Appendix D

Water Supply Assessment

(Available on City website)

Water Supply Assessment
and
Water Supply Verification

for the Proposed

Refuge Specific Plan

Prepared for:

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August 2022

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1 Summary and Requirements

The environmental review of the Refuge Specific Plan (Project) is being prepared in compliance with the California Environmental Quality Act (CEQA) process. The City of Palm Desert is the Lead Agency for the planning and environmental review of the proposed Project. The City of Palm Desert has identified the Coachella Valley Water District (CVWD) as the Public Water System (PWS) that will supply water for the proposed Project, and has requested that CVWD assist in preparing a Water Supply Assessment/Water Supply Verification (WSA/WSV) as part of the environmental review for the Project.

The Project is located in the central portion of the Coachella Valley within the City of Palm Desert, Riverside County. The Project proposes a Specific Plan to guide the development of up to 969 single-family and multi-family dwelling units on approximately 106.4 acres of vacant land. Common recreation facilities such as pools, spas, club houses, management offices, barbecues and other facilities appropriate for future development may be included. Project-level landscape plans are currently unknown, however it is assumed that up to 30 percent of the total Specific Plan area, or 31.92 acres, may be landscaped with a mix of drought tolerant landscaping and minimal turf for open space, retention basins, and private yards. It is also assumed that 60 percent of all private residential lots will have private pools, for a total of 240 private pools in addition to 3 community pools.

This WSA/WSV determined that the total projected water demand for the Project is up to 246.58 acre-feet per year (AFY), or 2.32 acre-feet per acre. This WSA/WSV demonstrates that sufficient water supplies exist, or will exist based on current water planning assumptions, to meet the projected demands of the Project, in addition to current and future projected water demands within CVWD's service area in normal, single-dry, and multiple-dry years over a 20-year projection. This WSA/WSV will be reviewed every five years, or in the event that the water planning assumptions have changed, until the Project completes construction to ensure it remains accurate and no significant changes to either the Project or available water supply has occurred. This WSA/WSV does not relieve the Project from complying with all current or future applicable state, county, city, and local ordinances or regulations including the CVWD Landscape Ordinance, and indoor water use performance standards provided in the California Water Code (CWC) which may result water demand lower than projected in this WSA/WSV.

1.1 Regulatory Requirements

This WSA/WSV provides an assessment and verification of the availability of sufficient water supplies during normal, single-dry, and multiple-dry years over a 20-year projection to meet the projected demands of the Project, in addition to existing and planned future water demands of CVWD, as required by Senate Bill 610 (SB 610), SB 221, and SB 1262. This WSA/WSV also includes identification of existing water supply entitlements, water rights, water service contracts, or

agreements relevant to the identified water supply for the Project and quantities of water received in prior years pursuant to those entitlements, rights, contracts, and agreements.

This WSA/WSV has been prepared in compliance with the requirements under SB 610, SB 221, and SB 1262 by Terra Nova Planning and Research in consultation with CVWD and the City of Palm Desert. This WSA/WSV does not relieve the Project from complying with all applicable state, county, city, and local ordinances or regulations, including the CVWD Landscape Ordinance and indoor water use performance standards provided in the California Water Code (CWC). This WSA/WSV will be reviewed every five years, or in the event that the water planning assumptions have changed, until the Project completes construction, to ensure it remains accurate and no significant changes to either the Project or available water supply has occurred. The Project applicant shall notify CVWD when construction begins. If neither the Project applicant nor the Lead Agency contacts CVWD within five years of approval of this WSA/WSV, it will be assumed that the Project no longer exists and the WSA/WSV provided by this document will become invalid.

1.1.1 Senate Bill 610

On January 1, 2002, Senate Bill 610 (SB 610) was enacted and codified in CWC Section 10910 et seq., requiring the preparation of a Water Supply Assessment (WSA) for certain new development projects. As stated in SB 610, the purpose of a WSA is to determine whether the PWS's "total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the PWS's existing and planned future uses, including agricultural and manufacturing uses."

CWC Section 10912 defines a "project" as any of the following:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor space;
- A mixed-use project that includes one or more of the projects specified in this subdivision; or
- A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project (about 250 acre-feet per year).

The intent of SB 610 is to improve the link between information on water supply availability and certain land-use decisions made by cities and counties.

1.1.2 Senate Bill 221

On January 1, 2002, Senate Bill 221 (SB 221) was enacted and amended Section 11010 of the Business and Professional Code. SB 221 also amended Section 65867.5 to add Section 66455.3 and 66473.7 to the Government Code. SB 221 establishes the relationship between the WSA prepared for a project and project approval under the Subdivision Map Act. Pursuant to CWC Section 66473.7, the PWS must provide a written verification of sufficient water supply prior to the approval of a new subdivision. SB 221 states that "a Water Supply Verification (WSV) is required prior to approval of a tentative subdivision map, or a parcel map for which a tentative map is not required, or a development agreement for a subdivision of property of more than 500 dwelling units, except as specified, including the design of the subdivision or similar type of improvement." The proposed Project proposes up to 969 dwelling units, involves a Tentative Parcel Map and, therefore, a WSV is required.

1.1.3 Senate Bill 1262

On January 1, 2017, Senate Bill 1262 (SB 1262) was enacted and amended CWC Section 10910, requiring that information regarding the Sustainable Groundwater Management Act (SGMA) be included in a WSA if the water supply for a proposed project includes groundwater from a basin that is not adjudicated and was designated medium- or high-priority by the California Department of Water Resources (DWR).

1.2 Water Management Planning Documents

CVWD has prepared long-term planning documents to project future water use and manage the water supplies within its service area. These planning documents can be used for compliance with SB 610, SB 221, and SB 1262, and are discussed in further detail in the following sections.

1.2.1 Urban Water Management Planning Act

The Urban Water Management Planning Act (UWMPA) was established by Assembly Bill 797 (AB 797) on September 21, 1983, and passage of this law recognized that water is a limited resource and that efficient water use and conservation would be actively pursued throughout the State. The UWMPA requires that municipal water suppliers providing either directly or indirectly to more than 3,000 customers, or supplying more the 3,000 acre-feet per year (AFY), prepare and adopt an Urban Water Management Plan (UWMP) every five years which defines their current and future water use, source of supply, source reliability, and existing conservation measures.

1.2.1.1 Coachella Valley Water District Urban Water Management Plan

CVWD prepared and adopted its 2005, 2010, and 2015 UWMPs to document CVWD's projected water demands and plans for delivering water supplies to its water service area during normal, single-dry, and multiple-dry years over a 20-year projection.

The six urban water suppliers in the Coachella Valley (CVWD, Coachella Water Authority, Desert Water Agency (DWA), Indio Water Authority (IWA), Mission Springs Water District (MSWD), and Myoma Dunes Mutual Water Company) collaboratively prepared the 2020 Coachella Valley Regional UWMP, including regional and individual agency content and other necessary elements as set forth in DWR's 2020 UWMP Guidebook. The 2020 Coachella Valley Regional UWMP was submitted to DWR on July 1, 2021. DWR accepted CVWD's portion of the Regional UWMP on May 17, 2022.

1.2.2 Sustainable Groundwater Management Act

In September 2014, Governor Brown signed three bills into law: Assembly Bill 1739, Senate Bill 1319, and Senate Bill 1168, which became collectively known as the Sustainable Groundwater Management Act (SGMA), creating a framework for sustainable, local groundwater management for the first time in California history. DWR evaluated and prioritized the 515 groundwater basins identified in Bulletin 118, and 94 of these groundwater basins were designated as high- or medium-priority basins, as of December 2019, requiring them to be sustainably managed within 20 years. SGMA required local authorities to form local Groundwater Sustainability Agencies (GSAs) by June 30, 2017 to evaluate conditions in their local groundwater basins and adopt locally-based Groundwater Sustainability Plans (GSPs), or Alternatives to a GSP (Alternative Plans), tailored to their regional economic and environmental needs.

As defined by DWR, the subbasins of the Coachella Valley Groundwater Basin are the Indio, Mission Creek, San Gorgonio Pass, and Desert Hot Springs Subbasins. CVWD's service area overlies the Indio, Mission Creek, and Desert Hot Springs Subbasins. The Indio and Mission Creek Subbasins have been designated medium-priority by DWR and are subject to the requirements of SGMA. The Desert Hot Springs Subbasin has been designated very low-priority by DWR and is not subject to the requirements of SGMA. The Project is located within the Indio Subbasin, which has been designated as a medium-priority groundwater basin by DWR under SGMA.

1.2.2.1 Alternative Plan for the Indio Subbasin

Twenty years before the adoption of SGMA, CVWD began the development of the initial water management plan for the Coachella Valley in 1994 after recognizing the need to sustainably manage the Coachella Valley Groundwater Basin. The original planning document is the 2002 Coachella Valley Water Management Plan (CVWMP). The 2002 CVWMP was updated in 2010 and adopted in 2012.

CVWD, DWA, CWA, and IWA, are the Indio Subbasin GSAs designated by DWR for their respective service areas. On December 29, 2016, CVWD, DWA, CWA, and IWA collaboratively submitted the 2010 CVWMP Update as an Alternative Plan for the Indio Subbasin, with an associated Bridge Document and supporting documents, to DWR for review and evaluation. On July 17, 2019, DWR determined that the Alternative Plan for the Indio Subbasin satisfies the objectives of SGMA and notified the Indio Subbasin GSAs that the Alternative Plan was approved, and that they would be required to submit an assessment and update of the Alternative Plan pursuant to the SGMA by

January 1, 2022 and every five years thereafter. The 2022 Alternative Plan Update for the Indio Subbasin was submitted to DWR on December 29, 2021.

On February 1, 2018, DWR notified all GSAs who submitted Alternative Plans that they would be required to submit annual reports pursuant to SGMA by April 1, 2018 and every year thereafter. CVWD, DWA, CWA, and IWA have collaboratively prepared and submitted the Indio Subbasin Annual Reports for Water Years 2016-2017 through 2020-2021.

1.2.2.2 Alternative Plan for the Mission Creek Subbasin

In 2004, CVWD, DWA, and MSWD created the Mission Creek Subbasin Management Committee (Management Committee). The Management Committee jointly prepared the 2013 Mission Creek-Garnet Hill Subbasin Water Management Plan (2013 MC-GH WMP).

On December 29, 2016, CVWD, DWA, and MSWD collaboratively submitted the 2013 MC-GH WMP as an Alternative Plan for the Mission Creek Subbasin, with an associated Bridge Document and supporting documents, to DWR for review and evaluation. On July 17, 2019, DWR determined that the Alternative Plan for the Mission Creek Subbasin satisfies the objectives of SGMA and notified the Management Committee that the Alternative Plan was approved, and that they would be required to submit an assessment and update of the Alternative Plan pursuant to SGMA by January 1, 2022 and every five years thereafter. The 2022 Alternative Plan Update for the Mission Creek Subbasin was submitted to DWR on December 30, 2021.

On February 1, 2018, DWR notified all GSAs who submitted Alternative Plans that they would be required to submit annual reports pursuant to SGMA by April 1, 2018 and every year thereafter. CVWD, DWA, and MSWD have collaboratively prepared and submitted the Mission Creek Subbasin Annual Reports for Water Years 2016-2017 through 2020-2021.

1.2.3 Groundwater Replenishment

State Water Code (SWC) 31630-31639 provides CVWD with the authority to levy and collect water replenishment assessments to implement groundwater replenishment programs (GRPs) within its jurisdictional boundary. Groundwater replenishment is necessary to mitigate overdraft of the groundwater basin and associated undesirable results. The jurisdictional areas that benefit from the GRPs, and where CVWD levies replenishment assessments on groundwater production, are termed Areas of Benefit (AOBs). There are three AOBs within CVWD's boundary: the Mission Creek Subbasin AOB, the West Whitewater River Subbasin AOB, and the East Whitewater River Subbasin AOB. GRPs are essential to the water management plans that were developed to prevent overdraft conditions and any associated undesirable results in all three AOBs. Groundwater replenishment is accomplished through two mechanisms: direct replenishment, by which imported surface water is percolated directly into the aquifer, and in-lieu replenishment, by which imported surface water or recycled water is provided to groundwater pumpers for irrigation purposes, thus reducing or eliminating their use of pumped groundwater. Historical declines in groundwater levels in the three AOBs led to joint management agreements between CVWD and DWA. The GRP for the West Whitewater River Subbasin AOB was formed in 1976, the

GRP for the Mission Creek Subbasin AOB was formed in 2003, and the GRP for the East Whitewater River Subbasin AOB was formed in 2004. The Project is located within the West Whitewater River Subbasin AOB.

