GOODMAN LOGISTICS CENTER

WATER SUPPLY ASSESSMENT

May 2020

Prepared for:
CITY OF FULLERTON

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TABLE OF CONTENTS

TABLES

FIGURES

ABBREVIATIONS/ACRONYMS

AF	Acre-feet
AFY	Acre-feet per year
amsl	Above mean sea level
BEA	Basin Equity Assessment
BPP	Basin Production Percentage
BBC	Beckman Business Center
CAWCD	Central Arizona Water Conservation District
CDR	California State University, Fullerton, Center for Demographic Research
CEQA	California Environmental Quality Act
City, Fullerton	City of Fullerton
CRA	Colorado River Aqueduct
CSDLAC	County Sanitation District of Los Angeles County
CVWD	Coachella Valley Water District
DDW	California State Department of Drinking Water
DOF	California State Department of Finance
DWR	California Department of Water Resources
ETAF	Evapotranspiration Adjustment Factor
ETo	Evapotranspiration
GAP	Green Acres Project
GLC	Goodman Logistics Center
GMP	Groundwater Management Plan
gpd	Gallons per day
gpd/ksf	Gallons per day per thousand square feet
GWRS	Groundwater Replenishment System
HGL	Hydraulic grade line
IID	Imperial Irrigation District
IRP	Integrated Resources Planning
IRWD	Irvine Ranch Water District
LTFP	Long Term Facilities Plan
MAF	Million acre-feet
MAWA	Maximum Applied Water Allowance
Metropolitan, MWD, MWDSC	Metropolitan Water District of Southern California
MGD	Million gallons per day
MPR	Master Plan Report
MWELO	Model Water Efficiency Landscape Ordinance
MWDOC	Municipal Water District of Orange County
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
QSA	Quantification Settlement Agreement
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid

PFOS	perfluorooctane sulfonate
ppt	parts per trillion
RA	Replenishment Assessment
RUWMP	Regional Urban Water Management Plan
SAR	Santa Ana River
SB	Senate Bill
sf	Square feet
SR	State Route
SWP	State Water Project
TAF	Thousand Acre Feet
UWMP	Urban Water Management Plan
WRD	Water Replenishment District
WSA	Water Supply Assessment
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management
WSSCP	Water Supply Shortage Conservation Plan

1.0 INTRODUCTION

Goodman Logistics Center -- Background

The Goodman Logistics Center development project (GLC or Project) site encompasses 65.4 net acres[1] at 2001 East Orangethorpe Avenue in the southeastern portion of the City of Fullerton in Orange County, California. The site is a rectangular parcel and is bounded by Acacia Avenue on the west, Kimberly Avenue on the north, State College Boulevard on the east and Orangethorpe Avenue on the south. The Proposed Project site location is shown on Figure 1. Regional access to the site is provided by State Route (SR) 57 via Orangethorpe Avenue or SR 91 via State College Boulevard.

The Project site is currently occupied by a manufacturing facility, with existing buildings totaling 1,210,720 square feet (sf). These existing buildings consist of 418,720 sf of manufacturing and 792,000 sf of warehouse uses. The current operations and associated use of the site will terminate by June 2020. The City of Fullerton Water Department maintains a water well facility in the north-central portion of the site west of the Kimberly Avenue access driveway, and there is a Southern California Edison (SCE) substation generally in the center of the Project site. A storage lot for recreational vehicles is located in the northeast corner of the Project site, which operates under a lease agreement with the current owner.

Purpose of this WSA

The purpose of this WSA is to provide information demonstrating the City of Fullerton has sufficient water supply entitlements to provide for the Project now and for the next 20 years. This WSA estimates the additional water demands from the Project that will need to be served by the City. The development proposed for Goodman Logistics Center warrants the preparation of a Water Supply Assessment due to the development density proposed.

It should be noted that this WSA document references the City's 2015 Urban Water Management Plan (UWMP) which was adopted by the City in June of 2016 and filed with the State of California Department of Water Resources in July of 2016. The UWMP has been relied upon primarily for historical water use data and other information and updated with current data obtained from City staff.

[1] The Project site encompasses approximately 73.1 gross acres, which includes an easement for City of Fullerton Water Department facilities (15,205 sf), areas to be dedicated for access improvements along the site-adjacent roadways, and public roadway right-of-way. The Project sites includes Assessor Parcel Numbers (APNs) 073-120-31 and 073-120-33.

2.0 LEGISLATION

The GLC is an office and warehouse project that meets or exceeds one or more of the development thresholds identified in Senate Bill 610, Water Code section 10912, including the "proposed office building having more than 250,000 square feet of floor space"; or "proposed industrial, manufacturing, or processing plant, or industrial park occupying more than 40 acres of land or having more than 650,000 square feet of floor area; or "mixed use project that includes one or more of the projects specified in this section" threshold. Therefore, the City must deem the GLC as a "Project" as defined by the State of California within the SB 610 legislation, and require that a Water Supply Assessment be prepared to evaluate the sufficiency of water supply entitlements held by the City to serve the Project over the next 20 years.

2.1 SB 610 – Water Supply Planning

SB 610 was chaptered into law on October 9, 2001. It mandates that a city or county approving certain projects subject to CEQA (i) identify any public water system that may supply water for the project, and (ii) request those public water systems to prepare a specified water supply assessment. The assessment is to include the following:

1. A discussion of 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, including agricultural and manufacturing uses.
2. The identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the Proposed Project and water received in prior years pursuant to those entitlements, rights, and contracts.
3. A 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. A demonstration of water supply entitlements, water rights, or water service contracts by the following means:
    a. Written contracts or other proof of entitlement to an identified water supply.
    b. Copies of a 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. The 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. Review of any information contained in the Urban Water Management Plan (UWMP) relevant to the identified water supply for the Proposed Project.
    b. Description of any 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 DWR has identified the basin as over-drafted or has projected that the basin will become over-drafted if present management conditions continue, in the most current bulletin of 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.
    c. Description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin 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. Description and analysis of the amount and location of groundwater projected to be pumped by the public water system from any groundwater basin by 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.
    e. Analysis of the sufficiency of the groundwater from the basin(s) from which the Proposed Project will be supplied.

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

Additionally, SB 610 requires new information to be included as part of an UWMP if groundwater is identified as a source of water available to the supplier. Information must include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 prohibits eligibility for funds from specified bond acts until the plan is submitted to the State.

3.0 THE GOODMAN LOGISTICS CENTER

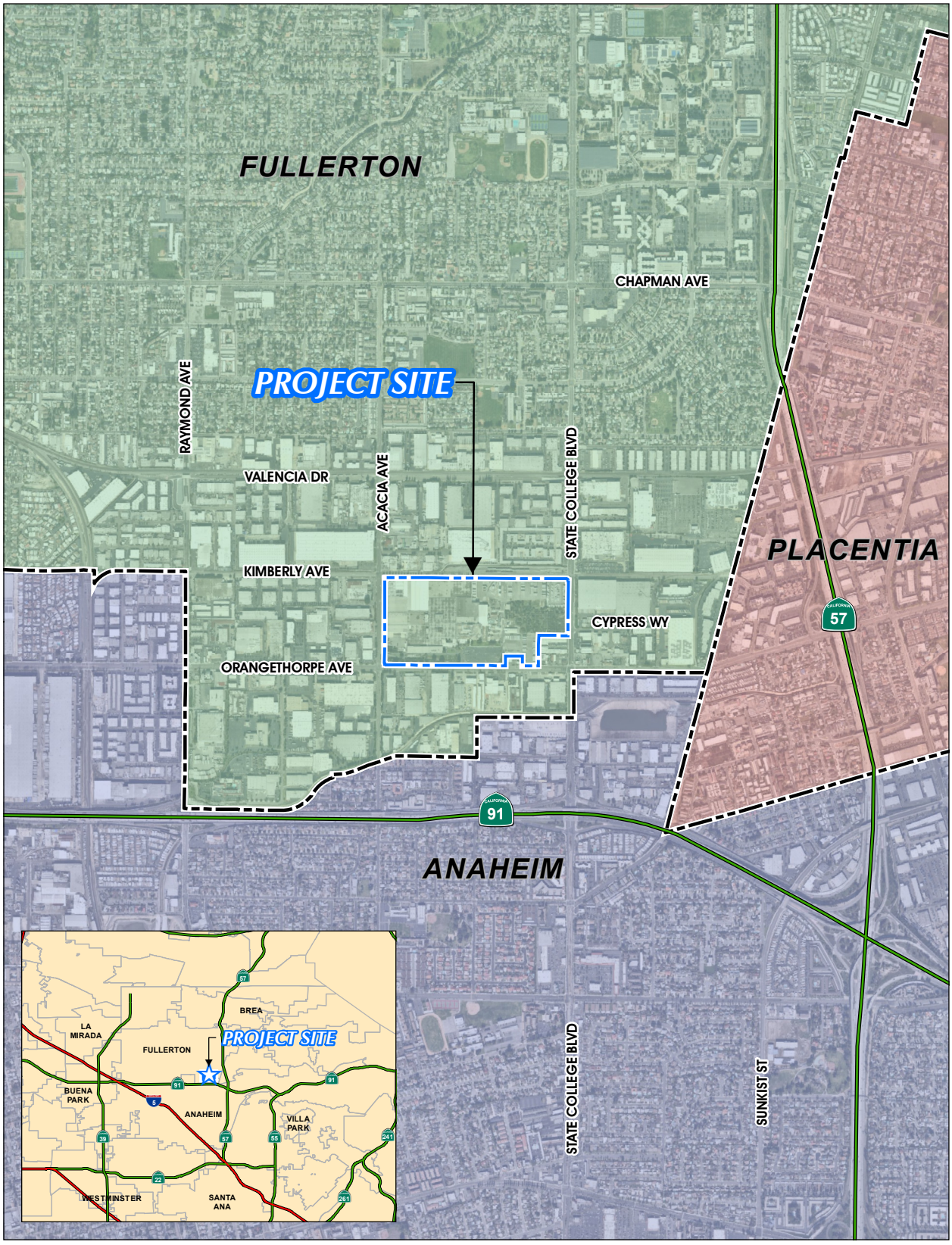
3.1 Proposed Project Description

The Goodman Logistics Center is located on 65.4 net acres in the southeastern portion of the City of Fullerton in Orange County, California, at 2001 East Orangethorpe Avenue. **Figure 3.1** and **Figure 3.2** show the Project's regional and local vicinities. The site is a rectangular parcel and is bounded by Acacia Avenue on the west, Kimberly Avenue on the north, State College Boulevard on the east and Orangethorpe Avenue on the south. The Proposed Project site location is shown on Figure 1. Regional access to the site is provided by State Route (SR) 57 via Orangethorpe Avenue or SR 91 via State College Boulevard.

The Project site is currently occupied by a manufacturing facility, with existing buildings totaling 1,210,720 square feet (sf). These existing buildings consist of 418,720 sf of manufacturing and 792,000 sf of warehouse uses. The current operations and associated use of the site will terminate by June 2020. The City of Fullerton Water Department maintains a water well facility in the north-central portion of the site west of the Kimberly Avenue access driveway, and there is a Southern California Edison (SCE) substation generally in the center of the Project site. A storage lot for recreational vehicles is located in the northeast corner of the Project site, which operates under a lease agreement with the current owner.

The Proposed Project encompasses the demolition of all existing structures on the site and construction of four new buildings with a mix of primarily warehouse and some office space uses. The Project site plan and statistics are shown on Figure 2. The water demand-related characteristics of the Project area are shown in Table 3.1.

The development plan includes approximately 1,456,522 sf of warehouse space and approximately 105,000 sf of office space (ground floor and mezzanine). It should be noted that the Project Applicant has engaged in negotiations for acquisition of an off-site, approximately 0.7-acre property, located south of proposed Building 3 and north of Orangethorpe Avenue (Duncan parcel). In the event the Project Applicant is able to acquire this property, the net site area would be 66.1 acres and Building 3 could be expanded to include approximately 47,862 sf of additional floor area, which would bring Building 3's total floor area to 543,152 sf and the Proposed Project's total floor area to 1,609,384 sf, including 1,504,384 sf of warehouse space and 105,000 sf of office space. Therefore, these higher Project Characteristics shown in Table 1 will be utilized to generate a conservative estimate of indoor water demands for the Water Supply Assessment (WSA). The landscape demands, also served by potable water, will be estimated based on the landscape area provided by the Project's landscape architect and include the Duncan parcel as well. The Project is proposed to be completed, by individual building in phases with all demands on-line by 2022.

