*MWDOC, Water Shortage Allocation Model*, November 2015). Since any production from amber-tinted groundwater wells and the MWRF does not contribute to Mesa Water's BPP and these wells have a total pumping capacity of 9,678 AFY, it was determined that Mesa Waters supply of 32,260 AFY (9,678/30%) would be the maximum amount pumped to stay within a BPP of 70%. Furthermore, when considering the clear groundwater wells total pumping capacity of 24,518 AFY the maximum amount pumped to stay within a BPP of 70% would be 35,026 AFY (24,518/70%), which is greater than 32,260 AFY, therefore causing the amber-tinted groundwater wells total pumping capacity to be the limiting factor.

5.3 ENSURING ADEQUATE SUPPLY

While there is no legal limit as to how much an agency can pump from the OC Basin, there is a financial disincentive to pump above the BPP. The OC Basin volumes are not expected to be affected during droughts lasting up to five years. If Mesa Water requires additional sources of

water, they can import purchased water from MWDOC, which if during a water shortage, is limited to 18,526 AF. It should be noted that for all dry-year scenarios water demand projections can be met without reliance on purchased water. Droughts will also be addressed by following the criteria of Mesa Water's Water Shortage Contingency Plan (WSCP) along with implementation of the regional contingency plans. These programs are discussed in the 2020 UWMP.

As indicated by the tables on the following pages, **without** and **with** the Development's projected water demand Mesa Water **does not expect to have a water supply shortage** during Normal Water Years, Single Dry Year, or Multiple Dry Years over the next 20 years.

Table 13
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Normal Water Year (AF)

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	125	119	113	108	103
Supply					
Groundwater Pumped (Total)	16,354	18,009	19,001	19,376	19,751
Recycled Water	1100	1100	1100	1100	1100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies *(Estimated Production)*	**17,454**	**19,109**	**20,101**	**20,476**	**20,851**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Demand					
Total Estimated Potable Demand	16,354	18,009	19,001	19,376	19,751
Total Estimated Recycled Water Demand	1,100	1,100	1,100	1,100	1,100
Total Estimated Demand	**17,454**	**19,109**	**20,101**	**20,476**	**20,851**
Compare to Avg. Demand for Previous 8 Yrs. (16,927 AF)[3]	103%	113%	119%	121%	123%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	33,332	31,677	30,685	30,310	29,935

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above):

1. Projections shown above for per capita consumption rates (GPCD) are slightly higher than the projections shown in *Table C-1 of the Reduced Delta Reliance Reporting*, due to recent higher water consumption rates (since the *2020 UWMP*). The only exception is for 2040 & 2045 , which *Table C-1* projected would remain constant after 2035.
   a. Avg. consumption rate of last 8 years = 127 gpcd.
   b. Consumption rate in 2016 = 122 gpcd.
   c. Consumption rate in 2023 = 115 gpcd.
   d. Projected "passive" savings = 1 gpcd per year.
   e. Projected consumption rate in 2045 = 103.
   f. Projected consumption rate in 2024 = 126 gpcd
2. The Minimum Available Supply was determined by conservatively projecting a OCWD BPP of 70% through 2045 (WSA for One Metro West Project) combined with a minimum imported supplies available to each of MWDOC's retail agencies for 2015-2018 of 18,526 AF (MWDOC, Water Shortage Allocation Model, November 2015).
3. Demand data for last eight (8) years was derived from Mesa Water's *California State Water Resources Control Board – Drought Report (2023)* and *eAR to the Division of Drinking Water* (2016-2022).
4. The Available Supply Capacity was determined by subtracting the Total Estimated Demand from the Minimum Available Supply. For all cases there is more than enough supply to meet demands, as shown by the Available Supply Capacity.

Table 14
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Single Dry Year (AF)

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	125	119	113	108	103
Supply					
Groundwater Pumped (Total)	17,401	19,156	20,207	20,605	21,002
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**18,501**	**20,256**	**21,307**	**21,705**	**22,102**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	17,454	19,109	20,101	20,476	20,851
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**18,501**	**20,256**	**21,307**	**21,705**	**22,102**
Normal Year Demand	17,454	19,109	20,101	20,476	20,851
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	32,285	30,530	29,479	29,081	28,684

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 15
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Multiple Dry Years (2023-2027) (AF)

Water Sources	2023	2024	2025	2026	2027
Population					
Water Service Area Population	113,627	113,957	114,288	117,443	120,598
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	116	126	125	124	123
Supply					
Groundwater Pumped (Total)	17,241	17,321	17,401	17,752	18,103
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**18,341**	**18,421**	**18,501**	**18,852**	**19,203**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	17,303	17,378	17,454	17,785	18,116
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**18,341**	**18,421**	**18,501**	**18,852**	**19,203**
Normal Year Demand	17,303	17,378	17,454	17,785	18,116
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	32,445	32,365	32,285	31,934	31,583

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 16
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Multiple Dry Years (2028-2032) (AF)

Water Sources	2028	2029	2030	2031	2032
Population					
Water Service Area Population	123,753	126,908	130,063	133,218	136,373
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	122	121	119	118	117
Supply					
Groundwater Pumped (Total)	18,454	18,805	19,156	19,366	19,576
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**19,554**	**19,905**	**20,256**	**20,466**	**20,676**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	18,447	18,778	20,101	19,308	19,506
% of Normal Year	106%	106%	101%	106%	106%
Demand					
Total Dry Demand	**19,554**	**19,905**	**20,256**	**20,466**	**20,676**
Normal Year Demand	18,447	18,778	19,109	19,308	19,506
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	31,232	30,881	30,530	30,320	30,110

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 17
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Multiple Dry Years (2033-2037) (AF)

Water Sources	2033	2034	2035	2036	2037
Population					
Water Service Area Population	139,527	142,682	145,837	146,447	147,057
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	116	115	113	112	111
Supply					
Groundwater Pumped (Total)	19,786	19,997	20,207	20,287	20,366
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**20,886**	**21,097**	**21,307**	**21,387**	**21,466**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	19,704	19,903	20,476	20,176	20,251
% of Normal Year	106%	106%	104%	106%	106%
Demand					
Total Dry Demand	**20,886**	**21,097**	**21,307**	**21,387**	**21,466**
Normal Year Demand	19,704	19,903	20,101	20,176	20,251
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	29,900	29,689	29,479	29,399	29,320

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 18
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Multiple Dry Years (2038-2042) (AF)

Water Sources	2038	2039	2040	2041	2042
Population					
Water Service Area Population	147,668	148,278	148,888	149,183	149,479
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	110	109	108	107	106
Supply					
Groundwater Pumped (Total)	20,446	20,525	20,605	20,684	20,764
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**21,546**	**21,625**	**21,705**	**21,784**	**21,864**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	20,326	20,401	20,851	20,551	20,626
% of Normal Year	106%	106%	104%	106%	106%
Demand					
Total Dry Demand	**21,546**	**21,625**	**21,705**	**21,784**	**21,864**
Normal Year Demand	20,326	20,401	20,476	20,551	20,626
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	29,240	29,161	29,081	29,002	28,922

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 19
Mesa Water - Water Supply Availability & Demand Projections (Without Development)
Multiple Dry Years (2043-2047) (AF)

Water Sources	2043	2044	2045	2046	2047
Population					
Water Service Area Population	149,774	150,070	150,365	150,660	150,956
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	105	104	103	102	101
Supply					
Groundwater Pumped (Total)	20,843	20,923	21,002	21,082	21,161
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**21,943**	**22,023**	**22,102**	**22,182**	**22,261**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	20,701	20,776	20,851	20,926	21,001
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**21,943**	**22,023**	**22,102**	**22,182**	**22,261**
Normal Year Demand	20,701	20,776	20,851	20,926	21,001
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	28,843	28,763	28,684	28,604	28,525

General Note: Projections shown above, except for those noted below, were taken directly from the 2020 UWMP.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 20
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Normal Water Year (AF)

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	125	119	113	108	103
Supply					
Groundwater Pumped (Total)	16,354	18,375	19,366	19,742	20,117
Recycled Water	1100	1100	1100	1100	1100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**17,454**	**19,475**	**20,466**	**20,842**	**21,217**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Demand					
Estimated Potable Water Demand	16,354	18,375	19,366	19,742	20,117
Estimated Recycled Water Demand	1,100	1,100	1,100	1,100	1,100
Total Estimated Demand	**17,454**	**19,475**	**20,466**	**20,842**	**21,217**
Compare to Avg. Demand for Previous 8 Yrs. (16,927 AF)[3]	103%	115%	121%	123%	125%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	33,332	31,311	30,320	29,944	29,569

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 21
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Single Dry Year (AF)

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population	114,288	130,063	145,837	148,888	150,365
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	125	119	113	108	103
Supply					
Groundwater Pumped (Total)	17,401	19,544	20,594	20,993	21,390
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies *(Estimated Production)*	**18,501**	**20,644**	**21,694**	**22,093**	**22,490**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	17,454	19,475	20,466	20,842	21,217
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**18,501**	**20,644**	**21,694**	**22,093**	**22,490**
Normal Year Demand	17,454	19,475	20,466	20,842	21,217
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	32,285	30,143	29,092	28,693	28,296

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 22
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Multiple Dry Years (2023-2027) (AF)

Water Sources	2023	2024	2025	2026	2027
Population					
Water Service Area Population	113,627	113,957	114,288	117,443	120,598
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	116	126	125	124	123
Supply					
Groundwater Pumped (Total)	17,241	17,321	17,401	17,752	18,103
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**18,341**	**18,421**	**18,501**	**18,852**	**19,203**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	17,303	17,378	17,454	17,785	18,116
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**18,341**	**18,421**	**18,501**	**18,852**	**19,203**
Normal Year Demand	17,303	17,378	17,454	17,785	18,116
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	32,445	32,365	32,285	31,934	31,583

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 23
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Multiple Dry Years (2028-2032) (AF)

Water Sources	2028	2029	2030	2031	2032
Population					
Water Service Area Population	123,753	126,908	130,063	133,218	136,373
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	122	121	119	118	117
Supply					
Groundwater Pumped (Total)	18,454	18,805	19,544	19,754	19,964
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**19,554**	**19,905**	**20,644**	**20,854**	**21,064**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	18,447	18,778	19,475	19,674	19,872
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**19,554**	**19,905**	**20,644**	**20,854**	**21,064**
Normal Year Demand	18,447	18,778	19,475	19,674	19,872
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	31,232	30,881	30,142	29,932	29,722

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 24
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Multiple Dry Years (2033-2037) (AF)

Water Sources	2033	2034	2035	2036	2037
Population					
Water Service Area Population	139,527	142,682	145,837	146,447	147,057
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	116	115	113	112	111
Supply					
Groundwater Pumped (Total)	20,174	20,385	20,595	20,675	20,754
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**21,274**	**21,485**	**21,695**	**21,775**	**21,854**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	20,070	20,269	20,466	20,542	20,617
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**21,274**	**21,485**	**21,695**	**21,775**	**21,854**
Normal Year Demand	20,070	20,269	20,467	20,542	20,617
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	29,512	29,301	29,091	29,011	28,932

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 25
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Multiple Dry Years (2038-2042) (AF)

Water Sources	2038	2039	2040	2041	2042
Population					
Water Service Area Population	147,668	148,278	148,888	149,183	149,479
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	110	109	108	107	106
Supply					
Groundwater Pumped (Total)	20,834	20,913	20,993	21,072	21,152
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**21,934**	**22,013**	**22,093**	**22,172**	**22,252**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	20,692	20,767	20,842	20,917	20,992
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**21,934**	**22,013**	**22,093**	**22,172**	**22,252**
Normal Year Demand	20,692	20,767	20,842	20,917	20,992
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	28,852	28,773	28,693	28,614	28,534

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Table 26
Mesa Water - Water Supply Availability & Demand Projections (With Development)
Multiple Dry Years (2043-2047) (AF)

Water Sources	2043	2044	2045	2046	2047
Population					
Water Service Area Population	149,774	150,070	150,365	150,660	150,956
Consumption Rate (GPCD)[1] *Including 1% Annual Passive Savings*	105	104	103	102	101
Supply					
Groundwater Pumped (Total)	21,231	21,311	21,390	21,470	21,549
Recycled Water	1,100	1,100	1,100	1,100	1,100
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies ***(Estimated Production)***	**22,331**	**22,411**	**22,490**	**22,570**	**22,649**
Minimum Available Supply[2]	50,786	50,786	50,786	50,786	50,786
Normal Year Supply	21,067	21,142	21,217	21,292	21,367
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand	**22,331**	**22,411**	**22,490**	**22,570**	**22,649**
Normal Year Demand	21,067	21,142	21,217	21,292	21,367
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity[4]	28,455	28,375	28,296	28,216	28,137

General Note: Projections shown above, except for those noted below, were taken directly from the *2020 UWMP* with the addition of the Development's projected maximum water demand (366 AFY). This value was not included in 2025 as the Development will not yet be constructed until 2030.

Footnotes (see number references in table above): All items derived in similitude to Table 13.

Section 6: Water-Use Efficiency Strategies

Mesa Water is committed to implementing water conservation programs and encourages its customers to conserve water whenever possible. Per the 2020 UWMP, Mesa Water has maintained a Conservation Coordinator position since 2001 and continues to provide support staff as necessary. The Conservation Coordinator is responsible for coordinating all conservation program activities and acts as the liaison between Mesa Water and MWDOC, MET, CalWEP, DWR, CA Water Board and others.

6.1 DEVELOPMENT CONSERVATION MEASURES

As outlined in 2020 UWMP Chapter 9 - Demand Management Measures, the following demand measures are applicable to the Development:

- Mesa Water Ordinance No. 26 was adopted by the Mesa Water Board of Directors on May 14, 2015, prohibiting the waste of water. Ordinance No. 1039 describes actions that are considered a waste of water and the subsequent penalties if a violation were to occur.

- All of Mesa Water's water service connections, for all customer sectors, are metered and customers are billed by volume of water used. Additionally, Mesa Water has a program to replace meters every eighteen (18) years as well as replacement of any meters that fail due to malfunctions and under-registration. Mesa Water will continue to meter all new water service connections.

- Mesa Water's water rate schedule is based on a uniform rate structure for commodity charges. Table 9-1 of the *One Metro West – Water Supply Assessment* shows Mesa Water's water rates effective as of January 1, 2016.

- MWDOC has initiated several water conservation programs to educate Mesa Water service customers with regard to various approaches to conserve water. Through various public information, education, and outreach programs, water conservation methods are taught year-round.

- As part of Mesa Water's normal operations, which includes consistently monitoring of water production with SCADA and performing a formal water audit each year, Mesa Water repairs major leaks to the distribution system as soon as possible after they are discovered. Further, under Mesa Water's capital improvement plan, old leaking pipes are continually being replaced.

Mesa Water's average consumption rate for the past 8 years is calculated to **be 127 gallons per capita per day (GPCD)**, without reductions due to recycled water use, which demonstrates that Mesa Water has met its 2020 target of **143 GPCD**. The adjusted 2020 GPCD determined in the 2020 UWMP was 85 GPCD. Mesa Water can maintain its consumption rates and future targets by continuing to focus on water conservation.

Section 7: Water Supply Assessment

The Hive Live Development (Development) is a proposed a mixture of high-density residential, commercial, and open space development of approximately 14.3 acres located in the northeasterly portion of the City of Costa Mesa. Based on the demand methodologies presented in **Section 2**, the projected MDD coming from the proposed Development is approximately 366 AFY. Based on the supply vs demand **Tables 20** through **26** in **Section 5**, Mesa Water can expect to meet future demands for all climate conditions through 2045, including the proposed Development.

7.1 CONCLUSION AND RECOMMENDATIONS

This WSA shall be adopted by the Mesa Water Board via resolution. Mesa Water staff shall prepare a staff report detailing the efforts made in preparing this WSA. Mesa Water will also prepare a "Will-Serve Letter", which will declare that Mesa Water will provide a water service

connection(s) to the proposed Project. The Will-Serve Letter will be issued upon payment of all fees by the Developer.

Should the construction of the proposed Project be delayed, it is recommended that this WSA be reviewed every five (5) years prior to construction, to verify that Mesa Water will have capacity to serve the Project.

Appendix A: Board Resolution Adopting Water Supply Assessment

Water Supply Assessment - Hive Live Development

Appendix B: 2020 Urban Water Management Plan – DWR Standardized Tables

Water Supply Assessment - Hive Live Development

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
CA3010004	Mesa Water District	25,032	17,077
	TOTAL	25,032	17,077
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Submittal Table 2-3: Supplier Identification	
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)	
7/1	
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.*	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
Municipal Water District of Orange County
NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	112,635	114,288	130,063	145,837	148,888	150,365
NOTES: Source: Center for Demographic Research at California State University, Fullerton, 2020						

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Single Family		Drinking Water	4,875
Multi-Family		Drinking Water	4,942
Institutional/Governmental		Drinking Water	904
Commercial		Drinking Water	2,731
Industrial		Drinking Water	257
Landscape		Drinking Water	1,549
Losses	Non-revenue water	Drinking Water	844
Other	Private Fire lines (flushing), Hydrant Meter (Construction)	Drinking Water	15
		TOTAL	16,118

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3. [2]

NOTES: Volumes reported in AF. This table only represents potable water; recycled water projections are shown in DWR Tables 4-3 and 6-4.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Single Family		5,154	5,554	5,854	5,953	6,084
Multi-Family		5,139	5,648	6,061	6,301	6,645
Institutional/Governmental		871	1,027	1,074	1,084	1,064
Commercial		2,632	3,102	3,244	3,275	3,213
Industrial		248	292	305	308	303
Landscape		1,563	1,564	1,595	1,571	1,541
Losses	Non revenue water	746	822	867	884	901
TOTAL		16,354	18,009	19,001	19,376	19,751

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes reported in AF. This table only represents potable water; recycled water projections are shown in DWR Tables 4-3 and 6-4.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	16,118	16,354	18,009	19,001	19,376	19,751
Recycled Water Demand[1] *From Table 6-4*	959	1,100	1,100	1,100	1,100	1,100
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	17,077	17,454	19,109	20,101	20,476	20,851

[1] Recycled water demand fields will be blank until Table 6-4 is complete *[2] 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:

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
07/2015	1278
07/2016	892
07/2017	803
07/2018	701
07/2019	741
[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* [2] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Water loss in AFY.	