1.2.3.1 Annual Engineer's Reports

CVWD is required to prepare and present to its Board of Directors annually an Engineer's Report on Water Supply and Replenishment Assessment reporting on the conditions of the groundwater supplies and recommend Replenishment Assessment Charges (RACs) to be levied upon groundwater production greater than 25 AFY within each AOB in accordance with SWC 31630-31639. The Engineer's Report must include the following information: a summary of the conditions of groundwater supplies; the need for replenishment; a description of the replenishment programs, including the source and amount of replenishment waters, the costs associated with the GRP, the areas directly and indirectly benefited by the GRP, and the amount of groundwater produced in each area during the prior year; and a recommendation for the RAC to be levied on each AOB. The 2022-2023 Engineer's Report on Water Supply and Replenishment Assessment was prepared and presented to CVWD's Board of Directors on April 26, 2022.

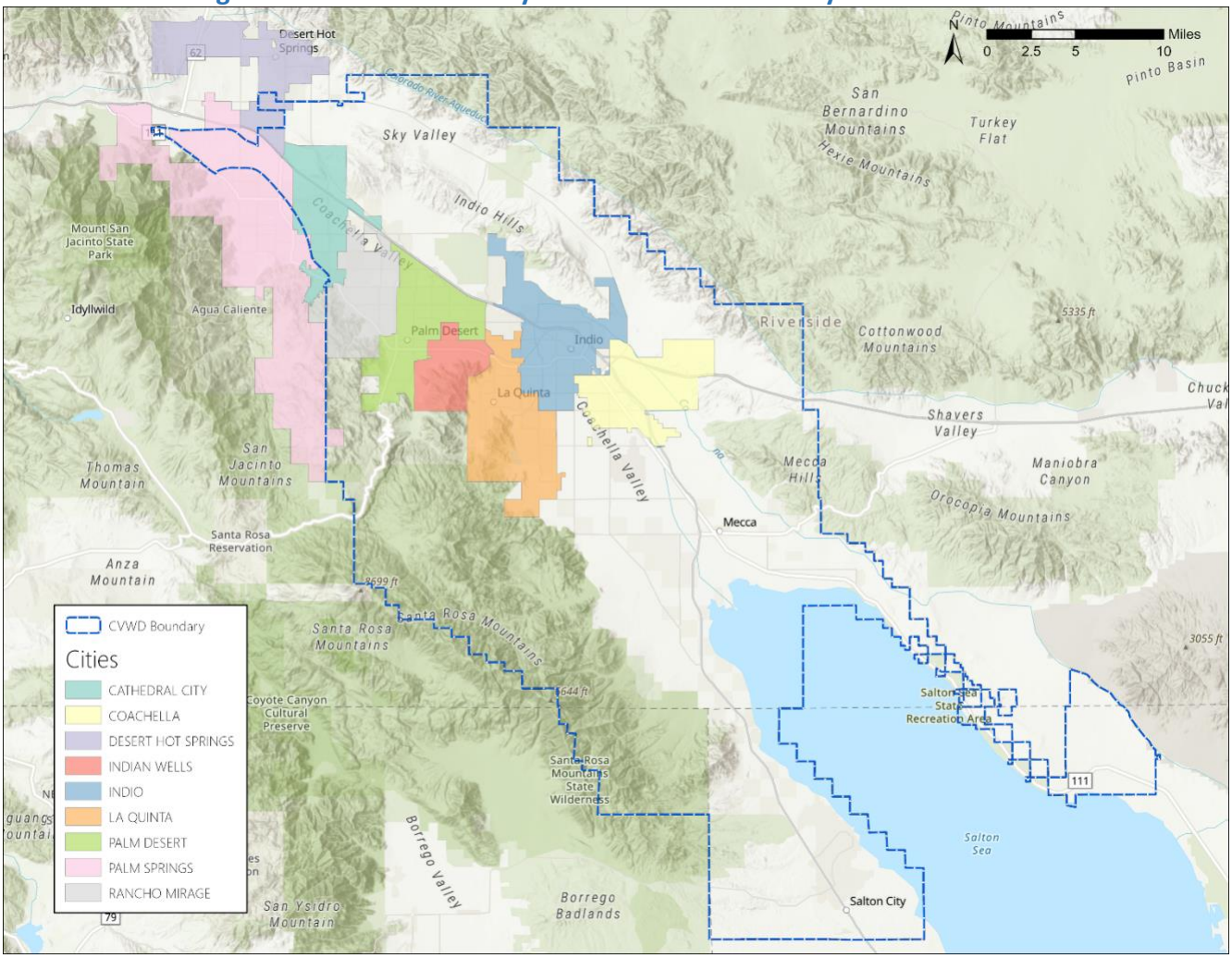
2 Public Water System

The City of Palm Desert is the Lead Agency for the planning and environmental review of the proposed Refuge Specific Plan (Project). The City of Palm Desert has identified the Coachella Valley Water District (CVWD) as the Public Water System (PWS) that will supply water for the proposed Project, and has requested that CVWD assist in preparing a Water Supply Assessment/Water Supply Verification (WSA/WSV) as part of the environmental review for the Project.

2.1 Coachella Valley Water District

CVWD was established in 1918 under the County Water District Act provisions of the California Water Code. CVWD provides water related services for domestic water, wastewater collection and treatment, recycled water, agricultural irrigation water, drainage management, imported water supply, groundwater replenishment, stormwater management, flood control, and water conservation. CVWD's boundary encompasses approximately 640,000 acres as shown in **Figure 2-1**, mostly within Riverside County, but also extending into northern Imperial and San Diego Counties.

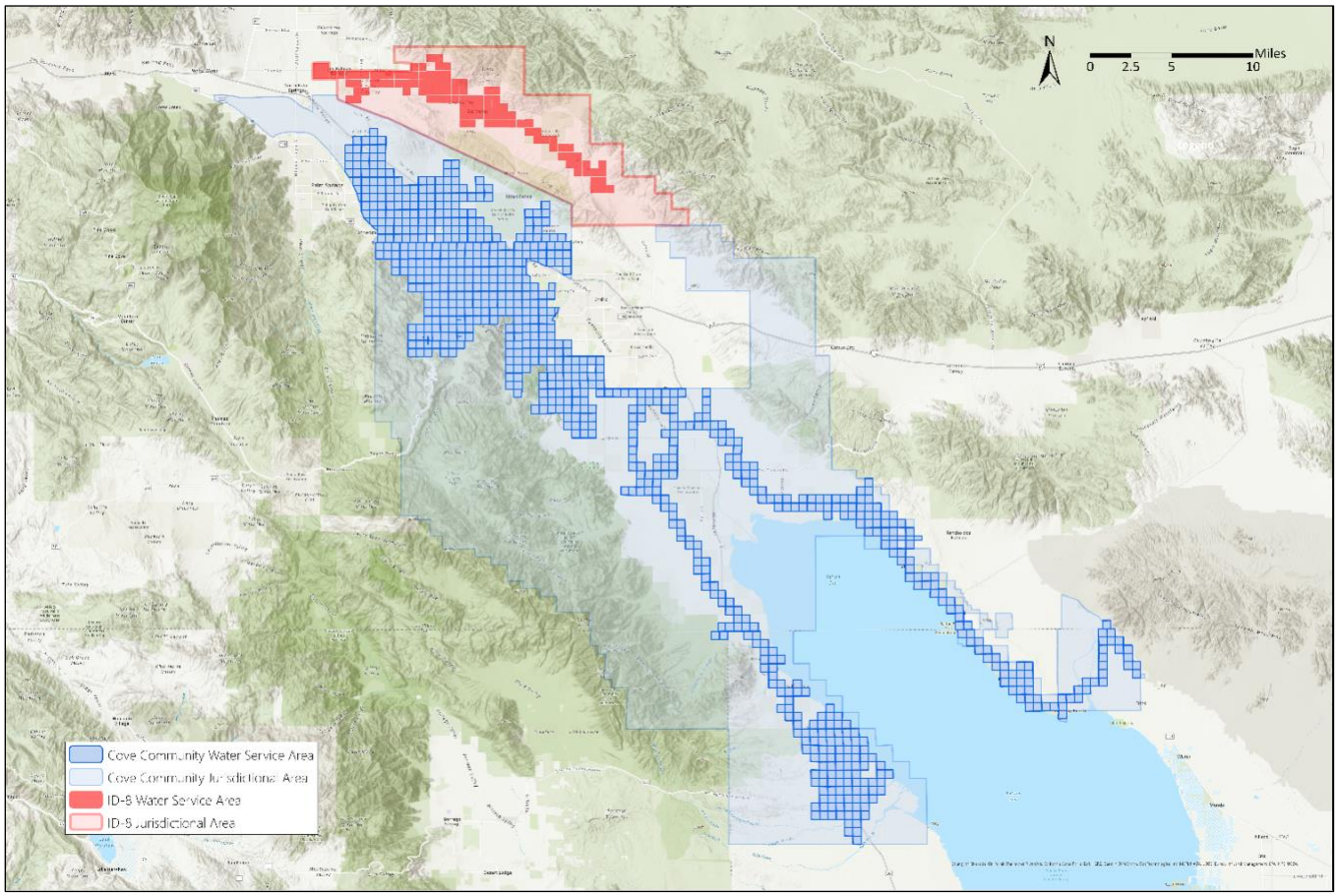
Figure 2-1: Coachella Valley Water District Boundary and Cities



2.1.2 Coachella Valley Water District – Potable Water Distribution Systems

CVWD has two domestic water service areas that serve potable water to its local communities: the Cove Communities system and Improvement District No. 8 (ID-8) as shown in **Figure 2-2**. CVWD previously had three water systems, but ID-11 was consolidated into the Cove Communities system in March 2021. CVWD had approximately 112,609 domestic water connections and served approximately 93,648 acre-feet (AF) of water in 2021. CVWD serves all of the Cities of Rancho Mirage, Thousand Palms, Palm Desert, Indian Wells, and La Quinta, and a portion of Indio, Coachella, and Cathedral City. Other areas served with domestic water by CVWD include a portion of lands near Desert Hot Springs and the Indio Hills. CVWD also serves other unincorporated communities including Thermal, Mecca, Oasis, Desert Shores, Salton Sea Beach, Salton City, North Shore, Bombay Beach, Hot Mineral Springs, and other portions of unincorporated Riverside and Imperial Counties. The Project is located within CVWD's Cove Communities domestic water distribution system.

Figure 2-2: Coachella Valley Water District Domestic Water Service Areas



The 2020 Regional UMWP projected that population in CVWD's urban water service area would increase as shown in **Table 2-1**.

Table 2-1: Current and Projected Population for CVWD's Service Area

Population Served	2020	2025	2030	2035	2040	2045
	268,952	292,077	315,202	338,274	360,813	383,300

Source: 2020 Coachella Valley Regional Urban Water Management Plan

2.2 Coachella Valley Hydrology

The bulk of natural groundwater replenishment comes from runoff from the adjacent mountains. Climate in the Coachella Valley is characterized by low humidity, high summer temperatures, and mild dry winters. Average annual precipitation varies from 3 to 6 inches of rain on the Coachella Valley floor to more than 30 inches in the surrounding mountains. Most of the precipitation occurs between December and February, except for summer thundershowers. Prevailing winds in the area are usually gentle, but occasionally increase to velocities as high as 30 miles per hour or more. Mid-summer temperatures commonly exceed 100 degrees Fahrenheit (°F), frequently

reach 110°F, and periodically reach or exceed 120°F, and the average winter temperature is approximately 60°F as shown in **Table 2-2** and **Table 2-3**.

Table 2-2: Monthly Average Climate Data for Palm Springs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max (°F)[1]	71	73	80	86	94	104	108	107	102	90	78	69	89
Min (°F)[1]	47	49	54	59	65	73	80	79	74	64	53	46	62
Rain (in)[1]	0.95	0.92	0.36	0.10	0.02	0.00	0.25	0.14	0.20	0.20	0.26	0.70	3.80
ETo (in)[2]	2.5	3.4	5.6	7.1	8.3	8.7	8.1	7.5	6.2	4.7	2.9	2.2	67.2

Source: 2020 Coachella Valley Regional Urban Water Management Plan

[1] National Weather Service Forecast, Station Palm Springs Airport, 1998-2020

[2] CIMIS Station 208 – La Quinta II, 2007-2020

Table 2-3: Monthly Average Climate Data for Thermal

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max (°F) [1]	71	74	81	87	95	103	107	106	101	91	79	69	89
Min (°F) [1]	39	43	49	55	63	69	76	75	68	57	45	38	56
Rain (in)[1]	0.64	0.61	0.34	0.08	0.01	0.01	0.13	0.12	0.32	0.19	0.17	0.34	2.96
ETo (in) [2]	2.7	3.9	6.4	8.0	9.3	9.3	9.6	9.1	7.1	5.3	3.2	2.4	70.2

Source: 2020 Coachella Valley Regional Urban Water Management Plan

[1] National Weather Service Forecast, Station Desert Resorts Regional Airport, 1990-2020

[2] CIMIS Station 218 – Thermal South, 2010-2020

3 Public Water System – Existing Supply and Demand

Currently, all of Coachella Valley Water District's (CVWD's) urban potable water uses are supplied using groundwater. In addition to groundwater, CVWD has imported water supplies from the State Water Project (SWP) and the Colorado River, and recycled water from water reclamation plants. These imported and recycled water supplies are used to meet CVWD's non-potable water demands and to replenish the groundwater basin.

