11.9 Water Supply Assessment

California Senate Bill 610
Water Supply Assessment

for

South Coast Water District
Doheny Village Zoning District Update Project

Prepared for
South Coast Water District

by:

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INTERNATIONAL

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ABBREVIATIONS

ac	acre
AF	Acre-Feet
AFY	Acre-Feet per Year
Ag	Agricultural
ACWRF	Aliso Creek Water Reclamation Facility
AMP	Allen-McCulloch Pipeline
ATM	Aufdenkamp Transmission Main
AWT	Advanced Water Treatment
Biops	Biological Opinions
BPS	Booster Pump Station
CDR	Center of Demographic Research
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CRA	Colorado River Aqueduct
CTP	Coastal Treatment Plant
CVP	Central Valley Project
GCM	General Circulation Model
DOF	Department of Finance
DFW	Department of Fish and Wildlife
DU	dwelling units
DWR	Department of Water Resources
EIR	Environmental Impact Report
ESA	Endangered Species Act
fps	feet per second or foot per second
ft	feet or foot
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GRF	Groundwater Recovery Facility
IRP	Integrated Water Resources Plan
JTM	Joint Transmission Main
Ksf	kilo- square feet (1,000 square feet)
LF	Linear Feet
MAF	million acre feet
MCL	Maximum Contaminant Level
Metropolitan	Water District of Southern California
MG	million gallons
MGD	million gallons per day
MWDOC	Municipal Water District of Orange County
NDMA	N-Nitrosodimethylamine
NOP	Notice of Preperation

NP	Non-potable Water
OCTA	Orange County Transportation Authority
PPCP	Pharmaceuticals and Personal Care Product
RW	Recycled Water
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCP	South County Pipeline
SCRRA	Southern California Regional Rail Authority
SCWD	South Coast Water District
sf	square feet
SJBA	San Juan Basin Authority
SOCWA	South Orange County Wastewater Authority
SWRCB	State Water Resources Control Board
SWP	State Water Project
TAF	Thousand-acre feet
TDS	Total Dissolved Solids
WIP	Water Importation Pipeline
WSA	Water Supply Assessment

EXECUTIVE SUMMARY

Per the requirements under Senate Bill 610 (SB 610), Water Code Section 10910 et seq., and Senate Bill 221 (SB 221), Government Code Section 66473.7. Michael Baker International (Michael Baker) has completed this Water Supply Assessment (WSA) for the proposed Doheny Village Zoning District Update Project (Project).

This WSA includes a discussion of the Senate Bill 610 legislation, a description of the proposed Project, and analysis of water demands for the South Coast Water District's (SCWD, District) existing service area and the Project. This WSA also identifies water supply and reliability within the SCWD Distribution System now and into the future and determines water supply sufficiency for the Project.

It is estimated that the Project will increase the District's water demands by approximately 82,100 gpd, or 92 AFY. These demands are assumed to be entirely supplied from the District's potable imported and local groundwater supplies for purposes of this WSA.

The WSA's analysis of the water supply and demand projections for normal year, single-dry year, and multiple-dry year scenarios demonstrate that the District has the ability to satisfy their demands projected during the 20-year planning period, including a sufficient water supply for the Doheny Village Zoning District Update.

The WSA does not, nor is it intended to, identify infrastructure needs for service distribution for the proposed projects.

1. INTRODUCTION

The Proposed Doheny Village Zoning District Update Project (Project) site is located in the City of Dana Point (City) and is situated within the Floodplain Overlay and Costal Overlay Boundary (Figure 1-1). The Project will modify the existing 80-acre site to include an additional 808 dwelling units and 241,228 square feet of new non-residential area.

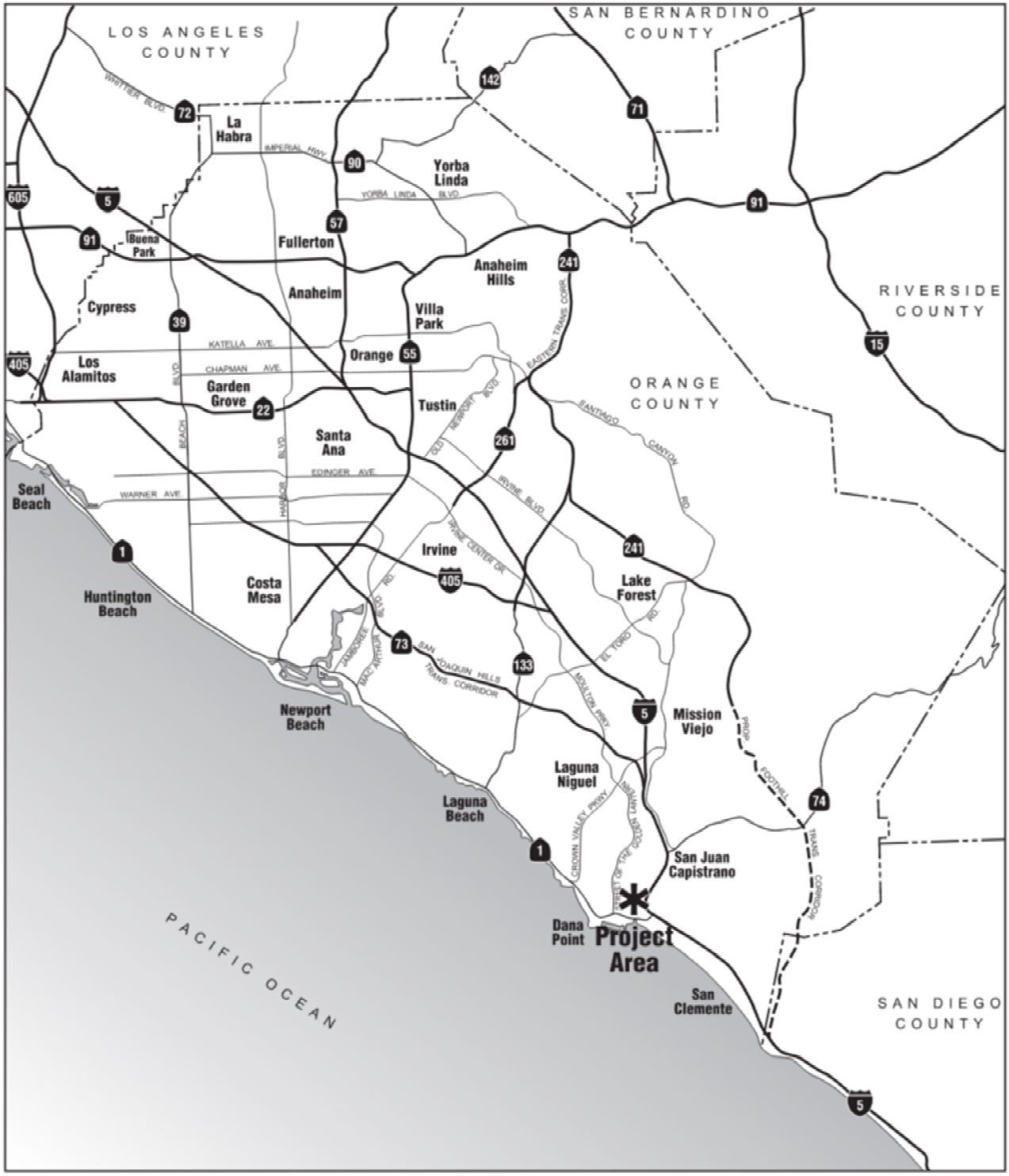
As the Project exceeds 500 dwelling units, the preparation of a Water Supply Assessment (WSA) is required, per the requirements under Senate Bill 610 (SB 610), Water Code Section 10910 et seq., and Senate Bill 221 (SB 221), Government Code Section 66473.7. This WSA shall determine the South Coast Water District's (SCWD) sufficiency of water supply to the Project and the City's water customers, now and for a 20-year planning period.

The WSA was prepared using the District 2015 Urban Water Management Plan, the District 2017 Water Master Plan (WMP), and additional information provided by SCWD, the developer, and the City of Dana Point. These documents and information serve as the bases of data and includes a discussion of the SB 610 Legislation, an overview of the proposed land use changes identified in the Project Description, analysis of water demands for SCWD's existing service area, the Project and future development projects over a 20-year planning period. The WSA also includes an analysis of reliability of SCWD's water supplies and water quality, and concludes with an analysis describing water supply during normal, single-dry, and multiple dry-years over a 20-year planning period.