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 8 and 9
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

Submittal Table 5-1 Baselines and Targets Summary
From SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1996*	*2005*	*179*	*143*
5 Year	*2004*	*2008*	*174*	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 5-2: 2020 Compliance
From SB X7-7 2020 Compliance Form
Retail Supplier or Regional Alliance Only

2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
85	*0*	*85*	*143*	*Y*

**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Alluvial Basin	Orange County Groundwater Basin	14,854	16,483	17,202	16,065	16,118
	TOTAL	14,854	16,483	17,202	16,065	16,118
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						

NOTES:
Sources - Mesa Water, 2021 and OC Retail Water Usage FY 2015 to FY 2020 (MWDOC, 2020)
These values include groundwater pumped from both clear wells and MWRF amber wells.

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	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? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Costa Mesa Sanitary District (CMSD)	Estimated	8,467	OC San	Plant No. 1 / Plant No. 2	No	No
Total Wastewater Collected from Service Area in 2020:		8,467				
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3 .*						
NOTES: Assumed a return rate of 56% (based on 2013 return rate study)						

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

☑	**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)* [2]	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total	0	0	0	0	0

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

[2] If the **Wastewater Discharge ID Number** 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:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐ 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 Supplier Producing (Treating) the Recycled Water:	Mesa Water
Name of Supplier Operating the Recycled Water Distribution System:	Mesa Water
Supplemental Water Added in 2020 (volume) *Include units*	
Source of 2020 Supplemental Water	

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030 [1]	2035 [1]	2040 [1]	2045 [1] (opt)
Agricultural irrigation										
Landscape irrigation (exc golf courses)	Landscape	See projections	Landscape	Tertiary	493	500	500	500	500	500
Golf course irrigation	Golf course	See projections	Golf course	Tertiary	466	600	600	600	600	600
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 (Description Required)										
				Total:	959	1,100	1,100	1,100	1,100	1,100
				2020 Internal Reuse						

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

NOTES:
Table does not include groundwater recharge (IPR) numbers as they are not separate from OCWD's supply

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.

Beneficial Use Type	2015 Projection for 2020 [1]	2020 Actual Use [1]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)	500	493
Golf course irrigation	600	466
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)	N/A	5,371
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	1,100	6,330

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

NOTE:
Groundwater recharge (IPR) estimated based on OCWD Groundwater Basin Production and Percent of Total Basin Production for FY2019-20 (33.3%)

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	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 *
		Total	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs					
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency'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? *Drop Down List (y/n)*	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
Chandler and Croddy Wells	No	Two groundwater wells to pump from the OC Basin	2022	All Year Types	7,000 gpm
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES:					

Submittal Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List
Groundwater (not desalinated)	Orange County Groundwater Basin	16,118	Drinking Water
Recycled Water	OCWD	959	Recycled Water
	Total	17,077	
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*			

NOTES:
Source - Mesa Water, 2021
Groundwater volumes include groundwater pumped from both clear wells and MWRF amber wells.

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	**Projected Water Supply *** Report To the Extent Practicable				
		2025	**2030**	**2035**	**2040**	**2045**
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater (not desalinated)	Orange County Groundwater Basin	16,354	18,009	19,001	19,376	19,751
Recycled Water	OCWD	1,100	1,100	1,100	1,100	1,100
	Total	17,454	19,109	20,101	20,476	20,851

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
Source - CDM Smith, 2021 and Mesa Water, 2021 (recycled water)
Groundwater volumes include groundwater pumped from both clear wells and MWRF amber wells. Mesa Water is 100% reliable on local water supply and potable water from the OC Basin, but volumes of groundwater may vary depending on OCWD's actual BPP projections, which are established annually.

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
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. Location _____
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year	2018-2019	-	100%
Single-Dry Year	2014	-	106%
Consecutive Dry Years 1st Year	2012	-	106%
Consecutive Dry Years 2nd Year	2013	-	106%
Consecutive Dry Years 3rd Year	2014	-	106%
Consecutive Dry Years 4th Year	2015	-	106%
Consecutive Dry Years 5th Year	2016	-	106%

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.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
Assumes an increase of 6% above average year demands in dry and multiple dry years based on the Demand Forecast TM (CDM Smith, 2021). 106% represents the percent of average supply needed to meet demands of a single-dry and multiple-dry years. Since Mesa Water can purchase imported water from MWDOC/MET in addition to already meeting demands with local groundwater and recycled water, the percent of average supply value reported is equivalent to the percent of average demand under the corresponding hydrologic condition.

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	17,454	19,109	20,101	20,476	20,851
Demand totals *(autofill from Table 4-3)*	17,454	19,109	20,101	20,476	20,851
Difference	0	0	0	0	0
NOTES: This table compares the projected demand and supply volumes determined in Sections 4.3.2 and 6.1, respectively.					

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	18,501	20,256	21,307	21,705	22,102
Demand totals*	18,501	20,256	21,307	21,705	22,102
Difference	0	0	0	0	0
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: It is conservatively assumed that a single dry year demand is 6% greater than each respective year's normally projected total water demand. Groundwater is sustainably managed through the BPP and robust management measures (Section 6.3.4 and Appendix G); recycled water provides additional local supply (Section 6.6); and based on MET's and MWDOC's 2020 UWMPs, imported water is available to close any water supply gap, should the need arise (Section 7.5.1).					

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	18,182	18,852	20,466	21,387	21,784
	Demand totals	18,182	18,852	20,466	21,387	21,784
	Difference	0	0	0	0	0
Second year	Supply totals	18,261	19,203	20,676	21,466	21,864
	Demand totals	18,261	19,203	20,676	21,466	21,864
	Difference	0	0	0	0	0
Third year	Supply totals	18,341	19,554	20,886	21,546	21,943
	Demand totals	18,341	19,554	20,886	21,546	21,943
	Difference	0	0	0	0	0
Fourth year	Supply totals	18,421	19,905	21,097	21,625	22,023
	Demand totals	18,421	19,905	21,097	21,625	22,023
	Difference	0	0	0	0	0
Fifth year	Supply totals	18,501	20,256	21,307	21,705	22,102
	Demand totals	18,501	20,256	21,307	21,705	22,102
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
It is conservatively assumed that a five consecutive dry year scenario is a repeat of the single dry year (106% of projected normal year values) over five consecutive years. The 2025 column assesses supply and demand for FY 2020-21 through FY 2024-25; the 2030 column assesses FY 2025-26 through FY 2029-30 and so forth, in order to end the water service reliability assessment in FY 2044-45.

Groundwater is sustainably managed through the BPP and robust management measures (Section 6.3.4 and Appendix G); recycled water provides additional local supply (Section 6.6); and based on MET's and MWDOC's 2020 UWMPs, imported water is available to close any water supply gap, should the need arise (Section 7.5.1).

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	18,182
Total Supplies	18,182
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	18,261
Total Supplies	18,261
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	18,341
Total Supplies	18,341
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	18,421
Total Supplies	18,421
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2025	**Total**
Total Water Use	18,501
Total Supplies	18,501
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description*)
0	0% (Normal)	A Level 0 Water Supply Shortage – Mesa Water proceeds with planned water efficiency best practices to support consumer demand reduction in line with state mandated requirements and Mesa Water goals for water supply reliability. Permanent water waste prohibitions are in place as stipulated in Mesa Water's Water Shortage Contingency Response Ordinance
1	Up to 10%	A Level 1 Water Supply Shortage – Condition exists when Mesa Water notifies its water users that due to drought or other supply reductions, a consumer demand reduction of up to 10% is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration of a Water Aware condition, Mesa Water shall implement the mandatory Level 1 conservation measures identified in this ordinance.
2	11% to 20%	A Level 2 Water Supply Shortage – Condition exists when Mesa Water notifies its water users that due to drought or other supply reductions, a consumer demand reduction of up to 20% is necessary to make more efficient use of water and respond to existing water conditions. Upon declaration of a Level 2 Water Supply Shortage condition, Mesa Water shall implement the mandatory Level 2 conservation measures identified in this ordinance
3	21% to 30%	A Level 3 Water Supply Shortage – Condition exists when Mesa Water declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 30% consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Mesa Water must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
4	31% to 40%	A Level 4 Water Supply Shortage - Condition exists when Mesa Water declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 40% consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Mesa Water must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
5	41% to 50%	A Level 5 Water Supply Shortage - Condition exists when Mesa Water declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 50% or more consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Mesa Water must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
6	>50%	A Level 6 Water Supply Shortage – Condition exists when Mesa Water declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that greater than 50% or more consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Mesa Water must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
NOTES:		

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
0	Landscape - Other landscape restriction or prohibition	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**Irrigation During Rain Events:** The application of potable water to outdoor landscapes during and up to forty-eight (48) hours after measurable rainfall is prohibited.	Yes
0	Landscape - Prohibit certain types of landscape irrigation	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**Irrigated Medians:** The use of potable water to irrigate ornamental turf on public street medians is prohibited.	Yes
0	Landscape - Restrict or prohibit runoff from landscape irrigation	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**No Excessive Water Flow or Runoff:** No person shall cause or allow watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive runoff from the property. Additionally, to the extent prohibited by any Statewide statute, or regulation adopted by any State agency with jurisdiction to adopt such regulations, including, but no limited to, the State Water Resources Control Board, no person shall cause or allow water to flow or runoff their property onto adjacent property, non-irrigated areas, private and public walkways, driveways, roadways, gutters or ditches, parking lots, or structures.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
0	Other - Prohibit use of potable water for washing hard surfaces	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a fully functioning, positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.	Yes
0	Water Features - Restrict water use for decorative water features, such as fountains	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**Re-circulating Water Required for Water Fountains and Decorative Water Features:** Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.	Yes
0	Other - Require automatic shut of hoses	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a fully functioning, positive self-closing water shut-off nozzle or device that causes it to cease dispensing water immediately when not in use. This subsection does not apply to any commercial car washing facility.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
0	Other	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**No Installation of Single Pass Cooling Systems:** Installation of single pass cooling systems is prohibited in buildings requesting new water service from Mesa Water District.	Yes
0	CII - Other CII restriction or prohibition	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems:** Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.	Yes
0	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	**Commercial Car Wash Systems:** All commercial conveyor car wash systems must utilize re-circulating water systems, or must secure a waiver of this requirement from Mesa Water Distirct.	Yes
1	Landscape - Limit landscape irrigation to specific times	5%	**Limits on Watering Hours:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited between the hours of 8:00 a.m. and 5:00 p.m. Pacific Standard Time on any day. Hand-held watering cans, buckets, or similar containers reasonably used to convey water for irrigation purposes are not subject to these time restrictions. Similarly, a hand-held hose equipped with a fully functioning, positive self-closing water shut-off nozzle or device may be used during the otherwise restricted period. If necessary, and for very short periods of time for the express purpose of adjusting or repairing it, one may operate an irrigation system during the otherwise restricted period.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
1	Landscape - Limit landscape irrigation to specific days	10%	**Designated Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area is limited up to a maximum of five (5) days per week on a schedule established and posted by Mesa Water District by a Resolution of the Board of Directors. This provision does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system, and then only while under the supervision of a competent person.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3%	**Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within ninty-six (96) hours of notification by Mesa Water District, or turned off, unless other arrangements are made with the District.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
2	Landscape - Limit landscape irrigation to specific days	10%	**Designated Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area is limited up to a maximum of four (4) days per week on a schedule established and posted by Mesa Water District by a Resolution of the Board of Directors. This provision does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system, and then only while under the supervision of a competent person.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3%	**Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by Mesa Water District, or turned off, unless other arrangements are made with the District.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
3	Landscape - Limit landscape irrigation to specific days	10%	**Designated Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area is limited up to a maximum of three (3) days per week on a schedule established and posted by Mesa Water District by a Resolution of the Board of Directors. This provision does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system, and then only while under the supervision of a competent person.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3%	**Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by Mesa Water District, or turned off, unless other arrangements are made with the District.	Yes
3	Water Features - Restrict water use for decorative water features, such as fountains	2%	**Limits on Filling Ornamental Fountains, Lakes, and Ponds**: Filling or re-filling ornamental fountains, lakes, and ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals have been actively managed within the water feature prior to declaration of a supply shortage level under this Conservation Program.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
4	Landscape - Limit landscape irrigation to specific days	10%	**Designated Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area is limited up to a maximum of two (2) days per week on a schedule established and posted by Mesa Water District by a Resolution of the Board of Directors. This provision does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system, and then only while under the supervision of a competent person.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3%	**Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by Mesa Water District, or turned off, unless other arrangements are made with the District.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
5	Landscape - Limit landscape irrigation to specific days	10%	**Designated Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area is limited up to a maximum of one (1) day per week on a schedule established and posted by Mesa Water District by a Resolution of the Board of Directors. This provision does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system, and then only while under the supervision of a competent person.	Yes
5	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	3%	**Car Washing at Commercial Facilities Only:** Washing of motor vehicles, trailers, boats, aircraft and other types of mobile equipment shall be done only at a commercial car wash with water recycling facilities. No restrictions apply where the healthy, safety, and welfare of the public is contingent upon frequent vehicle cleaning, such as with refuse trucks and vehicles used to transport food and perishables.	Yes
5	Other water feature or swimming pool restriction	2%	**No Initial Filling or Re-Filling of Swimming Pools & Spas:** Filling and Re-Filling of residential swimming pools or outdoor spas with water is prohibited.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	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*** *Drop Down List*
6	Landscape - Prohibit all landscape irrigation	10%	**No Watering or Irrigating:** Watering or irrigating of lawn, landscape, or other vegetated area is prohibited. This restriction does not apply to the following categories of use: Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device; Maintenance of existing landscape necessary for fire protection; Maintenance of existing landscape for soil erosion control; Maintenance of plant materials identified to be rare or essential to the well-being of protected species. Maintenance of landscape within active public parks and playing fields, day care centers, golf course greens, and school grounds, provided that such irrigation does not exceed a maximum of two (2) days per week according to the schedule established in Section 8(b)(1) and time restrictions in Section 6(a); Actively irrigated environmental mitigation projects.	Yes
NOTES:				

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1 through 6	Other Purchases	0 - 100%	Additional groundwater pumping in the Orange County Groundwater Basin
1 through 6	Other Purchases	0 - 100%	Additional imported water purchases through MWDOC
1 through 6	Other Purchases	0 - 100%	Interties with City of Santa Ana, City of Newport Beach, and IRWD
NOTES:			

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Costa Mesa	Yes	Yes
Newport Beach	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Orange County	Yes	Yes
NOTES:		

Urban Water Supplier: *Mesa Water District*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach

Enter Start Date for Reporting Period: 7/1/2018

End Date: 6/30/2019

☐ Is upstream embedded in the values reported?

	Water Volume Units Used	Urban Water Supplier Operational Control							
		Water Management Process						Non-Consequential Hydropower (if applicable)	
		Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process	AF	*13,354*	*0*	*0*	*2,686.30*	*15,120.75*	*15120.75*	*0*	*15120.75*
Energy Consumed (kWh)	*N/A*	*13,697,233*	*0*	*0*	*1,173,820*	*1,753,123*	*16624176*	*0*	*16624176*
Energy Intensity (kWh/vol.)	*N/A*	*1025.7*	*0.0*	*0.0*	*437.0*	*115.9*	*1099.4*	*0.0*	*1099.4*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Combination of Estimates and Metered Data

Data Quality Narrative:

Volume of Water Entering Process: Extraction data based Mesa WD water production meters, Treatment volume based on meters at the treatment facility, and Distribution data based on MWDOC Compiled Water Audits "Authorized Consumption." Non-Revenue Water is not considered in this calculation – the energy efficiency is based on water delivered to customers.
Energy Consumed: Based on metered data.

Narrative:

Mesa Water District relies on imported water and local groundwater to meet their customers' water needs. Operational control includes groundwater wells, a treatment facility, and potable water booster stations. This table does not include upstream embedded energy consumed prior to Mesa Water taking control. Distribution is based on the authorized consumption for 2019.