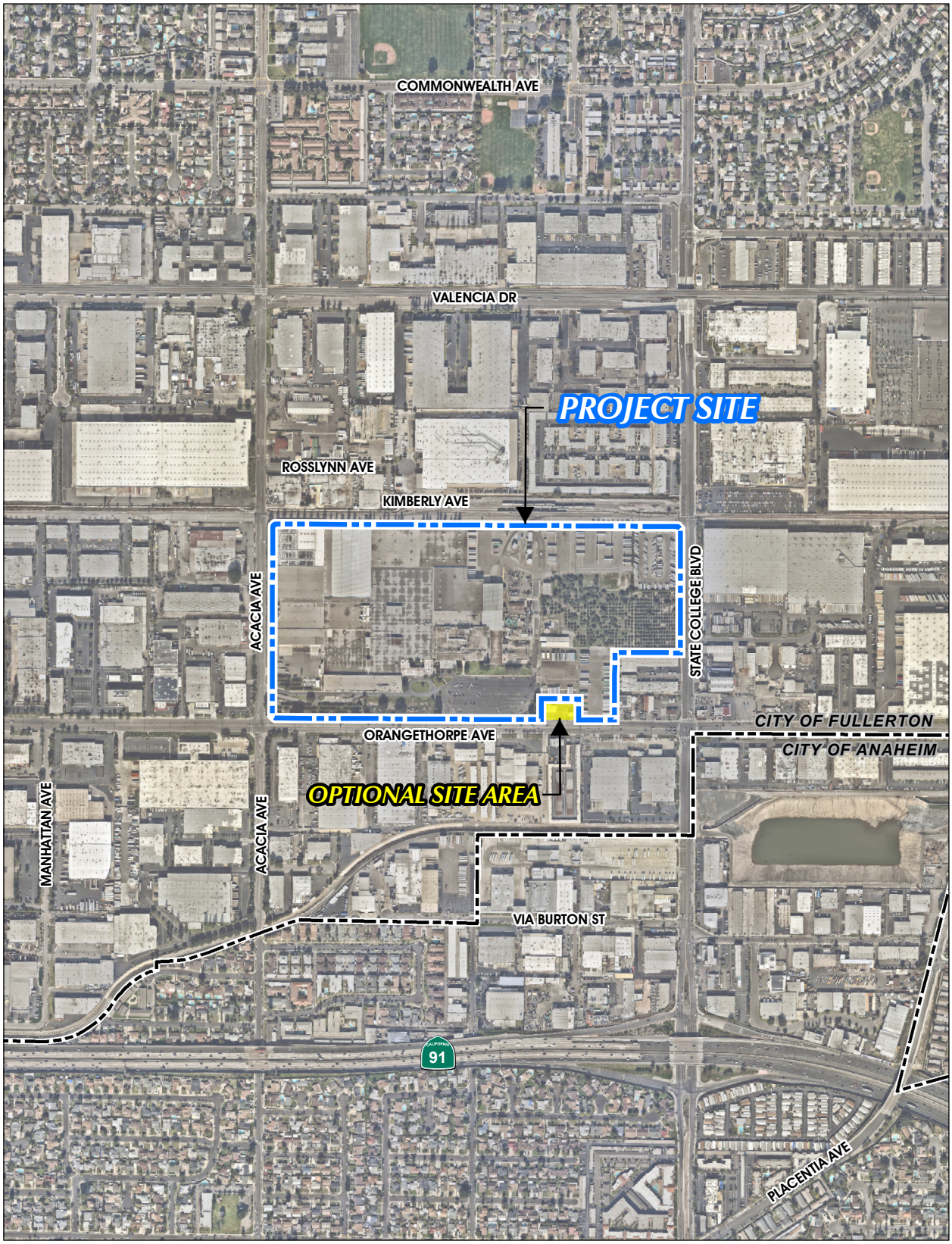


Source(s): ESRI, Nearmap Imagery (2019), OC Landbase (2019)

0 500 1,000 2,000 Feet

Figure 3.1

REGIONAL VICINITY



Source(s): ESRI, Nearmap Imagery (2019), OC Landbase (2019)

0 225 450 900 Feet

Figure 3.2

LOCAL VICINITY

Table 3.1
Proposed Project Site Land Uses with Additional Parcel

	Building 1	Building 2	Building 3	Building 4	Total
Site Area					
Net Area in square feet (sf)	609,339	985,420	968,456	316,300	2,879,517
Net Area in acres (ac)	14.0	22.6	22.2	7.3	66. 1
Building Area (sf)					
Office - 1st floor	10,000	10,000	10,000	5,000	35,000
Office - 2nd floor	20,000	20,000	20,000	10,000	70,000
Warehouse Area	312,695	515,255	513,152	163,282	1,504,384
Total	342,695	545,255	543,152	178,282	1,609,384
Landscape Area (sf)					
Landscape	58,809	50,174	54,062	34,046	197,091

3.2 Proposed Project Water Demands

Indoor water demand for the Proposed Project was estimated by multiplying estimated unit water demand factors for office and warehouse use in gallons per day per thousand square feet (gpd/ksf) by the appropriate building square footage. The Project will be designed to be water-efficient and meet or exceed all current water efficiency standards and regulations. An office use of 60 gpd/ksf was estimated using the Irvine Ranch Water District's (IRWD) factor from their Water Resources Master Plan.[2] IRWD's Master Plan utilized water meter records collected over an 8-year period as the basis for determining interior water use factors for non-residential land uses. The vast majority of irrigated non-residential lots in the IRWD service area are served through separate recycled water irrigation meters. As a result, the IRWD Master Plan provides empirical data for indoor water use separate from outdoor use and their demand factors are referenced and utilized throughout the water industry.

Since IRWD did not develop or report a factor for warehouse use, that use is estimated based on the County Sanitation Districts of Los Angeles County (CSDLAC), another highly referenced agency, sewer loading criteria for warehousing land use and adjusted for current water efficiency standards.[3] The CSDLAC loading for warehouse use is 25 gpd/ksf, which has not been updated to reflect current building code water fixture standards. As such, an adjusted value of 20 gpd/ksf was utilized assuming a 20% savings achieved by low flow fixtures required by current building and

[2] Irvine Ranch Water District, Water Resources Master Plan, 2002 Table 3-1 Land Use and Water Use Factors, Updated July 2003.
[3] County Sanitation Districts of Los Angeles County, "Revenue Program Report", Table 3, November 2007, Updated March 2017.

plumbing codes. The estimated indoor water use factors and indoor water demand, which would also be the estimate sewer flow, by building use type are summarized in Table 3.2.

Table 3.2
Estimated Indoor Water Use

Building Use	Area (sf)	Unit Water Use (gpd/ksf)	Water Use (gpd)	Water Use (AFY)
Warehouse	1,504,384	20	30,088	33.7
Office	105,000	60	6,300	7.1
Total Indoor Water Use			**36,388**	**40.8**

The State Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) limits potable landscape water irrigation to a Maximum Applied Water Allowance (MAWA) which is calculated in gallons per year as follows based on an Evapotranspiration Adjustment Factor (ETAF) of 0.55 for residential and 0.45 for non-residential use, the total landscaped area (LA) in square-feet, and the local reference evapotranspiration (ETo) rate in inches per year, where 0.62 is a conversion factor.

$$MAWA = (ETAF)(ETo)(0.62)(LA)$$

As the Proposed Project is a non-residential use, an ETAF of 0.45 applies. The total landscape area of the Proposed Project area will be 197,091 sf as shown in Table 3.1 per preliminary landscape plan area takeoffs prepared by Hunter Landscape, Inc., the Project Landscape Architect.

The ETo for the Project area is approximately 49.7 inches derived from the California Irrigation Management Information System (CIMIS) Spatial CIMIS data by zip code for zip codes in the City of Fullerton as reported in Ordinance No. 3226 "An Ordinance of the City Council of the City of Fullerton, California, Amending Title 15 of the Fullerton Municipal Code Pertaining to Landscaping and Irrigation Requirements". Using the formula above, the Maximum Applied Water Allowance (MAWA) for the Project area is calculated as 2,732,923 gallons per year or 7,487 gallons per day (8.4 AFY) using the maximum allowable ETAF of 0.45. The irrigation demand is conservatively estimated using the MAWA for the WSA and will likely come in lower based on actual plant materials selected and irrigation system efficiencies.

The estimated water demand for each use and total water demand for the Proposed Project are summarized in Table 3.3, with the total estimated use being 43,902 gpd (36,388+7,514) or 49.2 AFY.

Table 3.3
Estimated Project Water Use

	Area (sf)	Water Use (gpd)	Water Use (AFY)
Building Area (Indoor Use)			
Warehouse	1,195,340	30,088	33.7
Office	40,000	6,300	7.1
Building Subtotal	1,235,340	36,388	40.8
Landscape Area (Outdoor Use)			
Total Landscape Area & Use	197,091	7,487	8.4
Total Water Use		**43,875**	**49.2**

As a check, the resulting total water use equates to approximately 22 gpd per employee, based on the maximum of 2,000 employees. The Environmental Protection Agency documented an average daily water demand in commercial/industrial settings between 20 and 35 gpd per employee[4]. The Federal Energy Management Program documented an estimated range of between 8 and 20 gpd/employee for office use.[5] This demonstrates the wide range of estimated use per employee depending on area of the country and building type. The demand estimate calculated using the above per sf methodology correlates with this range. The 2,000-employee figure was provided as the maximum for the Project and with a less conservative number, the equivalent use per employee would increase.

The WSA will utilize the net new water demand for the Project site to evaluate if there is sufficient supply to meet the demands of the Project as well as all other existing and planned future water demand for the City over the next 20 years. The net new demand for the Project area would be the difference between the existing water use and the estimated new water demand for the site and would typically be a positive number. However, since the previous manufacturing use on this site generated in a substantially higher water use, the net new demand will be negative or a reduction in demand for the Project site with implementation of the Project. As discussed above, all existing buildings in the Project area will be demolished to make room for the new uses on the Project site, i.e. Buildings 1 through 4 shown in Table 1. Based on previous water use on the Project site over the past five years and the estimated water use documented above, the Proposed Project's buildout demand will result in an approximate four to six percent reduction of the total City-wide water use.

Based on City-provided meter records, the 2014/15 water use on the site was 1,709 AFY, which would have been accounted for in the City's UWMP water demand projections. Therefore, the net decrease in water demand for the site would be 1,659.8 AFY. Since these are demand projections, the supply needed to serve this demand would be 5.7 percent higher to account for water losses, or a reduction of 1,754 AFY. The 5.7 percent water loss figure comes directly from the water loss reported in the City's 2015 UWMP.

[4] http://www.dartmouth.edu/~cushman/courses/engs44/water.pdf
[5] https://www.energy.gov/eere/femp/federal-water-use-indices

4.0 CITY WATER DEMAND AND SUPPLIES

4.1 Overview of Supply and Demand

The City currently obtains water from (1) naturally and artificially recharged local groundwater managed by Orange County Water District (OCWD) and (2) imported water from Metropolitan Water District of Southern California (Metropolitan or MWDSC). In addition, the City of Fullerton Water Department maintains five emergency interconnections with adjacent water purveyors that are temporarily utilized on an as-needed basis.

According to the 2015 UWMP, the City received 70 percent of its total water needs from local groundwater in FY 2014/15 and 30 percent from imported sources. However, this mix can change annually, and the City attempts to maximize groundwater use due to its lower cost.

Historical Water Demand

The State implemented the 2009 Water Conservation Act (SBx7-7), which has become law and, thus, mandates water use reduction by all water agencies required to prepare Urban Water Management Plans. The City has elected to meet their water use reduction obligations through Municipal Water District of Orange County's (MWDOC) regional compliance plan "Orange County's 20x2020 Regional Alliance". As a member of the Regional Alliance, the City of Fullerton will follow the lead of the MWDOC as MWDOC administers its water conservation programs. Programs will include requiring new residential, commercial, industrial and institutional developments be constructed with water conserving fixtures inside, more efficient irrigation systems outside, and less water-demanding landscapes.

Water demand is supplied from groundwater and imported water. Table 4.1 shows historical water production by source from FY 2011 to FY 2015 and total water sales as reported in the 2015 UWMP and Table 4.2 shows the updated figures for the four years through fiscal year 2018/19 from City production records.

Table 4.1
City of Fullerton Production by Source from 2015 UWMP (AFY)

Source	2010/11	2011/12	2012/13	2013/14	2014/15
Groundwater	16,229	17,341	19,489	21,279	18,946
Imported Water[1]	9,645	9,370	9,205	8,776	8,298
Total Water Supply	25,874	26,711	28,694	30,055	27,244

1) Excludes water delivered for Conjunctive Use Groundwater Storage Program in FYs 2010/11 & 2011/12.

Table 4.2
City of Fullerton Updated Production by Source (AFY)

Source	2015/16	2016/17	2017/18	2018/19
Groundwater	17,541	17,933	17,070	18,373
Imported Water	5,855	6,471	7,317	5,520
Total Water Supply	23,396	24,404	24,387	23,893
Percent Groundwater	75.0	73.5	70.0	76.9

As shown in Table 4.2, which updates the 2015 UWMP, for the past four years the City has averaged almost 74 percent from groundwater with 2017/18 an outlier due to excess rainfall and In-Lieu Program water being taken (see Section 5.3 for discussion of In-Lieu Program water). The City attempts to maximize local groundwater supply each year at least up to the Basin Production Percentage (BPP) established annually by OCWD and described in more detail in Section 4.2 below.