The following documents were used as reference information in the development of this WSA:

1. 2015 Urban Water Management Plan
2. 2017 Water Master Plan Update
3. South Coast Water District Water Demand Data
4. South Coast Water District Water Demand Projections
5. Doheny Village Zoning District Update Project EIR

Figure 1-1: Project Vicinity Map



2.0 LEGISLATION

The purpose of the Water Supply Assessment (WSA) is to satisfy the requirements under Senate Bill 610 (SB 610), Water Code Section 10910 et seq., and Senate Bill 221 (SB 221), Government Code Section 66473.7 that adequate water supplies are, or will be, available to meet the water demands associated with the proposed Project.

SB 610 focuses on the content of a water supply agency's Urban Water Management Plan (UWMP). It also stipulates that, when an environmental impact report (EIR) is required in connection with a project, the appropriate water supply agency must provide an assessment of whether its total water supplies will meet the project water demand associated with the proposed project. SB610 applies to a proposed residential development of more than 500 dwelling units, or large commercial, industrial, or mixed-use development. SB 221 requires water supply verification when a tentative map, parcel map, or development agreement for a project is submitted to a land use agency for approval. SB 221 applies to proposed residential developments of more than 500 dwelling units with some exceptions. The need for an assessment or verification is determined by the lead agency for the project.

2.1 SB 610 – COSTA – WATER SUPPLY PLANNING

SB 610 was implemented in January 2002. SB 610 requires a development that qualifies as a "Project" under Water Code 10912 to be supported in CEQA documentation with a Water Supply Assessment report drafted to specifically identify the public water system that shall supply water to the project and analyze the availability and reliability of water supply to the development. The Water Supply Assessment is to include the following, if applicable to the supply conditions:

1. Discussion with regard to whether the public water system'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 public water system's existing and planned future uses.

2. Identification of existing water supply entitlements, water rights, or water service contracts secured by the purveying agency and water received in prior years pursuant to those entitlements, rights, and contracts.

3. Description of the quantities of water received in prior years by the public water system under the existing water supply entitlements, water rights or water service contracts.

4. Water supply entitlements, water rights or water service contracts shall be demonstrated by supporting documentation such as the following:

a. Written contracts or other proof of entitlement to an identified water supply.

b. Copies of capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

c. Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

d. Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

5. Identification of other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.

6. If groundwater is included for the supply for a proposed project, the following additional information is required:

a. Description of groundwater basin(s) from which the proposed project will be supplied. Adjudicated basins must have a copy of the court order or decree adopted and a description of the amount of groundwater the public water system has the legal right to pump. For non-adjudicated basins, information on whether the Department of Water Resources (DWR) has identified the basin as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin from DWR that characterizes the condition of the basin, and a detailed description of the efforts being undertaken in the basin to eliminate the long-term overdraft condition.

b. Description and analysis of the amount and location of groundwater pumped by the public water system for the past five (5) years from any groundwater basin from which the proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.

c. Description and analysis of the amount and location of groundwater projected to be pumped by the public water system from any groundwater basin from which the proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.

d. Analysis of sufficiency of the groundwater from the basin(s) from which the proposed project will be supplied.

7. The water supply assessment shall be included in any environmental document prepared for the project.

8. The assessment may include an evaluation of any information included in that

environmental document. A determination shall be made whether the projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.

2.2 SB X7-7 and EO B-37-16 and EO B-40-17

The Water Conservation Act of 2009 (SB X7-7) requires all California urban water agencies to set and meet certain demand reduction targets in order to assist the State in reducing urban water use 20 percent by 2020. The Act also requires each agency to monitor its progress toward its targets. This was implemented for the purpose of meeting the mandate to reduce per capita urban water consumption 20 percent statewide. SB X7-7 describes the overall process by which the Mesa Water District is to comply with the requirements. It specifically identifies methods for establishing urban water use targets.

Governor Jerry Brown issued a State of Emergency and Continued State of Emergency in 2014 in response to the persistent state-wide drought. In April 2015, Executive Order (EO) B-29-15 was issued by the Governor, which required a water use reduction of 25 percent, as compared to 2013 usage, throughout the State. The EO outlined specific water use reductions designed to heighten the urgency to reduce water consumption and facilitate the ability of local agencies to implement and enforce water conservation requirements.

Following unprecedented water conservation and plentiful winter rain and snow, on April 7, 2017 Governor Brown ended the drought State of Emergency in most of California, while maintaining water reporting requirements and prohibitions on wasteful practices such as water during or right after rainfall. EO B-40-17 lifts the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne, where emergency drinking water projects will continue to be implemented to help address diminished groundwater supplies. The Order also rescinds two emergency proclamations from January and April 2014 and four drought-related Executive Orders issued in 2014 and 2015, as briefly discussed above. EO B-40-17 builds on actions taken in EO B-37-16, which remains in effect, to continue making water conservation a way of life in California. The State Water Resources Control Board (SWRCB) maintains urban water use report requirements and prohibitions on wasteful practices such as watering during or after rainfall, hosing off sidewalks and irrigating ornamental turf on public street medians. As directed by Governor Brown in EO B-37-16, the Board will separately take action to make reporting of wasteful water practices permanent.

The Executive Director for the SWRCB, on April 26, 2017, rescinded the water supply stress test requirements and remaining mandatory conservation standards for urban water suppliers. The action was in response to Governor Brown's earlier announcement ending the drought state of emergency and transitioning to a permanent framework for making water conservation a California way of life. Additional information can be found on the SWRCB website at:

https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/emergency_regulation.html

3.0 DOHENY VILLAGE PLAN PROJECT

3.1 PROJECT DESCRIPTION

The Proposed Project site is located in the City of Dana Point and is situated within the Floodplain Overlay and Costal Overlay Boundary. The Project is bounded by the border of San Juan Capistrano and Interstate 5 (I-5) on the north, on the east by the I-5 off-ramp to Pacific Coast Highway (PCH), on the south by PCH, and on the west by the Southern California Regional Rail Authority (SCRRA)/Orange County Transportation Authority (OCTA) railroad right-of-way. The existing 80-acre site, comprised of a mix of residential, commercial, retail, manufacturing, and institutional uses, will be modified to include an additional 812 dwelling units and 180,831 square feet of new non-residential areas. Regional access to the site is provided via I-5 and PCH. The primary local roadway providing access through the project site is Doheny Park Road. Refer to Figure 3-1, Doheny Village Land Use Designations.

3.1.1 Existing Conditions

The existing project site encompasses a mix of residential, commercial, retail, manufacturing, and institutional uses. Based on the Dana Point General Plan (General Plan) Land Use Map, the project site is designated CC (Community Commercial), C/R (Commercial/Residential), RES-22- 30 (Residential 22-30 DU/AC), CF (Community Facility), and R/OS (Recreation/Open Space) and is situated within the Coastal Overlay Boundary.

Based on the City's Zoning Map, the project site is zoned CC/V (Community Commercial/Vehicle), CC/P (Community Commercial/Pedestrian), C/R (Commercial/Residential), RMF 30 (Residential Multiple Family 30 DU/AC), CF (Community Facilities), REC (Recreation), and OS (Opens Space), and is situated within the Floodplain Overlay (FP-2) and Coastal Overlay.

Specific sites within Doheny Village have been identified for updated land-use designations. Table 3-1 describes the existing developed conditions for each of these sites. Some on-site zones would be unchanged from existing conditions, including the existing mixed uses located to the east of Sepulveda Avenue and north of Victoria Boulevard.

Slightly more than one half of the residential area is comprised of the Beachwood Mobile Home Park east of Doheny Park Road. Most of the remaining residential uses are located to the east of Sepulveda Avenue, with a pocket of multi-family housing units located to the south of Domingo Avenue. This portion of Doheny Village consists of a mix of land uses (residential, commercial, and institutional uses). On average, residential densities range from about twelve (12) dwelling units per acre in the mobile home park to about thirty-six (36) dwelling units per acre elsewhere in Doheny Village.

Institutional uses within the project site are situated to the east of Doheny Park Road and south

of Victoria Boulevard. These include a private school (San Clemente Christian School) and two churches (San Felipe de Jesus Catholic Church and Capo Beach Community Church). To the east of Sepulveda is the Capistrano Valley Unified School District property, which is now used for bus maintenance and storage.

A community shopping center (Capistrano Plaza Shopping Center) that was constructed in 1965 is located at the north end of the west side of Doheny Park Road. Currently, this shopping center includes two primary tenants, Smart & Final and Big 5 Sporting Goods, as well as a restaurant (Las Golondrinas), a service station, and a thrift store. The majority of the buildings are set back from the street and separated from Doheny Park Road by a large surface parking lot.