Appendix C: Hive Live Development Project Summary and Conceptual Site Plan

Water Supply Assessment - Hive Live Development

HIVE LIVE		
PROJECT INFORMATION	A 1,050-UNIT PROJECT CONSISTING OF THREE SEPARATE 5-STORY MULTIFAMILY RESIDENTIAL BUILDINGS WITH ONE BUIDLING CONTAINING A ROOF DECK AND A MIXED-USE COMPONENT, INCLUDING AN ART GALLERY, RETAIL, AND A PUBLIC PLAZA.	
PROJECT ADDRESS	3333 S SUSAN ST., COSTA MESA, CA 92626	
ZONING DISTRICT		
EXISTING	PDI - PLANNED DEVELOPMENT INDUSTRIAL	
PROPOSED	PLANNED DEVELOPMENT COMMERCIAL	
LAND USE		
EXISTING	INDUSTRIAL PARK	
PROPOSED	URBAN CENTRAL COMMERCIAL	
GROSS LOT AREA	620,804 SQ.FT.	14.3 AC
GROSS BUILDING AREA	1,874,917 SQ.FT.	
SITE COVERAGE	336,579 SQ.FT.	
FLOOR AREA RATIO (FAR)*	2.3	
TOTAL UNITS	1,050 DU	
DENSITY	73.7 DU/AC	

*EXCLUDES PARKING STRUCTURES

BUILDING A SUMMARY	
TOTAL UNITS	315 UNITS
TOTAL ACRES	4.68 AC
RESIDENTIAL BUILDING DENSITY	67.3 DU/AC
RESIDENTIAL GFA	382,617 SF
NON-RESIDENTIAL GFA	3,692 SF
PARKING GFA	210,020 SF
FAR	1.89

BUILDING B SUMMARY	
TOTAL UNITS	346 UNITS
TOTAL ACRES	4.44 AC
RESIDENTIAL BUILDING DENSITY	77.9 DU/AC
RESIDENTIAL GFA	388,293 SF
PARKING GFA	216,794 SF
FAR	2.01

BUILDING C SUMMARY	
TOTAL UNITS	389 UNITS
TOTAL ACRES	5.13 AC
RESIDENTIAL BUILDING DENSITY	75.8 DU/AC
RESIDENTIAL GFA	441,005 SF
PARKING GFA	232,496 SF
FAR	1.97

BUILDING A UNIT SUMMARY			
UNITS	AREA (SQ. FT.)	NO. OF UNITS	%
STUDIO	778	41	13%
J 1 BR	633	26	8%
1 BR	772	128	41%
J 2 BR	938	21	7%
2 BR	1,078	99	31%
TOTAL	AVG. 868	315	100%

BUILDING B UNIT SUMMARY			
UNITS	AREA (SQ. FT.)	NO. OF UNITS	%
STUDIO	778	57	16%
J 1 BR	633	51	15%
1 BR	772	135	39%
J 2 BR	938	0	0%
2 BR	1,078	103	30%
TOTAL	AVG. 844	346	100%

BUILDING C UNIT SUMMARY			
UNITS	AREA (SQ. FT.)	NO. OF UNITS	%
STUDIO	778	43	11%
J 1 BR	633	38	10%
1 BR	772	184	47%
J 2 BR	938	0	0%
2 BR	1,078	124	32%
TOTAL	AVG. 857	389	100%

RESIDENTIAL SUMMARY			
UNITS	AREA (SQ. FT.)	NO. OF UNITS	%
STUDIO	778	141	13%
J 1 BR	633	115	11%
1 BR	772	447	43%
J 2 BR	938	21	2%
2 BR	1,078	326	31%
TOTAL	AVG. 856	1,050	100%

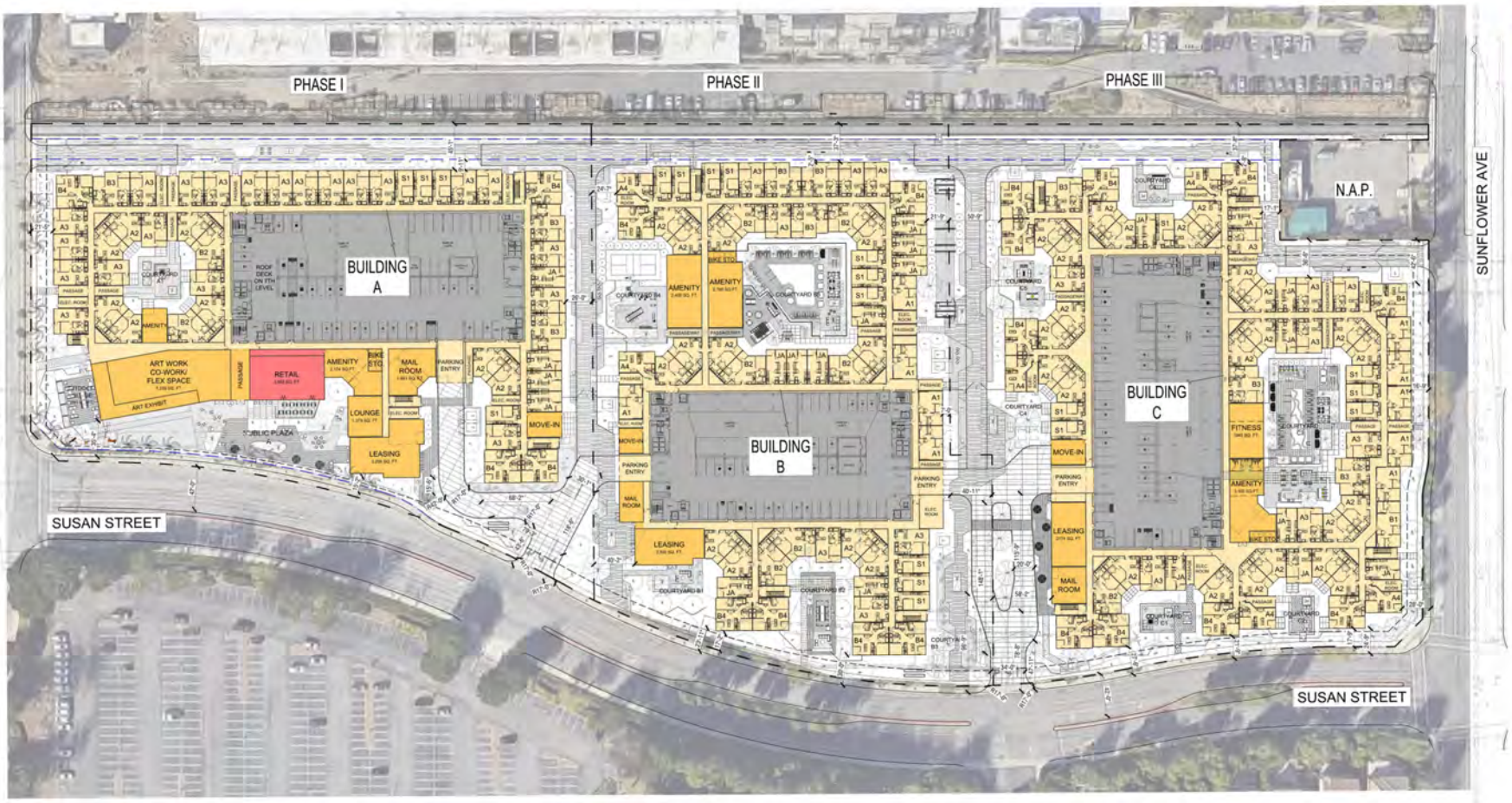
BUILDING A PARKING SUMMARY			
UNITS	NO. OF UNITS	PARKING RATIO	TOTAL PARKING
STUDIO	41	1.65	68
J 1 BR	26	1.65	43
1 BR	128	1.65	211
J 2 BR	21	1.65	35
2 BR	99	1.65	163
USPS STALL	N/A	N/A	1
TOTAL	315	RATIO: 1.65	521

BUILDING B PARKING SUMMARY			
UNITS	NO. OF UNITS	PARKING RATIO	TOTAL PARKING
STUDIO	57	1.65	94
J 1 BR	51	1.65	84
1 BR	135	1.65	223
J 2 BR	0	1.65	0
2 BR	103	1.65	170
USPS STALL	N/A	N/A	1
TOTAL	346	RATIO: 1.65	572

BUILDING C PARKING SUMMARY			
UNITS	NO. OF UNITS	PARKING RATIO	TOTAL PARKING
STUDIO	43	1.65	71
J 1 BR	38	1.65	63
1 BR	184	1.65	304
J 2 BR	0	1.65	0
2 BR	124	1.65	205
USPS STALL	N/A	N/A	1
TOTAL	389	RATIO: 1.65	643

RETAIL SUMMARY	
RETAIL	3,692 SF
BLDG A RETAIL	3,692 SF

BUILDING A RETAIL SUMMARY	
RETAIL AREA	3,692 SQ.FT.
PARKING PROVIDED (1 STALL PER 250 SQ.FT.)	15 STALLS



LEGEND

- RETAIL
- LEASING & AMENITIES
- RESIDENTIAL
- PARKING
- PROPERTY LINE
- EASEMENT
- SETBACK
- SITE CURB
- TRANSFORMERS

LEGACY PARTNERS · Invesco

HIVE Live
COSTA MESA, CA

CONCEPTUAL SITE PLAN

0 50' 100' 150' 200'

AO

A-15

SCALE: 1" = 50'
JOB NO.: 2022-1238
DATE: 04-05-2024

Appendix D: One Metro West WSA - Water Demand Factors

Water Supply Assessment - Hive Live Development

3.0 ONE METRO WEST PROJECT

3.1 Project Description

The One Metro West Development (Project) site is a 16.2-acre industrial area located North of Interstate 405, bounded by Sunflower Avenue and the South Coast Collection commercial development to the east and industrial uses to the west. The existing site is comprised of one building totaling 345,900 square feet of industrial use space. The existing building houses a dietary supplement manufacturer, a commercial decoration warehouse, and a frozen bakery product and supplies manufacturer. The existing industrial space, including the building, concrete sidewalks, asphalt pavement, landscaping, etc. will be demolished and replaced with the proposed Project.

The Developer plans to set aside 0.45 acres to OCTA along I-405 for future widening. The new development will occupy the remaining 15.75 acres and consist of three residential apartment buildings comprised of 1,057 dwelling units, and 6,000 square feet of specialty retail. A fourth building will contain 25,000 square feet of commercial creative office space. Each building is also equipped with one or more of the following parking options: below grade parking structure, above grade parking structure, at-grade parking stalls. The One Metro West Development will also have 1.5 acres of publicly irrigated open space, plus an additional 0.75 acres of landscaped median along Sunflower Avenue. Table 3-1 summarizes the existing and proposed developments.

Table 3-1: Existing and Proposed Development

Land Use	Classification	Dwelling Units / Building Area	Land Area
Existing			
Industrial	Industrial	345,900 SF	16.2 Acres
Proposed			
Residential	Medium/High Density	1,057	--
Creative Office	Commercial	25,000 SF	--
Retail	Commercial	6,000 SF	--
Park	Open Space	--	1.5 Acres
Landscaped Median	Open Space	--	0.75 Acres

3.2 Project Water Demands

The land use changes proposed as part of this Project will result in increased water demands. The proposed demands were estimated based upon demand factors and peaking factors established in the 2014 Water Master Plan (2014 WMP). It is assumed that the demand factors listed in the 2014 WMP account for both indoor and outdoor water consumption based on their respective land use category. Mesa Water®'s 2014 Water Master Plan does not specify irrigation demand factors based on land use type. Since the percentage of common irrigated area is a significant portion of the total development area, Michael Baker estimated a separate irrigation demand factor for this development. The irrigation demand factor is based off industry standards in similarly developed cities. See Table 3-2 for the water demand factors used in this analysis.

Table 3-2: Water Demand Factors [1]

Water Demand Factor Classification	Average Annual Demand (AAD)	Max Day Demand (MDD) (AAD*1.5)	Peak Hour Demand (PHD) (MDD*1.5)
Residential			
Low Density Residential (≤25 DU's/Ac)	2,500 gpd/acre	3,750 gpd/acre	5,625 gpd/acre
Mid/High Density Residential (>25 DU's/ Ac)	4,500 gpd/acre	6,750 gpd/acre	10,125 gpd/acre
Non-Residential			
Commercial	2,500 gpd/acre	3,750 gpd/acre	5,625 gpd/acre
Industrial	3,000 gpd/acre	4,500 gpd/acre	6,750 gpd/acre
Irrigation [2]	2,400 gpd/acre	--	--

[1] Source: 2014 Water Master Plan Technical Memoranda No. 1.2, prepared by Carollo Engineers
[2] Irrigation demands developed by Michael Baker using industry standard data

The existing site is occupied by a 345,900 square foot industrial building. Mesa Water District provided meter data for the FY 2019, which indicated a total water usage of 7,819 hundred cubic feet (CCF) for the year. The meter data indicates less water usage that would be expected from a manufacturing facility of this size, which means that the facility may have been abandoned part way through the year. Table 3-3 contains the existing project site demand.

Table 3-3: Existing Water Demands [1]

Land Use	Site Acreage	Building Square Footage	Average Day Demand [1]		Maximum Day Demand (MDD) (ADD*1.5)		Peak Hour Demand (PHD) (MDD*1.5)
			(gpd)	(gpm)	(gpm)	(gpm)	(gpm)
Industrial	16.2	345,900	16,024	11.13	24,036	16.69	25.04

[1] Source: Based on FY 2019 Mesa Water District meter data.

Similarly, the proposed commercial and irrigation demands were calculated using Mesa Water's published demand factors. The calculations for those demands are summarized in Table 3-4.

To develop the residential demands, Michael Baker calculated the development density using the ratio of the total number of dwelling units to the total development area. The calculated density is 67.11 DU/Ac. This density value places the development within the most dense land use category that Mesa Water District publishes in the 2014 Water Master Plan Technical Memoranda No. 1.2, the Mid/High Land Use category. However, the Mid/High land use factor covers any land use density greater than 25 DU/acre. Typically, developments that fall into the Mid/High density land use category, in Mesa Water®'s service area, are less than 40 DU/acre.

Using the published demand factor would result in demands being artificially lower than can generally be expected from a development of this size. Therefore, Michael Baker developed a modified demand factor to account for the discrepancy between the land use density and the actual development density. The modified demand factor is developed by converting from demand per acre to demand per dwelling unit using the calculation in Equation 3-1.

Equation 3-1:

Modified Demand Factor= $\frac{4{,}500\ gpd/acre}{25\ DU/Ac}$ = 180 gpd/DU

The modified demand factor was used to calculate the proposed development's average day demand. The demand calculation using the modified demand factor is summarized in Table 3-4.

Table 3-4: Project Water Demands [1]

Land Use	Category	DU	Area (Ac)	Average Day Demand		Maximum Day Demand		Peak Hour Demand
				(gpd)	(gpm)	(gpd)	(gpm)	(gpm)
Residential	Mid/High	1,057	--	190,260	132.13	285,390	198.19	297.28
Commercial	--	--	0.71	1,779	1.24	2,669	1.85	2.78
Irrigation [2]	--	-	2.25	5,400	3.75	13,500	9.38	25.03
			Total	**197,439**	**137.1**	**301,559**	**209.4**	**325.1**

[1] Demand and peaking factors based on Table 3-2.

[2] Irrigation peaking factors based on industry standard data. Maximum Day= 2.5xAAD. Peak Hour Demand is MDDx2.67.

Based upon the proposed land use, the total average water demand for the Project is expected to increase the total system demand for this site. The total increase in demand is calculated in Table 3-5.

Table 3-5: Net Increase in Demand

Condition	Average Day Demand		Maximum Day Demand		Peak Hour Demand
	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)
Existing	16,024	11.13	24,036	16.69	25.04
Proposed	197,439	137.11	301,559	209.42	325.09
Net Increase	**181,416**	**125.98**	**277,523**	**192.72**	**300.06**

Appendix E: OCWD - 2022-2023 Engineer's Report

Water Supply Assessment - Hive Live Development

2022-2023 Engineer's Report on the Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District

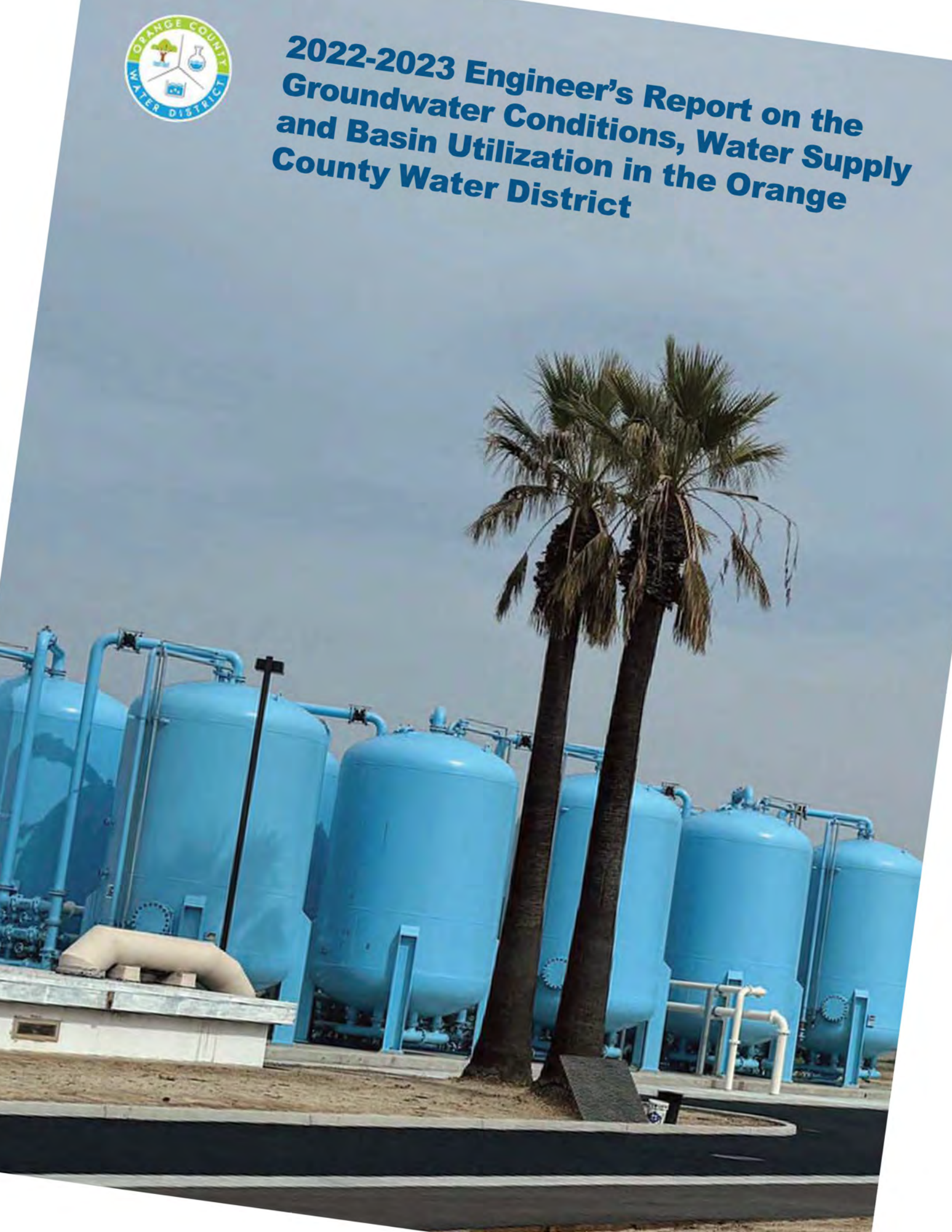


Photo Cover:

City of Fullerton PFAS Water Treatment Main Plant in Construction
Fullerton, California

2022-2023

ENGINEER'S REPORT ON

GROUNDWATER CONDITIONS,

WATER SUPPLY AND BASIN UTILIZATION

IN THE

ORANGE COUNTY WATER DISTRICT

FEBRUARY 2024

SINCE 1933

ORANGE COUNTY WATER DISTRICT

ORANGE COUNTY'S GROUNDWATER AUTHORITY

February 21, 2024

John C. Kennedy
General Manager
Orange County Water District
Post Office Box 8300
Fountain Valley, CA 92728-8300

Dear Mr. Kennedy:

In accordance with Section 26 of the District Act, the 2022-2023 Engineer's Report on the Groundwater Conditions, Water Supply and Basin Utilization in the District is hereby submitted.