As shown above, the 2018/19 (FY 2019) actual use of 23,893 AFY from Table 4.2 above is 2,806 AFY less than what was projected for FY 2020 of 26,699 AFY in the 2015 UWMP (see Table 4.4, below). Therefore, the City's actual use seems to be trailing the UWMP projections, which is likely due to conservation and lower growth than projected (as discussed below).

Population Growth

The City of Fullerton Water Utilities department currently provides water to residents and businesses within a service area of approximately 22.3 square miles. The population in Fullerton was approximately 102,994 in 1980 and increased to 138,600 in 2010 (approximately one percent per year). The Year 2015 population was approximately 141,042, according to the Department of Finance (DOF), and was 140,827 according to the California State University Fullerton Center for Demographic Research (CDR) and the CDR figure is what was used in the City's 2015 UWMP. The City's population was projected to increase by 14 percent over the next 25 years, representing an average growth rate of 0.56 percent annually, as shown in Table 4.1, per the 2015 UWMP and is illustrated in Table 4.1.

The latest DOF population estimate for the City of Fullerton is 142,824 as of January 1, 2019.[6] This figure is about halfway between the 2015 and 2020 population used in the 2015 UWMP as shown in Table 4.3 with less than one more year until 2020. Therefore, the population projections included in the UWMP appear to be conservative, at least to date.

Table 4.3
Water Service Area Population

	2015	2020	2025	2030	2035	2040
Population Served	140,827	145,791	152,026	155,464	158,421	160,545

[6] E-1 Population Estimates for Cities, Counties, and the State – January 1, 2018 and 2019, Department of Finance, http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-1/

Projected Supply and Demand

Due to proactive water conservation efforts, future water demands are expected to increase at a much lower rate compared to the population growth. Multi-family housing units are expected to increase at a faster rate than single family housing units.

The population data presented in Table 4.3 was used to project Citywide water demand on a per-capita basis. Both population and total water use in the City's service area is projected to increase, with a declining per capita water usage. Based on the 2015 UWMP, the projected water supply is included in Table 4.4, by source assuming a conservative 70 percent BPP for groundwater use and is assumed to not include the proposed Project.

Table 4.4
Projected Water Supply Requirement (AFY)

Source	2020	2025	2030	2035	2040
Groundwater	18,689	20,063	20,201	20,195	20,224
Imported	8,010	8,598	8,657	8,655	8,667
Total	**26,699**	**28,661**	**28,858**	**28,850**	**28,891**

The Imported Supply Requirement shown in Table 4.4 is directly from the projections in the City's 2015 UWMP. Any additional supply needed to balance supply and demand due to an additional demand from the additional projects not anticipated in the 2015 UWMP or the Proposed Project would normally be planned to come from Groundwater. And there is only one other proposed project that is conservatively assumed to be unaccounted for in the 2015 UWMP, which is the Beckman Business Center. The 2015 UWMP did include demand growth in the water service area through Year 2040 but did not specifically identify the Beckman Business Center with a total project supply requirement including non-revenue water (water loss) of 137 AFY, based on the Beckman Business Center WSA dated November 2016. Therefore, the 137 AFY is conservatively added to the projections from the 2015 UWMP. However, as stated previously, the Proposed Project will use substantially less water than what was used on the Project site in 2015 when the UWMP was prepared and from then until the current period.

Imported water supply from Metropolitan up to the amount shown in Table 4.4 will be demonstrated reliable in this WSA. Additionally, the 2015 UWMP showed Groundwater Supply using a conservative BPP of 70 percent and OCWD has upgraded its long-term goal for the BPP to 75 percent pursuant to their Board Resolution 13-1-6, which is discussed in Section 4.2, following. This is further demonstrated by the City's groundwater supply over the past four years. Finally, citywide water demands are trailing those projected in the 2015 UWMP. Based on these facts, an adequate supply is available for the Proposed Project and additional citywide water system demands now and into the future.

4.2 Groundwater

The information in this section is intended to furnish the information required by Water Code section 10910(f).

Basin Summary

The primary source of water for the City is the Orange County Groundwater Basin (Basin). The Basin underlies the north half of Orange County beneath broad lowlands. A description of the Coastal Plain of the Basin or DWR's Groundwater Basin Number 8-1, dated September 2001, states that the Basin underlies a coastal alluvial plain in the northwestern portion of Orange County. The Basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates at the Orange County line to the northwest, where its aquifer systems continue into the Central Basin of Los Angeles County.[7]

The Basin is dominated by a deep structural depression containing a thick accumulation of fresh water-bearing imbedded marine and continental sand, silt and clay deposits. The sediments containing easily recoverable fresh water extend to approximately 2,000 feet in depth. Although water bearing aquifers exist below that level, reduced water quality and pumping make these materials economically unviable at present. Upper, middle and lower aquifer systems are recognized in the Basin with well production yields ranging from 500 to 4,500 gallons per minute but are generally 2,000 to 3,000 gallons per minute.[8]

The aquifers comprising the Basin form a complex series of interconnected sand and gravel deposits. The Basin holds millions of acre feet of water, of which about 1.25 to 1.5 million AF is available for use.[9] To ensure the Basin is not overdrawn, OCWD recharges the Basin with local and imported water. Groundwater conditions in the Basin are influenced by the natural hydrologic conditions. The Basin is recharged primarily by four sources: (1) local rainfall, which varies due to the extent of the annual seasonal precipitation; (2) storm and base flows from the Santa Ana River, which includes recycled wastewater from treatment plants in Riverside and San Bernardino Counties; (3) imported water; and (4) highly treated recycled wastewater. The Basin generally operates as a reservoir in which the net amount of water stored is increased in wet years to allow for manageable overdrafts in dry years.

According to OCWD's Engineer's Report for fiscal year 2018-19, total water demands within OCWD were 393,222 AF for the water year (July 1, 2018 to June 30, 2019). Groundwater production for the water year totaled 303,496 AF including any available In-Lieu Program water. The use of supplemental water in OCWD's service area during the 2018-19 water year totaled 113,251 AF of which 70,872 AF resulted from the direct use by water agencies and districts and

[7] DWR's Bulletin 118-1 Basin Description for Coastal Plain of Orange County Groundwater Basin Number 8-1. September 5, 2001.
[8] DWR's Bulletin 118-1 Basin Description for Coastal Plain of Orange County Groundwater Basin Number 8-1. September 5, 2001.
[9] Orange County Water District 2020 Master Plan Report. Chapter 3, Orange County Groundwater Basin Hydrology. 2000.

42,379 AF were used for the purpose of groundwater replenishment and maintenance of seawater intrusion control barriers.

For the water year which ended on June 30, 2019, the "annual overdraft" (annual basin storage decrease without supplemental replenishment water) was 96,700 AF. The accumulated overdraft decreased from 277,000 AF on June 30, 2018 to 236,000 AF on June 30, 2019. Precipitation within the Basin was160 percent of the long-term average during the water year, totaling 21.46 inches.[10]

Based on the groundwater basin conditions for the water year ending on June 30, 2019, OCWD may purchase up to 160,000 AF of water for groundwater replenishment during the ensuing water year, beginning on July 1, 2020, pursuant to the District Act.

Over the recent past, production capability of the Basin has increased as a result of increased wastewater reclamation and the blending of waters of different qualities to produce high-quality potable water for public distribution.[11]

The most recent example of a highly successful wastewater reclamation project is the construction and operation of OCWD's $500 million water-purification plant, which is designed to turn wastewater into drinking water. This Groundwater Replenishment System (GWRS) project has been lauded by the environmental community because of the fact that these types of projects reduce the amount of energy needed to transport water from the northern part of the state to the southern part of the state, thereby also reducing greenhouse gas emissions. The GWRS is being emulated throughout the State and in other parts of the country. A treatment plant expansion of 30 million gallons per day was put on-line by OCWD in 2015 increasing the recharge capacity of the GWRS to 100 million gallons per day. The GWRS treatment system was laid out so it could eventually be expanded to 130 million gallons per day, which is currently expected to be in the 2023 timeframe.

GWRS currently treats and recharges up to 100 million gallons per day of wastewater back into the Basin for future potable use. This equates to the recycling of over 110,000 AFY of wastewater back into the Basin for future extraction and potable use.

As stated, the Basin is managed by the OCWD, a special district created by the State Legislature in 1933 pursuant to the OCWD Act, an un-codified statutory scheme set forth in the State's Water Code. The Basin is unadjudicated. All pumpers within the Basin are permitted to pump from the Basin, but OCWD is charged with managing the groundwater basin. OCWD manages the Basin largely through the Basin Production Percentage (BPP) that it establishes each water year.

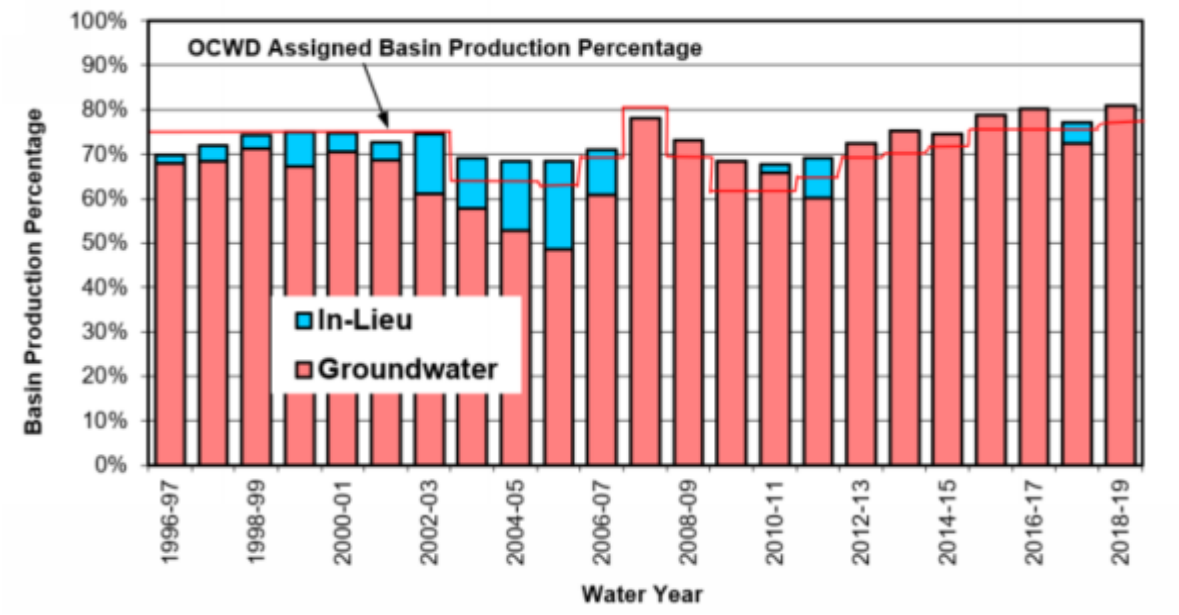
The BPP is set based on groundwater conditions, availability of imported water supplies, ideal precipitation, Santa Ana River runoff, and basin management objectives. In essence, the BPP represents a set percentage identifying the amount of groundwater all pumpers in the basin can pump without paying a high "pumping tax" or Basin Equity Assessment to OCWD (described below). Thus, for example, if OCWD establishes a BPP of 70 percent, all pumpers within the Basin, including the City, can supply 70 percent of their water needs from groundwater supplies

[10] OCWD. Engineer's Report, 2018/19, February 2020.
[11] OCWD. Engineer's Report, 2018/19, February 2020.

at a cost significantly less than the cost of imported water. The BPP is a major factor for the City in determining the cost of groundwater production. Groundwater production equal to or less than the BPP pays a Replenishment Assessment (RA). Funds collected by OCWD through RA payments made by all producers in the basin are used to fund groundwater replenishment and recharge programs aimed at ensuring the long-term viability and stability of the Basin.

The BPP was initially established in 1969 and has generally ranged from 62 to 89 percent. The historical assigned and achieved BPP's over the past 23 years are illustrated in **Figure 4.1**. The 2015 UWMP used a conservative BPP of 70 percent for future water supply projections. The 2014/15 BPP was set at 72 percent and the overall BPP achieved was 74.6 percent.[12] In 2013 OCWD upgraded its long-term goal for the BPP to 75 percent pursuant to their Board Resolution 13-1-6. The BPP for the 2018-19 water year was set at 77.0 percent by the OCWD Board of Directors and the overall BPP achieved within OCWD for non-irrigation use was 80.9 percent.[13] This achieved pumping in past years was greater than the BPP set by OCWD due to several water quality projects that were given a Basin Equity Assessment (BEA) exemption to pump above the BPP. A BPP of 77 percent is being proposed for the ensuing water year 2020-21.[14] Even with the accumulated overdraft in the Basin, since 2012-13 the BPP has been above the conservative 70 percent used in the 2015 UWMP and seven of the past nine years, including the current and upcoming year, it's been at 75 percent or above.

Figure 4.1
OCWD Assigned Basin Production Percentage



[12] 2014-15 Engineer's Report on Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District, February 2016.
[13] 2018-19 Engineer's Report on Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District, February 2020.
[14] 2018-19 Engineer's Report, February 2020.