3.1 Groundwater

Groundwater is the principal source of potable supply in the Coachella Valley and CVWD obtains groundwater from both the Indio and Mission Creek Subbasins of the Coachella Valley Groundwater Basin. CVWD has the legal authority to manage the groundwater basin within its boundaries under the County Water District Law (California Water Code section 30000, et seq.) and as a Groundwater Sustainability Agency (GSA) under the Sustainable Groundwater Management Act (SGMA).

Groundwater is also used by other domestic water suppliers and private pumpers for crop irrigation, fish farms, duck clubs, golf course irrigation, greenhouses, and industrial uses in the Coachella Valley.

3.1.1 Coachella Valley Groundwater Basin

The Coachella Valley Groundwater Basin is bounded on the north and east by the San Bernardino and Little San Bernardino Mountains, on the south and west by the Santa Rosa and San Jacinto Mountains, and on the south by the Salton Sea. At the west end of the San Gorgonio Pass, between Beaumont and Banning, the basin boundary is defined by a surface drainage divide separating the Coachella Valley Groundwater Basin from the Beaumont Groundwater Basin of the Upper Santa Ana Drainage Area.

The southern boundary is formed primarily by the watershed of the Mecca Hills and by the northwest shoreline of the Salton Sea running between the Santa Rosa Mountains and Mortmar. Between the Salton Sea and Travertine Rock, at the base of the Santa Rosa Mountains, the southern boundary crosses the Riverside County Line into Imperial and San Diego Counties.

Although there is interflow of groundwater throughout the Coachella Valley Groundwater Basin, fault barriers, constrictions in the basin profile, and areas of low permeability limit and control movement of groundwater. Based on these factors, the Coachella Valley Groundwater Basin has been divided into subbasins and subareas as described by DWR in 1964 and 2003, and by the United States Geological Survey (USGS) in 1974.

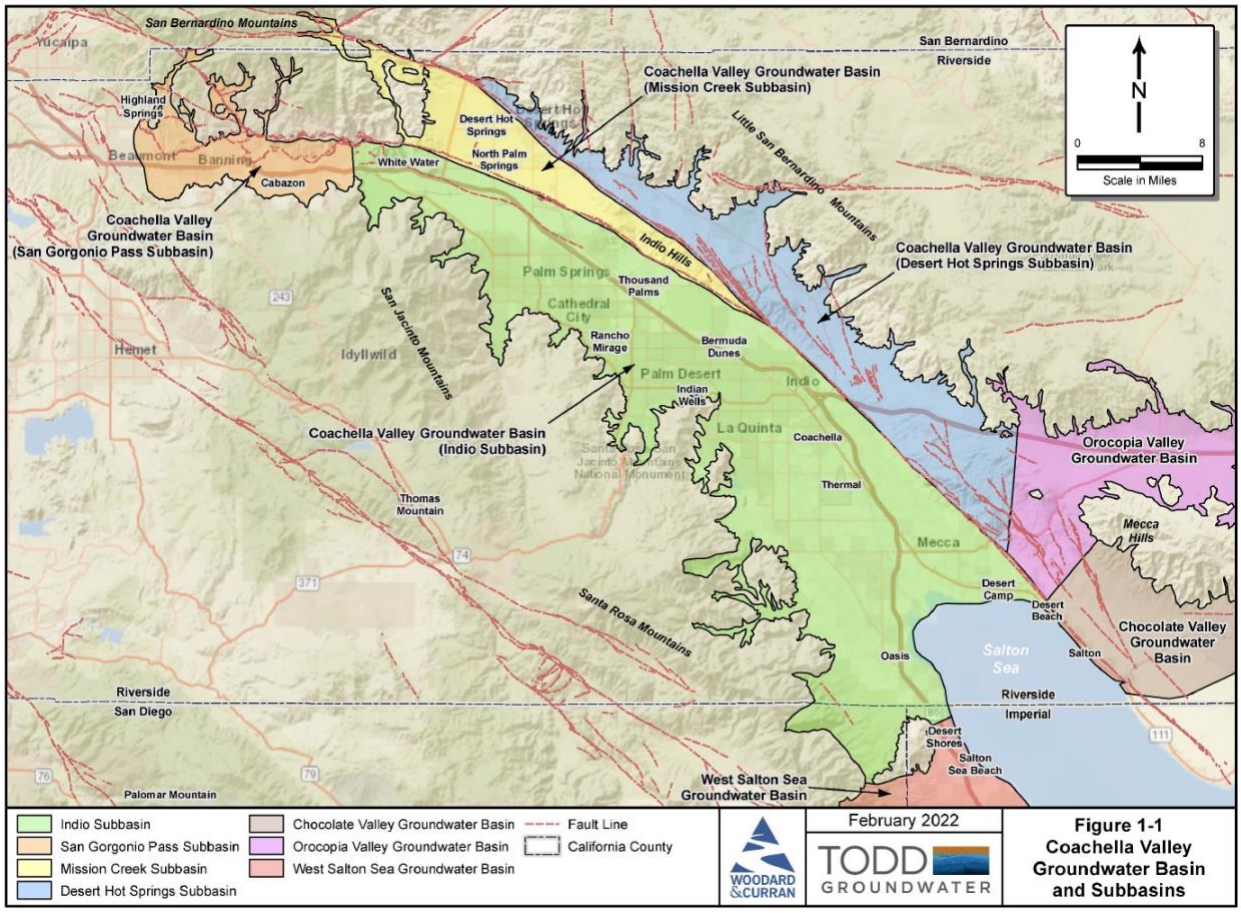
3.1.1.1 Coachella Valley Groundwater Basin – Subbasins

As shown on **Figure 3-1,** the subbasins of the Coachella Valley Groundwater Basin are the Indio, Mission Creek, San Gorgonio Pass, and Desert Hot Springs Subbasins. The subbasins are defined without regard to water quantity or quality. They delineate areas underlain by formations which

readily yield stored groundwater through water wells and offer natural reservoirs for the regulation of water supplies.

The boundaries between subbasins within the Coachella Valley Groundwater Basin are generally defined by faults that impede the lateral movement of groundwater. Minor subareas have also been delineated based on one or more of the following geologic or hydrologic characteristics: types of water-bearing formations, water quality, areas of confined groundwater, forebay areas, groundwater divides, and surface drainage divides.

Figure 3-1: Coachella Valley Groundwater Basin and Subbasins



Source: Indio Subbasin Annual Report for Water Year 2020-2021

The following is a list of the subbasins in the Coachella Valley Groundwater Basin as designated by DWR in Bulletin 118:

- Indio Subbasin (Subbasin 7-21.01)
- Mission Creek Subbasin (Subbasin 7-21.02)
- San Gorgonio Pass Subbasin (Subbasin 7-21.03)
- Desert Hot Springs Subbasin (Subbasin 7-21.04)

DWR designated the Indio, Mission Creek, and San Gorgonio Pass Subbasins as medium-priority, and the Desert Hot Springs Subbasin as very low priority. None of the subbasins are adjudicated or in a state of overdraft.

In 1964, DWR estimated that the subbasins in the Coachella Valley Groundwater Basin contained approximately 39,200,000 acre-feet (AF) of water in the first 1,000 feet below the groundwater surface. The capacities of the subbasins are shown in **Table 3-1**.

Table 3-1: Groundwater Storage in the Coachella Valley Groundwater Basin

Subbasin/Subarea	Storage (AF) [1]
Indio Subbasin	
Palm Springs Subarea	4,600,000
Thousand Palms Subarea	1,800,000
Oasis Subarea	3,000,000
Garnet Hill Subarea	1,000,000
Thermal Subarea	19,400,000
Indio Subbasin Subtotal	**29,800,000**
Mission Creek Subbasin	2,600,000
San Gorgonio Subbasin	2,700,000
Desert Hot Springs Subbasin	4,100,000
Total	**39,200,000**

Source: DWR Bulletin 108 (1964)

[1] First 1,000 feet below ground surface. (DWR, 1964)

3.1.2 Groundwater Demand

Groundwater is the principle source of potable supply in the Coachella Valley and CVWD obtains groundwater from both the Indio and Mission Creek Subbasins of the Coachella Valley Groundwater Basin. CVWD's groundwater demand in the Coachella Valley Groundwater Basin for 2017 through 2021 is shown in **Table 3-2**.

Table 3-2: CVWD Groundwater Demand in the Coachella Valley Groundwater Basin

Groundwater Production (AF)	2017	2018	2019	2020	2021
Indio Subbasin	93,798	96,176	93,130	96,661	98,484
Mission Creek Subbasin	2,917	2,786	2,642	3,182	3,062
Total	**96,715**	**98,962**	**95,772**	**99,843**	**101,546**

3.1.3 Groundwater Sustainability

Long-term sustainability is typically assessed based on changes in groundwater storage over a period on the order of ten to twenty years that includes wet and dry periods.

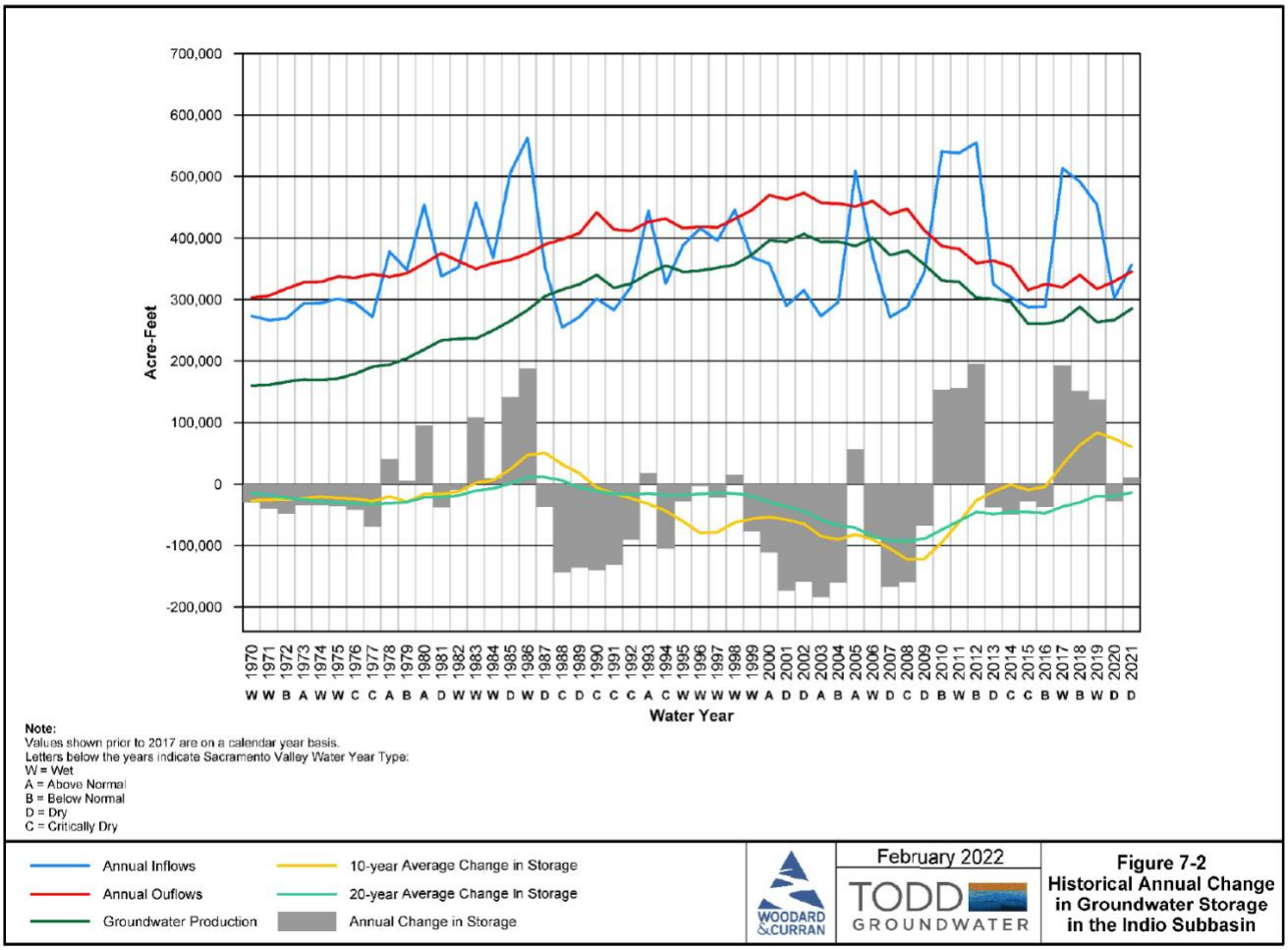
3.1.3.1 Indio Subbasin

Figure 3-2 shows the historical annual change in groundwater storage from 1970 through Water Year (WY) 2020-2021 in the Indio Subbasin. The figure also shows annual inflows, outflows, groundwater production, and 10-year and 20-year running-average change in groundwater

storage. During periods of high artificial recharge, the change in storage tends to be positive. In dry years or periods of high groundwater pumping, the change in storage can be negative.