Precipitation for the water year July 1, 2022 through June 30, 2023 within the District's boundaries averaged 21.12 inches, which was one hundred fifty eight percent of the long-term average rainfall. The average discharge of Santa Ana River flow past Prado Dam for the water year was measured to be 286,907 acre-feet which represented one hundred thirty two percent of the 30-year average flow. Flow past the District's spreading grounds (including any flow from the Santiago Creek) that was lost to the Pacific Ocean totaled 16,390 acre-feet.

Total water demands within the District for the water year 2022-2023 were 351,719 acre-feet (excluding water used for groundwater replenishment and barrier maintenance), the lowest demands in the past fifty water years. The use of supplemental water in the District's service area during the water year totaled 107,723 acre-feet. Groundwater production within the basin for the water year totaled 245,210 acre-feet which was a decrease of 4.5 percent from the prior water year.

The accumulated basin overdraft decreased from 258,000 acre-feet on June 30, 2022 to 189,000 acre-feet on June 30, 2023 using the three-layer approach and the new benchmark for full-basin conditions. Under the provisions of Section 27 of the District Act, a portion of the Replenishment Assessment for the ensuing 2024-2025 water year could be equal to an amount necessary to purchase up to 123,000 acre-feet of replenishment water.

Sincerely,

Chris S. Olsen
Director of Engineering

Lo Tan
Principal Engineer

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

APPENDICES

EXECUTIVE SUMMARY

Total water demands within Orange County Water District (OCWD) were 351,719 acre-feet (AF) for the 2022-23 water year (beginning on July 1, 2022 and ending on June 30, 2023). Groundwater production for the water year totaled 245,210 AF including any available In-Lieu Program water. The use of supplemental water in OCWD's service area during the 2022-23 water year totaled 107,723 AF of which 88,441 AF resulted from the direct use by water agencies and districts and 19,282 AF were used for the purpose of groundwater basin replenishment and maintenance of seawater intrusion control barriers.

For the water year which ended on June 30, 2023, the "annual overdraft" (annual basin storage decrease without supplemental replenishment water) was 52,250 AF. The accumulated overdraft decreased from 258,000 AF on June 30, 2022 to 189,000 AF on June 30, 2023. Precipitation within the groundwater basin was one hundred fifty eight percent of the long-term average during this water year, totaling 21.12 inches.

Based on the groundwater basin conditions for the water year ending on June 30, 2023, OCWD may purchase up to 123,000 AF of water for groundwater replenishment during the ensuing water year, beginning on July 1, 2024, pursuant to the District Act.

ACKNOWLEDGMENTS

A number of public and private entities contributed data used in this report including:

City of Anaheim
City of Buena Park
East Orange County Water District
City of Fountain Valley
City of Fullerton
City of Garden Grove
Golden State Water Company
City of Huntington Beach
Irvine Ranch Water District
City of La Palma
Mesa Water District
Metropolitan Water District of Southern California
Municipal Water District of Orange County
City of Newport Beach
City of Orange
County of Orange, Public Works Department
Orange County Sanitation District
City of Santa Ana
Santa Ana Watershed Project Authority
City of Seal Beach
Serrano Water District
City of Tustin
United States Geological Survey
City of Westminster
Yorba Linda Water District

The cooperation received from all agencies is gratefully acknowledged.

This report is based on the 2022-23 Basic Data Report which is placed on file at the office of OCWD in Fountain Valley.

GLOSSARY OF ACRONYMS

AF	Acre-Feet
AWPF	Advanced Water Purification Facility
BEA	Basin Equity Assessment
BPP	Basin Production Percentage
CPTP	Coastal Pumping Transfer Program
CUP	Conjunctive Use Program
EOS	Extraordinary Supply
GAP	Green Acres Project
GWRS	Groundwater Replenishment System
IDP	Irvine Desalter Project
IRWD	Irvine Ranch Water District
MF	Microfiltration
mg/L	Milligrams per Liter
MBI	Mid-Basin Injection
MGD	Million Gallons per Day
MSL	Mean Sea Level
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
NO_3	Nitrate
O&M	Operation and Maintenance
OC San	Orange County Sanitation District
OCWD	Orange County Water District
PFAS	per- and polyfluoroalkyl substances
RA	Replenishment Assessment
RO	Reverse Osmosis
RTS	Readiness-to-Serve
SAR	Santa Ana River
SARCCUP	Santa Ana River Conservation and Conjunctive Use Program
SBVMWD	San Bernardino Valley Municipal Water District
SPW	State Project Water
TDS	Total Dissolved Solids
UV	Ultraviolet
WRD	Water Replenishment District of Southern California

PART I: GROUNDWATER CONDITIONS

Section 25 of the OCWD Act requires that OCWD order an annual investigation to report on the groundwater conditions within the District's boundaries. A summary of the groundwater conditions for the water year covering July 1, 2022 to June 30, 2023 is as follows.

GROUNDWATER CONDITIONS
2022-23 SUMMARY OF FINDINGS

1. Groundwater production (including any In-Lieu Program water) totaled 245,210 acre-feet (AF) for the 2022-23 water year.

2. Groundwater stored in the basin increased by 69,000 AF for the 2022-23 water year.

3. Accumulated Overdraft[1] on June 30, 2023 was 189,000 AF.[2]

4. Annual Overdraft was 52,250 AF for the 2022-23 water year.

5. Average Annual Overdraft[3] for the immediate past five water years (2018-19 through 2022-23) was 103,700 AF.

6. Projected Annual Overdraft[3] for the current 2023-24 water year is 98,000 AF.

7. Projected Annual Overdraft[3] for the ensuing 2024-25 water year is 110,000 AF.

8. Projected Accumulated Overdraft[2] on June 30, 2024 is 168,000 AF.

9. Under the provisions of Section 27 of the District Act, a portion of the 2024-25 Replenishment Assessment (RA) could be equal to an amount necessary to purchase up to 123,000 AF of replenishment water.[4]

[1] Accumulated overdraft was calculated using OCWD's three-layer storage change methodology adopted on March 21, 2007 and the associated new benchmark for full-basin conditions. Water year 2005-06 was the first year this methodology was used. Additional explanation can be found in the report on "Evaluation of Orange County Groundwater Basin Storage and Operational Strategy" by OCWD in 2007.

[2] Water from the Metropolitan Water District of Southern California Long-Term Groundwater Storage Program was included as part of the total stored water in determining the basin's accumulated overdraft.

[3] Annual overdraft is defined in the District Act as "the quantity, determined by the Board of Directors, by which the production of groundwater supplies within said District during the water year exceeds the natural replenishment of such groundwater supplies in such water year."

[4] Determined by adding the five-year average annual overdraft (103,700 AF) to one-tenth of the accumulated overdraft (189,000 AF) which results in the following:
103,700 AF + [(189,000 AF) x 0.10] = 122,600 AF (or 123,000 AF when rounded).

BASIN HYDROLOGY

Groundwater conditions in the Orange County groundwater basin are influenced by the natural hydrologic conditions of rainfall, capture and recharge of Santa Ana River (SAR) and Santiago Creek stream flows, natural infiltration of surface water, and the transmissive capacity of the basin. The basin is also influenced by groundwater extraction and injection through wells, use of imported water for groundwater replenishment, wastewater reclamation and water conservation efforts and activities throughout OCWD's service area.

The water year beginning on July 1, 2022, yielded an average of 21.12 inches of rainfall within OCWD's boundaries, which is approximately one hundred fifty eight percent of the long-term annual average of 13.40 inches. Rainfall data within OCWD's boundaries was provided by the Orange County Public Works Department. The rainfall for the previous water year (2021-22) was 6.84 inches. The average annual rainfall in the OCWD service area for the five-year period (from July 1, 2018 through June 30, 2023) was 13.56 inches, and above-average rainfall in the watershed tends to lead to higher flows in the SAR reaching Orange County. Stream flow in the SAR measured downstream of Prado Dam for the water year 2022-23 totaled 286,907 AF which was approximately 132 percent of the 30-year flow average of 216,401 AF.

GROUNDWATER PRODUCTION

Groundwater production from wells within OCWD for the 2022-23 water year totaled 245,210 AF (excluding In-Lieu Program water, MWD Groundwater Storage Program extractions, and any groundwater used for the Talbert Barrier): 244,674 AF for non-irrigation and 536 AF for irrigation uses. The term "irrigation" used in the District Act and herein refers to irrigation for agricultural, horticultural, or floricultural crops and for pasture grown for commercial purposes.

OCWD's In-Lieu Program replaces groundwater supplies with imported water to reduce groundwater pumping. During the 2022-23 water year, OCWD did not purchase In-Lieu Program water from MWD in spite of its availability. Historical data on the annual groundwater production and In-Lieu quantities within OCWD are shown in Figure 1. Table 1 summarizes the annual groundwater production and In-Lieu Program water for the period of 1973-74 through 2022-23.

Groundwater production and In-Lieu Program quantities for 2022-23 for the major groundwater producers are summarized in Appendix 1. The groundwater production for all producers exceeding 25 AF per year for non-irrigation and irrigation purposes are presented in Appendices 2 and 3, respectively.

FIGURE 1. Groundwater Production

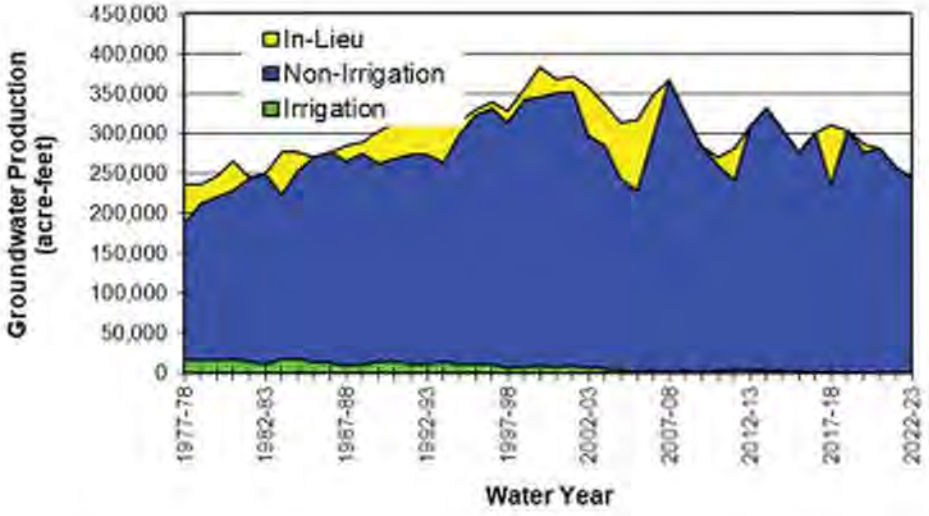


TABLE 1. Historical Groundwater Production Within OCWD

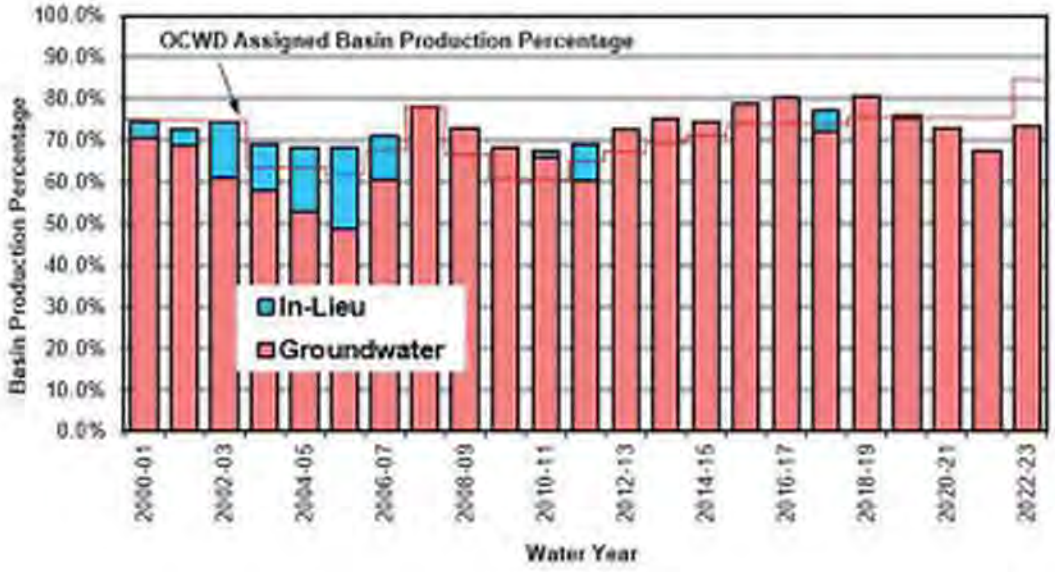
Water Year Jul 1-Jun 30	Groundwater Production (AF)	In-Lieu Program (AF)	Water Year Jul 1-Jun 30	Groundwater Production (AF)	In-Lieu Program (AF)
1973-74	218,863	-	1998-99	342,823	13,352
1974-75	225,597	-	1999-00	345,362	38,007
1975-76	245,456	-	2000-01	350,385	18,640
1976-77	243,511	-	2001-02	352,113	19,473
1977-78	188,407	-	2002-03	297,191	61,463
1978-79	213,290	48,290	2003-04	284,621	52,168
1979-80	221,453	23,792	2004-05	244,370	69,617
1980-81	228,943	24,861	2005-06	228,159	89,216
1981-82	244,184	36,373	2006-07	299,118	50,740
1982-83	249,548	-	2007-08	366,185	-
1983-84	223,207	-	2008-09	324,147	-
1984-85	252,070	52,822	2009-10	285,575	-
1985-86	270,932	25,198	2010-11	259,861	10,435
1986-87	276,354	-	2011-12	241,082	40,564
1987-88	265,226	-	2012-13	309,295	-
1988-89	275,077	18,856	2013-14	330,782	-
1989-90	261,190	15,022	2014-15	305,259	-
1990-91	266,745	38,961	2015-16	277,090	-
1991-92	271,224	44,588	2016-17	301,637	-
1992-93	273,587	39,789	2017-18	236,916	73,108
1993-94	264,159	38,900	2018-19	303,496	-
1994-95	298,217	48,134	2019-20	277,195	9,355
1995-96	324,111	5,542	2020-21	281,793	-
1996-97	331,406	7,883	2021-22	256,921	-
1997-98	313,805	15,096	2022-23	245,210	-

BASIN PRODUCTION PERCENTAGE

The Basin Production Percentage (BPP) is defined in the District Act as "*...the ratio that all water to be produced from groundwater supplies within the district bears to all water to be produced by persons and operators within the district from supplemental sources as well as from groundwater within the district.*" The BPP applies only to water producers that utilize more than 25 AF of groundwater per water year. Water producers that use 25 AF or less from the groundwater basin are excluded from the production percentage limitation.

The BPP for the 2022-23 water year was initially established at 77.0 percent by the OCWD Board of Directors, but effectively increased to 85% in February 2023 for the remainder of the water year. The overall BPP achieved within OCWD for non-irrigation use in the 2022-23 water year was 73.3 percent. The achieved pumping is less than the assigned BPP for the water year primarily due to the water quality impacts of per- and polyfluoroalkyl substances (PFAS). The production percentage achieved by each major producer for non-irrigation use is presented in Appendix 1. Historical assigned and achieved BPPs are illustrated below in Figure 2.

FIGURE 2. Groundwater BPP



GROUNDWATER LEVELS

Groundwater levels in the Orange County groundwater basin are shown on Plate 1. Groundwater level data used to prepare this plate were collected during late June and early July 2023 from over 500 production and monitoring wells screened within the principal aquifer system (approximately 300 to 1,200 feet deep), from which over 90% of basin pumping occurs. The groundwater elevation contours range from 10 to 80 feet below mean sea level in the coastal area of the basin due to pumping. A general indicator of changing basin levels is the location of the zero (0) mean sea level (MSL) elevation contour each year (MSL elevations are referenced to Vertical Datum NGVD 29). The zero MSL contour moved seawards (ranging from 0.1 to 1.7 miles) when compared to its alignment of the prior year, indicating an increase in groundwater levels in the principal aquifer system from June 2022 to June 2023.

Plate 1 also shows the relatively large depression in groundwater levels in the southern Santa Ana and northern Costa Mesa area due to the large concentration of production wells in this area. Groundwater levels are 40 to 50 feet lower than the surrounding areas. The potential impacts of this pumping depression include increased seawater intrusion and low well water levels which have been mitigated by OCWD's basin management programs including the Talbert seawater barrier expansion, the Groundwater Replenishment System (GWRS) and the mid-basin injection (MBI) wells. However, should groundwater production in this area substantially increase or groundwater elevations continue to decrease, the potential negative impacts should be evaluated in advance as they could, at least, partially offset the mitigative benefits of the aforementioned basin management programs.

Plate 2 shows the change in groundwater levels from June 2022 to June 2023 for the principal aquifer system. In the principal aquifer, groundwater levels generally rose by approximately 10 to 20 feet throughout most of the groundwater basin except at the OCWD Santiago Basin recharge facility in Orange where groundwater levels rose by 60 to 80 feet, at the OCWD recharge facilities in Anaheim where groundwater levels rose by 20 to 30 feet, and in the Irvine Sub-basin where groundwater levels rose by 20 to 40 feet.

Plate 3 shows the groundwater elevation trends within the principal aquifer since 1980 at four key well locations across the groundwater basin. In the pressure area of the basin at key wells GG-16 and COS-PLAZ, seasonal groundwater level fluctuations are noticeably larger than at AM-14 and IDM-3 located in the Anaheim and Irvine Forebay areas, respectively. All four key well locations show an increased water level response during or immediately following high-recharge wet periods such as 2005-06, 2011-12, 2018-19, and most recently 2022-23, but the response is largest at AM-14 due to its proximity to OCWD's spreading grounds.