If groundwater production greater than the BPP occurs, a Basin Equity Assessment (BEA) is assessed against the producer of that amount of groundwater produced in excess of the BPP. The BEA is an additional fee (i.e., a higher "pumping tax") paid on each AF of water pumped above the BPP, making the total cost of that water to Fullerton equal to the cost of imported water from Metropolitan. Thus, the BPP creates pricing incentives to ensure that groundwater producers pump within the framework established by the BPP.

Like funds collected by OCWD through the RA, funds collected by OCWD through the BEA are also used to fund groundwater replenishment, and recharge and recycling programs aimed at ensuring the long-term viability and stability of the Basin. The programs funded by the RA and the BEA include all of the groundwater replenishment, recharge, and recycling programs discussed above.

Basin recharge occurs largely in the following recharge basins: (i) Warner Basin, a 50-foot deep recharge basin located next to the Santa Ana River (SAR) at the intersection of the 55 and 91 freeways; (ii) Burris Pit, located between Lincoln Avenue and Ball Road; (iii) Kraemer Basin, located adjacent to Burris Pit, and (iv) Santiago Creek. A large portion of the recharge of the Basin comes from water flowing in the Santa Ana River (SAR) south of the Prado Dam, which is located in San Bernardino County, just east of the Orange County jurisdictional boundary. With the exception of contractual rights conveyed to Bryant Ranch landowners in east Yorba Linda which have contractual rights to approximately 2,800 AFY of SAR water, OCWD has the legal rights to all of the SAR flow south of the Prado Dam. (See OCWD v. City of Chino, et al, (Civ. Case No. 117628), Judgment and Settlement Documents.)

As set forth in DWR Bulletin 118 and in the OCWD Groundwater Management Plan, 2015 Update, the Basin is a managed basin and not in a state of overdraft. The Basin is one of the richest and most plentiful sources of groundwater in the entire State, containing approximately 1.25 to 1.5 million AF of water available for use at the present time, and millions of acre-feet that could possibly be produced in the future.[15]

Basin Water Quality

As part of its Basin management function, OCWD operates an extensive groundwater monitoring program whereby OCWD routinely tests all groundwater production wells located within the Basin in compliance with Title 22 of the California Administrative Code. OCWD maintains a multi-million-dollar laboratory whereby chemists test the well water for traces of pollution, hydrocarbons, pesticides, and other chemical components. OCWD's laboratories process tens of thousands of samples a year and perform hundreds of thousands of analyses a year. As part of its monitoring and management duties, OCWD has developed and adopted a Groundwater Management Plan which is a program to increase water supplies and increase monitoring and contamination clean up.

[15] Orange County Water District 2020 Master Plan Report. Chapter 3, Orange County Groundwater Basin Hydrology. 2000.

Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are chemicals that are prevalent in the environment and were once commonly used in many consumer products. They are part of a larger group referred to as per- and polyfluoroalkyl substances (PFAS). Due to the prolonged use of PFOA and PFOS, the chemicals are now being detected in water sources throughout the United States. Through an ongoing investigation, California and many other states have found that PFAS chemicals have made their way into the local groundwater, including near airports and military bases where these chemicals are commonly used.

In July 2018, the California State Department of Drinking Water (DDW) established interim drinking water Notification and Response Levels for PFOA and PFOS. Testing results above the Notification Level require agencies to notify the governing body for the areas where the water has been served within 30 days of receiving the verifying test results. If the Response Level is exceeded in drinking water provided to consumers, DDW recommends that the water agency remove the water source from service or provide treatment.

In April 2019, DDW sent monitoring orders to more than 200 public water systems across the state to test for PFOA and PFOS, including 12 agencies in OCWD's service area, of which the City of Fullerton was one. The comprehensive list of monitoring orders included 612 drinking water supply wells in California; of which 53 were in OCWD's service area and five in Fullerton (four were tested as one was off-line). Wells were selected based on proximity to either landfills, municipal airports or past detections of PFAS in wells. In August 2019, DDW announced a new Notification Level for PFOA and PFOS of 5.1 parts per trillion (ppt) and 6.5 ppt, respectively. Then in February 2020, DDW announced a new Response Level of 10 ppt for PFOA and 40 ppt for PFOS.

All water agencies in OCWD's service area operate their water systems following all drinking water requirements for PFOA and PFOS established by EPA and DDW. To meet the state's recommended PFAS levels, water purveyors are taking actions such as:

- Removal of water supply sources – to date, more than 40 wells have been taken out of service including one Fullerton well
- Use of imported water that meets state's recommended levels of PFAS
- Blending multiple water supply sources to meet state's recommended levels of PFAS
- Pilot testing of water treatment processes for PFAS

Sustainable Groundwater Management Act

State Senate Bill 1262 adopted in September 2016 amends Section 66473.7 of the Government Code to require WSAs to address certain elements regarding groundwater sustainability if the project relies in whole or in part on groundwater as a source of supply. The Orange County Groundwater Basin (Basin) has been designated as medium-priority pursuant to Section 10722.4 of the Water Code. The Sustainable Groundwater Management Act (SGMA) establishes OCWD as the exclusive local agency to manage groundwater within its statutory boundaries with powers to comply with the provisions of the SGMA (California Water Code Section 10723 (c) (1). OCWD adopted a Groundwater Management Plan, 2015 Update dated June 17, 2015, that includes the

required elements for Groundwater Sustainability Plans and additional plan elements have been incorporated into OCWD.[16] Furthermore, as mentioned above DWR has not identified the Basin as overdrafted or has it projected that the Basin will become overdrafted if present management conditions continue.

Section 5 of this WSA sets forth various groundwater production scenarios as required by the Water Code (Single Dry Year, Multiple Dry Year). This additional information set forth in Section 5 will furnish further information pertaining to the sufficiency of the groundwater basin in various pumping scenarios as required by Water Code section 10910(f)(5).

4.3 Imported Water

The information in this section is intended to provide the information required by Water Code section 10910(d).

Metropolitan provides imported water supplies to the City. Metropolitan is the wholesale water agency that serves supplemental imported water from northern California through the State Water Project (SWP) and the Colorado River to 26 member agencies located in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties.

The construction of the SWP was authorized by the State Legislature in 1951. Eight years later, the Legislature passed the Burns-Porter Act, which provided a mechanism for bonds to be issued to pay for the construction of certain portions of the SWP facilities. The DWR has entered into contracts with water districts and regional agencies (SWP Contractors) specifying the amount of SWP water to be delivered to each SWP Contractor. Each SWP Contractor was provided with a contract amount (Table A Amount) and capacity rights to the SWP aqueduct and storage system in return for payments intended to cover operation and maintenance, bondholder obligations, and repayment of moneys loaned from the California Water Fund. DWR water supply contracts contemplate that the SWP would deliver 4.2 million AFY to 29 SWP Contractors.

Although the SWP is not fully constructed and cannot yet deliver the full 4.2 million AFY in all years, the SWP has fully met SWP Contractors' water needs twelve out of the 16 years following the end of the six-year drought in 1992; the exceptions being the dry years of 1994, 2001, 2007 and 2008. Of SWP water deliveries, about 70 percent is delivered to SWP urban contractors and about 30 percent is delivered to SWP agricultural contractors. Kern County Water Agency and Metropolitan are the largest Contractors with DWR for SWP water.[17]

From a statewide perspective, the maximum capacity of the overall SWP transportation system is generally limited by the capacity of the system pumps. The capacity of the California Aqueduct is 10,300 cubic feet per second (cfs) at its northern end, and 4,480 cfs below the Edmonston pumping plant (1,000 cfs equates to approximately 82.6 acre-feet per hour, 1,980 acre-feet per day and 725,000 AFY). If these transportation rates were maintained for a full year, they would result in

[16] Orange County Water District, Groundwater Management Plan, 2015 Update, June 17, 2015.
[17] DWR, Bulletin No. 132-06 and later supplements to Bulletin No. 132.

the transport of approximately 7.2 million acre-feet near the Delta and 3.2 million acre-feet to users in Southern California.[18]

Demand can have a significant effect upon the reliability of a water system. For example, if the demand occurs only three months in the summer, a water system with a sufficient annual supply but insufficient water storage may not be able to reliably meet the demand. If, however, the same amount of demand is distributed over the year, the system could more easily meet the demand because the need for water storage is reduced. Because the City of Fullerton overlies the Orange County Groundwater Basin and can utilize the Basin to smooth out seasonal peaks, its imported water reliability is enhanced.

The City of Fullerton is one of only three retail member agencies of Metropolitan in Orange County. As a member agency, pursuant to the Metropolitan Act, the City has preferential rights to a certain percentage of water delivered to Metropolitan each year primarily from the State Water Project and/or the Colorado River Aqueduct as well as other Metropolitan storage programs. Being a member agency of Metropolitan puts the City in a better position relative to receiving water directly from Metropolitan, as opposed to other agencies in Orange County which obtain their imported Metropolitan water through MWDOC.

Metropolitan's SWP imported water is stored at Castaic Lake on the western side of Metropolitan's service area and at Silverwood Lake near San Bernardino. Metropolitan water imported from the Colorado River via the Colorado River Aqueduct (CRA) is stored at Diamond Valley Lake and Lake Mathews in Riverside County.

Through the 1996 Integrated Resources Plan and subsequent updates, Metropolitan has worked toward identifying and developing water supplies to provide 100 percent reliability. Due to competing needs and uses for all of the water sources and regional water operation issues, Metropolitan undertook a number of planning processes: the Integrated Resources Planning (IRP) Process, the Water Surplus and Drought Management (WSDM) Plan, the Strategic Planning Process, the Regional Urban Water Management Plan (RUWMP), and most recently, the Report on Metropolitan Water Supplies: A Blueprint for Water Reliability. Combined, these documents provide a framework and guidelines for optimum water planning into the future. Reliability of Metropolitan's supply is further discussed in Section 5.0, Reliability of Water Supplies.

Metropolitan member agencies receive imported water at various delivery points along the Metropolitan transmission system, and pay for it at tiered and/or uniform rates established by the Board depending on the class of service.

Historical water demands in the Metropolitan service area increased from 3.1 million acre feet (MAF) in 1980 to 3.9 MAF in 2000. However, water demands decreased to 3.4 MAF in 2010 and further decreased to 3.1 MAF primarily due to SBx7-7 water conservation. Total water use is projected to rebound to 3.7 MAF in 2020 following the State's drought which extended from 2011

[18] DWR, Bulletin No. 132-05, December 2006.

to 2019, but is then only forecast to increase to 4.0 MAF by 2040 (7.7 percent with the implementation of long-term water conservation measures.[19]

For the Orange County service area, according to Metropolitan, demands are projected to increase 14.8 percent between 2015 and 2040.[20] Table 4.5 shows the historic and projected total retail water demands for Metropolitan's Orange County service area from their 2015 UWMP. The water demand forecasts account for water savings resulting from plumbing codes, price effects, and actual and projected implementation of water conservation Best Management Practices.[21]

Table 4.5
Total Water Demand in Metropolitan's
Orange County Service Area
Includes Municipal & Industrial, and Agriculture (AF)

	Reported				Projected				
County	2000	2005	2010	2015	2020	2025	2030	2035	2040
Orange	660,000	629,000	546,000	539,000	604,000	613,000	617,000	613,000	619,000

Source: The Urban Water Management Plan for the Metropolitan Water District of Southern California, Appendix 1 Demand Forecast. June 2016.

[19] Metropolitan Water District of Southern California, 2015 UWMP, June 2016.
[20] Metropolitan, 2015 UWMP.
[21] Metropolitan, 2015 UWMP.

The City purchases both treated potable and untreated non-potable water from Metropolitan. The treated water is delivered through five major feeders, East Orange County Feeder No. 2, Orange County Feeder, Second Lower Feeder, West Orange County Feeder, and Allen-McColloch Pipeline. All of these infrastructure programs are in place, and no further regulatory permits are required to permit Metropolitan to convey imported water to these facilities for use by the City.

A description of the amount of Metropolitan water delivered to the City in the past and anticipated to be delivered to the City in the future under a variety of scenarios is set forth in Section 5 of this WSA.