The east side of Doheny Park Road, across from the Capistrano Plaza Shopping Center, is a series of older retail establishments that extend southward along Doheny Park Road. In this block, the uses vary from relatively small-scale stores to fairly large retail outlets, including Mission Glass, Vanity Salon, Surf Cycle Laundromat, Liquor Locker and Nikki's Cafe. South of Victoria Boulevard is a Sherwin Williams paint store, as well as cafes, bars, post office, car wash, U-Haul store, and small structures with a mixture of professional services.

Industrial/manufacturing uses include a number of automotive repairs and associated businesses mostly located to the south of Victoria Boulevard and to the west of Doheny Park Road.

Approximately 7 acres of land adjacent to the SCRRA/OCTA railroad right-of-way is used for storage. These mostly include self-storage units, as well as a large boat storage area that is secured and fenced.

Surrounding land uses include industrial/business park, commercial, community facility, and recreation/open space uses, which are further described as follows:

- North: Commercial uses, including but not limited to Costco Wholesale, Staples, and Petsmart, are located to the north of the project site. Uses to the north are located within the City of San Juan Capistrano.

- East: Commercial uses (Storage Solutions) and I-5 are located to the east of the project site. Uses to the east are located within the City of San Juan Capistrano.

- South: PCH bounds the project site to the south. Further south of PCH, land uses include residential, recreational (Doheny State Beach), and hotel (Doubletree Hotel) uses
- West: The SCRRA/OCTA railroad right-of-way bounds the project site to the west. Further west of the railroad, land uses include light industrial/manufacturing and storage uses as well as San Juan Creek.

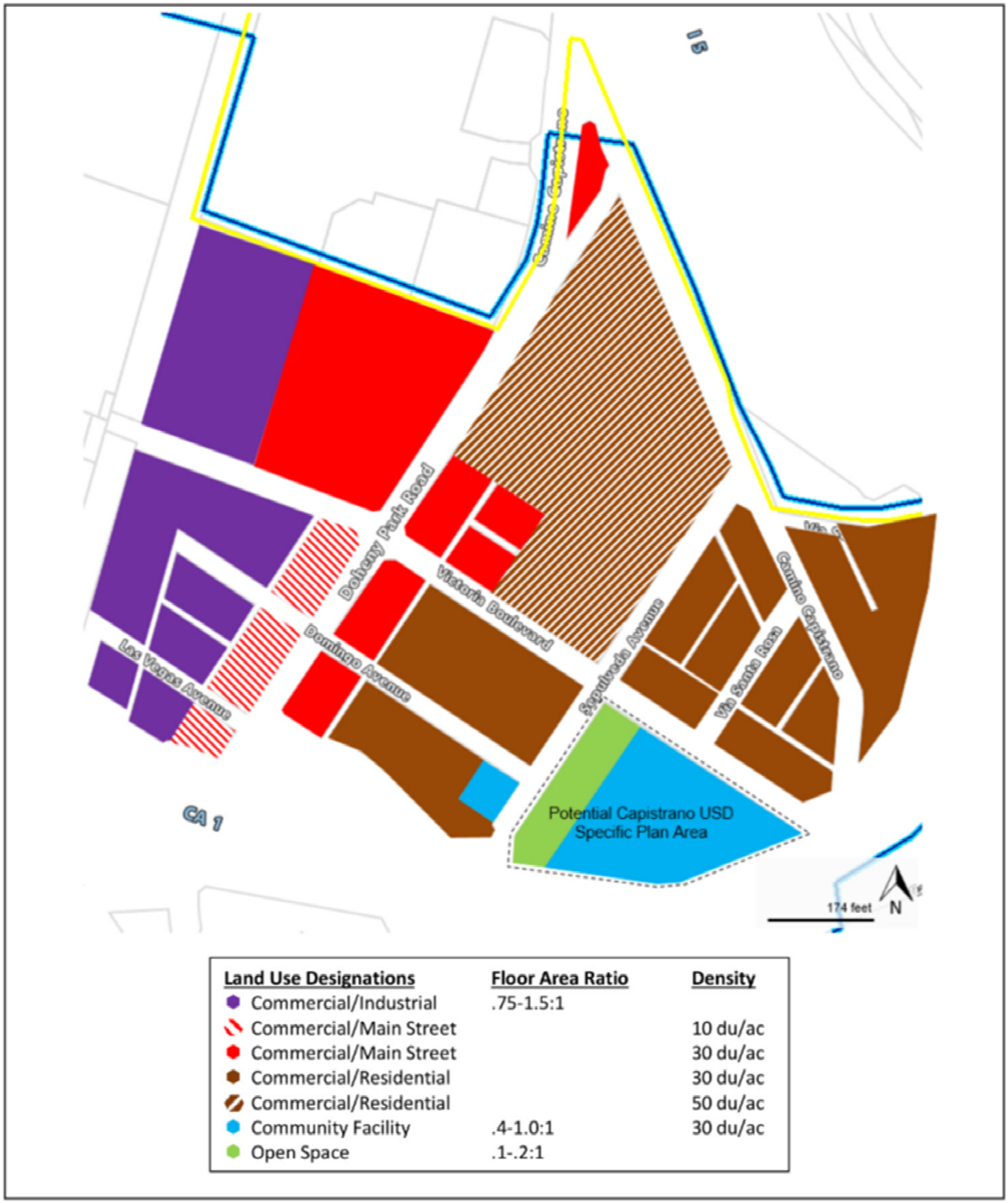
3.1.2 Proposed Development Conditions

Implementation of the proposed project would require a General Plan Amendment in order to reflect the revisions to the new Zone Code classifications via appropriate land use designations, or classifications. The proposed project would also amend the General Plan in order to accommodate appropriate circulation, open space, and other similar public improvements within Doheny Village. Implementation of the proposed project would also require a Local Coastal Program Amendment in order to reflect the revisions to the new Zone Code classifications.

The proposed Doheny Village Project will increase the total non-residential square footage of the study area by approximately 241,228 square feet. This is primarily due to increases in the Industrial, Commercial Retail, and Office types of uses. Residential dwelling units are proposed to increase from 450 units within the study area to approximately 1,258 dwelling units total. These units are assumed to be multi-family density type units for this water supply assessment.

The updated Doheny Village land use designations are illustrated on Figure 3-1. The Doheny Village Project does not contemplate rezoning every parcel within the boundary of the study area. There will be several areas unchanged by the Doheny Village Zoning District Update. Tables 3-1 and 3-2 show the existing and proposed land uses in Doheny Village, respectively. Table 3-3 summarizes the change in land use conditions in the Doheny Village Zoning District Update.

Figure 3-1: Doheny Village Land Use Designations



Land Use Designations	Floor Area Ratio	Density
Commercial/Industrial	.75-1.5:1	
Commercial/Main Street		10 du/ac
Commercial/Main Street		30 du/ac
Commercial/Residential		30 du/ac
Commercial/Residential		50 du/ac
Community Facility	.4-1.0:1	30 du/ac
Open Space	.1-.2:1	

Table 3-1 Existing Doheny Village Land Uses

Land Use	Existing Development
Residential	
Single Family	13 units
Multifamily	273 units
Mobile Home Park	160 units
Total – Existing Residential	**446 units**
Commercial[1]	172,501 sf
Industrial	137,729 sf
Office	57,187 sf
Other[2]	147,990 sf
Total – Existing Nonresidential	**515,407 sf**

[1] The 'Commercial' land use category includes existing commercial as well as existing museum, auto care center, and athletic club uses.

[2] The 'Other' land use category includes existing church, fire station, daycare, and bus storage facilities.

Table 3-2 Proposed Doheny Village Land Uses

Land Use	Proposed Development
Residential	
Village Commercial/Residential (V-C/R)	775 DU
Village Main Street (V-MS)	346 DU
Community Facilities (CF)	137 DU
Total – Residential Potential	**1,258 DU**
Commercial	364,902 sf
Industrial	251,533 sf
Office	68,599 sf
Other	11,204 sf
Total – Nonresidential Potential	**696,238 sf**

Table 3-3 Existing vs Proposed Doheny Village Land Uses

	Residential (DU)	Commercial (sf)	Industrial (sf)	Office (sf)	Others (sf)
Total Development Potential	1,258	364,902	251,533	68,599	11,204
Existing Conditions	446	172,501	137,729	57,187	147,990
Total Net Development Potential	**812**	**192,401**	**113,804**	**11,412**	**-136,786**

3.2 DOHENY VILLAGE ZONING DISTRICT UPDATE WATER DEMANDS

Water use information was obtained from historical meter data over the past three (3) years. This meter information was sorted and categorized according to land use type. Table 3-4 shows the existing and proposed demands estimated for just the potential development sites. Table 3-5 is provided to summarize the proposed demands for the Doheny Village Zoning District Update.