The storage increase of 69,000 AF resulted primarily from a significant rise in groundwater levels throughout most of the basin from June 2022 to June 2023. In the shallow aquifer, groundwater levels increased approximately 30 to 40 feet in the Anaheim Forebay area surrounding the OCWD recharge facilities, 20 to 50 feet near Santiago Basin, and 5 to 10 feet throughout the greater Anaheim/Fullerton Forebay area. Shallow aquifer groundwater levels increased approximately 0 to 5 feet in the pressure area of the basin and were stable relative to the prior year near the Talbert Barrier, where elevations remained at or above protective elevations for seawater intrusion control.

In the principal aquifer, groundwater levels rose approximately 20 to 30 feet surrounding the OCWD Anaheim recharge facilities, 20 to 60 feet in the Santiago area, 10 to 20 feet in the greater Anaheim/Fullerton Forebay area, and 20 to 40 feet in the Irvine Sub-basin. Principal aquifer groundwater levels rose 5 to 10 feet throughout most of the pressure area of the basin, except for the Irvine Ranch Water District (IRWD) Dyer Road Well Field and west end of the Talbert Barrier, where water levels slightly decreased 0 to 5 feet.

In the deep aquifer, groundwater levels surrounding the OCWD recharge facilities rose 10 to 20 feet in Anaheim, 20 to 30 feet in Orange near the SAR, and 20 to 40 feet near Santiago Basin. Deep aquifer groundwater levels rose 10 to 20 feet in the greater Anaheim/Fullerton Forebay area, 5 to 20 feet in the Irvine Sub-basin, and 0 to 10 feet in the pressure area.

In all three aquifers, groundwater levels in the Central Basin near the county line generally increased as much or more than in western Orange County.

ANNUAL OVERDRAFT

Annual groundwater basin overdraft, as defined in the District Act, is the quantity, determined by the Board of Directors, by which the production of groundwater supplies within the District during the water year exceeds the natural replenishment of such groundwater supplies in such water year. This difference between extraction and replenishment can be estimated by determining the change in volume of groundwater in storage that would have occurred had supplemental and recycled water not been used for any groundwater recharge purpose, including seawater intrusion protection, advanced water reclamation and the In-Lieu Program.

For the 2022-23 water year, it is estimated that the volume of groundwater in storage increased by 69,000 AF. The annual overdraft was 52,250 AF for the 2022-23 water year. For the five-year period from July 1, 2018 to June 30, 2023, an annual average of approximately 121,300 AF of supplemental water and recycled water were percolated for replenishment of groundwater basin or injected into the underground basin via wells for seawater intrusion control or used directly in place of pumping groundwater (i.e., In-Lieu

Program). The average annual overdraft during the same five-year period was approximately 103,700 AF.

GROUNDWATER BASIN ACCUMULATED OVERDRAFT

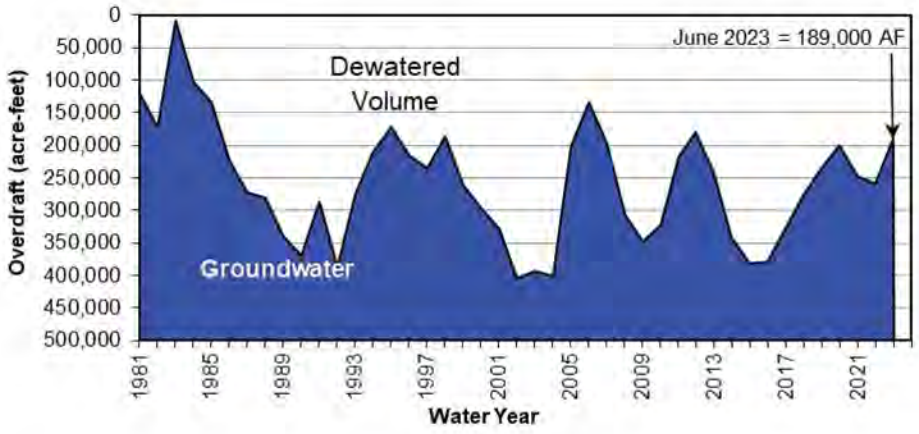
The accumulated overdraft, as defined in the District Act, is the quantity of water needed to be replaced at OCWD's intake area to prevent landward movement of ocean water into the fresh groundwater body. Landward movement of ocean water can be prevented if groundwater levels near the coast are several feet above sea level. Groundwater levels along the coast are related to the volume of water stored in the intake area, water pumped from the entire basin and the pattern or location of pumping. However, the Talbert and Alamitos seawater intrusion control projects have been implemented to prevent landward movement of ocean water into the fresh groundwater body. Due to the operation of seawater intrusion barrier facilities, there is no longer a direct correlation between accumulated overdraft and controlling seawater intrusion. These facilities allow greater utilization of the storage capacity of the groundwater basin. OCWD is also dedicated to maximizing its replenishment capabilities by actively negotiating with the U.S. Army Corps of Engineers to increase its water conservation program behind Prado Dam and implementing a Long-Term Facilities Plan to evaluate cost-effective improvements to its groundwater recharge capabilities.

In February 2007, OCWD staff completed a report entitled "Evaluation of Orange County Groundwater Basin Storage and Operational Strategy." This report presented a new methodology that had been developed, tested, and documented for calculating accumulated overdraft and storage change based on a three-aquifer layer approach. Furthermore, the report provided the basis for calculating accumulated overdraft using a new full-basin benchmark that was developed for each of the three aquifer layers, which in effect replaces the traditional single-layer full benchmark of 1969.

The annual analysis of basin storage change and accumulated overdraft for water year 2022-23 has been completed. Based on the three-layer methodology, an accumulated overdraft of 189,000 AF was calculated for the water year ending on June 30, 2023. The accumulated overdraft for the prior water year ending on June 30, 2022 was 258,000 AF (also calculated using the three-layer storage method). Therefore, an annual increase of 69,000 AF (reported earlier herein this report) was calculated as the difference between the June 2022 and June 2023 accumulated overdrafts.

Figure 3 shows the accumulated basin overdraft quantities for the period 1981 through 2023.

FIGURE 3. Accumulated Basin Overdraft



The accumulated overdraft for the current water year ending on June 30, 2024 is projected to be 167,000 AF. The projected annual overdraft is estimated to be 98,000 AF. This quantity is based on assumed annual groundwater production of approximately 280,000 AF for the current water year (including groundwater pumping within the BPP, In-Lieu Program water, groundwater pumped above the basin production percentage (BPP) from water quality improvement projects and MWD Groundwater Storage Program extractions) and that natural replenishment (including captured SAR flows and incidental recharge) is estimated to be approximately 182,000 AF for the basin under average rainfall conditions. In addition, GWRS production is projected to reach 117,000 AF.

Projected annual overdraft for the ensuing water year 2024-25 is estimated to be 110,000 AF. This estimate is based on the assumption that total annual groundwater production for the ensuing water year will be 292,000 AF, a figure that is based upon an assumed BPP of 85 percent and includes 15,000 AF of production above the BPP from water quality improvement projects (discussed further in the subsequent section entitled Recommended Basin Production Percentage). The natural replenishment is estimated to be 182,000 AF (average of last five years) under average rainfall conditions, and the GWRS production is projected to be 128,000 AF.

OCWD, MWD, the Municipal Water District of Orange County (MWDOC) and participating producers approved the funding agreement for the MWD Long-Term Groundwater Storage Program on June 25, 2003. This conjunctive use program (also informally referred to as MWD CUP) provides for MWD to store up to 66,000 AF in the OCWD groundwater basin to be pumped (less basin losses) by participating producers in place of receiving imported supplies during water shortage events. A compensation package from MWD was included in the agreement to build eight new groundwater

production wells, improvements to the seawater intrusion barrier, construction of the Diemer Bypass Pipeline and an annual administrative fee. The preferred means to store water in the MWD storage account has been through the In-Lieu deliveries to participating groundwater producers. Water into the MWD storage account has also been conducted through direct replenishment utilizing OCWD Forebay recharge basins. In any event, the water stored or extracted by MWD is considered as MWD supply and not groundwater production. There was no MWD CUP water stored or extracted in water year 2022-23 and the balance remains zero AF in the MWD CUP account at the end of the water year. The annual quantities and cumulative totals of MWD water stored since the inception of the program are shown in Appendix 4. It is important to note that the reported quantities do not include pumping extractions from the account or basin losses.

In April 2019, OCWD established the Santa Ana Conservation and Conjunctive Use Program (SARCCUP) water bank in the OCWD groundwater basin. Other SARCCUP water bank owners which include San Bernardino Valley Municipal Water District (SBVMWD), Western Municipal Water District (WMWD) and Eastern Municipal Water District (EMWD) also established water banks within their own service areas. The OCWD water bank can contain up to 36,000 AF of water to be used during dry years, as determined by OCWD. Sources of water for the SARCCUP banks include surplus State Project Water (SPW) from SBVMWD, imported water purchased from MWD, and water purchased on the open market. The SBVMWD, a SPW contractor, and MWD have an agreement in which surplus SPW purchased by MWD is made available to OCWD and other SARCCUP agencies for storage in the multiple water banks in the SAR watershed. Surplus SPW purchased from MWD can qualify as Extraordinary Supply (EOS) water which can be used during years when MWD reduces imported supplies via an allocation process. For accounting purposes, two types of water will be tracked in the OCWD SARCCUP water bank. The first is imported water, which is designated as local water and can be used in dry years as determined by OCWD. The second is the EOS water which is surplus SPW. The EOS water can be used during dry years or during allocation years.

The SARCCUP water bank was financed by a $55M Proposition 84 Integrated Regional Water Management grant from the Department of Water Resources and local matching funds from participating agencies including OCWD, SBVMWD, Inland Empire Utilities Agency, WMWD and EMWD. To date, 2,000 AF of imported water is in SARCCUP OCWD water bank.

REPLENISHMENT RECOMMENDATION

Section 27(b) of the District Act states the following:

"*The total of the replenishment assessment levied in any year shall not exceed an amount of money found to be necessary to purchase sufficient water to replenish the average annual overdraft for the immediate past five water years plus an additional amount of water sufficient to eliminate over a*

period of not less than 10 years nor more than 20 years, the accumulated overdraft, plus an amount of money to pay the costs of initiating, carrying on, and completing any of the powers, projects and purposes for which this district is organized."

Based upon Section 27(b), that portion of the RA that is used for water purchases for the ensuing water year 2024-25 is limited to the amount needed to purchase 123,000 AF as calculated below:

Five-year (7/1/2018 through 6/30/2023) Average Annual Overdraft* = 103,700 AF
Accumulated Overdraft (End of Water Year 2022-23) = 189,000 AF
Assumed Time Period to Eliminate Accumulated Overdraft = 10 years
Potential Water Purchase Amount: 103,700 AF + (189,000 AF/10 years) = 122,600 AF (use 123,000 AF)

**Referred to as the Average Annual Overdraft in Section 27(b) of the District Act.*

Table 2 presents the proposed 2024-25 water budget expenses, which shows the proposed quantity of purchased water (3,000 AF) being significantly less than the prescribed limit of 123,000 AF as allowed for under the provisions of Section 27(b) of the District Act.

TABLE 2. 2024-25 Water Budget Expenses

Water Source	Amount (AF)	Unit Cost ($/AF)	Total Cost ($)
Alamitos Barrier	3,000	$ 1,440.00	$ 4,320,000
MWD Untreated Full-Service Water	0	$ 879.50	$ 0
Water Purchases Sub-total	3,000	—	$ 4,320,000
Applicable Charges			**Total Cost ($)**
MWD Readiness to Serve Charge	—	—	$ 1,300,000
MWDOC Groundwater Charge	—	—	$ 400,000
MWD Capacity Charge	—	—	$ 10,000
Total Expenses			$ 6,030,000

RECOMMENDED BASIN PRODUCTION PERCENTAGE

In December 2002, OCWD approved a basin management approach for determining the BPP for future water years. The management approach is based upon the development of a base amount of groundwater production the basin can annually sustain utilizing dependable water supplies OCWD expects to receive. It is a policy for OCWD to provide an estimate of the BPP each January for the following fiscal year to assist the groundwater producers in the preparation of their annual budgets.

The BPP does not restrict the amount of groundwater that a groundwater producer may pump; but a groundwater producer must pay the basin equity assessment (BEA) on any groundwater production (other than BEA-exempt groundwater) above the BPP. The BEA

is set at an amount so that groundwater production above the BPP cost the same amount as imported supplemental water. If groundwater producers produced groundwater significantly above the BPP, this additional groundwater production could increase the annual overdraft (and, over time, increase the accumulated overdraft), with potential detriments to the basin, including seawater intrusion. Substantial groundwater production significantly above the BPP could also impair OCWD's ability to manage the groundwater basin for sustainable groundwater production. The OCWD Act provides regulatory powers to OCWD that can be exercised by OCWD, including the setting of basin production limitations and surcharges, and mid-year modifications to the BPP, BEA, and production limitations/surcharges, to address potential production of significant quantities of groundwater above the BPP. The OCWD Board of Directors may approve a surcharge, in an amount to be determined in its discretion, for production by a producer in excess of any production limitation.

A BPP of 85 percent is currently being proposed for the ensuing water year 2024-25. Analysis of the groundwater basin's projected accumulated overdraft, the available supplies to the basin (assuming below-average hydrology) and the projected pumping demands indicate that this level of pumping could potentially be sustained for 2024-25 without detriment to the basin. Under normal conditions, the annual groundwater production could reach 315,000 AF. However, it is anticipated that the groundwater production for the ensuing water year 2024-25 will be approximately 292,000 AF due to the water quality impacts of PFAS causing wells to be shut down.

In order to achieve water quality objectives in the groundwater basin, it is estimated for the ensuing water year 2024-25 that additional production of approximately 15,000 AF (above the BPP) will be undertaken by the City of Tustin, City of Huntington Beach, Mesa Water District and IRWD. These agencies need the additional pumping allowance in order to accommodate groundwater quality improvement projects. As in prior years, production above the BPP from these projects would be partially or fully exempt from the BEA as a result of the benefit provided to the basin by removing poor-quality groundwater and treating it for beneficial use.

In March 2024, staff will review with the OCWD Board of Directors the basis and the assumptions made for the proposed BPP and receive any direction on the matter. In April 2024, staff will again apprise the OCWD Board of Directors on the status of the aforementioned conditions. If the estimate of basin supplies in the current or ensuing year are substantially different than those contained in the respective conditions, a revised BPP may then be recommended.

PART II: WATER SUPPLY AND BASIN UTILIZATION

Section 31.5 of the District Act requires an investigation and annual report setting forth the following information related to water supply and basin utilization within the OCWD service area, together with other information as OCWD may desire:

WATER SUPPLY AND BASIN UTILIZATION
2022-23 SUMMARY OF FINDINGS

1. Water usage from all supplemental sources and non-local water sources (if any) totaled 107,723 AF for the 2022-23 water year.

2. Water usage from recycled water produced from within OCWD including the GWRS totaled 120,018 AF for the 2022-23 water year.

3. Water demands within OCWD totaled 351,719 AF for the 2022-23 water year.

4. Estimated demands for groundwater for the ensuing 2024-25 water year are 292,000 AF.

SUPPLEMENTAL WATER

Supplemental water is used by water agencies within OCWD's boundary to augment groundwater supplies in satisfying their user demands and by OCWD to recharge the groundwater basin. Supplemental water, as defined in Section 31.5 of the District Act, is any water that originates from outside the SAR watershed (comprised of an area of 2,081 square miles) with the exception of that portion of that watershed on and along Santiago Creek upstream of the downstream toe of the slope of the Villa Park Flood Control Dam which is counted as supplemental water. It is important to note that the Santiago Creek watershed lies entirely within the SAR watershed. Sources of supplemental water typically include imported deliveries from MWD and diversions from Irvine Lake/Santiago Reservoir (i.e., Santiago Creek) that are conveyed to users within OCWD boundaries. MWD deliveries originate from either the Colorado River or the SWP. In addition, supplemental water would also include deliveries from within the SAR watershed that involve water exchanges (i.e., releasing a quantity of water that originates from within the SAR watershed while importing an equal quantity of supplemental water to replace it).

Non-local waters are defined, for the purposes of this report, as waters purchased from agencies outside of OCWD's boundary for use within OCWD. Non-local waters include all water deliveries to OCWD where the water source is located within the SAR watershed. Water deliveries to OCWD from the Arlington Desalter in Riverside and the San Bernardino Valley Municipal Water District's High Groundwater Mitigation Project are considered non-local waters. Although not utilized in recent years, both projects involve pumping (and treatment in Arlington's case) and release of groundwater from the SAR upstream groundwater basins to OCWD via the SAR for groundwater replenishment at OCWD Forebay recharge facilities. For the purpose of being consistent with previous Engineer's Reports and to present information in a concise manner, non-local water deliveries that are purchased and used by OCWD for groundwater replenishment are included in the supplemental water totals in this report. However, while accounted for in the supplemental water totals in this Engineer's Report for convenience and consistency purposes, these non-local waters are not supplemental sources of water as defined in Section 31.5 of the District Act because the non-local waters originate within the SAR watershed. These non-local water deliveries are not included in the accounting of supplemental sources that address water demands within OCWD as shown in Table 5.

Recycled wastewater produced and used within OCWD is considered, for the purposes of this report, as neither non-local water nor supplemental water (sometimes referred to as neutral water). Therefore, recycled water that originates from within OCWD is reported separately from supplemental water totals. However, recycled water used in the Alamitos Barrier is supplied by Water Replenishment District of Southern California

(WRD) and originated from outside the SAR watershed, and, as such, is categorized as supplemental water.