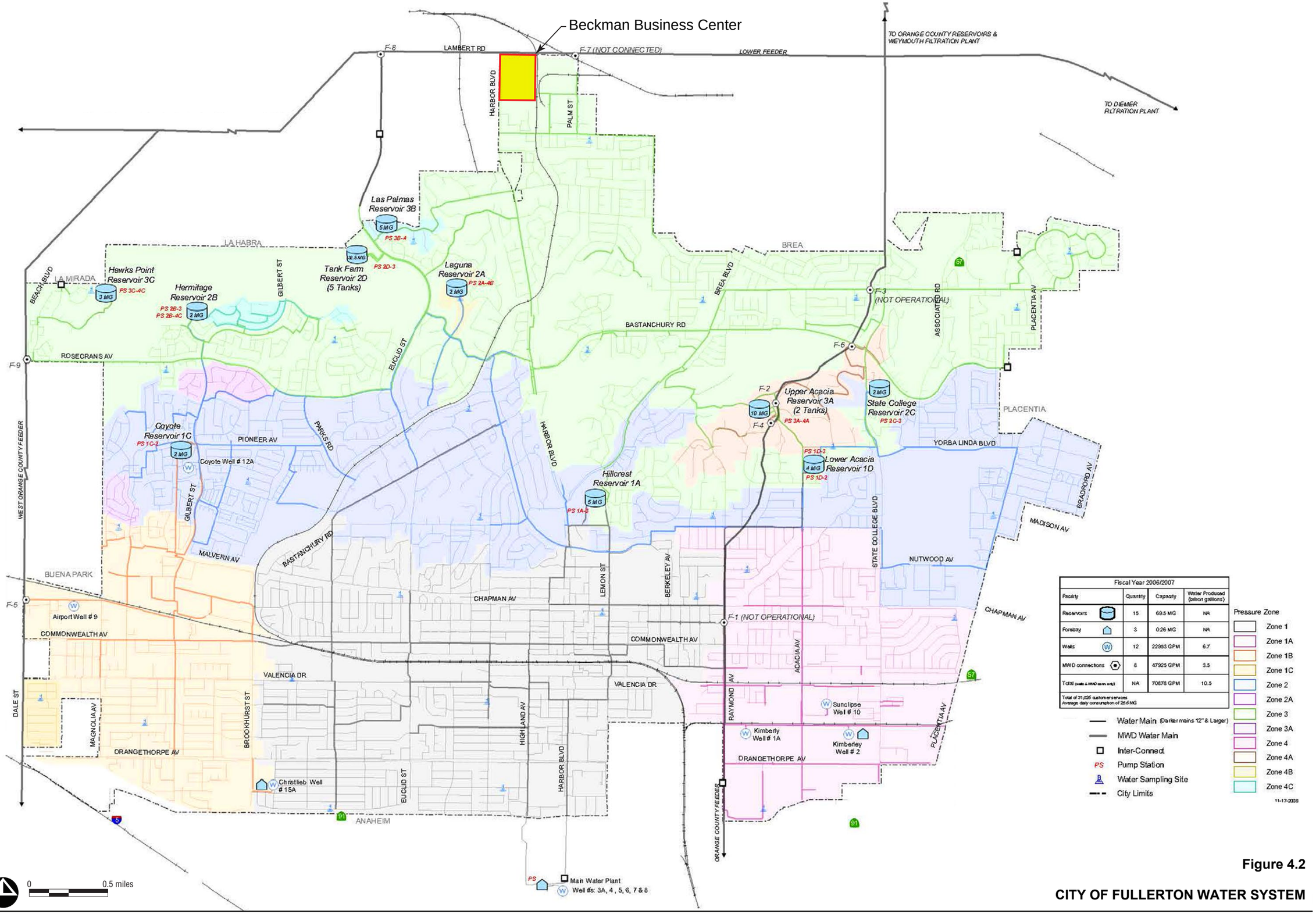
4.4 City Water System

The City of Fullerton's Water Utility (Water Utility) provides water service to approximately 142,800 people, as noted in Section 4.1, within its 22.3-square mile service area. The City's basic water services include single family residential, multifamily residential and general services (i.e., commercial, industrial, municipal, and institutional consumers).

Since the formation of the Water Utility in 1906, millions of dollars of water facilities have been installed. Currently, the Water Utility owns, operates and maintains over 420 miles of transmission and distribution mains, 15 reservoirs with a capacity of 69.5 million gallons, 12 pumping stations, and 11 production wells. Eight wells are currently active with one offline due to rehabilitation, one offline but scheduled for replacement by 2023 and one offline due to water quality. The City's water system and service area are shown in **Figure 4.2**.

Of the City's 10 production wells, 8 are potentially impacted by 2020 DDW testing orders for PFAS (see previous discussion in Section 4.2). Should wells be recommended for removal from service based on DDW's Response Levels and related guidance, the City anticipates the loss of approximately 10,000 AFY loss of production on a temporary basis. If treatment is required, facility construction would be phased with the wells at the City's Main Plant all treated centrally at that location and other wells treated at their respective locations. Optimistically, current City plans would call for half of the treatment facilities online by approximately Spring of 2021 and the remainder online by the end of 2021.

The City's service area elevations range from approximately 80 feet to 512 feet above mean sea level (amsl). In order to provide service to all of its customers at reasonable operating pressures, the water system is divided into 12 pressure zones. The lowest pressure zone operates at a nominal hydraulic grade line (HGL) elevation of 263 feet amsl and the highest pressure zone at a nominal HGL of 660 feet amsl.



Source: City of Fullerton

2/10/14 JN 138943-19895 MAS

Figure 4.2

CITY OF FULLERTON WATER SYSTEM

4.5 Recycled Water

The City does not own or operate its own wastewater treatment facilities and sends all collected wastewater to Orange County Sanitation District (OCSD) for treatment/reuse or disposal. The City relies on the Basin for the majority of its water supply. As manager of the Basin, OCWD strives to maintain and increase the reliability of the Basin by increasing recycled water usage to replace dependency on groundwater. To further this goal, OCWD and OCSD have jointly constructed the Green Acres Project (GAP) and the OCWD Groundwater Replenishment System (GWRS). GAP provides an alternate source of water to the Cities of Fountain Valley, Huntington Beach, Newport Beach, Santa Ana, and Mesa Consolidated Water District. Approximately 100 sites use GAP water and some current water users include Mile Square Park in Fountain Valley, Costa Mesa Golf Course, Chroma Systems carpet dyeing, Kaiser Permanente and Caltrans. The GWRS has operated since 2008 by taking highly treated sewer water, purifying it to levels that meet drinking water standards, and injecting and percolating the recycled water into the groundwater basin to form a seawater barrier and for groundwater replenishment. Since water from the GWRS is utilized to recharge the groundwater basin and the City extracts water from the groundwater basin, they are, in effect, practicing indirect potable water reuse of recycled water.

4.6 Projected City Water Supply

Projected normal year, i.e. non dry-year supply, by source for the City through the year 2040 is shown in Table 4.6. Imported water supplies are maintained the same as estimated in the City's 2015 UWMP since the City's and Metropolitan's UWMPs demonstrated those supplies to be reliable. Groundwater supply is decreased relative to the 2015 groundwater supply estimates to supply the net reduced demands of the Proposed Project but including the net additional demands for the Beckman Business Center, to be conservative as discussed previously in Section 4.1. As shown in Table 4.6, the ratio of groundwater supply to groundwater plus imported supply is at or below 70.2 percent, which is less than the BPP goal of 75.0 percent set by OCWD as discussed previously. However, the City has the ability and will likely utilize higher percentages of groundwater at least up to the BPP whenever possible so there is added reliability and flexibility in terms of supplying required water demands.

Table 4.6
Projected Normal Year City Water Supply (AFY)

Water Sources	2020	2025	2030	2035	2040
Supply	**Normal Water Years**				
Imported[1]	8,010	8,598	8,657	8,655	8,667
Groundwater[2]	18,826	18,446	18,584	18,578	18,607
Total Supply	**26,836**	**27,044**	**27,241**	**27,233**	**27,274**
Groundwater Percentage (BPP)	70.2%	68.2%	68.2%	68.2%	68.2%

[1] From Table 3-4, City of Fullerton 2015 UWMP

[2] Volume of groundwater required to balance demand and supply (including additional net demands from Beckman Business Center and Proposed Project from Section 3) assuming imported water is equivalent to what was included in City's 2015 UWMP and including water loss.

5.0 RELIABILITY OF WATER SUPPLIES

This section provides a description of Metropolitan's, OCWD's, and City of Fullerton's efforts in securing adequate water supply as well as reliability of the region and City's normal, single dry year, and multiple dry year supplies.

The Southern California region faces a challenge in satisfying its water requirements and securing firm water supplies. Increased environmental regulations and the competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth correspond to increased water demands within the region, putting an even larger burden on local supplies.

Reliability is a measure of a water system's ability to manage water shortages. Reliability planning requires information about the following: (1) expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur. The reliability of the City's water supply is currently dependent on the reliability of both groundwater and imported water supplies, which are managed and delivered by OCWD and Metropolitan, respectively. Despite the ongoing water supply challenges within the region, the goal and statutory mission of these agencies are to identify and develop projects to meet the water demands in the region. Sections 5.1 and 5.2 discuss these agencies, their roles in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the City and the region as a whole.

State funding has been made available, through California voters' approval, to increase reliability of state water supplies. In March 2000, California voters approved Proposition 13, which authorized the State to issue $1.97 billion of its general obligation bonds for water projects. Additionally, California voters approved Proposition 50 in November 2002 and Proposition 84 in November 2006, which authorized the issuance by the State of $3.4 billion and $5.4 billion, respectively, of its general obligation bonds for water projects. Types of water projects that were eligible for funding under Propositions 13, 50, and 84 of these programs included water conservation, groundwater storage, water treatment, water quality, water security and Colorado River water management projects, many of which are within the scope of the California Plan. The 2014 Water Bond, through Proposition 1, provides funding to implement the three broad objectives of the California Water Action Plan:

1. More reliable water supplies
2. Restoration of important species and habitat
3. A more resilient, sustainably managed water resources system

It includes allocations of $1,495 million administered by the California Department of Fish and Wildlife under Chapter 6 for watershed restoration and Delta water quality and ecosystem restoration grants. Proposition 1 also includes the following funding administered by DWR: $810 million for regional water reliability under Chapter 7 including integrated regional water

management (IRWM) and water conservation and water use efficiency (WUE), $725 million for water recycling under Chapter 9 including desalination and advanced treatment technology, $900 million for groundwater sustainability under Chapter 10 including local plans and projects to manage groundwater, $395 million for flood management under Chapter 11 including reducing risk of levee failure and flooding in the Delta and statewide flood management. Additionally, the 2015 Agricultural Water Use Efficiency Grants provide a funding limit of $30 million and CalConserve water use efficiency revolving fund loans provide another $10 million limit. These funding levels include funds appropriated in a current or prior year budget.

5.1 Metropolitan Water District Supply Reliability

Metropolitan was formed in the late 1920's. Collectively, charter members recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of Southern California depended upon the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of Southern California possible.

Metropolitan acquires water from Northern California via the State Water Project (SWP) and from the Colorado River to supply water to most of Southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its 26 member agencies. One such member agency is the City of Fullerton.

Through the Integrated Resources Plan and subsequent updates including the 2015 update, Metropolitan has worked toward identifying and developing water supplies to provide 100 percent reliability. Due to competing needs and uses for all of the water sources and regional water operational issues, Metropolitan has undertaken a number of planning processes: the Integrated Resources Planning (IRP) Process, the Water Surplus and Drought Management (WSDM) Plan, the Urban Water Management Plan, and the Water Supply Allocation Plan (WSAP). Combined, these documents provide a framework and guidelines for optimum water planning into the future.

The reliability and operational issues related to Metropolitan's various sources of supply are discussed in detail by major source in the subsequent sections.

State Water Project

The SWP is owned and operated by the California Department of Water Resources (DWR). The reliability of the SWP impacts Metropolitan's member agencies' ability to plan for future growth and supply. On an annual basis, each of the 29 SWP contractors, including Metropolitan, request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full Table A Amount,[22] currently at 1,911,500 AFY. The full

[22] Generally, two types of deliveries are assumed for all SWP contractors: Table A and Article 21. Table A Amount is the contractual amount of allocated SWP supply, set by percentage amount annually by DWR; it is scheduled and uninterruptible. Article 21 water refers to the SWP contract provision defining this supply as water that may be made available by DWR when excess flows area available in the Delta (i.e., Delta outflow requirements have been met, SWP storage south of the Delta is full, and conveyance capacity is available beyond that being used for SWP operations and delivery of allocated and scheduled Table A supplies). Article 21 water is made available on an unscheduled and interruptible basis and is typically available only in average to wet years, generally only for a limited time in the later winter.

Table A amount is defined as the maximum amount of imported water to be delivered and is specified in the contract between the DWR and the contractor. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply. Once the percentage is set early in the water year, the agency can count on that amount of supply or more in the coming year. The percentage is typically set conservative and then held or adjusted upwards later in the year based on a reassessment of precipitation, snow pack, etc.

DWR prepares a SWP Delivery Capability Report approximately every two years to update their estimates of SWP water deliveries for current conditions and conditions 20 years in the future. The latest of these reports is the Final State Water Project Delivery Capability Report 2017 prepared by DWR and dated March 2018. The 2017 Delivery Capability Report presents the current DWR estimate of the amount of water deliveries for current conditions and conditions 20 years in the future. Many of the same specific assumptions on SWP operations described in the SWP Delivery Capability Report 2015, which Metropolitan would have relied upon in preparation of its 2015 UWMP, remain the same in this update for 2017. Most notably, the effects on the timing and the amount of SWP and Central Valley Project (CVP) diversions, by operating system to meet the constraints spelled out in accordance with the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on December 15, 2008, and June 4, 2009, respectively (federal biological opinions or BiOps). In addition, these estimates of future capability also reflect potential impacts of climate change and sea level rise.