Table 3-4 Doheny Village Water Demand Projection

Land Use	Total Non- Residential Area		Total Residential DU's		Water Use Factor[2]		Existing Demand (gpd)	Proposed Demand [1] (gpd)
	Existing (sf)	Prop. [1] (sf)	Existing DU	Prop. [1] DU				
Residential	-	-	446	1,258	44.8	gpd/DU	19,977	56,347
Commercial	172,501	364,902	-	-	269.5	gpd/ksf	46,486	94,334
Industrial	137,729	251,533	-	-	12.0	gpd/ksf	1,655	3,023
Office	57,187	68,599	-	-	24.3	gpd/ksf	1,391	1,668
Other	147,990	11,204	-	-	25.0	gpd/ksf	3,702	280
Total	**515,407**	**696,238**	**446**	**1,258**	-		**73,211**	**159,652**

[1] "Proposed" refers to the Total Development Potential

[2] The Water Use Factors used are based on the historical billing data for the study.

Table 3-5 Summary of Doheny Village Water Demand

Land Use	Existing Demand (AFY)	Proposed Demand (AFY)	Net Change in Demand (AFY)
Residential	22.4	63.1	40.7
Commercial	52.1	110.2	58.1
Office	1.9	3.4	1.5
Industrial	1.6	1.9	0.3
Other	4.1	0.3	-3.8
Total	**82.0**	**178.8**	**96.8**

Of this total increase in demands, approximately 13.5 AFY is estimated to be for irrigation purposes. The Project increased irrigation demand by 4 AFY when compared to the same area in existing conditions. It should be noted that Doheny Village spans 80 acres and only 52 acres will be modified in the Project. Therefore, a fraction of the existing 80 acres of Doheny Village were analyzed to accurately compare the existing and proposed irrigation demands. See Table 3-6 below.

Table 3-6 Estimated Doheny Village Irrigation Demands Component

Land Use	Fraction of Existing Doheny Village Area (acre)	Proposed Doheny Village Area (acre)	Existing Irrigation Demand (AFY)	Proposed Irrigation Demand (AFY)
Residential	19.47	36.97	9.0	11.4
Commercial	23.35	8.38	2.5	0.6
Industrial	3.53	5.77	0.8	0.9
Office	1.06	1.57	0.7	0.7
Other	5.53	0.26	1.9	0.1
Total	**52.96**	**52.96**	**9.5**	**13.5**

The estimated irrigation demands are based on a percent irrigable area for each land use and an irrigation demand factor of 2,500 gpd/acre.

4.0 SCWD WATER DEMAND

4.1 TOTAL WATER DEMAND PROJECTIONS

In the 2014-2015 fiscal year, the District served approximately 12,553 domestic water customer metered service connections, active and inactive, within the water distribution system. Approximately sixty-three (63) percent of the District's water demand is residential; commercial/industrial/institutional (CII) accounts for nineteen (19) percent; sixteen (16) percent is used by dedicated landscape irrigation meters; and the remaining two (2) percent consists of non-revenue water. The District also serves approximately 185 recycled water customer services, accounting for approximately thirteen (13) percent of the current demands. The current total number of customer services connections served by the District is 12,738.

The District's dedicated landscape demands are met with both potable and recycled water supply. The District is aggressively seeking opportunities to increase recycled water for irrigation uses to fully utilize its recycled water potential.

Table 4-1 contains a summary of the District's current and total water demand projections.

Table 4-1 Total Water Demand Projections (AFY)

Demand Type	2015[1]	2020	2025	2030	2035	2040
Potable Water and Raw Water	5,915	5,460	5,503	5,870	6,219	6,295
Recycled Water	859	1,149	1,350	1,350	1,350	1,350
Total	**6,774**	**6,609**	**6,853**	**7,220**	**7,569**	**7,645**

[1] Based on actual volumes as reported by the District for 2015. Demand includes approximately 2% of water that is un- accounted for through system losses or other non-revenue water. The total Potable Water demands shown in the table do not include the proposed Doheny Village demand increase of 96.8 AFY.

The District does not sell water to other agencies except in the case of emergencies.

4.2 WATER CONSERVATION

The Water Conservation Act of 2009, also known as Senate Bill (SB) x7-7, signed into law on February 3, 2010, requires the State of California to reduce urban water use by twenty (20) percent by the year 2020. The District must determine baseline water use during their baseline period and water use targets for the years 2015 and 2020 to meet the state's water reduction goal. The District has been actively engaged in efforts to reduce water use in its service area to meet the 2015 interim ten (10) percent reduction and the 2020 final water use target.

4.2.1 Baseline Water Use

The baseline water use is the District's gross water use divided by its service area population, reported in gallons per capita per day (GPCD). Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area
- Indirect recycled water
- Water placed in long term storage
- Water conveyed to another urban supplier
- Water delivered for agricultural use
- Process water

To calculate the District's water use targets requires determining its base daily per capita water use (baseline water use). This baseline water use is essentially the District's gross water use divided by its service area population, reported in gallons per capita per day (GPCD). The baseline water use is calculated as a continuous (rolling) 10-year average during a period, which ends no earlier than December 31, 2004 and no later than December 31, 2010. Water suppliers whose recycled water made up ten (10) percent or more of their 2008 retail water delivery can use up to a 15-year average for the calculation. Recycled water use was eleven (11) percent of the District's retail delivery in 2008; therefore, a 15-year baseline period is used.

The District's baseline water use is 188 GPCD, obtained from the 15-year period July 1, 1990 to June 30, 2005.

4.2.2 Service Area Population

The District's service area boundaries correspond with the boundaries for a census designated place. This allows the District to use service area population estimates prepared by the Center of Demographic Research (CDR). CDR is the entity which compiles population data for Orange County based on the Department of Finance (DOF) data. The baseline water use and water use targets are based on the 2010 U.S. Census population and projections in Table 4-2.

Table 4-2 Service Area Population Projections[1]

	2015	2020	2025	2030	2035	2040
Population Served	35,004	37,062	37,226	38,060	38,298	38,268

[1] From the Center of Demographic Research, California State University, Fullerton 2015.

4.2.3 SBx7-7 Water Use Targets

Although DWR has established several target calculation methods from which urban retail water suppliers can choose, the District has selected to comply with the requirement for a simple ten (10) percent from the baseline by 2015, and twenty (20) percent reduction by 2020.

Under this requirement, the District's 2015 target is 169 GPCD and the 2020 target is 150 GPCD. The 2015 target is the midway value between the baseline and the confirmed 2020 target. In addition, the confirmed 2020 target needs to meet a minimum of five (5) percent reduction from the five-year baseline water use.

In 2015, the District used 151 GPCD, which is approximately eleven (11) percent lower than their 2015 interim target of 169 GPCD. Therefore, the District complies with their 2015 interim target and is near meeting their 2020 water use target of 150 GPCD.

5.0 SCWD WATER SUPPLIES

5.1 OVERVIEW

The District relies on a combination of imported water, local groundwater, and recycled water to meet its current water needs. The District works together with two primary agencies, Metropolitan Water District of Southern California (Metropolitan) and Municipal Water District of Orange County (MWDOC), to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the State Water Project (SWP) provided by Metropolitan and delivered through MWDOC.

The following sections provide a detailed discussion of the District's water sources as well as projections to the District's future water supply portfolio for the next twenty (20) years. Additionally, the District's projected supply and demand under various hydrological conditions are compared to determine the District's supply reliability for the twenty (20)-year planning horizon.

5.2 IMPORTED WATER

In 2015, the District supplemented its local groundwater with 5,737 AFY of imported water purchased wholesale by Metropolitan through MWDOC. Imported water represents approximately eighty-five percent of the District's total current water supply. Metropolitan's principal sources of water are the Colorado River via the Colorado River Aqueduct (CRA) and the Lake Oroville watershed in Northern California through the SWP. The raw water obtained from these sources is, for Orange County, treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder. Imported water is conveyed to the District through the EOCF #2 system, which conveys Diemer water to the Aufdenkamp Transmission Main (ATM) and the Joint Transmission Main (JTM), which serves the District and other coastal agencies.