As shown in **Figure 3-2**, annual inflows to the Indio Subbasin are highly variable with years of high inflows corresponding to wet years when SWP delivery volumes were greater. Higher inflows in the mid-1980s occurred when the Metropolitan Water District of Southern California (MWD) commenced large-scale advanced water deliveries to the Indio Subbasin. After an extended period of decline, both the 10-year and 20-year running-average change in storage have shown positive trends since 2009, and the 10-year running-average has been positive since 2017.

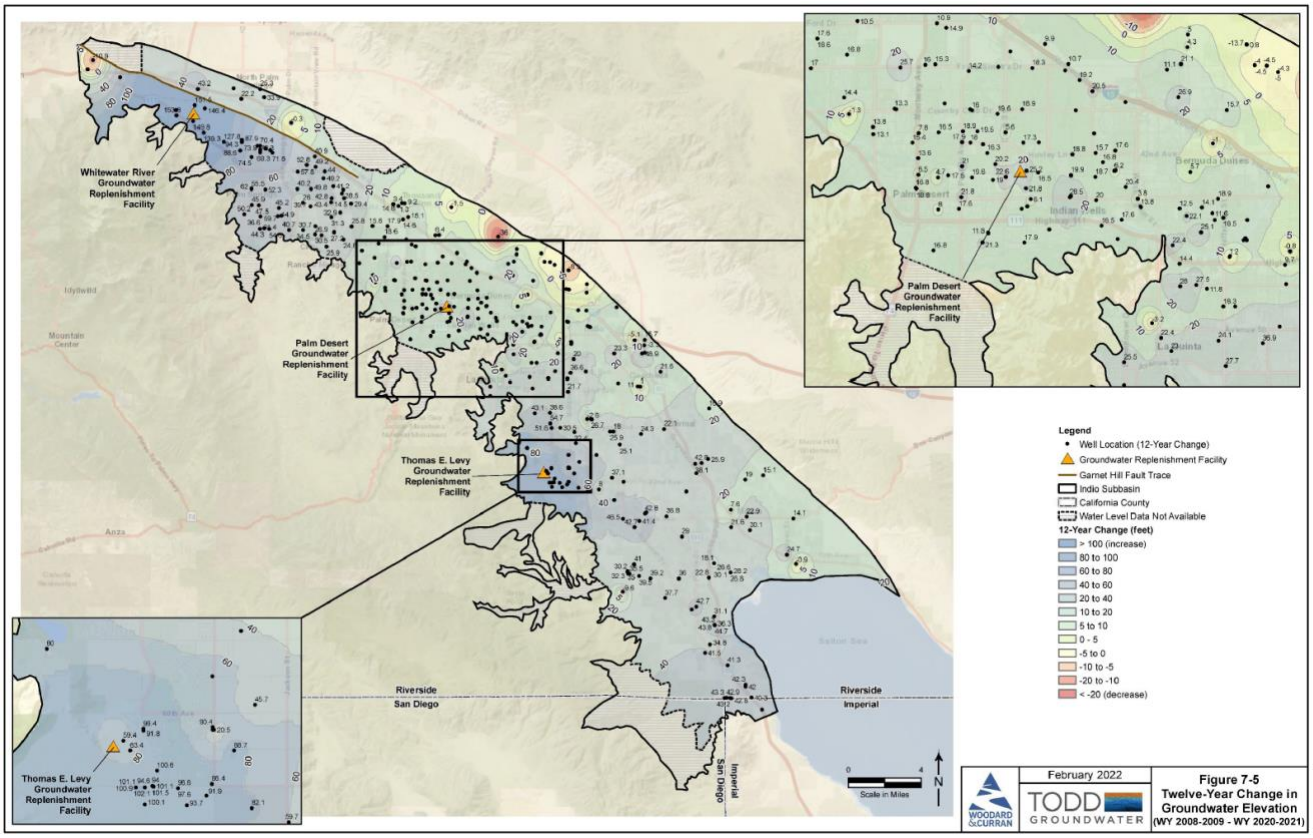
Figure 3-2: Historical Annual Change in Groundwater Storage in the Indio Subbasin



Source: Indio Subbasin Annual Report for Water Year 2020-2021

As shown in **Figure 3-3**, groundwater levels have increased significantly in the Indio Subbasin from WY 2008-2009 to WY 2020-2021. The 2022 Indio Subbasin Alternative Plan Update uses 2009 water levels as a metric of sustainability because historical low groundwater levels occurred in the years around 2009 throughout most of the Indio Subbasin. The Indio Subbasin shows a long-term positive trend in sustainability resulting from implementation of the Indio Subbasin Alternative Plan.

Figure 3-3: 12-Year Change in Groundwater Elevation from Water Year 2008-2009 through Water Year 2020-2021 in the Indio Subbasin



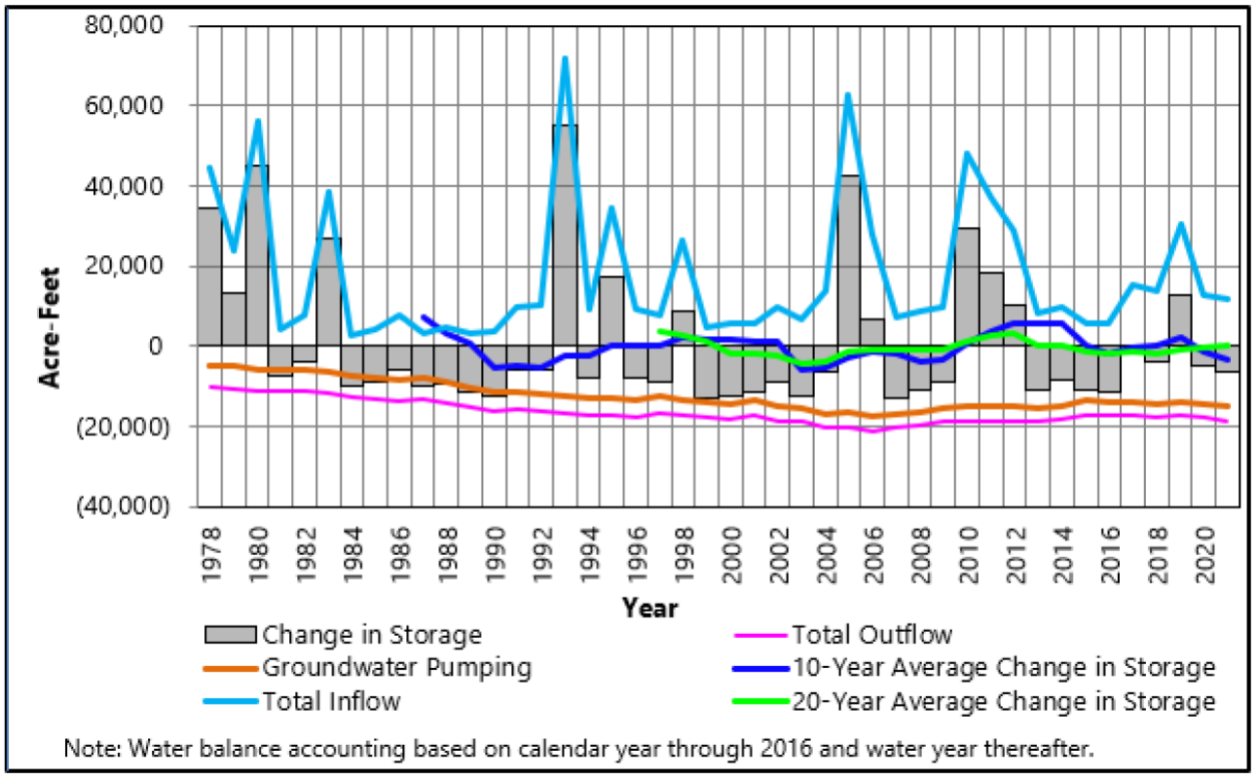
Source: Indio Subbasin Annual Report for Water Year 2020-2021

3.1.3.2 Mission Creek Subbasin

Figure 3-4 shows the historical annual change in groundwater storage from 1978 through WY 2019-2020 in the Mission Creek Subbasin. The figure also shows annual inflows, outflows, groundwater production, and 10-year and 20-year running-average change in groundwater storage. During periods of high artificial recharge, the change in storage tends to be positive. In dry years or periods of high groundwater pumping, the change in storage can be negative.

As shown in **Figure 3-4**, after a period of decline, starting in 2004 both the 10-year and 20-year running-average change in groundwater storage have shown positive trends. Annual inflows to the Mission Creek Subbasin are highly variable with years of high inflows corresponding to years when SWP delivery volumes were greater. The 20-year running-average change in storage shows that the Mission Creek Subbasin has been in balance since 2012.

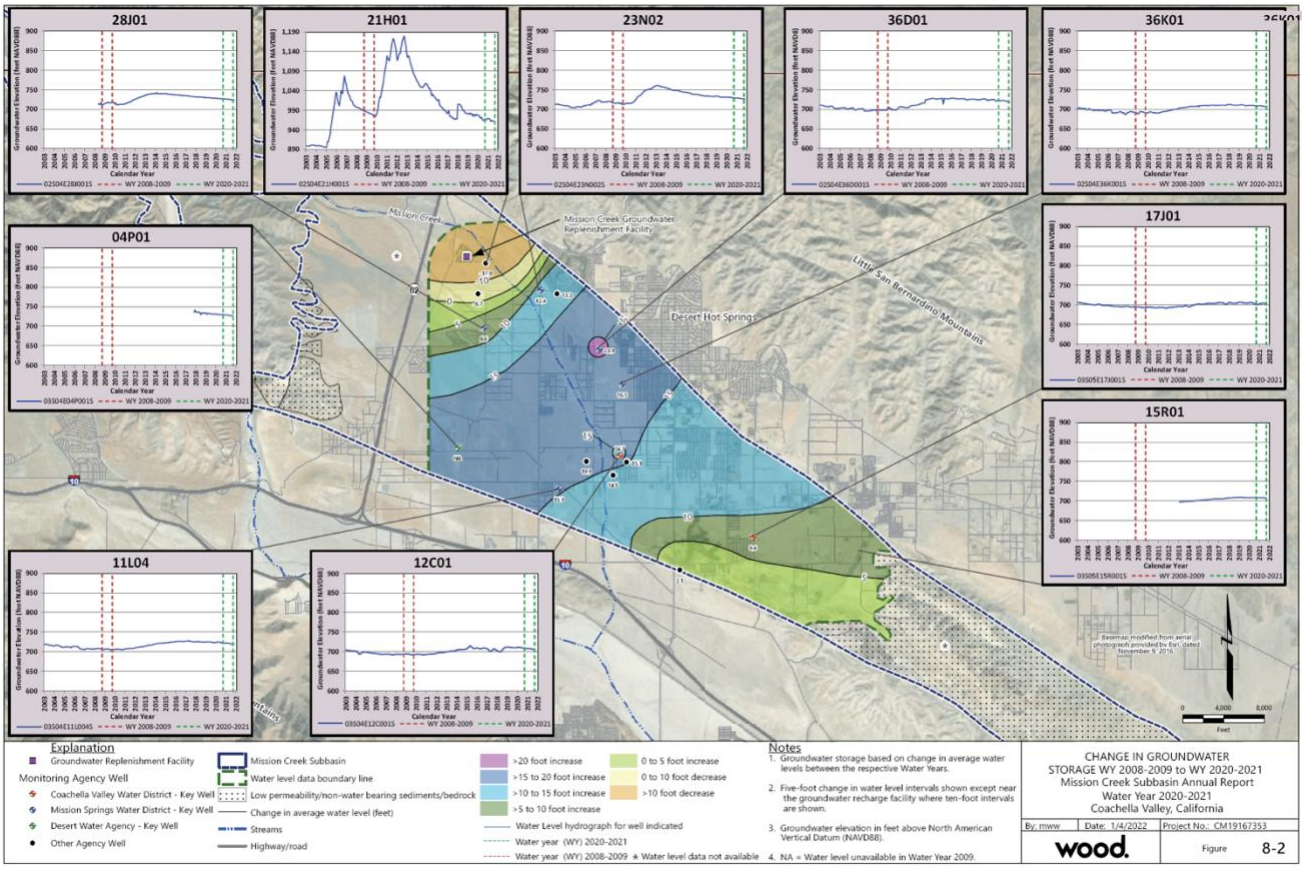
Figure 3-4: Historical Annual Change in Groundwater Storage in the Mission Creek Subbasin



Source: Mission Creek Subbasin Annual Report for Water Year 2020-2021

Groundwater levels have increased significantly in the Mission Creek Subbasin over the past 10 years from WY 2008-2009 to WY 2020-2021 as shown in **Figure 3-5**. The 2022 Mission Creek Subbasin Alternative Plan Update uses 2009 water levels as a metric of sustainability because historical low groundwater levels occurred in the years around 2009 throughout most of the Mission Creek Subbasin. The Mission Creek Subbasin shows a long-term positive trend in sustainability resulting from implementation of the Mission Creek Subbasin Alternative Plan.