Metropolitan used modeling studies from the 2015 DCR to develop SWP supply forecasts in their 2015 UWMP. Metropolitan used the Base Scenario as the current 2015 condition and transitioned to the delivery capability from the Early Long-Term Scenario in the next five years. For 2020 through 2029, Metropolitan used the forecasts from the Existing Conveyance Low Outflow Scenario. Metropolitan used the Alternative 4a study associated with the recirculated draft EIR/supplemental draft EIS on the California Water Fix for SWP deliveries for 2030 and beyond.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Metropolitan has worked collaboratively with the other contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

Metropolitan has made rapid progress to date developing SWP storage and transfer programs. Metropolitan has contractual rights to 65 TAF of flexible storage at Lake Perris (East Branch terminal reservoir) and 154 TAF of flexible storage at Castaic Lake (West Branch terminal reservoir). This storage provides Metropolitan with additional options for managing SWP deliveries to maximize yield. Over multiple dry years, it can provide Metropolitan with 73 TAF of additional supply. In a single dry year like 1977, it can provide up to 219 TAF of additional supply.

Colorado River Aqueduct

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. Water from the Colorado River or its tributaries is also available to other users in California, as well as to users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming (the "Colorado River Basin States"), resulting in both competition and the need for cooperation among these holders of Colorado River entitlements. In addition, under a 1944 treaty, Mexico has an allotment of 1.5 million acre-feet of Colorado River water annually, except in the event of extraordinary drought or serious accident to the delivery system in the United States, when the water allotted to Mexico would be curtailed. Mexico also can schedule delivery of an additional 200,000 acre-feet of Colorado River water per year if water is available in excess of the requirements in the United States and the 1.5 million acre-feet allotted to Mexico.

The Colorado River Aqueduct (CRA), which is owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. After deducting for conveyance losses and considering maintenance requirements, up to 1.2 million acre-feet of water a year may be conveyed through the Colorado River Aqueduct to Metropolitan's member agencies, subject to availability of Colorado River water for delivery to Metropolitan as described below.

California is apportioned the use of 4.4 million acre-feet of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to, but not used by, Arizona and Nevada when such supplies have been requested for use in California. Under the 1931 priority system that has formed the basis for the distribution of Colorado River water made available to California, Metropolitan holds the fourth priority right to 550,000 acre-feet per year. This is the last priority within California's basic apportionment of 4.4 million acre-feet. In addition, Metropolitan holds the fifth priority right to 662,000 acre-feet of water, which is in excess of California's basic apportionment.

Metropolitan's planning strategy recognized explicitly that program development would play an important part in reaching the target level of deliveries from the CRA. The implementation approach explored a number of water conservation programs with water agencies that receive water from the Colorado River or are located in proximity to the CRA. Negotiating the Quantification Settlement Agreement (QSA) was a necessary first step for these programs. On October 10, 2003, representatives from Metropolitan, Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD) executed the QSA and other related agreements. Parties involved also included San Diego County Water Authority (SDCWA), DWR, California Department of Fish and Wildlife (DFW), the U.S. Department of the Interior, and the San Luis Rey Settle Parties. One of those related agreements was the Colorado River Water Delivery Agreement: Federal QSA which specifies to which agencies water will be delivered under priorities 3a and 6a of the Seven Party Agreement during its term.

Metropolitan has identified a number of programs that could be used to achieve the regional long-term development targets for the CRA as listed below. For details of these programs, reference Metropolitan's 2015 UWMP, Section 3.

- Imperial Irrigation District/Metropolitan Conservation Program
- Palo Verde Land Management, Crop Rotation, and Water Supply Program
- Management of Metropolitan-Owned Land in Palo Verde
- Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement
- Lower Colorado Water Supply Project
- Lake Mead Storage Program
- Quagga Mussel Control Program

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. 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 the WSAP, is dependent on its storage resources.

In developing the supply capabilities in the 2015 UWMP, Metropolitan assumed the current (2015) storage levels at the start of simulation and used the median storage levels going into each of the five year increments based on the balances of supplies and demands. Under the median storage conditions, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used. All storage capability figures shown in the 2015 UWMP reflect actual storage program conveyance constraints. Under some assumptions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet demands.

Supply Management Strategies

On the regional level, Metropolitan has taken a number of actions to secure a reliable water source for its member agencies. Metropolitan developed a WSAP [23] and has utilized it initially in 2009 and 2010 and in 2015 for dealing with potential shortages that took into consideration the impact on retail customers and the economy, changes and losses in local supplies, the investment in and development of local resources, and conservation achievements. Additional actions taken by Metropolitan over the past several years have increased spending on conservation, local projects and water supply/reliability enhancements significantly.

This spending plan included expenditures for the improvement of water conveyance facilities, water transfers, and providing financial assistance to member agency's local conservation, recycling, and groundwater clean-up efforts, and is continuing. To fund these past and future

[23] Metropolitan Water District Press Release dated February 12, 2008.

expenditures on conservation, recycling and other local projects, Metropolitan Tier 1 treated water rates were increased by almost 54 percent for the 5-year period from January 1, 2009 to January 1, 2014. This rate has since increased more modestly by 1.5 percent each year for 2015 and 2016, 4 percent each year for 2017 and 2018 and 3 percent each year for 2019 and 2020.

5.2 Orange County Water District Supply Reliability

As has been discussed throughout this WSA, the primary source of water for the City is the Orange County Groundwater Basin (Basin). OCWD is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the Basin.[24] OCWD replenishes and maintains the Basin at safe levels while significantly increasing the Basin's annual yield by utilization of the best available technology. Other than recycled water, OCWD primarily recharges the Basin with water from the Santa Ana River and to a lesser extent with imported raw water purchased from Metropolitan.

According to the OCWD's 2018/19 Engineer's Report, approximately 137,700 acre-feet of water was supplied to the Basin as (1) directly from the percolation or injection of purchased imported water from the Colorado River and State Water Project, and (2) use of recycled water to supplement purchased imported water in the Alamitos seawater intrusion barrier, and (3) use of GWRS recycled water.

As of January 2008, OCWD began recharging recycled water from the Groundwater Replenishment System (GWRS). The GWRS, the largest water purification project of its kind in the world, can currently produce up to 100 million gallons per day (MGD) or 105,000 AFY of recycled water and has increased Orange County's water independence by providing a locally controlled, drought-proof supply of safe, high-quality water. The initial expansion of GWRS was completed in 2015 increasing its capacity from 70 to 100 MGD. Other processes such as local agency recycling of wastewater, conservation and water use efficiency programs, and creative water purchases have aided in replenishing the basin to desired levels to meet required demands.

As discussed previously, OCWD establishes the Basin Production Percentage (BPP) each water year. The BPP is set based on groundwater conditions, availability of imported water supplies, ideal precipitation, Santa Ana River runoff, and basin management objectives. Resolution No. 13-1-6 adopted on January 16, 2013 by the OCWD Board of Directors stated the District's goal to develop the necessary supplies and facilities to achieve and maintain a 75 percent BPP, long-term. Based on previous OCWD water budgets and water replenishment, an average projected BPP between 65 and 69 percent had been documented and was projected to increase by approximately 7 percent as a result of the GWRS Expansion Project discussed above. This was based on the 30 MGD expansion conservatively yielding approximately 31,000 AFY and a projected total demand within the Basin approaching 450,000 AFY (31,000/450,000 = 6.9%).[25]

[24] OCWD Groundwater Management Plan, 2009.

[25] Orange County Water District Resolution No. 13-1-6 and Presentation at January 16, 2013 OCWD Board of Directors Meeting.

The BPP is a major factor for the City in determining the cost of groundwater production. For groundwater production equal to or less than the BPP, groundwater producers including Fullerton pay a replenishment assessment. If groundwater production greater than the BPP occurs, a Basin Equity Assessment (BEA) will be assessed. The BEA is an additional fee paid on each acre foot (AF) of water pumped above the BPP, making the total cost of that water to Fullerton equal to the cost of imported water from Metropolitan.

Total water demand within OCWD was 393,222 AF for the 2018-19 water year (beginning July 1, 2018 and ending June 30, 2019). In the same period, groundwater production (including In-Lieu Program water and excluding Metropolitan Groundwater Storage Program extractions) for the water year totaled 303,396 AF. For the water year, a total of 42,379 AF of supplemental water was used for the purpose of groundwater replenishment and barrier maintenance to prevent seawater intrusion from occurring in areas of the groundwater basin adjacent to the Pacific Ocean in Huntington Beach, Costa Mesa, and Fountain Valley.

A BPP of 77 percent is currently being proposed for the ensuing water year 2020-21.[26] Analysis of the groundwater basin's projected accumulated overdraft, the available supplies to the basin (assuming below-average hydrology) and the projected pumping demands indicate that this level of pumping could potentially be sustained for 2020-21 without detriment to the basin. Under normal conditions, the annual production could reach 323,000 AF. However, it is anticipated that the groundwater production for the 2020-21 water year will decrease to approximately 224,000 AF due to the water quality impacts of PFAS. Because of the State DDW setting of a Response Level of 10 parts per trillion for perfluorooctanic acid, OCWD anticipates that up to 70 production wells could be shut down until treatment systems can be installed.[27]

Based on the groundwater basin conditions for the water year ending June 30, 2019, OCWD may purchase up to 160,000 AF for groundwater basin replenishment during the ensuing water year, beginning July 1, 2020, pursuant to the District Act. Since the formation of OCWD in 1933, OCWD has made substantial investment in facilities, basin management and water rights protection, resulting in the elimination and prevention of adverse long-term "mining" overdraft conditions. OCWD continues to develop new replenishment supplies, recharge capacity and basin protection measures to meet projected production from the basin during average/normal rainfall and drought periods.[28] OCWD has invested in seawater intrusion control (injection barriers), recharge facilities, laboratories and basin monitoring to effectively manage the basin. Some of these programs include:

Recharge Facilities - OCWD currently owns and operates more than 1,500 acres of surface water recharge facilities in and adjacent to the SAR and Santiago Creek. OCWD has built a recharge system that provides the majority of water supplied by the District. The 17 major facilities in the Anaheim/Orange area are grouped into four major components: the Main River System, the Off-River System, the Deep Basin System, and the Burris Pit/Santiago System. Each system has a

[26] OCWD. Engineer's Report, 2018/19, February 2020.
[27] OCWD. Engineer's Report, 2018/19, February 2020.
[28] Orange County Water District, *Groundwater Management Plan, 2015 Update,* June 17, 2015.

series of percolation spreading basins, either shallow or deep, whose sidewalls and bottoms allow for percolation into the underlying aquifer.

Seawater Intrusion Barriers - OCWD's Talbert Barrier is composed of a series of injection wells that span the 2.5-mile-wide Talbert Gap between the Newport and Huntington mesas. The Talbert Barrier wells can inject approximately 36,000 AFY of water into four aquifer zones.[29] Injecting water through the wells forms a hydraulic barrier to seawater that would otherwise migrate inland toward areas of groundwater production.

The Alamitos seawater intrusion barrier is composed of a series of injection wells that span the Los Angeles/Orange County line in the Seal Beach-Long Beach area. It is operated by the Los Angeles County Department of Public Works (LACDPW) in cooperation with OCWD and the Water Replenishment District (WRD). The source of this water is a blend of purified wastewater from WRD and potable supplies from Metropolitan. Also, the Alamitos Barrier System includes four extraction wells located seaward of the injection barrier to create a pumping trough to remove the degraded brackish groundwater.

Groundwater Monitoring – OCWD has one of the most sophisticated groundwater monitoring programs in the country. The District runs more than 350,000 analyses of water from more than 650 wells every year. OCWD performs nearly 50 percent more water quality tests than it is required to do in order to ensure the highest water quality possible. In 2004, OCWD completed a 10-year, $10 million Santa Ana River Water Quality and Health Effects Study, which demonstrated the safety of SAR water as a source for recharging the groundwater basin. A panel of nationally recognized experts provided an independent review of the study and validated its positive results.

OCWD Long Term Facilities Plan (LFTP)

OCWD developed a LTFP through a series of discussions in 2008-2009 with its Board of Directors and producers. It was received and filed by the Board in July 2009. Its purpose was to evaluate potential basin and water quality enhancement projects that may be implemented in the 20-year planning period. In 2012, OCWD staff made a presentation to the OCWD Board updating the progress on the 19 projects included in the LTFP and recommended the LFTP purpose going forward include the following:

- Identify and evaluate potential projects to:
    - cost effectively increase the amount of sustainable yield
    - protect and enhance groundwater quality
    - increase operational efficiency
- Prioritize efforts for next 3 to 5 years
- Assist with preparation of capital improvement program budget

[29] Orange County Water District, *Groundwater Management Plan, 2015 Update,* June 17, 2015.

- Becomes a living document, updated periodically

The LTFP utilizes the most recent information developed in OCWD's Groundwater Management Plan and Recharge Development Study. The LTFP includes a master list of developed and proposed projects. The various projects are grouped into five categories: (1) recharge facilities, (2) water source facilities, (3) basin management facilities, (4) water quality management facilities, and (5) operational improvements facilities. Each project is evaluated using criteria such as technical feasibility, cost, institutional support, functional feasibility, and environmental compliance. The LTFP currently tracks 19 projects that are either under construction or completed, in design or feasibility study completed, or in concept stage. Staff completed updating the LFTP and a copy of the LFTP 2014 Update, dated November 19, 2014 is on OCWD's website (ocwd.com).