The District has capacity rights of five (5) cfs in the ATM reach from the Coastal Junction to the northerly border of El Toro Water District. The District's capacity in the downstream reach to Coast Highway in Laguna Beach increases to eight (8) cfs due to flows from the Coast Supply Line. The District's capacity is 6.34 cfs in the JTM. The other major conveyance system is the Allen-McCulloch Pipeline (AMP) which supplies Diemer water through the South County Pump Station in Lake Forest, to the South County Pipeline (SCP) through Santa Margarita Water District to San Clemente, where it is delivered to the District through the Water Importation Pipeline (WIP) along Coast Highway. The District's capacity right in the AMP is 10.7 cfs and is shared with the City of San Clemente. Downstream, the District owns twenty-five (25) cfs in the SCP (MWDOC, Interconnection of the IRWD Water System, July 2006).

5.2.1 Colorado River Supplies

The CRA is owned and operated by Metropolitan and includes supplies from the implementation of the Quantification Settlement Agreement and related agreements to transfer water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 million acre-feet (MAF) on an as-needed basis. Metropolitan has a basic entitlement of 550,000 AFY of Colorado River water, plus a priority for up to an additional 662,000 AFY when the following conditions exists (Metropolitan, 2015 UWMP, June 2016):

- Water unused by the California holders of priorities 1 through 3
- Water saved by the Palo Verde land management, crop rotation, and water supply program
- When the U.S. Secretary of the Interior makes available either one or both:
  - Surplus water is available
  - Colorado River water is apportioned to but unused by Arizona and/or Nevada

Metropolitan has not received surplus water for a number of years. The Colorado River faces current and long-term imbalances between water supply and demand in the Colorado River Basin due to long term drought conditions. In the past sixteen (16) years (2000-2015), there have only been three years when the Colorado River flow has been above average (Metropolitan, 2015 UWMP, June 2016). The long-term imbalance in future supply and demand is projected to be approximately 3.2 MAF by the year 2060.

5.2.2 State Water Project Supplies

The SWP is operated by DWR and is an integral part of the effort to ensure that California has sufficient water. Nearly two-thirds of residents in California receive at least part of their water from the SWP with approximately seventy (70) percent of SWP's contracted water supply going to urban users and thirty (30) percent to agricultural users. The primary purpose of the SWP is to divert and store water during wet periods in Northern and Central California and distribute it to areas of need in throughout the state.

The availability of water supplies from the SWP can be highly variable. Depending on the water supply availability, water supply agencies may implement increased conservation measures or explore new local projects and supplies.

The Bay-Delta (Delta) is key to the SWP's ability to deliver water to its urban contractors. All but five of the twenty-nine (29) SWP contractors receive water deliveries below the Delta. However, the Delta faces many challenges concerning its long-term sustainability such as climate change posing a threat of increased variability in floods and droughts. Sea level rise complicates efforts in managing salinity levels and preserving water quality in the Delta to ensure a suitable water supply for urban and agricultural use. Furthermore, other challenges include continued

subsidence of Delta islands, many of which are below sea level, and the related threat of a catastrophic levee failure as the water pressure increases, or as a result of a major seismic event.

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented. "Table A" water is the maximum entitlement of SWP water for each water contracting agency. Currently, the combined maximum Table A amount is 4.172 MAF per year. Of this amount, 4.132 MAF per year is the maximum Table A water available for delivery from the Delta.

SWP contractors may receive Article 21 water on a short-term basis in addition to Table A water if requested. Article 21 of SWP contracts allows contractors to receive additional water deliveries only under specific conditions, generally during wet months of the year (December through March). Because an SWP contractor must have an immediate use for Article 21 supply or a place to store it outside of the SWP, there are few contractors, like Metropolitan, that can access such supplies.

5.2.3 Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan, is dependent on its storage resources.

Lake Oroville is the SWP's largest storage facility, with a capacity of about 3.5 MAF. The water is released from Oroville Dam into the Feather River as needed, which converges with the Sacramento River while some of the water at Bethany Reservoir is diverted from the California Aqueduct into the South Bay Aqueduct. The primary pumping plant, the Harvey O. Banks pumping plant, pumps Delta water into the California Aqueduct, which is the longest water conveyance system in California.

5.3 GROUNDWATER

In 2008, the District incorporated local groundwater into its water resource portfolio with the construction of its GRF, which extracts and treats brackish groundwater from the San Juan Basin (Basin). The District's past groundwater production has averaged roughly 850 AFY, or about twelve (12) percent of the District's total water supply. With the addition of the District's 2nd GRF well (located in the city of Dana Point's Creekside Park), the District will be able to extract its full permitted amount of 1,300 AFY from the Basin, which will net approximately 1,040 AFY of treated groundwater production. The Creekside well was drilled in 2013 but is not currently active.

5.3.1 San Juan Basin Characteristics

The Basin is located in southern Orange County within the San Juan Creek Watershed. The Basin is comprised of four sub-basins: Upper San Juan, Middle San Juan, Lower San Juan, and Lower Trabuco and is bound on the west by the Pacific Ocean and by tertiary semi-permeable marine deposits.

The Basin is recharged through flow from San Juan Creek, Oso Creek, and Arroyo Trabuco, precipitation to the valley floor, and Hot Spring Canyon spring flows.

The primary water-bearing unit within the Basin is Quaternary alluvium. This alluvium ranges from a heterogeneous mixture of sand, silt, and gravel in the eastern portion of the basin, to coarse sand near the center and fine-grained lagoonal sediments in the western portion of the basin. Thickness of the alluvium averages about 65 feet and may reach more than 125 feet. Specific yield of the alluvium is estimated to average about 13 percent and range from 3 to 22 percent. The total storage capacity has been estimated to be 90,000 AF. Wells typically yield 400 to 1,000 gpm. Sand layers of the Tertiary Santiago Formation may be water bearing within the region and beneath the basin, and minor amounts of water are extracted from fractured basement rock beneath the basin.

The physical boundaries of the Basin include the Santa Ana Mountain to the north, sedimentary rock formations to the sides of the Upper Basin and Arroyo Trabuco, and the Pacific Ocean to the south.

The Basin is recharged through a variety of sources such as:

- Streambed infiltration in San Juan Creek, Horno Creek, Oso Creek, and Arroyo Trabuco
- Subsurface inflows along boundaries at the head of the tributaries upstream and other minor subsurface inflows from other boundaries.
- Precipitation and applied water.
- Flow from fractures and springs.

Discharge of groundwater from the Basin occurs from a variety of sources such as:

- Groundwater production
- Rising groundwater
- Evapotranspiration
- Outflow to Pacific Ocean

Currently, five agencies, including the District, have groundwater rights to the Basin and use this water for either municipal purposes or for irrigation. The agencies with groundwater rights to the Basin and their current rights are listed below:

- South Coast Water District: 1,300 AFY
- San Juan Basin Authority: 8,026 AFY
- SMWD: 643 AFY
- San Juan Hills Golf Course: 450 AFY
- City of San Juan Capistrano: 3,325 AFY

The Basin differs from many other adjudicated groundwater basins as it does not strictly follow the term "safe yield" in preventing undesirable results occurring as a result of over-production of groundwater. The Basin is governed by the San Juan Basin Authority (SJBA) and is a Joint Power Agency comprised of representatives from four local jurisdictions, the District, MNWD, the City of San Juan Capistrano, and Santa Margarita Water District. The SJBA has recently adopted the concept of "adaptive management" of the Basin to vary pumping from year to year based on actual basin conditions derived from monitoring efforts. This is due in part to the SWRCB characterization of the Basin as a "flowing underground stream" and because the storage in the groundwater basin is small relative to recharge and production. The range of natural yield of the Basin is 7,000 AFY to 11,000 AFY. Work was underway to construct rubber dams and increase recharge with recycled water to increase the recharge of the Basin by 4,000 AFY to 7,000 AFY (SJBA, Draft Foundational Action Program Report, March 2016).

5.3.2 San Juan Basin Management

The State Water Resources Control Board (SWRCB) has determined that the San Juan Creek watershed is not a groundwater basin but is rather a surface and underground flowing stream. Therefore, it is subject to SWRCB jurisdiction and its processes with respect to the appropriation and use of waters within the watershed. The District is a member of the SJBA a joint powers agency, formed in 1971 to manage the watershed. Other member agencies include the City of San Juan Capistrano, Moulton Niguel Water District and Santa Margarita Water District. SJBA has SWRCB Permit for Diversion and Use of Water Permit No. 21074 for appropriation and diversion of up to 8,026 AFY, with the ability to increase to 10,702 AFY of water upon demonstration of sufficient availability of unappropriated water.

As a member of the SJBA, the District is entitled to participate in the development of projects to appropriate and divert water from the San Juan Watershed.