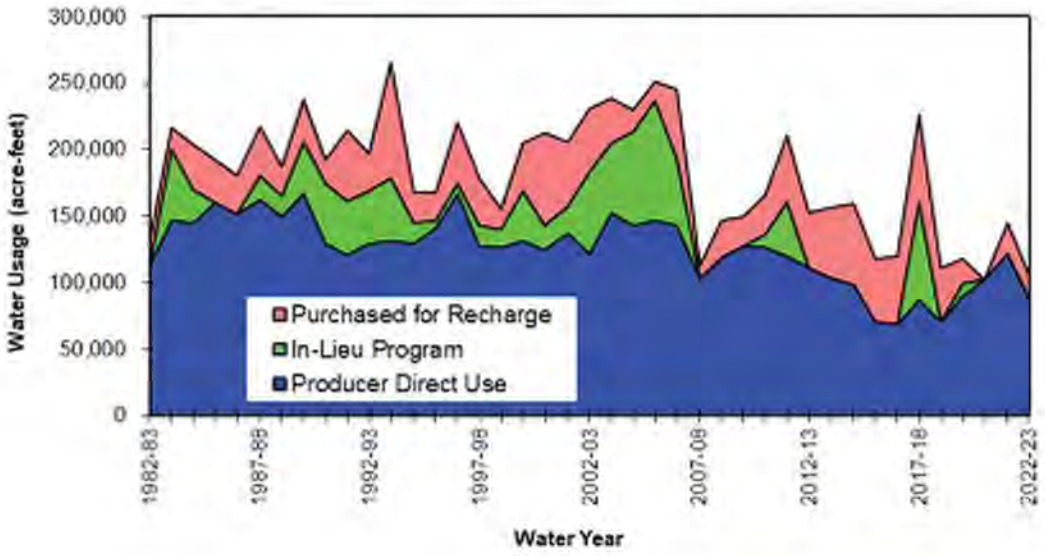
Water agencies utilizing supplemental water are listed in Appendix 1. As summarized in Table 3, the use of supplemental water in OCWD's service area during the 2022-23 water year totaled 107,723 AF of which 88,441 AF resulted from the direct use by water agencies and districts and 19,282 AF were used for groundwater replenishment purposes. The supplemental water used by water agencies included 86,510 AF for municipal and industrial use and zero AF for agricultural purposes. Historical supplemental water usage is illustrated in Figure 4. The GWRS delivered recycled water to OCWD Forebay recharge basins and the Talbert seawater intrusion barrier throughout the 2022-23 water year. A breakdown of non-local water purchases by OCWD from water years 2003-2004 through 2022-23 is presented in Appendix 4.

TABLE 3. 2022-23 Supplemental Water Usage

Direct Agency Use	AF
Imported Water[1]	86,510
Santiago Creek Native Water	1,931
Subtotal	**88,441**
Groundwater Replenishment (Purchased)	**AF**
In-Lieu Program[2]	0
Forebay Recharge[3]	16,865
Alamitos Barrier[4]	2,414
Talbert Barrier	3
Subtotal	**19,282**
TOTAL	**107,723**

[1]Includes any extractions from MWD Groundwater Storage Program.
[2]Any amount reported herein includes water received by OCWD's groundwater producers as In-Lieu water.
[3]Full service rate untreated water.
[4]Total amount combines imported and recycled water deliveries.

FIGURE 4. Historical Supplemental Water Usage



Recycled water use within OCWD is presented in Table 4 (excluding WRD-supplied recycled water to the Alamitos Barrier because this water is categorized as supplemental water and already included in the total amount reported in Table 3). The major uses of recycled water are groundwater replenishment (including Kraemer, Miller, Miraloma and La Palma recharge basins and Talbert Barrier injection wells) and supply water for irrigation and industrial users.

TABLE 4. 2022-23 Recycled Water Usage

Groundwater Replenishment	Water Usage (AF)
GWRS AWPF (for Talbert Barrier)	19,747
GWRS AWPF (for Recharge Basins)[1]	74,687
GWRS AWPF (for Mid-Basin Injection)	7,516
Subtotal	**101,950**
Irrigation	**Water Usage (AF)**
IRWD[2]	14,672
OCWD (Green Acres Project)[3]	3,396
Subtotal	**18,068**
TOTAL	**120,018**

[1]Includes 63 AF of GWRS recycled water delivered to City of Anaheim Canyon Power Plant and Anaheim Regional Transportation Intermodal Center.
[2]Recycled water used within the portion of OCWD that lies within IRWD's boundaries (excludes OCWD/IRWD intertie water deliveries to the Green Acres Project).
[3]Excludes deliveries to the Orange County Sanitation District and includes IRWD/OCWD Intertie deliveries to the Green Acres Project.

AVAILABILITY OF SUPPLEMENTAL REPLENISHMENT WATER

MWD's untreated full-service water supply for any groundwater-basin agencies was available during the water year 2022-23 as a result of its allocation of State Project Water and normal rainfall conditions. Supplemental water from MWD to recharge the groundwater basin is available in the current water year and is expected to be available in the ensuing water year 2024-25. OCWD is not planning to purchase untreated full-service water to recharge its groundwater basin in the ensuing water year 2024-25 due to the relatively full condition of the groundwater basin.

WATER DEMANDS

During the 2022-23 water year, the total water demands within OCWD's service area were 351,719 AF. Total demands include the use of groundwater, MWD In-Lieu Program water, supplemental sources (including imported water and Santiago Creek native water) and recycled water (which is not included within supplemental sources if originating within the SAR watershed). Total demands exclude any groundwater, supplemental water, and recycled water (such as the GWRS recycled water) used by OCWD for groundwater recharge.

Water demands for 2022-23 and projected water demands for 2023-24 and 2024-25 are summarized in Table 5. The water demands for the current year 2023-24 were determined by assessing the data that is presently available for the first half of the water year and projecting that data to develop the total annual water demands. The water demands for the ensuing year 2024-25 are based on the projections provided by the retail water agencies within OCWD's service area. Long-term projections are presented in Figure 5.

TABLE 5. Water Demands Within OCWD

	Ground-water[1]	Imported Water[2,3]	Santiago Creek Native Water[3]	Recycled Water[4]	Total[6]
2022-23					
Non-Irrigation	244,674	86,510	1,931	-	333,115
Irrigation	536	0	-	18,068	18,604
Total	**245,210**	**86,510**	**1,931**	**18,068**	**351,719**
2023-24 (Current Year)[5]					
Non-Irrigation	279,400	70,000	2,000	-	351,400
Irrigation	600	-	-	18,000	18,600
Total	**280,000**	**70,000**	**2,000**	**18,000**	**370,000**
2024-25 (Ensuing Year)[5]					
Non-Irrigation	291,300	59,000	2,000	-	350,300
Irrigation	700	-	-	18,000	18,700
Total	**292,000**	**59,000**	**2,000**	**18,000**	**370,000**

[1] *Includes In-Lieu Program water, if available. Also includes groundwater pumped under water quality improvement agreements entered into between OCWD and certain producers pursuant to Section 38.1 of the District Act where the produced groundwater is exempted from payment of all or a portion of the BEA. The BEA-exempt groundwater is deducted from the projection of total groundwater used to calculate the BPP.*

[2] *Excludes water conservation credits and imported water used for groundwater replenishment.*

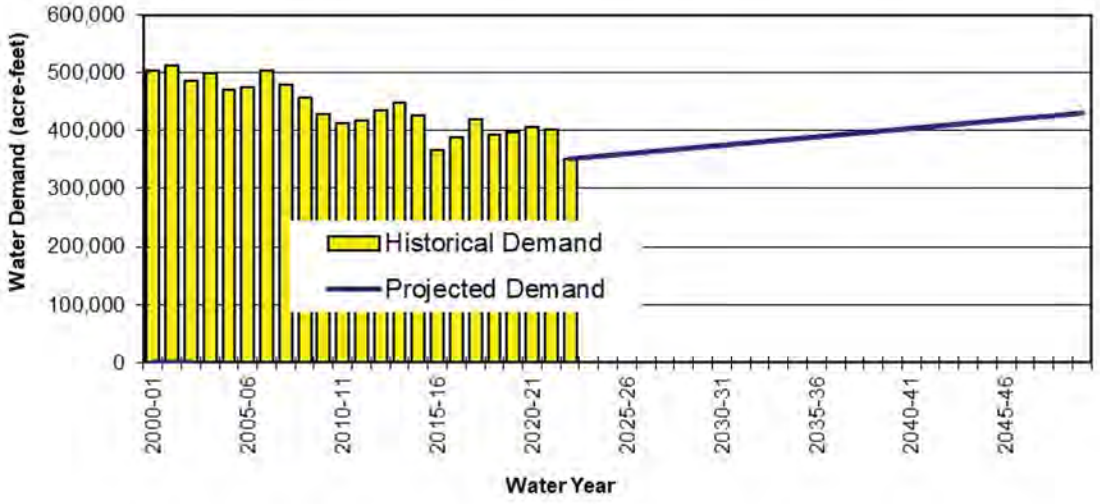
[3] *"Imported Water" and "Santiago Creek Native Water" are both counted as supplemental water.*

[4] *Excludes GWRS recycled water recharged into the groundwater basin. Includes recycled water from IRWD and OCWD's Green Acres Project (excluding Orange County Sanitation District's usage).*

[5] *Water demands are estimated by OCWD assuming average hydrology.*

[6] *Includes all groundwater and non-groundwater sources and is greater than the number of supplemental sources used in the calculation of BPP. For purposes of this table, supplemental water is calculated as the sum of Imported Water and Santiago Creek Native Water and does not include Recycled Water.*

FIGURE 5. Water Demand Projections



WATER DEMAND FORECAST

OCWD participates with MWDOC and retail groundwater producers to predict future demands in OCWD's service area. Each groundwater producer projected its total water demands to the year 2050. These projections include the effect of local water conservation efforts and slight increase in population. Figure 5 illustrates the historical and the projected water demands for OCWD's service area to the year 2050.

ADVANCED WASTEWATER RECLAMATION

Groundwater, supplemental water, and local surface water have historically been the primary water sources within OCWD. In recent decades, wastewater reclamation has increasingly become a significant source of additional water. Purified recycled water has been produced by OCWD for use as injection water in the Talbert Barrier and as percolation water in Kraemer, Miller, Miraloma and La Palma recharge basins. OCWD and IRWD also recycle wastewater at their respective treatment plants for irrigation and industrial uses.

The GWRS is an advanced wastewater reclamation project jointly funded by OCWD and the Orange County Sanitation District (OC San). The project was operational in January 2008. The advanced treatment processes utilized in the GWRS consist of microfiltration (MF) followed by reverse osmosis (RO) membranes and advanced oxidation process of ultraviolet (UV) light in combination with hydrogen peroxide. For the water year 2022-23, the GWRS treated wastewater from the OC San to drinking water standards and delivered 101,950 AF of purified water for direct injection into the

Talbert seawater intrusion barrier and percolation into the OCWD groundwater basin via recharge basins and MBI well.

For water year 2022-23, OCWD and IRWD recycled water deliveries for landscape irrigation and industrial uses in Fountain Valley, Costa Mesa, Huntington Beach, Newport Beach, Santa Ana and IRWD's service area within OCWD totaled 18,068 AF.

WRD operates the Alamitos Barrier Recycled Water Project, known as the Leo J. Vander Lans Water Treatment Facility, that has a design capacity of 8 MGD; however, its recent production is typically 4 MGD. This project supplies highly treated recycled water to the Alamitos Barrier. The Leo J. Vander Lans advanced wastewater treatment facility located in Long Beach utilizes the treatment processes of MF, RO and advanced oxidation process of UV light and hydrogen peroxide. This project is ultimately intended to replace most of the imported water used to supply the Alamitos Barrier with purified recycled water. The project operated throughout the water year 2022-23 and supplied 1,619.9 AF of purified recycled water to OCWD's portion of the Alamitos Barrier, which represented 67.1 percent of the barrier's supply that OCWD is responsible for payment. Recycled water deliveries from the Leo J. Vander Lans plant to the Orange County portion of the Alamitos Barrier are classified as supplemental water because this recycled water originates from outside the SAR watershed.

WATER QUALITY

OCWD maintains a comprehensive groundwater protection policy that includes water quality monitoring, removal of contaminants, regulatory agency support, toxic residuals removal and hazardous waste management. In addition, OCWD provides water quality information to regulatory agencies, other water agencies and the general public. In order to meet the current and future water quality testing requirements, OCWD operates the Philip L. Anthony Water Quality Laboratory at the Fountain Valley campus. The laboratory houses approximately 31 chemists and laboratory technicians, 12 water quality monitoring personnel and all the analytical instruments that are needed to perform more than 400,000 analyses of approximately 20,000 water samples taken each water year. The laboratory supports the extensive water quality testing requirements for the GWRS.

When blended together by the major agencies within OCWD's service area, the blended groundwater (without treatment) and treated supplemental water for 2022-23 was determined to have a flow-weighted average of 440 milligrams per liter (mg/L) of total dissolved solids (TDS) which is lower than the average TDS concentration of 465 mg/L reported for the prior year (2021-22). The average groundwater TDS concentration for the basin for 2022-23 was 415 mg/L (compared to 402 mg/L reported for 2021-22), ranging from a low of 235 mg/L in coastal areas (such as Seal Beach) to a high of approximately 716 mg/L in certain inland areas.

Average concentrations of TDS, nitrate (NO_3) and hardness for groundwater and groundwater combined with supplemental water supplied by agencies within OCWD's service area during the 2022-23 water year are summarized in Table 6. These concentrations were determined from groundwater and supplemental water analyses and from production reports submitted to and filed with OCWD by each water agency. The City of Tustin and IRWD have active groundwater treatment projects that help to reduce certain constituents reported in Table 6 in their groundwater supply prior to service to their customers (see note 6 for detailed explanation).

WATER RESOURCES DATA

A summary of water resources data within OCWD for the 2022-23 water year and the previous water year (2021-22) is included in Appendix 5.

TABLE 6. 2022-23 Water Quality Summary

City/Agency	Groundwater[1,7]			Delivered Blend[1,2,7]		
	TDS[3]	NO_3-N[4]	Hard-ness[5]	TDS[3]	NO_3-N[4]	Hard-ness[5]
Anaheim	509	2.1	300	506	0.8	247
Buena Park	416	1.4	256	425	1.3	253
East Orange County Water District	588	3.4	336	504	0.3	225
Fountain Valley	334	1.0	190	334	1.0	190
Fullerton	516	2.3	252	513	1.8	246
Garden Grove	517	3.5	330	515	2.9	310
Golden State Water Company	392	1.4	233	441	0.9	229
Huntington Beach	287	0.4	142	355	0.4	168
Irvine Ranch Water District[6]	316*	0.6*	109*	326*	0.6*	115*
La Palma	286	ND[8]	144	287	ND[8]	144
Mesa Water District	306	0.5	117	306	0.5	117
Newport Beach	302	1.2	175	338	1.0	184
Orange	472	2.4	274	478	2.0	264
Santa Ana	396	2.1	242	424	1.6	238
Seal Beach	235	ND[8]	88	292	ND[8]	116
Serrano Water District	576	1.5	310	560	1.1	314
Tustin[6]	716*	6.6*	425*	621*	3.8*	336*
Westminster	373	1.8	244	376	1.8	244
Yorba Linda Water District	672	1.2	332	648	1.1	317
Weighted Average[7]	**415**	**1.6**	**220**	**440**	**1.2**	**222**

[1] *All groundwater results (alone or blend) are for untreated groundwater (see note 6 below). Units are reported in mg/L.*

[2] *Delivered blend includes untreated groundwater and treated imported MWD water (i.e., blend of Colorado River water and State Project water as measured at the MWD Diemer Plant), except Serrano Water District, which blends with treated Santiago Reservoir water. Units are reported in mg/L. Annual average water qualities for MWD and Santiago Reservoir (Irvine Lake) for 2022-23 are as follows:*

MWD Water Quality			*Santiago Reservoir Water Quality*		
TDS	=	*504 mg/L*	*TDS*	=	*533 mg/L*
NO_3-N	=	*0.29 mg/L*	*NO_3-N*	=	*0.43 mg/L*
Hardness (as $CaCO_3$)	=	*225 mg/L*	*Hardness (as $CaCO_3$)*	=	*321 mg/L*

[3] *Secondary Drinking Water Standards for TDS are as follows:*

500 mg/L = recommended limit
1,000 mg/L = upper limit

[4] *Primary Drinking Water Standard for nitrate NO_3-N (i.e., nitrate expressed as nitrogen) is 10 mg/L.*

[5] *Hardness is reported as mg/L of $CaCO_3$. General classifications of hard and soft water are within the following concentration ranges:*

0-75 mg/L	=	*soft*	*150-300 mg/L*	=	*hard*
75-150 mg/L	=	*moderately hard*	*300 and up mg/L*	=	*very hard*

[6] *Agencies with active groundwater quality improvement projects that treat for one or more of the constituents listed in the table. The results shown herein for "groundwater" and "delivered blend" reflect results from untreated groundwater. Water quality constituents that are marked with an asterisk (*) are reduced prior to delivery to customers.*

[7] *All water quality results are flow-weighted averages based on groundwater and imported water delivered to each agency.*

[8] *ND = not detected. Nitrate (expressed as NO_3-N) analytical detection limit for OCWD Philip L. Anthony Water Quality Laboratory is 0.1 mg/L.*

PART III: WATER PRODUCTION COSTS FOR ENSUING WATER YEAR (2024-25)

Section 31.5 of the District Act requires that costs of producing groundwater and obtaining supplemental water be evaluated annually. These costs vary for each groundwater producer and depend on many factors. Although these variations in cost are recognized, it is necessary for the purpose of this report to arrive at figures representing the average cost of producing groundwater and purchasing supplemental water.

ENSUING WATER YEAR (2024-25) WATER PRODUCTION COSTS SUMMARY OF FINDINGS

1. Cost for producing water from the groundwater basin within OCWD including a replenishment assessment for 2024-25 is estimated to be $1,009.00 per acre-foot.

2. Cost of treated, non-interruptible supplemental water for 2024-25 is estimated to be $1,380.00 per acre-foot.

GROUNDWATER PRODUCTION COSTS FOR NON-IRRIGATION USE

Cost for producing an acre-foot of groundwater in the ensuing 2024-25 water year has been estimated for a potable water well for a large groundwater producer (i.e., a city water department, water district) in OCWD's service area. Operations and maintenance (O&M) and energy costs were determined using the cost information provided by nineteen large groundwater producers from a survey conducted by OCWD in fall 2023. The capital cost component was derived using the current capital cost of a typical production well (including design and construction costs) financed with an annual interest rate of five percent and amortized over a 30-year repayment period. Appendix 6 contains several of the key design characteristics for a typical production well. The OCWD RA used in the determination of groundwater production cost is the proposed RA for 2024-25.