OCWD Groundwater Management Plan (GMP)

OCWD finalized its GMP in June 2015, which updated its 2009 and 2004 GMPs. The GMP complies with SB 1938, passed in 2002, which includes a list of items to be included in a GMP. A copy of this GMP is available on OCWD's website (ocwd.com). The GMP's objectives include (1) protecting and enhancing groundwater quality, (2) increasing the basin's sustainable yield in a cost-effective manner, and (3) increasing operational efficiency.[30] Various programs, policies, goals, and projects are defined in the GMP to assist OCWD staff meet these objectives. The potential projects described in the GMP are discussed in further detail in the LTFP. The GMP describes the following:

- the background and purpose of the GMP
- the hydrogeology of the basin
- the range of activities and management programs, including groundwater monitoring, groundwater quality management, production management, recharge water supply, and improvement projects
- the historical and future water demands and integrated demand/supply management strategies
- the financial management programs
- the recommendations for continued proactive basin management

OCWD 2020 Water Master Plan Report (MPR)

OCWD's 2020 Water Master Plan Report (MPR) describes local water supplies and estimates their availability extending to the year 2020. Specifically, OCWD states in their 2020 Water MPR that significant water supply sources will be available in the future for potable, non-potable, and recharge purposes. The 2020 Water MPR discusses source waters such as imported water from Metropolitan, base flows from the Santa Ana River, treated wastewater through the OCWD/OCSD

[30] Orange County Water District, Groundwater Management Plan, June 17, 2015.

GWRS program, and possibly desalinated ocean water. The local supplies' availability and projections from the 2020 Water MPR are incorporated in the LTFP.

OCWD Huntington Beach Sea Water Desalination Facility

As technology progresses, additional water supplies and facilities are being brought on line to further assure water supply reliability well into the future.

One recent example is the proposal by Poseidon Resources, Inc. to build a 50 MGD (56,000 AFY) seawater desalination project in Huntington Beach called the Huntington Beach Sea Water Desalination Facility. Poseidon Resources Corporation is working with local and state agencies to obtain the required permits to ensure proper safeguards to the community and environment.

The Environmental Impact Report was certified in September 2005 by the Huntington Beach City Council. The City Council also approved the Coastal Development Plan, Conditional Use Permit, and Owner's Participation Agreement for the facility in February 2006. In 2014 the California Coastal Commission issued a staff report on the project requiring a revised intake facility that Poseidon Resources indicated could render the project infeasible and pulled their application pending additional studies.

In 2015, OCWD approved a term sheet to purchase all 56,000 AFY of water from the proposed HBDP. The term sheet calls for Poseidon to permit, finance, construct and operate the treatment plant. OCWD would be responsible for purchasing the water and for permitting, financing, constructing and operating the necessary system to distribute the water to the local Orange County water community.

As part of the planning process, OCWD has been considering a variety of water conveyance and utilization options they might implement once it purchases the desalinated water from the HBDP. One of these options includes potential modifications to OCWD's existing groundwater basin recharge and seawater barrier operations. Additionally, OCWD has been working with other water agencies in the area who may be interested in participating in the integration of the desalinated water supply.

5.3 City of Fullerton Water Supply Reliability Measures

Reliability is a measure of a water system's expected success in managing water shortages. The City has strategies to manage water demand with respect to frequency and magnitude of supply deficiencies. The City's Water Supply Shortage Conservation Plan (WSSCP) was established to provide procedures, rules and regulations for mandatory conservation to minimize the effect of a water supply shortage emergency on the City's water customers. The City Council will vote to implement the WSSCP if it finds and determines one or more of the following:

- A shortage could exist due to increased demand or limited supplies
- Storage or distribution facilities of the City become inadequate
- A major local or regional supplier experiences a major failure or contamination

- The City's wholesale water providers call for an allocation of water supply combined with a penalty rate and/or extraordinary water conservation measures.

When a water shortage appears imminent, the City Manager shall notify the City Council and recommend holding a public hearing to determine whether a shortage exists and determine the appropriate phase of the water supply shortage.

There are four shortage phases and supply conditions. The water supply conditions for the phases to be implemented included;

- Increased demand or limited supply
- Distribution or storage facilities of the City become inadequate
- A major failure or contamination of the supply
- Shortage
- Failure of storage and/or distribution facilities of Metropolitan, OCWD, and/or City occurs
- The City's wholesale water providers, Metropolitan and OCWD, call for an allocation of water supply combined with an allocation penalty rate
- Other extraordinary water conservation measures

The WSSCP lists water conservation requirements that shall take effect upon implementation by the City Council. These prohibitions shall promote the efficient use of water, reduce or eliminate water waste, complement the City's Water Quality regulations and urban runoff reduction efforts, and enable implantation of the City's Water Shortage Contingency Measures. Water conservation measures become more restrictive at each progressive stage in order to address the increasing differential between the water supply and demand.

Any customer who violates provisions of the WSSCP by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by the City and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination. It is unlawful for any customer of the Utility to fail to comply with any provisions following a violation. The first and second violation of the Water Shortage Emergency Phases by any person shall result in the Utility issuing a written notice along with a possible fine. The City may install a flow restrictor or discontinue water service to the customer in violation of the Water Shortage Conservation measures after three violation within a twelve-month period.

The complete WSSCP is contained in the Fullerton Municipal Code Chapter 12.06, as updated in 2008. The City does not have a set percent of supply reduction for each of the four stages of shortage but will determine the percent reduction as it enters into each stage.

The City will use its CIS Infinity Customer Information and Billing Software to determine actual reductions in water use pursuant to the water shortage contingency analysis. By using the data management capabilities of the CIS software, the City can prepare detailed reports regarding

present and historical data on a monthly, quarterly, semi-annual, and annual basis, including water consumption, sales and revenues.

The City of Fullerton has had a successful track record in implementing water conservation programs. In response to the Governor Brown's April 2015 Executive Order (EO) B-29-15 calling for a 25 percent statewide reduction and the State Water Board's target conservation set for Fullerton of an aggressive 28 percent below demands of 2013, the City had reduced its water demand by a cumulative 20.4 percent, through August 2016. It should be noted that the State Water Board then approved a reduction in Fullerton's target water conservation goal of 28 percent less than 2013 demands by 7 percent to 21 percent. This reduction was in recognition of the significant new water supply provided by the GWRS project, available to all OCWD members. Over the ensuing three year period from 2015/16 to 2018/19, demands have increased 2.1 percent with a comparable population growth of 1.4 percent so there has been a slight bounce back as anticipated.

In May 2016, the Governor issued EO B-37-16, which continued the requirement for monthly reporting of water conservation levels versus 2013 use but allowed each urban water supplier to set its own target customized to fit its unique conditions. Following this EO, the State Water Board adopted a revised emergency regulation which extends restrictions on urban water use through January 2017. Under the new regulation, the state-mandated conservation targets were replaced with locally determined measures established under a self-certification approach ("Stress Test"). The Stress Test requires each water supply agency to demonstrate whether or not they require a water use reduction requirement under specific, extreme conditions of high demand and low precipitation over the next three years, assuming the drought continues.

On June 15, 2016, Metropolitan released results of their analysis demonstrating it has sufficient water supplies to meet the demand of its member agencies, including Fullerton, under these conditions. In a memo dated June 17, 2016 from OCWD to the State Water Board, OCWD demonstrated they have adequate supply for their 19 water agencies, including Fullerton, and included supplying the City an average of 20,464 AFY for FY 16-17 to FY 18-19 from the Basin. As shown later in Tables 5-3 and 5-4, the City will only require 19,956 AFY in single and multiple dry years from Groundwater in 2020, one year past the Stress Test period. City staff conducted an assessment of Fullerton's water supply, pursuant to hypothetical criteria set forth by the State and found that they are drought-prepared in the event of another three dry years and do not require a mandatory conservation target.

Since 2004, OCWD, MWDOC, and participating producers have participated in Metropolitan's Conjunctive Use Program (known as the Metropolitan Long-Term Groundwater Storage Program). This program allows for the storage of Metropolitan water in the Orange County Groundwater Basin. The existing Metropolitan storage program provides for Metropolitan to store up to 66,000 AF of water in the Basin in exchange for Metropolitan's contribution to improvements in Basin management facilities. These improvements included eight new groundwater production wells, improvements to the seawater intrusion barrier, and construction of the Diemer Bypass Pipeline. This water can then be withdrawn over a three-year period.

Metropolitan's replenishment program has historically been used to increase storage in the Basin. This program has allowed Metropolitan to sell groundwater replenishment water to OCWD and make direct deliveries to agency distribution systems in lieu of producing water from the Basin when surplus imported water is available. This program indirectly replenishes the Basin by avoiding pumping. In the in-lieu program, OCWD requests an agency to halt pumping from specified wells. The agency then takes replacement water through its import connections, which is purchased by OCWD from Metropolitan (through MWDOC). OCWD then bills the agency for the amount it would have had to pay for energy and the Replenishment Assessment (RA) if it had produced the water from its wells. The deferred local production results in water being left in local storage for future use.

As previously stated, groundwater is currently the most reliable and least expensive water resource for the City. The City plans to drill new wells to replace existing shallow and deteriorated wells and provide additional production capacity. Additional groundwater pumping capacity will add to the reliability of the system by: (1) meeting peak demands during the summer months; (2) providing a contingency for wells that are temporarily out of service; and (3) providing availability for any additional pumping requests from OCWD.

The City's long-term plans to assure a reliable water supply include, but are not limited to, the following:

- Reduction of water demand through aggressive water use efficiency programs.
- Groundwater production capacity and distribution ability to meet 100 percent of the water service area demands.
- Cooperation with OCWD to maximize conservation activities throughout Orange County and increase groundwater recharge capabilities.

As discussed earlier, the reliability of the City's water supply is currently dependent on the reliability of both groundwater and, to a lesser extent, imported water supplies, which are managed and delivered by OCWD and Metropolitan, respectively.

5.4 Dry Year Reliability Comparison

Metropolitan Supplies and Demands

As previously noted, the City of Fullerton is a direct member agency of Metropolitan. In their 2015 UWMP, Metropolitan estimated supply capability and projected demands for an average (normal) year based on an average of hydrologies for the years 1922-2012; for a single-dry year based on a repeat of the hydrology in the year 1977; and for multiple-dry years based on a repeat of the hydrology of 1990-1992. These single and multiple-dry year hydrologies were also used in Metropolitan's 2010 UWMP, 2010 IRP and 2015 IRP as they historically represent the timing of the least amount of available water resources from the SWP, a major source of Metropolitan's supply.

Metropolitan developed demand forecasts by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation. Projections of local supplies then were derived using data on current and expected local supply programs and the IRP Local Resource Program Target. The resulting difference between total demands net of conservation and local supplies is the expected regional demands on Metropolitan supplies. These estimates are summarized by category in Table 5.1 for Average, Single Dry and Multiple Dry Year scenarios. More detailed information on Metropolitan's forecasts and these tables can be found in their 2015 UWMP. In all scenarios shown on Table 5.1 there is a projected surplus, even without Metropolitan's Supplies Under Development and Potential Supplies.

Table 5.1
Metropolitan Regional Water Supplies & Demands
Single Dry, Multiple Dry and Average Years (Acre-Feet)

Single Dry Year MWD Supply Capability and Projected Demands (1977 Hydrology)					
Fiscal Year	**2020**	**2025**	**2030**	**2035**	**2040**
Capability of Current Supplies	2,584,000	2,686,000	2,775,000	2,905,000	2,941,000
Projected Demands	2,005,000	2,066,000	2,108,000	2,160,000	2,201,000
Projected Surplus	579,000	620,000	667,000	745,000	740,000
Projected Surplus %[(a)]	29%	30%	32%	34%	34%
Supplies under Development	63,000	100,000	316,000	358,000	398,000
Potential Surplus	642,000	720,000	983,000	1,103,000	1,138,000
Potential Surplus %[(a)]	32%	35%	47%	51%	52%
Multiple Dry Year MWD Supply Capability and Projected Demands (1990-1992 Hydrology)					
Fiscal Year	**2020**	**2025**	**2030**	**2035**	**2040**
Capability of Current Supplies	2,103,000	2,154,000	2,190,000	2,242,000	2,260,000
Projected Demands	2,001,000	2,118,000	2,171,000	2,216,000	2,258,000
Projected Surplus	102,000	36,000	19,000	26,000	2,000
Projected Surplus %[(a)]	5%	2%	1%	1%	0.1%
Supplies under Development	43,000	80,000	204,000	245,000	286,000
Potential Surplus	145,000	116,000	223,000	271,000	288,000
Potential Surplus %[(a)]	7%	5%	10%	12%	13%
Average Year MWD Supply Capability and Projected Demands (1922 - 2012 Hydrology)					
Fiscal Year	**2020**	**2025**	**2030**	**2035**	**2040**
Capability of Current Supplies	3,448,000	3,550,000	3,658,000	3,788,000	3,824,000
Projected Demands	1,860,000	1,918,000	1,959,000	2,008,000	2,047,000
Projected Surplus	1,588,000	1,632,000	1,699,000	1,780,000	1,777,000
Projected Surplus %[(a)]	85%	85%	87%	89%	87%
Supplies under Development	63,000	100,000	386,000	428,000	468,000
Potential Surplus	1,651,000	1,732,000	2,085,000	2,208,000	2,245,000
Potential Surplus %[(a)]	89%	90%	106%	110%	110%

(a) As a percentage of projected demand
Source: Tables 2-4, 2-5 and 2-6 of Metropolitan's 2015 UWMP, June 2016.