Figure 3-5: 12-Year Change in Groundwater Elevation from Water Year 2010-2011 through Water Year 2020-2021 in the Mission Creek Subbasin



Source: Mission Creek Subbasin Annual Report for Water Year 2020-2021

3.2 Imported Water

CVWD has two sources of imported water available: Colorado River water delivered via the Coachella Canal and SWP water exchanged for Colorado River water delivered through the Colorado River Aqueduct. These imported water sources are used to recharge the groundwater basin and as an alternative source to meet non-potable demands from irrigation of agriculture, golf, and urban uses that would have otherwise been met by pumping groundwater. In the future, if urban demand significantly increases relative to non-potable uses, Colorado River water may be treated and delivered directly to customers through CVWD's potable water distribution system.

3.2.1 Colorado River Water

Colorado River water has been a significant water supply source for the Indio Subbasin since the Coachella Canal was completed in 1949. CVWD is the only agency in the Indio Subbasin that receives Colorado River water allocations. The Colorado River is managed and operated in accordance with the Law of the River, a collection of interstate compacts, federal and state legislation, various agreements and contracts, an international treaty, a U.S. Supreme Court decree, and federal administrative actions that govern the rights to use Colorado River water

within the seven Colorado River Basin states. The 1922 Colorado River Compact apportioned the waters of the Colorado River Basin between the Upper Colorado River Basin (i.e., Colorado, Wyoming, Utah, and New Mexico) and the Lower Basin (i.e., Nevada, Arizona, and California). The 1922 Colorado River Compact allocates 15 million AFY of Colorado River water as follows: 7.5 million AFY to the Upper Basin and 7.5 million AFY to the Lower Basin, plus up to 1 million AFY of surplus supplies. The Lower Basin's water was further apportioned among the three Lower Basin states by the 1928 Boulder Canyon Project Act and the 1931 Boulder Canyon Project Agreement, typically called the 1931 Seven Party Agreement, which allocates California's apportionment of Colorado River water among Palo Verde Irrigation District, Imperial Irrigation District (IID), CVWD, Metropolitan Water District of Southern California (MWD), City of Los Angeles, City of San Diego, and County of San Diego. The 1964 U.S. Supreme Court decree in Arizona v. California established Arizona's basic annual apportionment at 2.8 million AFY, California's at 4.4 million AFY, and Nevada's at 0.3 million AFY. Mexico is entitled to 1.5 million AFY of the Colorado River under the 1944 United States-Mexico Treaty for Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande. However, this treaty did not specify a required quality for water entering Mexico. In 1973, the United States and Mexico signed Minute No. 242 of the International Boundary and Water Commission requiring certain water quality standards for water entering Mexico. California's Colorado River supply is protected by the 1968 Colorado River Basin Project Act, which provides that in years of insufficient supply on the main stem of the Colorado River, supplies to the Central Arizona Project shall be reduced to zero before California will be reduced below 4.4 million AF in any year. This assures full supplies to the Coachella Valley, except in periods of extreme drought.

The Coachella Canal is a branch of the All-American Canal that brings Colorado River water into the Imperial and Coachella Valleys. Under the 1931 Seven Party Agreement, CVWD receives 330,000 AFY of Priority 3A Colorado River water diverted from the All-American Canal at the Imperial Dam. The Coachella Canal originates at Drop 1 on the All-American Canal and extends approximately 123 miles, terminating in CVWD's Lake Cahuilla. The service area for Colorado River water delivery under CVWD's contract with the U.S. Bureau of Reclamation (USBR) is defined as Improvement District No. 1 (ID-1), which encompasses 136,400 acres covering most of the East Valley and a portion of the West Valley north of Interstate 10. Under the 1931 Seven Party Agreement, CVWD has water rights to Colorado River water as part of the first 3.85 million AFY allocated to California. CVWD is in the third priority position along with IID.

In 2003, CVWD, IID, and MWD successfully negotiated the 2003 Quantification Settlement Agreement (2003 QSA), which quantifies Colorado River allocations through 2077 and supports the transfer of water between agencies. Under the 2003 QSA, CVWD has a base entitlement of 330,000 AFY. CVWD negotiated water transfer agreements with MWD and IID that increased CVWD supplies by an additional 123,000 AFY. CVWD's net QSA supply will increase to 424,000 AFY by 2026 and remain at that level until 2047, decreasing to 421,000 AFY until 2077, when the agreement terminates. As of 2021, CVWD's available Colorado River water diversions at Imperial Dam under the QSA were 399,000 AFY. This includes the base entitlement of 330,000 AFY, the MWD/IID Transfer of 20,000 AFY, IID/CVWD First Transfer of 50,000 AFY, and IID/CVWD Second Transfer of 28,000 AFY. CVWD's QSA diversions also deducts the -26,000 AFY transferred to San

Diego County Water Authority (SDCWA) as part of the Coachella Canal Lining Project and the -3,000 AFY transfer to Indian Present Perfected Rights. Additionally, under the 2003 QSA, MWD transferred 35,000 AFY of its State Water Project (SWP) Table A Amount to CVWD. This SWP water is exchanged for Colorado River water and can be delivered at Imperial Dam for delivery via the Coachella Canal to the eastern portion of the Indio Subbasin or at Lake Havasu for delivery via the Colorado River Aqueduct to the western portion of the Indio Subbasin at the Whitewater River Groundwater Replenishment Facility (WWR-GRF). The 2019 Second Amendment guaranteed delivery of the 35,000 AFY from 2019 to 2026, for a total of 280,000 AFY of water to the WWR-GRF during that timeframe. MWD can deliver the water through CVWD's Whitewater Service Connections (for recharge at WWR-GRF) or via the Advance Delivery account.

The MWD/IID Transfer originated in a 1989 agreement with MWD to receive 20,000 AF of its Colorado River supply. The 2019 Amended and Restated Agreement for Exchange and Advance Delivery of Water defined the exchange and delivery terms between MWD, CVWD, and DWA. The 2019 Second Amendment to Delivery and Exchange Agreement reduced CVWD's annual delivery of the MWD/IID Transfer to 15,000 AFY, for a total of 105,000 AF, if taken at the Whitewater Service Connections (for recharge at WWR-GRF) between 2020 and 2026. For those seven years, MWD keeps the remaining 5,000 AFY, after which CVWD's allocation increases back up to 20,000 AFY. CVWD's total allocations under the QSA, including MWD's transfer of 35,000 AFY and the MWD/IID Transfer, will increase from 424,000 AFY in 2020 to 459,000 AFY by 2026 and remain at that level for the remainder of the 75-year term of the QSA. **Table 3-3** lists total Colorado River entitlements under existing agreements.

Table 3-3: CVWD Colorado River Entitlements (AFY)

Diversion	2020	2025	2030	2035	2040	2045
Base Entitlement	330,000	330,000	330,000	330,000	330,000	330,000
1988 MWD/IID Approval Agreement	20,000	20,000	20,000	20,000	20,000	20,000
IID/CVWD First Transfer	50,000	50,000	50,000	50,000	50,000	50,000
IID/CVWD Second Transfer[1]	23,000	48,000	53,000	53,000	53,000	53,000
Coachella Canal Lining	-26,000	-26,000	-26,000	-26,000	-26,000	-26,000
Indian Present Perfected Rights Transfer	-3,000	-3,000	-3,000	-3,000	-3,000	-3,000
QSA Diversions	**394,000**	**419,000**	**424,000**	**424,000**	**424,000**	**424,000**
MWD SWP Transfer[2]	35,000	35,000	35,000	35,000	35,000	35,000
Total Diversions	**429,000**	**454,000**	**459,000**	**459,000**	**459,000**	**459,000**
Assumed Conveyance Losses (5%)	-21,200	-22,700	-22,950	-22,950	-22,950	-22,950
MWD/IID Approval Agreement Transfer[3]	-5,000	-5,000	0	0	0	0
Total Available Deliveries	**402,800**	**426,300**	**436,050**	**436,050**	**436,050**	**436,050**

Source: 2022 Alternative Plan Update for the Indio Subbasin

[1] The Second IID/CVWD Transfer began in 2018 with 13,000 AF of water. This amount increases annually by 5,000 AFY for a total of 53,000 AFY in 2026.

[2] The 35,000 AFY MWD/CVWD SWP Transfer may be delivered at either Imperial Dam or Whitewater River and is not subject to SWP or Colorado River reliability.

[3] Accounts for -5,000 AFY reduction in MWD/IID Approval Agreement deliveries from 2020-2026 per the 2019 Amendments with MWD.

The Colorado River deliveries to CVWD at the Imperial Dam/Coachella Canal from 2017 through 2021 are shown in **Table 3-4.**

Table 3-4: Colorado River Deliveries to CVWD at the Imperial Dam/Coachella Canal

Diversions (AF)	2017	2018	2019	2020	2021
Imperial Dam/Coachella Canal	335,321	338,035	343,971	350,618	357,543

Source: U.S. Bureau of Reclamation, Lower Colorado Region, Colorado River Accounting and Water Use Reports for Arizona, California, and Nevada. 2021 data is provisional.

CVWD's recharge volumes of Colorado River water from 2017 through 2021 are shown in **Table 3-5**.

Table 3-5: CVWD Groundwater Recharge of Colorado River Water

Groundwater Recharge (AF)	2017	2018	2019	2020	2021
Thomas E. Levy GRF	34,614	33,348	36,143	37,536	37,971
Palm Desert GRF	0	0	7,757	9,700	10,633
Total	**34,614**	**33,348**	**43,900**	**47,236**	**48,604**

Source: 2022-2023 CVWD Annual Engineer's Reports on Water Supply and Replenishment Assessment

3.2.2 State Water Project

The SWP is managed by DWR and includes 705 miles of aqueduct and conveyance facilities extending from Lake Oroville in Northern California to Lake Perris in Southern California. The SWP has contracts to deliver 4.172 million AFY to the State Water Contractors. The State Water Contractors consist of 29 public entities with long-term contracts with DWR for all, or a portion of, their water supply needs. In 1962 and 1963, DWA and CVWD, respectively, entered contracts with the State of California for a total of 61,200 AFY of SWP water. SWP water has been an important component of the region's water supply mix since CVWD and DWA began receiving and recharging SWP exchange water at the WWR-GRF. Starting in 1973, CVWD and DWA began exchanging their SWP water with MWD for Colorado River water delivered via MWD's Colorado River Aqueduct. Because CVWD and DWA do not have a physical connection to SWP conveyance facilities, MWD takes delivery of CVWD's and DWA's SWP water, and in exchange, delivers an equal amount of Colorado River water to the Whitewater Service Connections (for recharge at WWR-GRF and Mission Creek Groundwater Replenishment Facility). The exchange agreement was most recently re-established in the 2019 Amended and Restated Agreement for Exchange and Advance Delivery of Water.

Each SWP contract contains a "Table A" exhibit that defines the maximum annual amount of water each contractor can receive excluding certain interruptible deliveries. DWR uses Table A amounts to allocate available SWP supplies and some SWP project costs among the contractors. Each year, DWR determines the amount of water available for delivery to SWP contractors based on hydrology, reservoir storage, the requirements of water rights licenses and permits, water quality, and environmental requirements for protected species in the Sacramento-San Joaquin River Delta (Delta). The available supply is then allocated according to each SWP contractor's Table A amount.

CVWD's and DWA's collective increments of Table A water are listed in Table **3-6**. Original Table A SWP water allocations for CVWD and DWA were 23,100 AFY and 38,100 AFY, respectively, for a combined amount of 61,200 AFY. CVWD and DWA obtained a combined 100,000 AFY transfer from MWD under the 2003 Exchange Agreement. In 2004, CVWD purchased an additional 9,900 AFY of SWP Table A water from the Tulare Lake Basin Water Storage District (Tulare Lake Basin) in Kings County. In 2007, CVWD and DWA made a second purchase of Table A SWP water from Tulare Lake Basin totaling 7,000 AFY. In 2007, CVWD and DWA also completed the transfer of 16,000 AFY of Table A Amounts from the Berrenda Mesa Water District in Kern County. These latter two transfers became effective in January 2010. With these additional transfers, the total SWP Table A Amount for CVWD and DWA is 194,100 AFY. **Table 3-7** shows the recharge of SWP Exchange Water from 2017 through 2021.