5.3.3 Groundwater Recovery Facility (GRF)

The District constructed the 1 MGD GRF in Capistrano Beach, adjacent to San Juan Creek that

became operational in FY 2007-2008. The plant was initially permitted to extract 976 AFY of groundwater from the Basin. It has since been re-permitted to extract 1,300 AFY of groundwater from the Basin. The plant treats brackish groundwater using reverse osmosis and an iron and manganese treatment system (i.e., greensand).

5.3.3.1 Groundwater Historical Extraction

In 2000, the SWRCB granted a water rights permit of 8,026 AFY to SJBA for diversion and use from the Basin. The permit also allows an additional production of 2,676 AFY in the future depending on certain conditions specified in the permit. A copy of the permit is available for review in the offices of the District.

The District obtained its own permit from the SWRCB. That permit allows the District to extract 1,300 AFY from the Basin. A copy of the permit is available for review in the offices of the District or on the SWRCB website.

A summary of the net volume of treated groundwater produced by the District into the potable water system is shown in Table 5-1.

Table 5-1 Historical Annual Treated Groundwater Production (AFY)

Location or Basin Name	2011	2012	2013	2014	2015
San Juan Groundwater Basin	807	933	907	764	178
Total	**807**	**933**	**907**	**764**	**178**

NOTE: The above amounts are the net treated volumes produced into the system; the raw water extractions for each fiscal year were higher.

5.4 RECYCLED WATER SUPPLY

In 1984, the District constructed the AWT facility, located adjacent to the CTP, which has a capacity of 2.61 MGD. The secondary effluent from CTP is treated to a disinfected tertiary level that meets Title 22 requirements for landscape irrigation use.

The AWT treatment train consists of chemical addition, coagulation (with mechanical mixing), filtration, and chlorine disinfection. From 1995 to 2013, AWT recycled water had contained elevated levels of Total Dissolved Solids (TDS) consistently measuring greater than 1,000 mg/L. The presence of such high levels of TDS made this supply of recycled water unattractive to some customers. Water with elevated levels of TDS is harmful to some types of landscape irrigation as the high salt content is trapped in the soil and kills grass roots.

In 2014, the District began producing water from the Aliso Creek Water Reclamation Facility (ACWRF). The ACWRF is an innovative water harvesting and treatment system that improves the quality of the local recycled water supply as it removes polluted runoff in Aliso Creek and

improves the local ocean environment. It is located in Aliso Canyon at the CTP, next to the AWT. The facility can recover and treat urban runoff from Aliso Creek and blend it with water from the AWT, to reduce the salinity of the recycled water supply. Alternatively, the facility can also treat effluent from the AWT, to supplement runoff or to further reduce the TDS levels in the AWT recycled water. The ACWRF produces up to 0.5 MGD of low TDS water. Due to ongoing drought conditions, the facility has not recently been recovering urban runoff from Aliso Creek, but rather has been treating effluent from the AWT to effectively reduce TDS levels below 1,000 mg/L. The ACWRF is permitted to produce 0.5 MGD at specified levels pursuant to RWQCB and DFW permit conditions - the permit specifies a maximum creek diversion rate of 1.23 cubic feet per second (cfs) of direct diversion.

The District's recycled water distribution system consists of sixteen (16) miles of pipeline, three (3) pump stations with a total pumping capacity of 5,200 gpm, and three (3) reservoirs with a capacity of 4.7 MG. The distribution system begins at the AWT facility to the north and a pipeline that runs south along Pacific Coast highway to Stonehill Drive.

Recycled water is used to irrigate parks, golf courses, greenbelts, and offsets demand on imported potable water. The District's recycled water is delivered via pipelines south of Pacific Coast Highway to customers within the District service area. Current customers include the Montage Resort, Lang Park, The Ranch Golf Course & Bungalows, Monarch Links Golf Course at the St. Regis Resort, Niguel Shores Community Association, Dana Hills High School, the City of Dana Point parks, Golden Lantern and Town Center medians, Gloria Dei Lutheran Church, Lantern Bay Villas HOA, Lantern Bay estates, Cape Cove HOA, Ritz Cove, Pacific Coast Highway median areas, and numerous other greenbelt areas located within private HOAs.

The District furnishes approximately 800 to 850 AFY of recycled water to its customers in South Laguna Beach and Dana Point. Additionally, MNWD has an agreement with the District to receive a contracted amount not to exceed 1,000 AFY of recycled water. Current and projected recycled water uses are shown in Table 5-2.

Table 5-2 Recycled Water Supply (AFY)

Supply	2015	2020	2025	2030	2035	2040
Recycled Water – Tertiary Treated	859	1,149	1,350	1,350	1,350	1,350
Total	**859**	**1,149**	**1,350**	**1,350**	**1,350**	**1,350**

5.4.1 Recycled Water Supply Planning

The following recycled water facility and potential expansion projects listed below are planned projects to increase the use of recycled water in the District, as described in the District's Capital Improvement Program and Infrastructure Master Plan.

RW 1 Reservoir Rehabilitation: The roof connections and shell on the two (2) MG welded steel recycled water tank are budgeted for recoating and repairs in FY 2016-17 to extend the service life and increase recycled water system reliability.

RPS 1 Pump Replacements: The existing pumps at Recycled Water Pump Station #1 are nearing the end of their service life and was budgeted for replacement in FY 2016-17. This project will increase the District's recycled water system reliability.

Recycled Water Tier A Conversions: forty-three (43) sites have been targeted by the District for Tier A conversions to recycled water. Eight (8) sites have been converted and another twenty-five (25) are targeted for conversion over the next five (5) years. In addition to its own incentives, the District actively promotes Metropolitan's On-site Retrofit Program to help fund conversion of existing potable customers to recycled water within the District service area.

Recycled Water System PCH Bottleneck Upsizing: The District was approved for a $750,000 Grant under Proposition 84 to increase the size of 6,200 feet of recycled water main along Pacific Coast Highway to eliminate a bottleneck that causes excessive operating pressures and friction loss within the recycled water system. This project will help extend the service life of the recycled water system and was budgeted for construction in FY 2016-17.

AWT Rehabilitation: This project consists of replacing aged equipment at the District's AWT facility located at the CTP to increase the District's recycled water system reliability and extend the useful life of the facility.

Tier A Recycled Water Extensions, Improvements & Conversions: This project consists of correcting existing pressure deficiencies in the recycled water distribution system, extending the recycled water distribution system, and converting targeted Tier A Conversion customers. Improvements, extensions and conversions are planned in Del Obispo Street, Golden Lantern, Crown Valley Parkway and Stonehill Drive. The District's recycled water demand is projected to be 1,350 AFY upon completion of all Tier A conversions.

Tier B and C Recycled Water Extensions, Improvements & Conversions: Ultimate recycled water customers include existing recycled customers, conversion customers and new customers. Potential recycled water customers were subjected to a preliminary screening to evaluate whether it would be feasible to connect to recycled water based on their proximity to existing and potential infrastructure. Although not contemplated by this WSA, the Doheny Village Zoning District Update could become part of the water supply planning effort for the city of Dana Point project that would include evaluating the improvements necessary to bring recycled water to the project area. The projected irrigation demand of the greater Capistrano Beach, along with Caltrans irrigation (a potentially large customer) are targeted in the proposed Tier B and C

conversions for planning purposes.

Overall, an additional demand of 850 AFY has been targeted for Tier A, B, and C conversions. Recycled water demands could continue to increase beyond that limit if other existing potable water users are converted. Single-family residential irrigation customers were excluded from ultimate conversion demands as it is difficult to permit and control recycled water use for single-family residential irrigation

5.5 OTHER PLANNED WATER SUPPLIES

5.5.1 DESALINATED WATER

On March 11, 2016, the District issued a Notice of Preparation (NOP) to notify reviewing agencies, including Responsible and Trustee Agencies (Agencies), that it, as the Lead Agency, will be preparing an Environmental Impact Report (EIR) for the proposed Doheny Ocean Desalination Project. The District is requesting comments and guidance on the scope and content of the EIR from Responsible and Trustee agencies, interested public agencies, organizations, and the general public, in accordance with State of California Environmental Quality Act [CEQA] Guidelines §15082. Desalinated water is included in the District's planned sources of water.

The District intends to initially construct a five (5) MGD demonstration phase of the Project, with potential future expansions up to fifteen (15) MGD. The Project EIR will evaluate both the initial five (5) MGD demonstration phase as well as the potential fifteen (15) MGD ultimate capacity. Both the initial five (5) MGD and ultimate fifteen (15) MGD capacities would be available for the District and local water agencies to provide a high quality, locally-controlled, drought-proof potable drinking water supply. The desalination facility would also provide emergency back-up water supplies, should an earthquake, system shutdown, or other event disrupt the delivery of imported water to the area.