City of Fullerton Water Utility

This section addresses demand and supply projections for the City including the Proposed Project for Average, Single Dry, and Multiple Dry Years. The City's water demand in fiscal year 2014/15 was 27,244 AF per their 2015 UWMP (Table 4.1, herein). By the year 2039/40, the City's water demand was projected to be 28,891 (Table 4.4, herein). All demand values above include a 5.7 percent allowance for unaccounted-for or non-revenue water, consistent with the 2015 UWMP. Since adoption of the 2015 UWMP, the City has approved one WSA, which was for the Beckman Business Center. The Beckman Business Center was not specifically identified in the 2015 UWMP; however, demand growth in the service area through Year 2040 was projected. To provide a conservative estimate, the specific demand estimated for the Beckman Business Center in that previously approved WSA is added to the demand projections included in the City's 2015 UWMP, along with the net demand reduction due to the Proposed GLC-Fullerton Project.

The City's 2015 UWMP was used to project 2020 and future City-wide water demand based on future growth projections from that document.

Past hydrologic data and their effect on historic water demand were considered to determine factors for single-dry and multiple-dry years, which is consistent with the City's 2015 UWMP. The 2015 UWMP used a single-dry year increase of 6.0 percent from the normal water year, and for multiple-dry year demands (three-year period) the same 6.0 percent increase from the normal water year demand is utilized. These same percentage demand increases are utilized in this WSA.

The average BPP for the past twenty years has been approximately 73 percent. Based on OCWD's Resolution 13-1-6 as discussed earlier, OCWD has established a goal of achieving and maintaining a 75 percent BPP into the future. In projecting future supply reliability, a BPP of 70 percent is used for future periods in normal and dry year periods with the remaining 30 percent coming from imported Metropolitan water to supply demands projected in the City's 2015 UWMP, without the Proposed Project. And since Metropolitan has deemed its supplies adequate in normal and dry periods, the 30 percent imported is deemed reliable for the City. Importantly, and as has been stated above, the City can produce groundwater above the conservative assumptions included in the 2015 UWMP and, if necessary, above the BPP. If production above the BPP occurs, the producer pays the BEA pump tax which is a higher payment as compared to the RA that is paid by a producer for groundwater produced within the BPP limits. And due to the impending PFAS issues imported water may increase substantially for a year to 18 months while treatment facilities are constructed but that should only be temporary in the scheme of long-term water supply.

Even though Metropolitan shows a substantial surplus in all cases, imported water supply to the City as set forth in Tables 5.2 through 5.4 is set at the same fixed amount as in the similar projection tables from the City's 2015 UWMP with difference in net supply needed due to the Beckman Business Center and the Proposed Project coming from groundwater. As stated above and illustrated in Tables 5.2 through 5.4, the fact that the BPP does not even have to approach 70 percent shows there is adequate water supply for the anticipated demand with the City water service area. It also demonstrates the added reliability and flexibility in terms of supplying the

required water demands since the City has the ability and will likely utilize higher percentages of groundwater at least up to the BPP whenever possible.

Table 5.2 presents future normal year water demands based on the 2015 UWMP and the demands for the Beckman Business Center and the net decrease in demand on the Proposed Project site as detailed in Section 3. Table 5.3 shows single dry water year supply and demand projections. Table 5.4 shows the multiple dry water years projected supply and demand projections. All demand data includes unaccounted-for-water or non-revenue water of 5.7 percent based on average water losses and the single and multiple dry year projections include a 6.0 percent demand increase to account for dry year conditions as utilized in the City's 2015 UWMP.

Table 5.2
City of Fullerton Projected Water Supply and Demand
Normal Year (AFY)

Water Sources	2020	2025	2030	2035	2040
Supply	**Normal Water Years**				
Imported[1]	8,010	8,598	8,657	8,655	8,667
Groundwater[2]	18,826	18,446	18,584	18,578	18,607
Groundwater/Total Supply	70.2%	68.2%	68.2%	68.2%	68.2%
Total Supply	**26,836**	**27,044**	**27,241**	**27,233**	**27,274**
Demand[3]					
Total City Demand without Proposed Project[4]	26,699	28,661	28,858	28,850	28,891
Additional Beckman Business Ctr. Demand[5]	137	137	137	137	137
Net Additional Project Demand (Decrease)[5]	0	(1,754)	(1,754)	(1,754)	(1,754)
Total Demand	**26,836**	**27,044**	**27,241**	**27,233**	**27,274**

[1] Equal to 30 percent of Total City Demand without Proposed Project, assuming any net supply increase or decrease for Proposed Project, including Beckman Business Center (BBC) comes from Groundwater.

[2] This figure represents the amount of Groundwater required to balance demand and supply assuming Imported Water is equivalent to what was included in City's draft 2015 UWMP (30%).

[3] All Demands include 5.7% allowance for unaccounted-for or non-revenue water, consistent with City's 2015 UWMP.

[4] This figure represents normal year demand based on the City of Fullerton's 2015 UWMP, Table 3-6, excluding the additional BBC and net Proposed Project Demand.

[5] This figure represents the net additional BBC and Proposed Project Demand (decrease).

Table 5.3
City of Fullerton Projected Water Supply and Demand
Single Dry Year (AFY)

Water Sources	2020	2025	2030	2035	2040
Supply	**Single Dry Year**				
Imported[1]	8,490	9,114	9,177	9,174	9,187
Local (Groundwater)[2]	19,956	19,552	19,699	19,693	19,723
Groundwater/Total Supply	70.2%	68.2%	68.2%	68.2%	68.2%
Total Supply	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Demand[3]					
Total City Demand without Proposed Project[4]	28,301	30,381	30,589	30,581	30,624
Additional Beckman Business Ctr. Demand[5]	145	145	145	145	145
Net Additional Project Demand (Decrease)[5]	0	(1,859)	(1,859)	(1,859)	(1,859)
Total Demand	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**

[1] Equal to 30 percent of Total City Demand without Proposed Project, assuming any net supply increase or decrease for Proposed Project, including Beckman Business Center (BBC) comes from Groundwater.

[2] This figure represents the amount of Groundwater required to balance demand and supply assuming Imported Water is equivalent to what was included in City's 2015 UWMP (30%).

[3] All Demands include 5.7% allowance for unaccounted-for or non-revenue water and are 6.0% higher than normal year water demand due to drier conditions, both consistent with City's 2015 UWMP.

[4] This figure represents single dry year demand based on the City of Fullerton's 2015 UWMP, Table 3-7, excluding the additional BBC and Proposed Project Demand.

[5] This figure represents the net additional BBC and Proposed Project Demand (decrease) increased by 6.0% for dry year conditions.

Table 5.4
City of Fullerton Projected Water Supply and Demand
Multiple Dry Years (AFY)

Water Sources	2020	2025	2030	2035	2040
Supply	**First Multiple Dry Year**				
Imported[1]	8,490	9,114	9,177	9,174	9,187
Local (Groundwater)[2]	19,956	19,552	19,699	19,693	19,723
Groundwater/Total Supply	70.2%	68.2%	68.2%	68.2%	68.2%
Total Supply	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Total Demand[3]	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Supply	**Second Multiple Dry Year**				
Imported[1]	8,490	9,114	9,177	9,174	9,187
Local (Groundwater)[2]	19,956	19,552	19,699	19,693	19,723
Groundwater/Total Supply	70.2%	68.2%	68.2%	68.2%	68.2%
Total Supply	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Total Demand[3]	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Supply	**Third Multiple Dry Year**				
Imported[1]	8,490	9,114	9,177	9,174	9,187
Local (Groundwater)[2]	19,956	19,552	19,699	19,693	19,723
Groundwater/Total Supply	70.2%	68.2%	68.2%	68.2%	68.2%
Total Supply	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**
Total Demand[3]	**28,446**	**28,667**	**28,875**	**28,867**	**28,910**

[1] Equal to 30 percent of Total City Demand without Proposed Project, assuming any net supply increase or decrease for Proposed Project, including Beckman Business Center (BBC) comes from Groundwater.

[2] This figure represents the amount of Groundwater required to balance demand and supply assuming Imported Water is equivalent to what was included in City's 2015 UWMP (30%).

[3] All Demands include 5.7% allowance for unaccounted-for or non-revenue water and are 6.0% higher than normal year water demand due to drier conditions, both consistent with City's 2015 UWMP, Table 3-8. These figures include Total Dry Year Demand, including Proposed Additional Proposed Project Demand from Table 5.3.

It should be noted that imported water supplies are increased in single and multiple dry years consistent with Metropolitan's 2015 UWMP and IRP Reports due to the fact that in dry years Metropolitan draws water from surface and groundwater storage programs. These withdrawals from storage are illustrated, numerically, in both Metropolitan's 2015 UWMP and IRP. For all scenarios in Tables 5.2 through 5.4 the BPP for groundwater production is shown near or below the 70 percent assumed in the City's 2015 UWMP, which leaves a lot of room between there and the 77 percent set for 2020/21 and the 75 percent long-term goal adopted by the OCWD Board of Directors in Resolution 13-1-6.

Based on the demand and supply analysis shown in the following tables, this WSA does not envision any significant impacts with respect to water resources resulting from approval of the Proposed Project; thus no significant impacts were identified that require mitigation.

6.0 CONCLUSION

The City's total water demand in Fiscal Year 2014/15 was approximately 27,244 AFY including unaccounted-for water. This represented a significant decrease in per-capita usage and overall usage since the recorded demands of the City's service area in the 2010 Urban Water Management Plan. The reduced demands are attributable to conservation implemented since the State-wide drought and economic recession. By Year 2040 the City's 2015 UWMP estimated total production requirements for the water service area to be approximately 28,891 AFY, under normal hydrologic conditions.

Since the adoption of the 2015 UWMP in June 2016, the City has approved a WSA for the Beckman Business Center, which was assumed to be excluded from the projections of the UWMP and therefore added a demand of 137 AFY, including water losses under normal hydrologic conditions. The Proposed Project is estimated to lower water demand on the project site equating to a net reduction on the City system of 1,754 AFY by Project buildout, scheduled to occur prior to the 2025 5-year projection. Therefore, overall system demands are estimated to be decreased by a net 1,617 AFY over those projected in the 2015 UWMP, in years 2025 and beyond. Another conservative factor is the fact that actual Citywide water demand for FY 2019 was 23,893 AFY and the 2015 UWMP projected 2020 demands to be 26,669 AFY. Therefore, demands would have to increase 11.6 percent in one year to reach that projection, which is unlikely as the highest single year increase in the past eight years has been 7.4 percent.

The City makes the determination that sufficient water supplies are available now, and will be available 20 years from now, for its existing and projected demands including the Proposed Project, Goodman Logistics Center, based on the following:

1. The City of Fullerton is the identified Public Water System (supplier) for the Goodman Logistics Center.

2. The City is a member agency of OCWD and the Metropolitan Water District of Southern California.

3. The Goodman Logistics Center Project is not specifically identified in the 2015 UWMP; however, demand growth in the service area through Year 2040 has been projected, which is estimated and planned to be met by the City's current groundwater production and imported water rights. The City's 2015 UWMP is clear that even meaningfully higher water demand than anticipated would be met.

4. There is an estimated average annual net water demand decrease due to buildout of the Project of 1,754 AFY, which is equivalent to a reduction of 7.3 percent of the current 2019 water supply of 23,893 AFY.

5. Under normal, single-dry and multi-dry year conditions, the City will meet its water demand.

6. In general, the City's current water supply is highly reliable now and through Year 2040 based on performance of existing supplies and related management activities, as well as development of additional programs implemented and currently underway by OCWD and Metropolitan, and the cooperative efforts of MWDOC and its member agencies.

7. OCWD's on-going coordination with Metropolitan and its Integrated Water Resource Plan (IRP), including In-Lieu and groundwater banking programs, has provided a high level of reliability for all Metropolitan member agencies, including the City of Fullerton.

8. Reliability of the City's future water supplies will continue through on-going implementation of the OCWD Groundwater Management Plan, OCWD's Long Term Facilities Plan, local agency programs, and the combined efforts and programs among member and cooperative agencies of Metropolitan. These agencies include all water wholesalers and retailers, the Orange County Sanitation District, the Santa Ana Regional Water Quality Control Board, and the Santa Ana Watershed Project Authority.

Upon evaluation of the estimated water demands of the Goodman Logistics Center, and the information presented in the Water Supply Assessment, the City of Fullerton concludes that sufficient water supply exists now, and will be available for the Project through Year 2040.

7.0 REFERENCES

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