The estimated cost for groundwater production for a large groundwater producing entity such as a city water department or a water district is presented in Table 7. The total cost to produce an acre-foot of groundwater within OCWD in the ensuing 2024-25 water year is estimated to be $1,009 per acre-foot. Based on the responses to the aforementioned survey, the flow-weighted average (based upon the quantity of groundwater pumped) for energy cost equaled $110 per AF. The O&M costs ranged from $5 to $395 per acre-foot with a median cost of approximately $86 per acre-foot. Elements that influence these costs include load factors and variations in groundwater levels. Recently drilled wells are generally deeper than those drilled decades ago. From the aforementioned survey, the average load factor which indicates the percent-of-use of an extraction facility equaled 50 percent.

TABLE 7. Estimated 2024-25 Groundwater Production Costs

Cost Item	Non-Irrigation Use	
	Annual Cost ($)	Cost per AF ($/AF)
Energy	286,000	110[2]
RA	1,788,800	688[3]
Capital	325,000[1,4]	125[1,4]
O&M	223,600	86[2]
Total Cost to Producers	2,623,400	1,009

[1] *Based upon an annual average production of 2,600 AF per production well.*
[2] *Based on survey of major agencies within OCWD's service area, non-irrigation groundwater users.*
[3] *Proposed RA for 2024-25.*
[4] *Assuming $5,000,000 capital cost (including design and construction) with an interest rate of five percent amortized over a 30-year period and excluding cost of land purchase.*

COST OF SUPPLEMENTAL WATER

Supplemental water is supplied to OCWD's service area by MWD. MWD delivers both treated and untreated water as either an uninterruptible supply or an interruptible supply. As a result, there are several categories of water available from MWD. The categories most applicable for purposes of this report are 1) uninterruptible (i.e., firm) treated water, which is referred to as "full-service water," and 2) uninterruptible untreated water. Treated water is purchased and used directly by various groundwater producers for municipal and industrial purposes, while untreated water is purchased and recharged into the basin by OCWD to support higher groundwater production. Table 8 shows the estimated cost for the MWD uninterruptible treated water (full-service water) cost for the ensuing 2024-25 water year. Figure 6 illustrates the historical supplemental water costs along with the historical groundwater production costs. A comparison of estimated costs for groundwater versus supplemental water (non-irrigation use) during the ensuing water year 2024-25 is summarized in Table 9 and in Figure 6. Values used in Figure 6 are presented in tabular form in Appendix 7.

TABLE 8. Estimated 2024-25 Supplemental Water Cost[1]

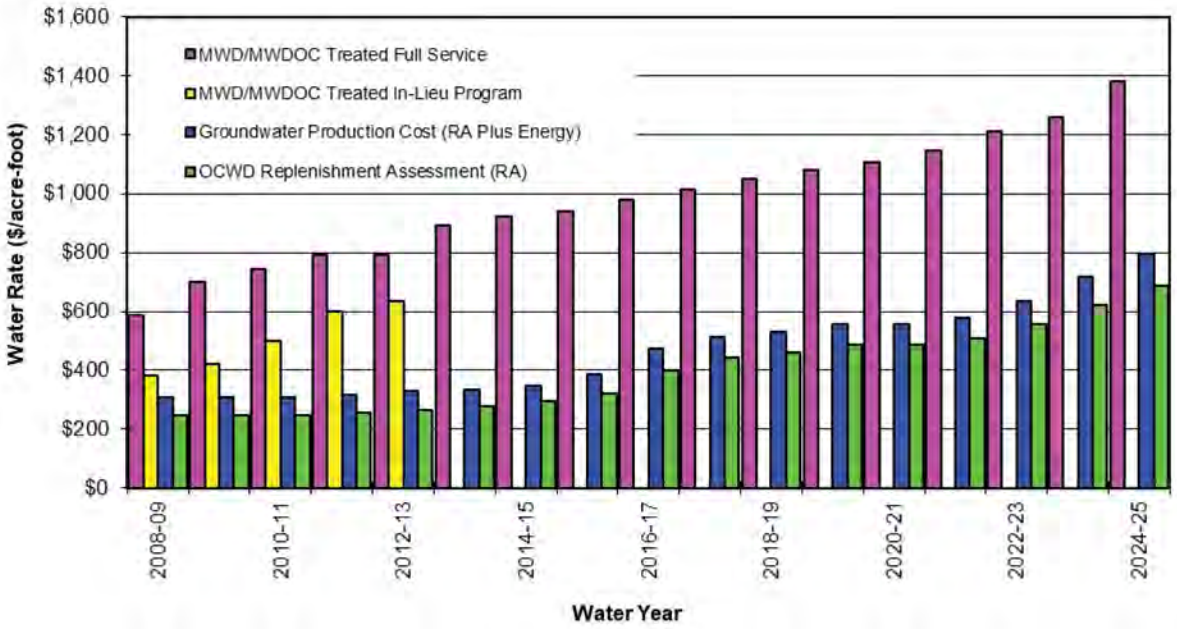
Rate and Charge Components	Treated Water Rate ($/AF)
Firm Deliveries	**Full-Service Water**
MWD Supply Rate (MWDOC Melded Rate)	343.50
MWD System Access Rate	402.50
MWD System Power Rate	188.50
MWD Treatment Surcharge	365.50
MWD RTS and Capacity Charges[2]	80.00
Total	**1,380.00**

[1] *Rates are an average of calendar year 2024 and calendar year 2025. Supplemental water costs for MWD's member agencies (i.e., Anaheim, Fullerton, and Santa Ana) are not reported herein due to the variability among these agencies on water supply allocations between MWD's Tier 1 and Tier 2.*

[2] *Readiness-to-Serve (RTS) and Capacity Charges have been converted to an approximate cost per acre-foot but are not normally reported in terms of unit cost.*

Cost components for supplemental treated and untreated water are listed in Table 8. Beyond the normally expected water supply, treatment and power charges, there are several other charges. The System Access charge is for costs associated with the conveyance and distribution system, including capital and O&M costs. MWD uses the Capacity Charge to recover its cost for use of peaking capacity within its distribution system. The RTS charge is to recover MWD's cost associated with providing standby and peak conveyance capacity and system emergency storage capacity.

FIGURE 6. Adopted and Projected Water Rates for Non-Irrigation Use[1]

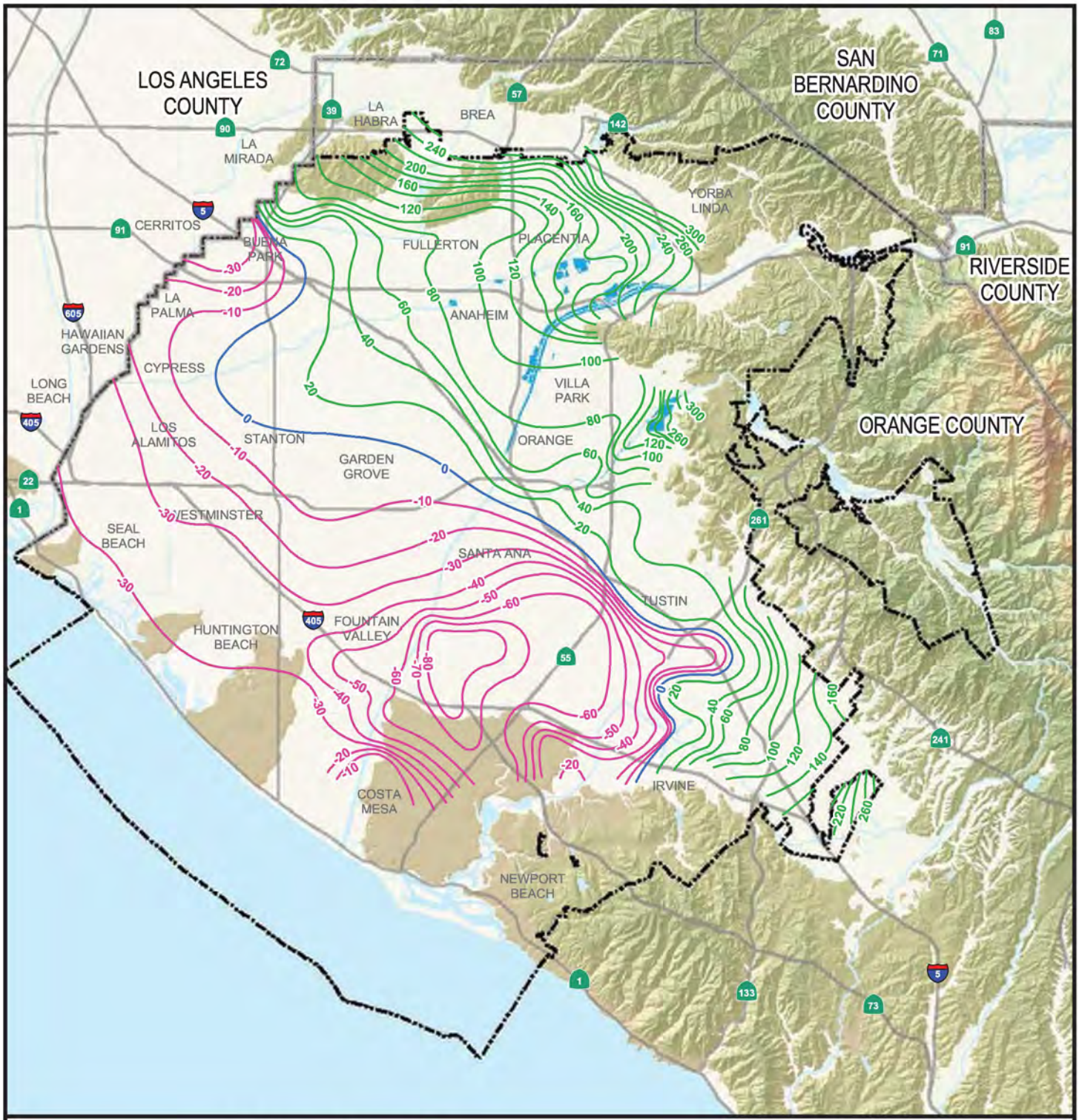


[1] *Refer to Appendix 7 for actual values used in Figure 6.*

TABLE 9. Estimated 2024-25 Water Production Cost Comparison

Non-Irrigation Use	Groundwater Cost ($/AF)	Supplemental Water Cost ($/AF)
Fixed Cost	125.00[1]	1,380.00[3]
Variable Cost	884.00[2]	-[3]
Total	**1,009.00**	**1,380.00**

[1] *Capital cost.*
[2] *Cost for energy, O&M and proposed RA.*
[3] *Delineation of fixed and variable costs is not available.*



Estimated Groundwater Elevations within the Principal Aquifer
Feet above Mean Sea Level* (ft MSL)

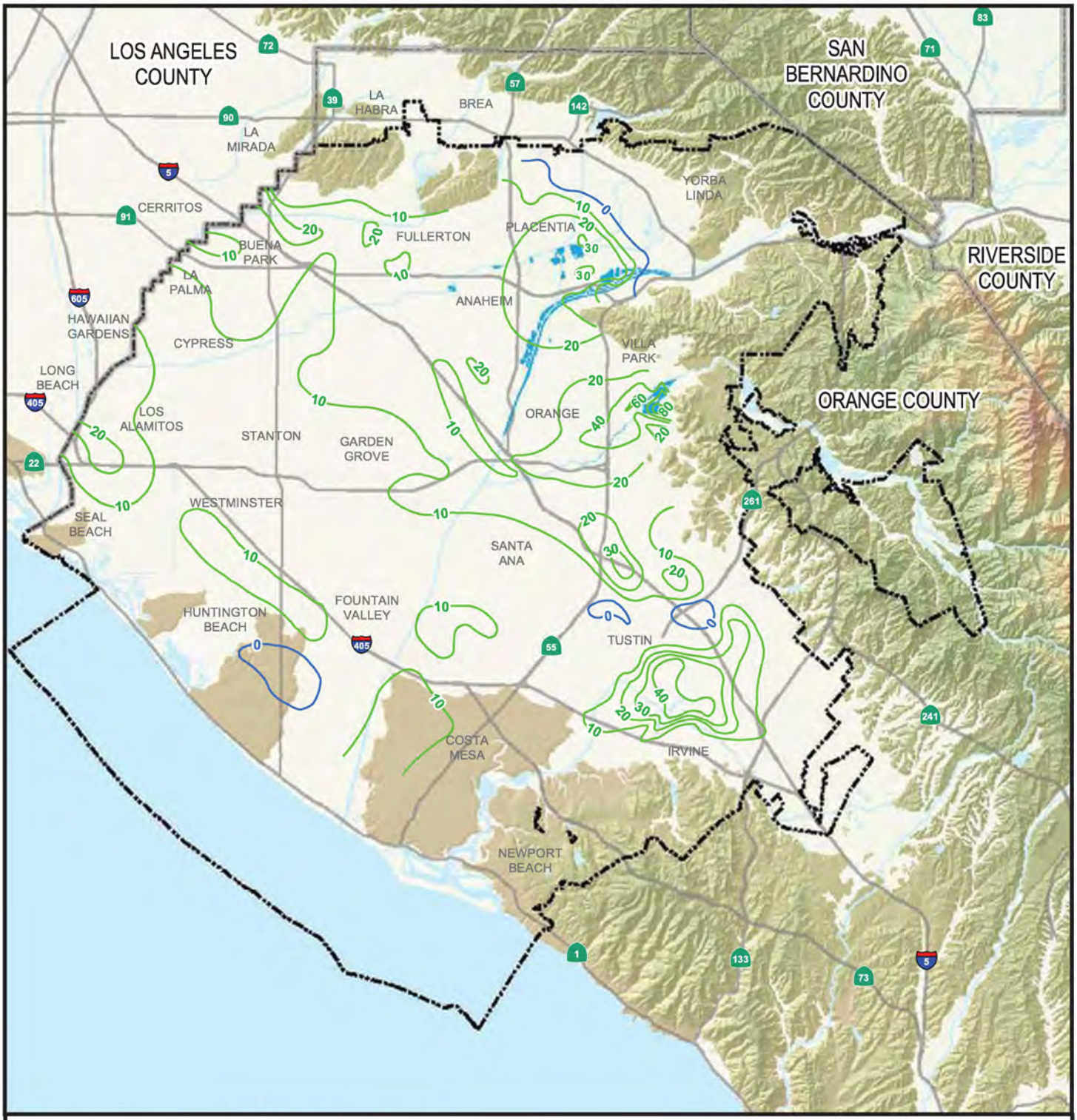
- -80 to -10
- 0
- 20 to 300
- Recharge Facility Areas
- Freeways / Highways
- Rivers / Streams
- Orange County Water District
- Water Bodies

PLATE 1
GROUNDWATER CONTOUR MAP
JUNE 2023

N W E S

0 1 2 4 Miles

*NOTE: MSL elevations are referenced to Vertical Datum NGVD 29



Estimated Groundwater Elevation Changes within the Principal Aquifer (Feet)

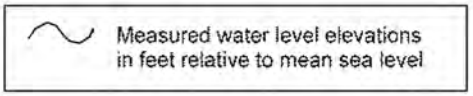
- 0
- 10 to 80
- Recharge Facility Areas
- Freeways / Highways
- Rivers / Streams
- Orange County Water District
- Water Bodies

PLATE 2
CHANGE IN GROUNDWATER LEVEL FROM JUNE 2022 TO JUNE 2023

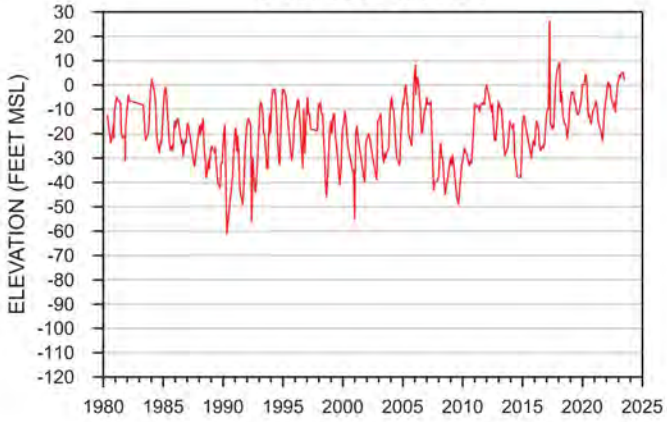
N W E S

0 1 2 4 Miles

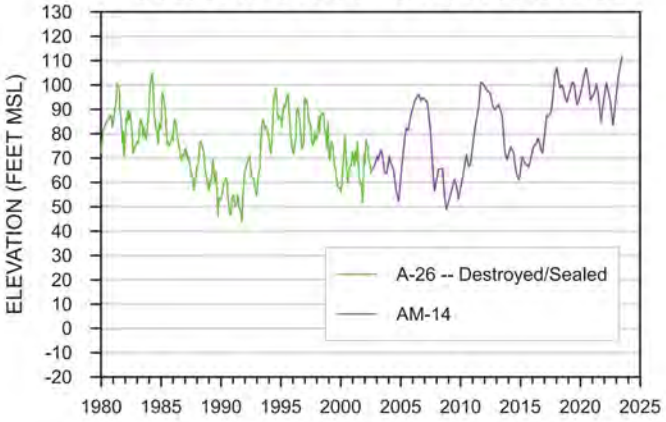
PLATE 3
KEY WELL GROUNDWATER ELEVATION TRENDS IN THE PRINCIPAL AQUIFER



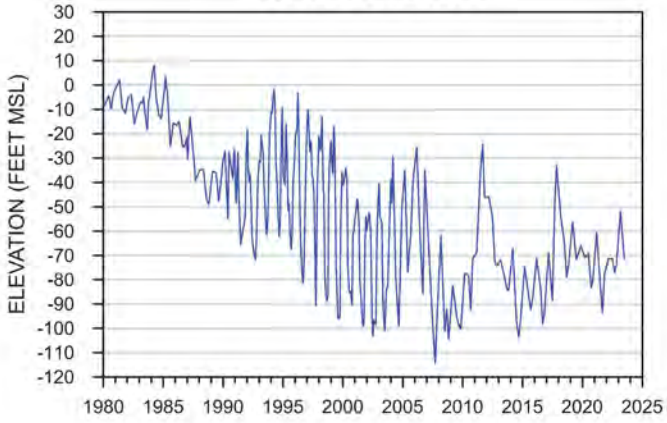
GG-16
04S/11W-33L01



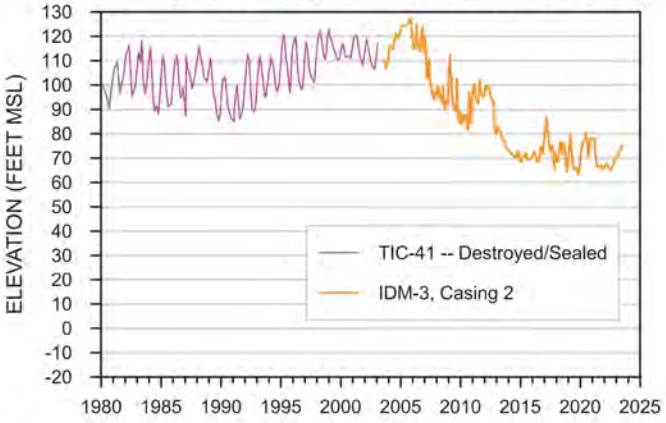
A-26 / AM-14
04S/10W-01F01 / 04S/10W-01P02