5.5.2 GRF Well No. 2 Wellhead Facilities & Pipeline

The second extraction well to the GRF (Creekside Well No. 2) will be equipped in FY 2016-17 that will allow the District to extract its full permitted amount of 1,300 AFY from the Basin and produce 1,040 AFY of potable water supply for its customers.

5.6 SUMMARY OF EXISTING AND PLANNED WATER SUPPLIES

Table 5-3 provides a summary of the current and planned water supplies for the District.

Table 5-3 Summary of Current and Planned Supplies (AFY)

Supply	2015	2020	2025	2030	2035	2040
Imported Water	5,737	6,223	6,223	6,223	6,223	6,223
Groundwater[1]	859	1,040	1,040	1,040	1,040	1,040
Recycled Water	178	1,252	1,472	1,472	1,472	1,472
Total	**6,774**	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**

[1] The permitted Basin raw groundwater extraction amount is 1,300 AFY, which yields a net treated amount produced into the system of 1,040 AFY.

The Imported water supply projections shown in Table 5-3 are based on the District's 2015 UWMP. The District conservatively assumes that the 6,223 AFY is the reasonably assumed volume available, which is based on the lowest level, Tier 3, supply projections projected by Metropolitan and MWDOC. If in the future, current drought conditions improve and water supplies available increase, then the reasonably assumed Imported Water supply available shown in Table 5-3 may increase.

6.0 RELIABILITY OF WATER SUPPLIES

6.1 FACTORS IMPACTING RELIABILITY

The District depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below.

6.1.1 Environment

Endangered species protection needs in the Delta have resulted in operational constraints to the SWP system, as mentioned previously in the State Water Project Supplies section.

6.1.2 Legal

The addition of more species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations.

6.1.3 Water Quality

6.1.3.1 Imported Water

As the District's primary imported water supplier, Metropolitan is responsible for providing high quality potable water throughout its service area. Over 300,000 water quality tests are performed per year on Metropolitan's water to test for regulated contaminants and additional contaminants of concern to ensure the safety of its waters. Metropolitan's supplies originate primarily from the CRA and from the SWP. A blend of these two (2) sources, proportional to each year's availability of the source, is then delivered throughout Metropolitan's service area.

Metropolitan's primary water sources face individual water quality issues of concern. The CRA water source contains higher TDS and lower levels of organic matter, conversely the SWP contains a lower TDS, but higher levels of organic matter, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic matter, Metropolitan blends CRA and SWP supplies and provides updated treatment processes to decrease the formation of disinfection byproducts. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA), and pharmaceuticals and personal care products (PPCPs). While unforeseeable water quality issues could alter reliability, Metropolitan's

current strategies ensure the deliverability of high-quality water.

The presence of Quagga mussels in water sources is a water infrastructure reliability concern. Quagga mussels are an invasive species that was first discovered in 2007 at Lake Mead, on the Colorado River. This species of mussels forms massive colonies in short periods of time, disrupting ecosystems and blocking water intakes. They are capable of causing significant disruption and damage to water distribution systems. Controlling the spread and impacts of this invasive species within the CRA requires extensive maintenance and results in reduced operational flexibility.

6.1.3.2 Groundwater

Groundwater quality from the Basin was determined through the analyses of available data from production and monitoring wells. Constituents of concern within the Basin include TDS, nitrate nitrogen, manganese, and iron.

TDS consists of inorganic salts dissolved in water, with the major ions being sodium, potassium, calcium, magnesium, bicarbonates, chlorides, and sulfates under Title 22. The California secondary Maximum Contaminant Level (MCL) for TDS is 500 mg/L. Four wells were tested for TDS and all of the wells exceeded the secondary MCL for TDS. The lower portion of the Basin exhibits relatively higher TDS levels due to irrigation return flows, fertilizer use, consumptive use, and dissolution of ions from weathered rock surfaces and salts.

Nitrate within groundwater can be both naturally-occurring and can also be associated with agriculture and other synthetic production. The primary MCL for nitrate in drinking water is 10 mg/L. Most groundwater wells monitored for nitrate exhibited levels below MCL except for two (2) wells.

Manganese is a naturally-occurring inorganic constituent dissolved in water. Manganese is an essential micronutrient at low concentrations, but at higher concentrations in drinking water, manganese may lead to objectionable aesthetic qualities such as bitter taste and staining of clothes. The California secondary MCL for manganese is 0.5 mg/L. Most wells monitored for manganese exceeded the secondary MCL for manganese by as much as forty (40) times with the exception of two (2) wells in the Oso and Lower Trabuco area.

Iron is a naturally-occurring inorganic constituent dissolved in water. Similar to manganese, iron in low concentrations is an essential micronutrient, but iron in higher concentrations in drinking water leads to the same objectionable aesthetic qualities as those of manganese. The California secondary drinking water MCL for iron is 0.3 mg/L. With the exception of one groundwater well in the Oso area, all wells exceeded the secondary MCL for iron by as much as sixty (60) times (San Juan Basin Authority, San Juan Basin Groundwater and Facilities Management Plan, November 2013).

6.1.4 Climate Change

Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning more challenging. The areas of concern for California include a reduction in Sierra Nevada Mountain snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of Delta levee failure, seawater intrusion of coastal groundwater basins, and potential cutbacks on the SWP and CVP. The major impact in California is that without additional surface storage, the earlier and heavier runoff (rather than snowpack retaining water in storage in the mountains), will result in more water being lost to the oceans. A heavy emphasis on storage is needed in the State of California.

In addition, the Colorado River Basin supplies have been inconsistent since about the year 2000, resulting in thirteen (13) of the last sixteen (16) years of the upper basin runoff being below normal. Climate models are predicting a continuation of this pattern whereby hotter and drier weather conditions will result in continuing lower runoff.

Legal, environmental, and water quality issues may have impacts on Metropolitan imported supplies. However, climatic factors would have more of an impact than legal, water quality, and environmental factors. Climatic conditions have been projected based on historical patterns, but severe pattern changes are still a possibility in the future.

6.2 SUPPLY AND DEMAND ASSESSMENT

The District has entitlements to receive imported water from Metropolitan through MWDOC via connection to Metropolitan's regional distribution system. Per the District's 2016 UWMP, Metropolitan's 2015 UWMP finds that Metropolitan is able to meet, with existing supplies, full-service demands of its member agencies starting 2020 through 2040 during normal years, single dry year, and multiple dry years.

Metropolitan's 2015 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2020 through 2040. The foundation of Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements. The water supplies are projected to meet full-service demands.

6.2.1 Normal-Year Reliability Analysis

Although pipeline and connection capacity rights to imported water from Metropolitan through MWDOC do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies are assumed available to the District from existing water transmission facilities. The demand and supplies listed below also include local groundwater supplies that are available to the District through the San Juan Basin by a pre-determined volume.

The analysis was conducted assuming potable water demand projections and that potable water supply sources are available to the Doheny Village. The District's recycled water projections and infrastructure planning currently does not propose to supply this area with recycled water. Therefore, recycled water demands and supply were not taken into consideration.

Table 6-1 shows the normal year demand and supply analysis, assuming the net increase in demands of the Doheny Village Zoning District Update of 92 AFY is added to the current District demand projections.

Table 6-1 Normal Year Supply and Demand Analysis (AFY)

	2020	2025	2030	2035	2040
Potable Water Supplies:					
Imported Supplies	6,223	6,223	6,223	6,223	6,223
Recycled Water Supply	1,252	1,472	1,472	1,472	1,472
Groundwater	1,040	1,040	1,040	1,040	1,040
Total District Potable Water Supply	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**
Projected Potable Water Demands:					
Potable Water and Raw Water Demand Projections[1]	5,460	5,503	5,870	6,219	6,295
Recycled Water Demands	1,149	1,350	1,350	1,350	1,350
Doheny Village Zoning District Update Water Demands[2]	24	49	73	97	97
Total District Potable Water Demands	**6,633**	**6,902**	**7,293**	**7,666**	**7,742**
Surplus Water Supply	**1,882**	**1,833**	**1,442**	**1,069**	**993**

[1] See Table 4-1 for the Potable and Raw Water Demand Projections.

[2] The Doheny Village Zoning District Update net increase of 96.8 AFY is assumed to be a linear projection over an approximate 20-year build-out period. The actual built-out period may vary.

The District assumes that for normal year supply and demand conditions, the recycled water system will supply and meet the demands entirely without any supplement from the potable or raw water supply sources.

The Imported water supply projections shown in Table 6-1 are based on the District's 2015 UWMP. The District conservatively assumes that the 6,223 AFY is the reasonably assumed supply available, which is based on the lowest level, Tier 3, supply projections projected by Metropolitan and MWDOC.