Table 3-6: State Water Project Table A Allocations

	Original SWP Table A (AFY)	Tulare Lake Basin 2004 Transfer (AFY)	Metropolitan Water District 2003 Transfer (AFY)	Tulare Lake Basin 2007 Transfer (AFY)	Berrenda Mesa 2007 Transfer (AFY)	Total (AFY)
CVWD	23,100	9,900	88,100	5,250	12,000	138,350
DWA	38,100	0	11,900	1,750	4,000	55,750
Total	**61,200**	**9,900**	**100,000**	**7,000**	**16,000**	**194,100**

Source: 2020 Coachella Valley Regional Urban Water Management Plan

Table 3-7: CVWD and DWA Groundwater Recharge of State Water Project Exchange Water

Groundwater Recharge (AF)	2017	2018	2019	2020	2021
Whitewater River GRF	385,994	129,725	235,600	126,487	15,006
Mission Creek GRF	9,248	2,027	3,688	1,768	0
Total	**395,242**	**131,752**	**239,288**	**128,255**	**15,006**

Source: CVWD 2022-2023 Annual Engineer's Reports on Water Supply and Replenishment Assessment

3.2.3 Other SWP Water

There are other types of SWP water that can be purchased, such as individual water purchase opportunities and transfers/exchanges. These may be conveyed to CVWD and DWA as available, but no commitments exist.

In 2008, CVWD and DWA entered into separate agreements with DWR for the purchase and conveyance of supplemental SWP water under the Yuba River Accord Dry Year Water Purchase Program (Yuba Accord). This program provides dry year supplies through a water purchase agreement between DWR and Yuba County Water Agency, which settled long-standing operational and environmental issues over instream flow requirements for the lower Yuba River. The amount of water available for purchase varies annually and is allocated among participating SWP contractors based on their Table A amounts. CVWD and DWA may purchase up to 1.72 percent and 0.69 percent, respectively, of available Yuba Accord water, in years it is made available. Yuba Accord deliveries have varied from zero in multiple years to a total of 2,664 AFY to CVWD and DWA in 2013.

Article 21 water (described in Article 21 of the SWP water contracts), "Interruptible Water," is water that State Water Contractors may receive on a short-term basis in addition to their Table A water if they request it in years when it is available. Article 21 water is used by many contractors to help meet demands in low allocation years. Article 21 water is not available every year, amounts vary when it is available, and is proportionately allocated among participating Contractors. The availability and delivery of Article 21 water cannot interfere with normal SWP operations and cannot be carried over for delivery in a subsequent year.

3.3 Surface Water

CVWD does not currently use or intend to use any local surface water as part of its urban potable water supply. Local runoff is captured and used for groundwater recharge.

3.3.1 River/Stream Diversion

Surface water supplies come from several local rivers and streams including the Whitewater River, Snow Creek, Falls Creek, and Chino Creek, as well as a number of smaller creeks and washes. Because surface water supplies are affected by variations in annual precipitation, the annual supply is highly variable. The 50-year hydrologic period from 1970 to 2019 had an annual average watershed runoff of 52,506 AFY, with approximately 43,300 AFY in natural infiltration. Runoff during the 25-year period from 1995 to 2019 was below average, with 39,196 AFY in watershed runoff and 29,200 AFY in natural infiltration. CVWD does not currently use or intend to use any local surface water as part of its urban potable water supply. Local runoff is captured and used for groundwater recharge.

3.3.2 Stormwater Capture

The Coachella Valley drainage area is approximately 65 percent mountainous and 35 percent typical desert valley with alluvial fan topography buffering the valley floor from the steep mountain slopes. The mean annual precipitation ranges from 30 inches or more in the San Bernardino Mountains to less than 3 inches at the Salton Sea. Three types of storms produce precipitation in the drainage area: general winter storms, general thunderstorms, and local thunderstorms. Longer duration, lower intensity rainfall events tend to have higher recharge rates, but runoff from flash flooding can result from all three types of storms. Otherwise, there is little to no flow in most of the streams in the drainage area.

Significant amounts of local runoff are currently captured at the Whitewater River GRF and in the debris basins and unlined channels of the western Coachella Valley. Additional stormwater will be captured when the Thousand Palms Flood Control Project is completed and when flood control is constructed in the Oasis area. However, limited data exists to estimate the amount of additional stormwater that could be captured by new facilities in the Coachella Valley. Nonetheless, large-scale stormwater capture is not expected to yield sufficient water to be worth the investment as a single purpose project. Small-scale stormwater retention systems located in areas of suitable geology to allow percolation could capture small intensity storms as well as street runoff. The potential yield of these system is not known at this time, but stormwater

capture should are considered in conjunction with projects that construct stormwater and flood control facilities.

3.4 Wastewater and Recycled Water

Wastewater that has been highly treated and disinfected can be reused for landscape irrigation and other purposes. Recycled wastewater has historically been used for irrigation of golf courses and municipal landscaping in the Coachella Valley since as early as the 1960s. As growth occurs in the eastern Coachella Valley, the supply of recycled water is expected to increase, creating an additional opportunity to maximize local water supply.

CVWD operates five water reclamation plants (WRPs), two of them (WRP-7 and WRP-10) generate recycled water for irrigation of golf courses and large landscaped areas. WRP-4 became operational in 1986 and serves the communities from La Quinta to Mecca. WRP-4 effluent is not currently recycled, however, it will be in the future when the demand for recycled water is developed and tertiary treatment is constructed. The other two WRPs serve communities near the Salton Sea. A sixth WRP (WRP-9) was decommissioned in July 2015. The wastewater treated by CVWD from 2017 through 2020 is shown in **Table 3-8**. **Table 3-9** shows the recycled water produced by CVWD from 2017 through 2020. CVWD will continue to expand its recycled water program by connecting additional recycled water customers to meet the non-potable water demands in the western and eastern portions of the Coachella Valley.

Table 3-8: Wastewater Treated by CVWD

Wastewater (AF)	2017	2018	2019	2020	2021
WRP-1	19	19	16	18	24
WRP-2	13	12	16	13	15
WRP-4	5,695	5,900	6,065	6,353	6,452
WRP-7	3,124	3,275	3,246	3,236	3,287
WRP-10	9,710	10,124	9,663	9,238	8,980
Total	**18,561**	**19,330**	**19,006**	**18,858**	**18,758**

Table 3-9: Recycled Water Produced by CVWD

Recycled Water (AF)	2017	2018	2019	2020	2021
WRP-7	1,267	2,246	1,657	1,936	2,136
WRP-10	4,702	7,857	7,100	7,521	7,285
Total	**5,969**	**10,103**	**8,757**	**9,457**	**9,421**

3.5 Conservation

Water conservation, and the reduced groundwater production associated with water conservation, benefits the groundwater basin and is an important element of the Alternative Plans and the 2020 Regional UWMP.

CVWD has utilized several programs to ensure water conservation within its service area. CVWD has implemented allocation-based conservation water pricing (i.e. tiered rates) to prevent water

waste or unreasonable use of water. In addition, CVWD's indoor rebate programs are designed to assist homeowners and commercial customers reduce water usage by upgrading toilets, replacing inefficient devices, and installing new technology to improve efficiency. CVWD also has outdoor rebate programs that are designed to assist homeowners, homeowners associations, and commercial customers reduce outdoor water usage by converting turf to desert landscaping, installing smart irrigation controllers, and improving the efficiency of irrigation systems. CVWD offers seminars, workshops, and classes to help educate the public regarding the need for water conservation and the conservation programs that are available.

3.6 Landscape Ordinance

CVWD Landscape Ordinance 1302.5 requires a series of reduction methods, including requirements that new developments install weather-based irrigation controllers that automatically adjust watering. Additional requirements include setbacks of spray emitters from impervious surfaces, as well as use of porous rock and gravel buffers between grass and curbs to eliminate run-off onto streets. With the exception of turf, all landscaping including groundcover and shrubbery must be irrigated with a drip system. Also, the maximum water allowance for landscaped areas through the CVWD service area has been reduced. This reduction goal requires that developers maximize the use of native and other drought-tolerant landscape materials and minimize use of more water-intensive landscape features, including turf and fountains.

3.7 Water Shortage Contingency Planning

Based on the experiences from the 2013-2015 drought, CVWD's domestic Water Shortage Contingency Plan provides the shortage levels summarized in **Table 4-9**. The trigger levels used to determine the water shortage level depend on the local water situation or applicable State manadates. CVWD has a diverse mix of water supplies and benefits from a large groundwater basin providing storage. CVWD's groundwater replenishment program replenishes the basin to increase groundwater storage during wet years and that supply is available for use during dry years.

Table 3-10: Urban Water Shortage Contingency Plan Shortage Levels

Shortage Level	Shortage Range	Water Supply Condition
1	Up to 10%	Normal water supplies
2	Up to 20%	Slightly limited water supplies
3	Up to 30%	Moderately limited water supplies
4	Up to 40%	Limited water supplies
5	Up to 50%	Significantly limited water supplies
6	Up to 60%	Severe shortage or catastrophic incident

Source: 2020 CVWD Water Shortage Contingency Plan

4 Public Water System – Projected Supply and Demand

Coachella Valley Water District (CVWD) projects that a majority of its urban potable water uses will continue to be supplied from local groundwater. In addition to groundwater, CVWD has secured imported water supplies from the State Water Project (SWP) and the Colorado River, and recycled water from water reclamation plants. These imported and recycled water supplies are used to meet CVWD's non-potable water demands and to replenish the groundwater basin.

4.1 Projected Urban Demand and Supply

The following tables from the 2020 Regional Urban Water Management Plan (Regional UWMP) provide the CVWD's projected water supplies and demands. Potable water demand projections for the CVWD service area are summarized in **Table 4-1**.

Table 4-1: CVWD Projected Urban Retail Demands

	Projected Water Use				
Use Type	**2025**	**2030**	**2035**	**2040**	**2045**
Single Family	60,142	63,824	67,331	69,816	71,695
Multi-Family	6,873	7,245	7,742	8,267	9,045
CII	7,060	7,244	7,438	7,709	7,985
Landscape	34,193	36,205	38,226	39,865	41,516
Other	1,457	1,563	1,670	1,755	1,840
Losses	13,736	14,501	15,222	15,670	16,085
Total	**123,461**	**130,582**	**137,629**	**143,081**	**148,166**

Source: 2020 Coachella Valley Regional Urban Water Management Plan

A summary of existing and planned urban water supply volumes by source are presented in **Table 4-2**. It should be noted that the supplies and demands presented in the tables below include recycled water delivered to CVWD's non-potable customers based on the DWR standardized tables and 2020 UWMP Guidebook. DWR requires the supply reliability table to include both potable and recycled water, however, CVWD's recycled water is not a potable water supply and is not delivered to CVWD's potable water customers. Instead, recycled water is used to offset the groundwater pumping of private well owners (mainly for golf course and landscape irrigation) to eliminate overdraft.

These projections were based on 2010 U.S. Census Data, DWR's Population Tool, the Southern California Association of Governments' (SCAG) 2020 Connect SoCal Regional Transportation Plan, and seasonal occupancy data from the Greater Palm Springs Convention and Visitors Bureau.

Table 4-2: CVWD Projected Urban Water Supplies

Water Supply	Projected Water Supply (AFY)				
	2025	2030	2035	2040	2045
Groundwater	123,461	130,582	137,629	143,081	148,166
Recycled Water	13,600	14,400	15,100	15,900	16,800
Total	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**

Source: 2020 Coachella Valley Regional Urban Water Management Plan

4.2 Normal, Single-Dry, Multiple-Dry Year Comparison

The following tables from the 2020 Regional UWMP provide CVWD's projected water supplies and demands in a normal year, single-dry year, and multiple-dry years.

During normal years, CVWD will be able to meet current and future urban water demand needs projected in the 2020 Regional UWMP through groundwater pumping and recycled water as shown in **Table 4-3**.

Table 4-3: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
Groundwater	123,461	130,582	137,629	143,081	148,166
Recycled Water	13,600	14,400	15,100	15,900	16,800
Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
Potable Water Demand	123,461	130,582	137,629	143,081	148,166
Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
Difference	**0**	**0**	**0**	**0**	**0**

Source: 2020 Regional Urban Water Management Plan

Note: CVWD and the other Regional UWMP agencies collaborate on groundwater management plans for long-term sustainability. During a normal year, single-dry year, or five-dry year period, the agencies could produce additional groundwater if demands exceeded the estimates shown here.

During single-dry years, CVWD will be able to meet current and future urban water demand needs through groundwater pumping and recycled water as shown in **Table 4-**4. Water supplies during the single-dry year are 100 percent reliable. CVWD's groundwater replenishment program replenishes the basin to increase groundwater storage during wet years and that supply is available for use during dry years. Thus, the supply and demand comparison for the single-dry year is the same as the normal year.