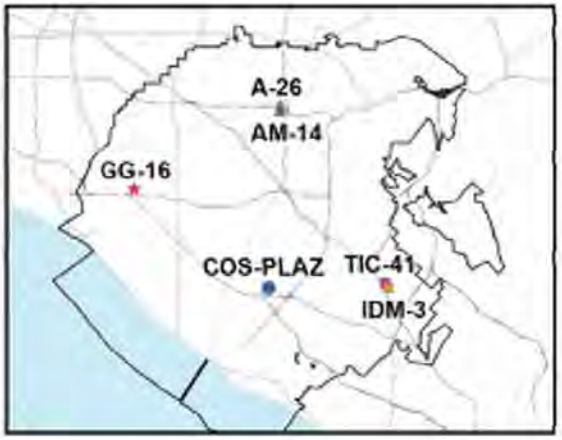


COS-PLAZ
05S/10W-35K01



TIC-41 / IDM-3
05S/09W-36B01 / 05S/09W-36B02





APPENDIX 1. 2022-23 Water Production Data

Groundwater Producer	Groundwater (AF)				Supplemental Water (AF)			Grand Total (AF)	Actual BPP Non-Irrigation [1] Only
	Non-Irrigation [1]		Irrigation Pumping	Total	Non-Irrigation Deliveries	Irrigation Deliveries	Total		
	Pumping	In-Lieu [2]							
Anaheim, City of [6]	15,482.1	-	-	15,482.1	36,572.9	-	36,572.9	52,055.0	29.7%
Buena Park, City of [6]	10,465.3	-	-	10,465.3	1,302.3	-	1,302.3	11,767.6	88.9%
East Orange County Water District	2.5	-	-	2.5	753.9	-	753.9	756.4	0.3%
County of Orange	103.5	-	-	103.5	59.1	-	59.1	162.6	63.7%
Fountain Valley, City of	7,854.8	-	-	7,854.8	-	-	0.0	7,854.8	100.0%
Fullerton, City of	15,469.5	-	-	15,469.5	5,058.1	-	5,058.1	20,527.6	75.4%
Garden Grove, City of [3,6]	16,136.2	-	-	16,136.2	3,641.7	-	3,641.7	19,777.9	81.6%
Golden State Water Company [6]	11,393.7	-	-	11,393.7	8,813.0	-	8,813.0	20,206.7	56.4%
Huntington Beach, City of	16,108.6	-	-	16,108.6	7,257.9	-	7,257.9	23,366.5	68.9%
Irvine Ranch Water District [3,4]	43,964.0	-	-	43,964.0	2,212.4	-	2,212.4	46,176.4	95.2%
La Palma, City of	1,610.2	-	-	1,610.2	4.1	-	4.1	1,614.3	99.7%
Mesa Water District [3]	14,777.9	-	-	14,777.9	9.8	-	9.8	14,787.7	99.9%
Newport Beach, City of	10,595.9	-	-	10,595.9	2,248.8	-	2,248.8	12,844.7	82.5%
Orange, City of [4]	18,390.1	-	-	18,390.1	4,374.3	-	4,374.3	22,764.4	80.8%
Orange County Water District [5]	1,558.0	-	-	1,558.0	-	-	0.0	1,558.0	100.0%
Santa Ana, City of [6]	22,674.2	-	-	22,674.2	7,894.3	-	7,894.3	30,568.5	74.2%
Seal Beach, City of	2,152.5	-	-	2,152.5	569.9	-	569.9	2,722.4	79.1%
Serrano Water District [4]	1,803.6	-	-	1,803.6	852.4	-	852.4	2,656.0	67.9%
Tustin, City of [3]	5,296.2	-	-	5,296.2	4,279.7	-	4,279.7	9,575.9	55.3%
Westminster, City of [6]	9,499.7	-	-	9,499.7	218.2	-	218.2	9,717.9	97.8%
Yorba Linda Water District [6]	14,239.7	-	-	14,239.7	2,318.7	-	2,318.7	16,558.4	86.0%
Total Major Groundwater Producers	239,578.2	0.0	0.0	239,578.2	88,441.5	0.0	88,441.5	328,019.7	73.0%
Other Producers	5096.3	-	535.5	5,631.8	-	-	-	5,631.8	
Total Amount	244,674.5	0.0	535.5	245,210.0	88,441.5	0.0	88,441.5	333,651.5	
Basin Production Percentage Overall									**73.3%**

[1] *Water classed as being used for purposes other than commercial agriculture.*

[2] *Imported MWD water purchased for domestic use to offset groundwater pumping.*

[3] *Agencies that participate in a groundwater water quality improvement project.*

[4] *Agencies that receive Santiago Creek native water above Villa Park Dam which are conveyed to users within OCWD. Such water, if delivered, is included within the classification of "Supplemental Water"*

[5] *Groundwater quantity reported herein is that quantity used by OCWD for purposes other than seawater intrusion barrier maintenance.*

[6] *These agencies participated in the MWD Long-Term Groundwater Storage Program for which groundwater was extracted and accounted for as supplemental water.*

APPENDIX 2. 2022-23 Groundwater Production — Non-Irrigation Use Production Over 25 Acre-feet

PRODUCER	AF	PRODUCER	AF
Alta Vista Country Club	168.5	Mesa Verde Country Club	280.1
Anaheim Cemetery	43.5	Mesa Water District	14,777.9
Anaheim, City of	15,482.1	Midway City Mutual Water Co.	127.7
Billy Casper Golf	193.0	Mile Square Golf Course	69.0
Buena Park, City of	10,465.3	Newport Beach Golf Course	102.3
Canyon RV Park	65.8	Newport Beach, City of	10,595.9
County of Orange	103.5	Old Ranch Country Club	319.9
DS Services of America, Inc.	158.1	Orange County Water District	1,557.9
Eastlake Village HOA	53.3	Orange, City of	18,390.1
Eastside Water Association	171.0	River View Golf	181.3
Fairhaven Memorial Park	136.5	Santa Ana Cemetery	51.7
Forest Lawn Memorial Park	120.3	Santa Ana Country Club	214.5
Fountain Valley, City of	7,854.8	Santa Ana, City of	22,674.2
Fullerton, City of	15,469.5	Seal Beach, City of	2,152.5
Garden Grove, City of	16,136.2	Serrano Water District	1,803.6
Golden State Water Company	11,393.7	SMCM Water Co.	63.5
Hargis and Associates, Inc.	57.1	The Boeing Company	156.3
Huntington Beach, City of	16,108.6	The Good Shepherd Cemetery	51.6
Hynes Estates, Inc.	71.2	The Lakes Master Association	59.6
Irvine Ranch Water District	43,964.0	Tustin, City of	5,296.2
Knott's Berry Farm	150.8	Westminster Memorial Park	277.5
La Palma, City of	1,610.2	Westminster, City of	9,499.7
Laguna Beach County Water District	450.4	Yorba Linda Country Club	298.9
Lockheed Martin Corp.	27.0	Yorba Linda Water District	14,239.7
Los Alamitos Race Course	161.9		
		Total	**243,857.9**

APPENDIX 3. 2022-23 Groundwater Production — Irrigation Use Production Over 25 Acre-feet

PRODUCER	AF
OG Citrus Pickers, Inc.	40.7
Orange County Produce	346.9
Treesap Farms, LLC	122.9
Total	**510.5**

APPENDIX 4. Non - Local Water Purchased by OCWD for Water Years 2003-04 through 2022-23

	Water Exchange		Talbert Barrier		Forebay Recharge		In-Lieu Program		SARCCUP	SAR Upstream Groundwater Projects		TOTAL
	Western Mun. WD	Alamitos Barrier	FV[1] OC32A	Mesa WD OC44B	Forebay Recharge	CUP[2] Recharge	CUP[2] In-Lieu	In-Lieu	Water Bank[3]	Arlington Desalter	SBVMWD	
Water Year	Purch. AF	Purch. AF	Purch. AF	Purch. AF	Purchase AF	Delivery AF	Delivery AF	Purch. AF	Delivery AF	Purch. AF	Purch. AF	Delivery and Purchase AF
2003-04	3,605.0	1,938.3	1,703.3	3,380.6	14,832.0	2,462.7	2,479.6	49,688.8	-	4,087.3	-	84,177.6
2004-05	-	1,914.9	2,451.8	8,368.6	3,810.8	-	15,021.1	54,596.1	-	567.5	-	86,730.8
2005-06	-	833.0[4]	1,079.9	5,431.1	7,256.7	-	15,452.9	73,763.1[5]	-	-	-	103,816.7
2006-07	1,745.0	534.1[4]	143.9	7,394.7	42,173.0	-	14,427.3	36,313.0	-	227.6	-	102,958.6
2007-08	2,882.4	1,505.7[4]	-	4,581.4	-	-	-	-	-	1,266.6	-	10,236.1
2008-09	3,663.5	2,094.2[4]	-	4,140.3	18,100.0	-	-	-	-	428.2	-	28,426.2
2009-10	-	1,321.9[4]	-	176.9	20,535.7	-	-	-	-	106.2	-	22,140.7
2010-11	-	1,689.1[4]	-	100.5	11,038.6	16,500.0	-	10,435.4	-	-	-	39,763.6
2011-12	-	1,198.7[4]	-	1.9	41,230.8	7,709.6	9,719.9	30,843.6	-	-	-	90,704.5
2012-13	-	1,721.8[4]	-	3.7	24,356.1	15,570.8	-	-	-	-	-	41,652.4
2013-14	-	2,370.2[4]	-	6.2	50,700.5	-	-	-	-	-	-	53,076.9
2014-15	-	2,236.3[4]	-	17.7	48,616.8	-	-	-	-	-	-	60,870.8[6]
2015-16	-	2,398.9[4]	-	7.0	45,118.0	-	-	-	-	-	-	47,523.9
2016-17	-	1,166.1[4]	-	7.8	48,918.1	-	-	-	-	-	-	50,092.0
2017-18	-	912.2[4]	-	18.4	66,113.5	-	-	73,108.6	-	-	-	140,152.7
2018-19	-	2,015.2[4]	-	20.1	40,344.9	-	-	-	-	-	-	42,380.2
2019-20	-	2,100.0[4]	-	2.0	18,098.2	-	-	9,354.7	-	-	-	29,554.9
2020-21	-	2,617.6[4]	1.3	15.7	-	-	-	-	2,000.0	-	-	4,634.6
2021-22	-	2,704.0[4]	-	14.1	22,982.1	-	-	-	-	-	-	25,700.2
2022-23	-	2,414.0[4]	-	3.6	16,865.0	-	-	-	-	-	-	19,282.6
Total	11,895.9	35,686.2	5,380.2	33,692.3	541,090.8	42,243.1	57,100.8	338,052.0	2,000.0	6,683.4	0	1,083,824.7

[1] Includes only imported water and excludes groundwater deliveries from Fountain Valley to OCWD.

[2] CUP is the multi-agency conjunctive use program (known as the MWD Long-Term Groundwater Storage Program or MWD CUP). Basin losses are excluded.

[3] Both EOS and imported water from MWD will be tracked in the SARCCUP water bank.

[4] Includes both MWD imported deliveries and supplemental recycled water deliveries.

[5] Includes 16,000 AF of 2005-06 MWD Supplemental Storage Program (i.e., "Super In-Lieu") water that was received as In-Lieu by the groundwater producers.

[6] Includes purchase of 10,000 AF of stored water from MWD CUP storage account at full-service untreated water rate in water year 2014-15.

APPENDIX 5. 2022-23 Water Resources Summary

	2022-2023 Water Year (AF)	2021-2022 Water Year (AF)	Change from last year to this year
SUMMARY OF BASIN CONDITIONS			
BASIN SUPPLIES			
Water Purchases from MWD (excludes In-Lieu)	16,865	22,982	-6,117
Water into MWD Storage Account (excludes In-Lieu)	0	0	0
SAR & Santiago Creek Flows[1]	313,265	127,168	186,097
GWRS AWPF Water to Forebay Recharge Basins	74,624	60,774	-13,850
GWRS AWPF Water to Mid-Basin Injection	7,516	7,807	-291
GWRS AWPF Water to Talbert Barrier	19,747	23,980	-4,233
Imported Water to Talbert Barrier (OC-44 & Fountain Valley)	25	14	11
Alamitos Barrier	2,414	2,704	-290
Incidental Recharge	23,921	20,449	3,472
Evaporation from Recharge Facilities	-3,449	-2,567	882
SAR Flow Lost to Ocean	-141,373	-16,390	-124,983
Total Groundwater Recharge	**313,555**	**246,921**	**66,634**
WATER PRODUCTION			
Groundwater Production	245,210	256,921	-11,711
MWD Storage Program Extractions	0	0	0
Total Groundwater Production	**245,210**	**256,921**	**-11,711**
BASIN STATUS			
Change in Groundwater Storage	69,000	-10,000	79,000
Change in Groundwater Storage excluding MWD Stored Water	69,000	-10,000	79,000
Accumulated Overdraft (AOD)	189,000	258,000	69,000
AOD without MWD Storage Program Water	189,000	258,000	69,000
IN-LIEU WATER			
OCWD In-Lieu Purchases	0	0	0
MWD In-Lieu Storage	0	0	0
Total In-Lieu	**0**	**0**	**0**
OTHER KEY INFORMATION			
1. Total Dissolved Solids of SAR below Prado Dam (mg/L)	656	646	10
2. Total Nitrogen of SAR below Prado Dam (mg/L)	1	4	-3
3. Total GWRS AWPF Production[2]	101,950	92,623	9,327
4. Green Acres Project	3,396	3,827	-431
5. Base Flow of Santa Ana River	67,753	71,141[3]	-3,388
6. Year-end Storage behind Prado Dam	1	0[3]	1
7. Year-end Storage in Recharge Facilities	21,250	10,876[3]	10,374
8. Total Artificial Recharge (percolation plus barriers)	289,632	226,472	63,159
9. Rainfall Measured at OCWD Field Headquarters (inches)	26	7	19
10. Annual Mean Temperature at Santa Ana Fire Station (°F)	65	67	-2

[1] Accounts for storage to/from recharge facilities.
[2] Total includes deliveries to recharge basins, Talbert Barrier, MBI, Anaheim Canyon Power Plant and ARTIC
[3] These values were revised after the publication of 2021-22 Engineer's Report.

APPENDIX 6. Typical Groundwater Extraction Facility Characteristics

PARAMETER	CHARACTERISTICS
Water System Pressure	62 psi
Load (Use) Factor	63%
Design Flow Rate	2,563 gpm
Annual Production	2,600 AF
Bowl Efficiency (minimum)	84%
Motor Horsepower	325 hp
Type Motor	Electric
Well Casing Diameters	16 – 20 inches
Type of Pump	Vertical Turbine
Depth of Well	1,052 feet
Depth of Bowls	278 feet
Total Dynamic Head	325 feet
Estimated Life	30 years
Annual Cost of Facilities[1]	$325,000

[1] *Assuming $5,000,000 capital cost (including design and construction) with an interest rate of five percent amortized over a 30-year period and excluding the cost for land purchase.*

APPENDIX 7. Values Used in Figure 6 For Water Rates for Non-Irrigation Use

Water Year	RA ($/AF)	Estimated Groundwater Production Cost[1,2] ($/AF)	MWD Treated Interruptible Rate (In-Lieu and Replenishment Water Programs)[2,3] ($/AF)	MWD Treated Uninterruptible Rate (Full Service)[2,3] ($/AF)
1989-90	45	119	136	231
1990-91	48	91	137	232
1991-92	51	100	156	263
1992-93	60	116	206	325
1993-94	67.5	124	257	389
1994-95	88	145	279	416
1995-96	85	140	294	440
1996-97	88	140	303	448
1997-98	91	141	303	455
1998-99	94	143	303	458
1999-00	100	150	303	459
2000-01	107	150	303	459
2001-02	117	162	303	459
2002-03	127	176	299	455
2003-04	149	203	301	460
2004-05	172	229	318	479
2005-06	205	258	337	494
2006-07	223	278	354	510
2007-08	237	296	382	538
2008-09	249	307	420	586
2009-10	249	308	501[4]	701
2010-11	249	310	602[4]	744
2011-12	254	315	633[4]	794
2012-13	266	330	-[5]	794
2013-14	276	334	-[5]	890
2014-15	294	349	-[5]	923
2015-16	322	386	-[5]	942
2016-17	402	473	-[5]	979
2017-18	445	513	-[5]	1,015
2018-19	462	529	-[5]	1,050
2019-20	487	557	-[5]	1,078
2020-21	487	555	-[5]	1,104
2021-22	509	581	-[5]	1,143
2022-23	544	620	-[5]	1,209
2023-24	624	720	-[5]	1,256
2024-25	688[3]	798	-[5]	1,380[4]

[1] *Includes RA plus energy cost to produce groundwater.*
[2] *Rate is rounded.*
[3] *Rate is proposed.*
[4] *Rate is estimated.*
[5] *This rate is no longer available because MWD terminated the Replenishment Program.*

WEST&ASSOCIATES
ENGINEERING INC