As shown in Table 6-1, the District can meet the projected demands with the Doheny Village Zoning District Update proposed demands with a supply surplus for each year of the planning period. The surplus supplies for each time period show that the District could meet the project demands if the project is developed faster than the assumed linear increase over 20 years. In addition, the District can meet the full demand projections with or without the location groundwater supplies. However, utilization of the location groundwater supplies will allow the District to be less reliant on the imported supplies.

6.2.2 Single-Dry Year Reliability Analysis

A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. The District has documented that it is 100 percent reliable for single dry year demands from 2020 through 2040 with a demand increase of 9 percent using FY

2013-14 as the single dry-year. This percentage was determined by MWDOC in the Orange County Reliability Study for South Orange County.

Table 6-2 Single-Dry Year Supply and Demand Analysis (AFY)

	2020	2025	2030	2035	2040
Potable Water Supplies:					
Imported Supplies	6,223	6,223	6,223	6,223	6,223
Recycled Water Supply	1,252	1,472	1,472	1,472	1,472
Groundwater	1,040	1,040	1,040	1,040	1,040
Total District Potable Water Supply	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**
Projected Potable Water Demands:					
Potable Water and Raw Water Demand Projections[1]	5,951	5,998	6,398	6,779	6,862
Recycled Water Demands	1,252	1,472	1,472	1,472	1472
Doheny Village Zoning District Update Water Demands[2]	23	49	73	97	97
Total District Potable Water Demands[3]	**7,228**	**7,519**	**7,943**	**8,347**	**8,430**
Surplus Water Supply	**1,287**	**1,216**	**792**	**388**	**305**

[1] See Table 4-1 for the Potable and Raw Water Demand Projections.

[2] The Doheny Village Zoning District Update net increase of 96.8 AFY is assumed to be a linear projection over an approximate 20-year build-out period. The actual built-out period could be sooner or significantly longer.

[3] The demands are increased by 9% for a single dry year demand condition in accordance with the MWDOC "bump" methodology.

As shown in Table 6-2, the District can meet the projected demands with the Doheny Village Zoning District Update proposed demands with a supply surplus for each year of the planning period for the single-dry year supply and demand conditions, assuming the reasonably available volumes are available. The District assumes that for the single-dry year supply and demand conditions, the recycled water system will supply and meet the annual increase of nine (9) percent demands entirely without any supplement from the potable or raw water supply sources. The capacity of the recycled water system can accommodate demands of up to 8,400 AFY, which is more than sufficient to many the proposed increase in recycled water demands on its own.

The Imported water supply projections shown in Table 6-2 are based on the District's 2015 UWMP. The District conservatively assumes that the 6,223 AFY is the reasonably assumed volume available based on the District's 2015 UWMP. If in the future available water supplies increase, then the Imported Water supply available shown in Table 6-2 may increase which would increase the surplus shown.

For the planning years 2030 through 2040, it assumed that the groundwater supply may be required. The groundwater supply is assumed to be available based on historical records for the historical most single-dry year of FY 2013-14, which shows pumping available up to 760 AFY. Additionally, other planned supplies are assumed to be available for use such as the District's Doheny Ocean Desalination Project as discussed in Section 5.5.

6.2.3 Multiple-Dry Year Period Reliability Analysis

Multiple-dry years are defined as three (3) or more years with minimal rainfall within a period of average precipitation. The District is capable of meeting all customers' demands with significant reserves held by Metropolitan, local groundwater supplies, and conservation in multiple dry years from 2020 through 2040 with a demand increase of nine (9) percent based on the Orange County Reliability Study for the South Orange County service area of MWDOC. This value was repeated over the three-year span as a conservative assumption where demand would increase significantly in a prolonged drought and would remain constant through the years.

As shown in Table 6-3, the District can meet the projected demands with the Project's proposed demands with a supply surplus for each year of the planning period for the multi- dry year supply and demand conditions, assuming reasonably available volumes. It is assumed that for the single-dry year supply and demand conditions, the recycled water system will supply and meet the annual increase of nine (9) percent entirely without any supplement from the potable or raw water supply sources.

The Imported water supply projections shown in Table 6-3 are based on the District's 2015 UWMP. The District conservatively assumes that the 6,223 AFY is the reasonably assumed volume available, which is based on the lowest level, Tier 3, supply projections projected by Metropolitan and MWDOC. If in the future available water supplies increase, then the Imported Water supply available shown in Table 6-3 may increase which would increase the surplus shown.

For the planning years 2030 through 2040, it assumed that the groundwater supply may be required. The groundwater supply is assumed to be available based on historical records for the historical most single-dry year of FY 2013-14, which shows pumping available up to 760 AFY. Additionally, other planned supplies are assumed to be available for use such as the District's Doheny Ocean Desalination Project as discussed in Section 5.5

Table 6-3 Multiple-Dry Year Supply and Demand Analysis (AFY)

		2020	2025	2030	2035	2040
First Year	Potable Water Supplies:					
	Imported Supplies	6,223	6,223	6,223	6,223	6,223
	Recycled Water Supply	1,252	1,472	1,472	1,472	1,472
	Groundwater	1,040	1,040	1,040	1,040	1,040
	Total District Potable Water Supply	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**
	Projected Potable Water Demands:					
	Potable Water and Raw Water Demand Projections[1]	5,951	5,998	6,398	6,779	6,862
	Recycled Water Demands	1,252	1,472	1,472	1,472	1472
	Doheny Village Zoning District Update Water Demands[2]	23	49	73	97	97
	Total District Potable Water Demands[3]	**7,228**	**7,519**	**7,943**	**8,347**	**8,430**
	Difference	**1,287**	**1,216**	**792**	**388**	**305**
Second Year	Potable Water Supplies:					
	Imported Supplies	6,223	6,223	6,223	6,223	6,223
	Recycled Water Supply	1,252	1,472	1,472	1,472	1,472
	Groundwater	1,040	1,040	1,040	1,040	1,040
	Total District Potable Water Supply	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**
	Projected Potable Water Demands:					
	Potable Water and Raw Water Demand Projections[1]	5,951	5,998	6,398	6,779	6,862
	Recycled Water Demands	1,252	1,472	1,472	1,472	1472
	Doheny Village Zoning District Update Water Demands[2]	23	49	73	97	97
	Total District Potable Water Demands[3]	**7,228**	**7,519**	**7,943**	**8,347**	**8,430**
	Difference	**1,287**	**1,216**	**792**	**388**	**305**
Third Year	Potable Water Supplies:					
	Imported Supplies	6,223	6,223	6,223	6,223	6,223
	Recycled Water Supply	1,252	1,472	1,472	1,472	1,472
	Groundwater	1,040	1,040	1,040	1,040	1,040
	Total District Potable Water Supply	**8,515**	**8,735**	**8,735**	**8,735**	**8,735**
	Projected Potable Water Demands:					
	Potable Water and Raw Water Demand Projections[1]	5,951	5,998	6,398	6,779	6,862
	Recycled Water Demands	1,252	1,472	1,472	1,472	1472
	Doheny Village Zoning District Update Water Demands[2]	23	49	73	97	97
	Total District Potable Water Demands[3]	**7,228**	**7,519**	**7,943**	**8,347**	**8,430**
	Difference	**1,287**	**1,216**	**792**	**388**	**305**

[1] See Table 4-1 for the Potable and Raw Water Demand Projections.

[2] The Doheny Village Zoning District Update net increase of 96.8 AFY is assumed to be a linear projection over an approximate 20-year build-out period. The actual built-out period could be sooner or significantly longer.

[3] The demands are increased by 9% for a single dry year demand condition in accordance with the MWDOC "bump" methodology

7.0 CONCLUSIONS

The District relies on a combination of imported water, local groundwater, and recycled water to meet its current and projected water needs. The Doheny Village Zoning District Update will increase the District's demands over the next 20-year planning horizon by 96.8 AFY. This demand is assumed be supplied from the District's imported and local groundwater supply sources. No recycled water demand or supply is proposed by this WSA for the Doheny Village Zoning District Update.

The analysis of the water supply and demand projections for normal year, single-dry year, and multiple-dry year scenarios demonstrates that the District has the ability to satisfy their demands projected during the 20-year planning period with the current and planned supplies.

Collectively, the information included in this WSA identifies a sufficient and reliable water supply for the District, now and in the future, including a sufficient water supply for the Doheny Village Zoning District Update.

APPENDIX A

DOHENY VILLAGE ZONING DISTRICT UPDATE PROJECT
NOTICE OF PREPERATION