Table 4-4: Single-Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
Groundwater	123,461	130,582	137,629	143,081	148,166
Recycled Water	13,600	14,400	15,100	15,900	16,800
Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
Potable Water Demand	123,461	130,582	137,629	143,081	148,166
Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
Difference	**0**	**0**	**0**	**0**	**0**

Source: 2020 Regional Urban Water Management Plan

Note: CVWD and the other Regional UWMP agencies collaborate on groundwater management plans for long-term sustainability. During a normal year, single-dry year, or five-dry year period, the agencies could produce additional groundwater if demands exceeded the estimates shown here.

During multiple-dry years, CVWD will be able to meet current and future urban water demand needs through groundwater pumping and recycled water as shown in **Table 4-5**. Similar to the single-dry year, the multiple-dry year water supply reliability is 100 percent. Thus, the supply and demand comparison for the multiple-dry years is the same as the normal year. CVWD and the other Regional UWMP agencies collaborate on groundwater management plans for long-term sustainability. During a normal year, single-dry year, or five-dry year period, the agencies could produce additional groundwater if demands exceeded the estimates shown in Table 4-5.

CVWD's total current urban water demand was 110,967 acre-feet (AF) for 2021, including 101,546 AF of groundwater and 9,421 AF of recycled water.

Table 4-5: Multiple-Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
First Year	**Supply Totals (AFY)**	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Groundwater	123,461	130,582	137,629	143,081	148,166
	Recycled Water	13,600	14,400	15,100	15,900	16,800
	Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Potable Water Demand	123,461	130,582	137,629	143,081	148,166
	Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	**Supply Totals (AFY)**	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Groundwater	123,461	130,582	137,629	143,081	148,166
	Recycled Water	13,600	14,400	15,100	15,900	16,800
	Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Potable Water Demand	123,461	130,582	137,629	143,081	148,166
	Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	**Supply Totals (AFY)**	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Groundwater	123,461	130,582	137,629	143,081	148,166
	Recycled Water	13,600	14,400	15,100	15,900	16,800
	Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Potable Water Demand	123,461	130,582	137,629	143,081	148,166
	Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	**Supply Totals (AFY)**	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Groundwater	123,461	130,582	137,629	143,081	148,166
	Recycled Water	13,600	14,400	15,100	15,900	16,800
	Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Potable Water Demand	123,461	130,582	137,629	143,081	148,166
	Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	**Supply Totals (AFY)**	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Groundwater	123,461	130,582	137,629	143,081	148,166
	Recycled Water	13,600	14,400	15,100	15,900	16,800
	Demand Totals (AFY)	**137,061**	**144,982**	**152,729**	**158,981**	**164,966**
	Potable Water Demand	123,461	130,582	137,629	143,081	148,166
	Recycled Water Demand	13,600	14,400	15,100	15,900	16,800
	Difference	**0**	**0**	**0**	**0**	**0**

Source: 2020 Regional Urban Water Management Plan

Note: CVWD and the other Regional UWMP agencies collaborate on groundwater management plans for long-term sustainability. During a normal year, single-dry year, or five-dry year period, the agencies could produce additional groundwater if demands exceeded the estimates shown here.

5 Project Description

The Refuge Specific Plan (Project) is located in the central portion of the Coachella Valley within the incorporated limits of the City of Palm Desert, Riverside County as shown in **Figure 5-1**. The Project will be accessible from Gerald Ford Drive and is bounded by Gerald Ford Drive to the north, single-family residential homes to the east and south, and Shadow Ridge Road and the Marriott Shadow Ridge Golf Club to the west, as shown in **Figure 5-2**. Vitalia Way will intersect with Gerald Ford Drive and is not yet built but was approved in 2021 as part of the Vitalia multi-family residential project. The proposed Specific Plan extends Vitalia Way farther south than originally approved to access the central and southern portions of the Specific Plan area. The Project proposes to develop approximately 106.4 acres of vacant land in the Coachella Valley to include up to 969 single-family and multi-family dwelling units as shown in **Figure 5-3** and **Table 5-1**. Common recreation facilities such as pools, spas, club houses, management offices, barbecues and other facilities appropriate to future development may be included. Project-level development and landscape plans are currently unknown, however this WSA/WSV assumes 5,000 square feet of office/leasing/amenities building space and that up to 30 percent of the total site area, or 31.92 acres, may be landscaped with a mix of drought tolerant landscaping and minimal turf for open space, retention basins, and landscaping. It is also assumed that 60 percent of all private residential lots will have private pools, for a total of 240 private pools in addition to 3 community pools.

Figure 5-1: Project Regional Location Map

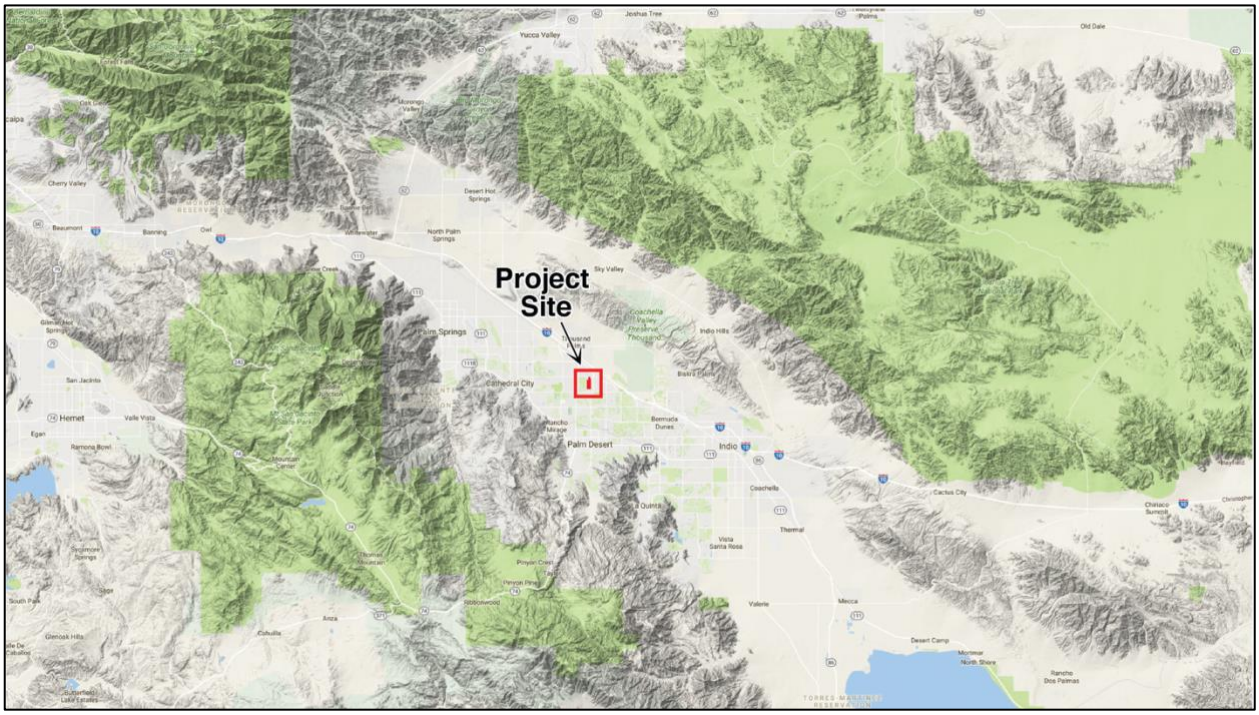


Figure 5-2: Project Vicinity Map

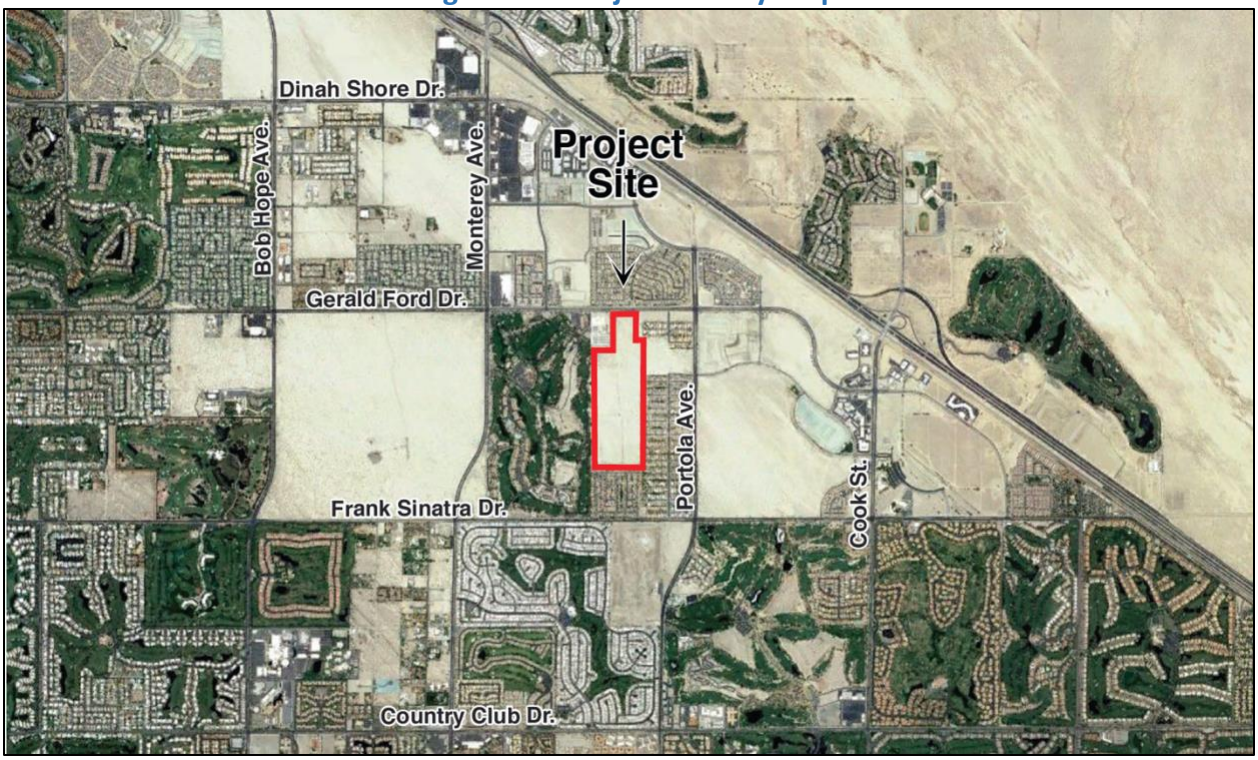


Figure 5-3: Planning Area Map

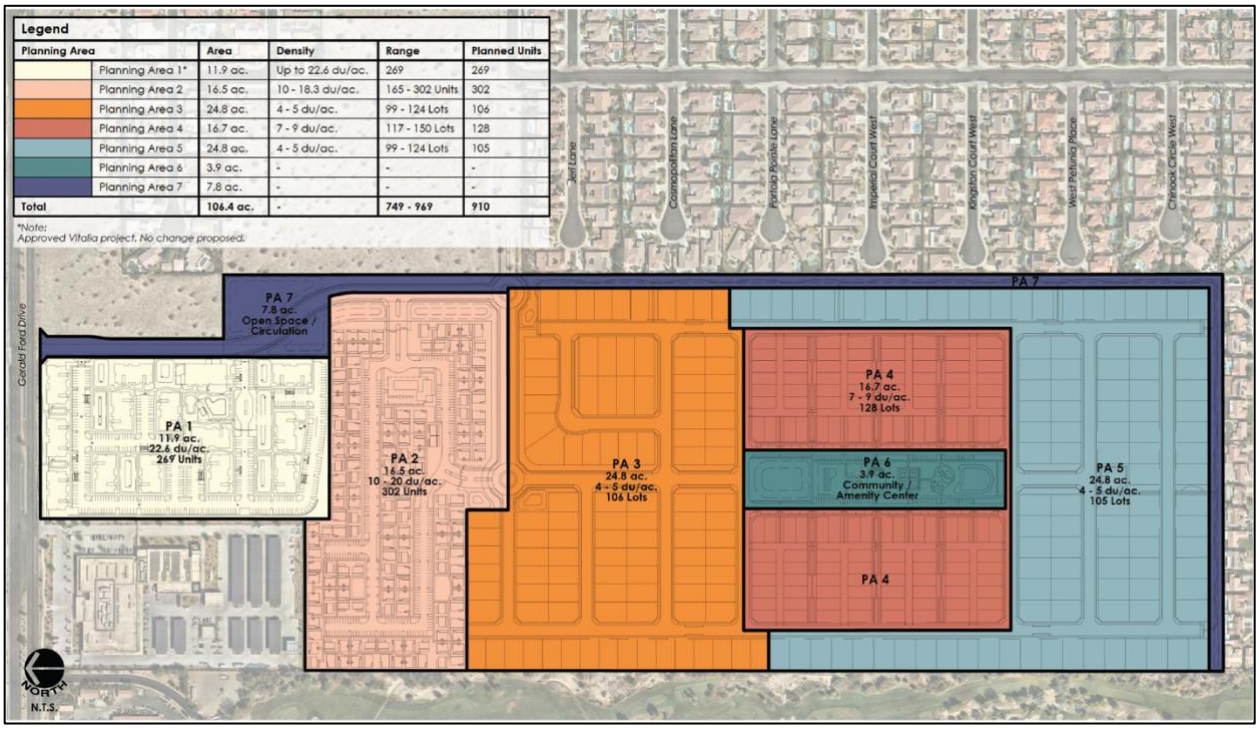


Table 5-1: Project Land Use Summary

Planning Area	Specific Plan/Land Use Designation	Land Area (Acres)	Target Density (EDUs/Acre)	Estimated Dwelling Units (EDUs)	Non-Residential Building Area (ft^2)
1	Multi-Family Residential	11.9	22.6 du/ac	269 units	NA
2	Multi-Family Residential	16.5	10-18.23 du/ac	165-302 units	NA
3	Single Family Residential	24.8	4-5 du/ac	99-124 lots	NA
4	Multi-Family Residential	16.7	7-9 du/ac	117-150 lots	NA
5	Single Family Residential	24.8	4-5 du/ac	99-124 lots	NA
6	Community/Amenity Center	3.9	NA	NA	5,000
7	Open Space/Circulation	7.8	NA	NA	NA
Total		**106.4**		**749-969**	**5,000**

Note: Outdoor landscaped and recreational acreage is spread across all Planning Areas.

6 Project Water Demands

The Refuge Specific Plan (Project) proposes to develop approximately 106.4 acres of vacant land in the Coachella Valley to include up to 969 single-family and multi-family dwelling units. Future housing developments may include common recreation facilities such as pools, spas, club houses, management offices, barbecues, and other facilities. Project-level development and landscape plans are currently unknown, however this WSA assumes 5,000 square feet of office/leasing/amenities building space and that up to 30 percent of the total site area, or 31.92 acres, may be landscaped with a mix of drought tolerant landscaping and minimal turf for open space, retention basins, and paseos. It is also assumed that 60 percent of all private residential lots will have private pools, for a total of 240 private pools in addition to 3 community pools.

6.1 Projected Indoor Residential Water Demand

The projected indoor residential unit usage for this Water Supply Assessment/Water Supply Verification (WSA/WSV) is based on indoor water use performance standards as provided in the California Water Code (CWC) for residential water demand Water Code Section 10910 approved November 10, 2009, codified in CWC section 10608.20 (b)(2)(A). The projected indoor residential water demand for the Project totals 128.34 acre-feet per year (AFY) as shown in **Table 6-1**. SB 606 and AB 1668 established guidelines for efficient water use and a framework for the implementation and oversight of the new standards, which must be in place by 2022. Based on results of the Indoor Residential Water Use Study, DWR and the State Water Resources Control Board jointly recommended that the indoor residential standard remain at 55 gallons per capita per day (gpcd) through 2024 and decline to 47 gpcd in 2025 and to 42 gpcd starting in 2030.

Table 6-1: Projected Indoor Residential Water Demand

Planning Area	Land Area (Acres)	Estimated Dwelling Units (EDUs)	Estimated Occupants per Home [1]	Gallons per Day (gpd) per Occupant [2]	gpd/EDU	Water Demand (gpd)	Water Demand (AFY)
1	11.9	269	2.15	55	118.25	31,809.25	35.63
2	16.5	302	2.15	55	118.25	35,711.50	40.00
3	24.8	124	2.15	55	118.25	14,663.00	16.42
4	16.7	150	2.15	55	118.25	17,737.50	19.87
5	24.8	124	2.15	55	118.25	14,663.00	16.42
Total	**94.7**	**969**				**114,584.25**	**128.34**

[1] CA Department of Finance Table 2: E-5 City/County Population and Housing Estimates, 2021 for the City of Palm Desert.

[2] CA Indoor Water Use Performance Standard

6.2 Projected Indoor Commercial Water Demand

The projected indoor commercial usage for this WSA/WSV are based on the American Water Works Association Research Foundations (AWWARF's) Commercial and Industrial End Uses of Water. The projected indoor commercial water demand for the Project totals 0.54 AFY as shown in **Table 6-2** below.

Table 6-2: Projected Indoor Commercial and Industrial Water Demand

Planning Area	Indoor Area (ft^2)	Number of Rooms	Maximum Interior Floor Space per Unit	Water Demand Factor (gal/ft^2)[1]	Water Demand (gpd)	Water Demand (AFY)
6	5,000	NA	NA	35	479.45	0.54
Total	**5,000**				**479.45**	**0.54**

[1] AWWARF Commercial and Industrial End Uses of Water, 2000.

6.3 Projected Outdoor Water Demand

The projected outdoor irrigation water usage is based on the Maximum Applied Water Allowance (MAWA) equation from Appendix D of Coachella Valley Water District's (CVWD's) Landscape Ordinance No. 1302.5, which meets the water conservation goals of the California Department of Water Resources (DWR) Model Water Efficient Landscape Ordinance (MWELO). As previously discussed, Project-level landscape plans are currently unknown. For analysis purposes it is assumed that up to 30 percent of the total Project area, or 31.92 acres/1,390,435 square feet, may be landscaped with a mix of drought tolerant landscaping and minimal turf for open space, retention basins, and paseos.

The projected outdoor recreational water usage is based on the Estimated Total Water Usage (ETWU) equation from Appendix D of CVWD's Landscape Ordinance No. 1032.5. It is assumed that 60 percent of the residential lots in PAs 3, 4 and 5 will be pool lots for a total of 240 private pools. PAs 1, 2, and 6 will have one shared community pool each.

The projected outdoor water demand for the Project is 117.70 AFY as shown in **Table 6-3** on the following page. Projected outdoor water demand is a best estimate for the purposes of the WSA/WSV analysis. The Project will need to comply with CVWD's Landscape Ordinance No. 1032.5 or any other applicable ordinances and regulations that may be in place when CVWD approves landscape plans for the Project.

Table 6-3: Projected Outdoor Irrigation Water Demand

Outdoor Use Type	Planning Area	Outdoor Use Area (ft^2)[1]	ETo (in/yr)[2]	ETAF/Plant Factor[3]	Conversion Factor (gal/ft^2)[4]	Water Demand (gpd)	Water Demand (AFY)
Landscaping	Project Wide	1,390,435	83.34	0.45	0.62	88,575.89	99.22
Recreation	1	3,500	83.34	1.1	0.62	545.02	0.61
Recreation	2	2,000	83.34	1.1	0.62	311.44	0.35
Recreation	3	32,000	83.34	1.1	0.62	4,983.05	5.58
Recreation	4	32,000	83.34	1.1	0.62	4,983.05	5.58
Recreation	5	32,000	83.34	1.1	0.62	4,983.05	5.58
Recreation	6	4,500	83.34	1.1	0.62	700.74	0.78
	Total	**1,390,435.00**				**105,082.24**	**117.70**

[1] Assumes an average private swimming pool is 400 square feet. Assumes 60% of private lots in PAs 3, 4, and 5 will opt for pool upgrade for a total of 240 private pools, or 80 pools in each. PAs 1, 2, and 6 will have one shared community pool each.

[2] Reference Evapotranspiration (ETo) for ETo Zone [X] from CVWD Landscape Ordinance 1302.5, Appendix C

[3] Evapotranspiration Adjustment Factor (ETAF) for landscaping and pools is from the CVWD Landscape Ordinance 1302.5.

[4] Conversion Factor from CVWD Landscape Ordinance 1302.5, Appendix D

6.4 Projected Total Water Demand

The total projected water demand for the Project is 246.58 AFY, or 2.32 acre-feet per acre, as shown in **Table 6-4** below.

Table 6-4: Projected Total Water Demand

Planning Area	Land Area (Acres)	Indoor Residential Demand (AFY)	Indoor Commercial Demand (AFY)	Outdoor Demand (AFY)	Total Water Demand (AFY)
1 Multi-Family Residential	11.9	35.63	NA	NA	35.63
2 Multi-Family Residential	16.5	40.00	NA	NA	40.00
3 Single Family Residential	24.8	16.42	NA	NA	16.42
4 Multi-Family Residential	16.7	19.87	NA	NA	19.87
5 Single Family Residential	24.8	16.42	NA	NA	16.42
6 Community/ Amenity Center	3.9	NA	0.54	NA	0.54
7. Open Space/Circulation	7.8	NA	NA	NA	-
Outdoor Use - Overall[1]	NA	NA	NA	117.70	117.70
Total	**106.4**	**128.34**	**0.54**	**117.70**	**246.58**

[1] Outdoor landscaping and recreational acreage and associated water demand are spread across all Planning Areas.

6.5 Projected Water Sources

The Project is anticipated to utilize the CVWD Domestic System to provide water for all Project demands.

Table 6-5: Projected Water Sources

Planning Area	Land Area (Acres)	Indoor Residential	Indoor Commercial	Outdoor
1 Multi-Family Residential	11.9	CVWD Domestic	NA	NA
2 Multi-Family Residential	16.5	CVWD Domestic	NA	NA
3 Single Family Residential	24.8	CVWD Domestic	NA	NA
4 Multi-Family Residential	16.7	CVWD Domestic	NA	NA
5 Single Family Residential	24.8	CVWD Domestic	NA	NA
6 Community/Amenity Center	3.9	NA	CVWD Domestic	NA
7. Open Space/Circulation	7.8	NA	NA	NA
Outdoor Use - Overall	NA	NA	NA	CVWD Domestic

6.6 Conservation Measures

According to the Specific Plan, the Project's planting and irrigation design shall meet Coachella Valley Water District (CVWD) standards and the State of California Model Water Efficient Landscape Ordinance (MWELO). Planting selections for shrubs must have 75% of the plant palette be designated low-water plants from "WUCOLS"—the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2014.

The Project's adherence with the CVWD conservation programs, most notably in CVWD Landscape Ordinance 1302.5, has guided development of the Project landscape plan and will further enforce the water conservation ideology.

7 Assessment and Verification – Availability of Sufficient Supplies

7.1 Water Supply Assessment

Based on the analysis in this Water Supply Assessment/Water Supply Verification (WSA/WSV), the projected total water demand for the Refuge Specific Plan (Project) will be 246.58 acre-feet per year (AFY), or 2.32 acre-feet per acre. CVWD's long-term water management planning ensures that adequate water supplies are available to meet existing and future water needs within its service area. CVWD's current urban water demand was 101,546 acre-feet (AF) for 2021, and the projected urban water demand by 2045 is 148,166 AF. This Project's water demand of 246.58 AFY accounts for approximately 0.53 percent of the total planned increases in demand of 46,620 AF by 2045.

This WSA/WSV provides an assessment and verification of the availability of sufficient water supplies during normal, single-dry, and multiple-dry years over a 20-year projection to meet the projected demands of the Project, in addition to existing and planned future water demands of CVWD, as required by Senate Bill 610 (SB 610), SB 221, and SB 1262. This WSA/WSV also includes identification of existing water supply entitlements, water rights, water service contracts, and agreements relevant to the identified water supply for the Project and quantities of water received in prior years pursuant to those entitlements, rights, contracts, and agreements.

This WSA/WSV has been prepared in compliance with the requirements of SB 610, SB 221, and SB 1262 by Terra Nova Planning and Research in consultation with CVWD and the City of Palm Desert. This WSA/WSV does not relieve the Project from complying with all applicable state, county, city, and local ordinances or regulations including the CVWD Landscape Ordinance, and indoor water use performance standards provided in the CWC now or in the future.

This WSA/WSV will be reviewed every five years, or in the event that the water planning assumptions have changed, until the Project completes construction to ensure it remains accurate and no significant changes to either the Project or available water supply has occurred. The Project applicant shall notify CVWD when construction begins. If neither the Project applicant nor the Lead Agency contacts CVWD within five years of approval of this WSA/WSV, it will be assumed that the Project no longer exists and the WSA/WSV provided by this document will become invalid.

7.2 Water Supply Verification

A WSA/WSV has been prepared for the Project pursuant to the requirements of Senate Bill 221 (SB 221) because it includes a Tentative Parcel Map. This document provides verification that adequate water supply for the Project is available, as required by California Government Code Section 66473.7.

8 References

American Water Works Association Research Foundation, *Commercial and Institutional End Uses of Water*, 2000

California Department of Water Resources, *Final State Water Project Delivery Capability Report 2019*, August 2020

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Coachella Valley Water District, *Landscape Ordinance 1302.5*, July 2020

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United States Bureau of Reclamation, *Colorado River Accounting and Water Use Reports for Arizona, California, and Nevada*