

CITY OF SANTA ANA

WATER SUPPLY ASSESSMENT

FOR

COUNTY OF ORANGE CIVIC CENTER FACILITIES STRATEGIC PLAN

NOVEMBER 2016

Prepared for:

County of Orange

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FINDINGS

In accordance with Water Code §10912 (a)(3), any development that is proposing commercial office buildings employing more than 1,000 persons or having more than 250,000 square feet of floor space is determined to be a “Project” and requires the preparation of a water supply assessment per Water Code §10910 *et seq.* and related provisions of the California Environmental Water Quality Act (CEQA).

The proposed County of Orange Civic Center Facilities Strategic Plan (FSP) requires the preparation of a water supply assessment because the project is proposing the renovation of approximately 289,360 square feet, demolition of approximately 429,277 square feet, and construction of approximately 818,676 square feet or a net increase of 389,399 square feet of new government office buildings.

The City of Santa Ana is the public water system that is currently and will supply water to the proposed County of Orange Civic Center FSP Project.

Per Water Code §10910, “If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment”. **As the projected water demand associated with the proposed County of Orange Civic Center FSP Project was accounted for in the City of Santa Ana 2015 Urban Water Management Plan (UWMP)**, this water supply assessment was prepared incorporating the requested information from the City’s UWMP.

Based on this water supply assessment, sufficient water supply is available for the proposed County of Orange Civic Center FSP Project. The total water supplies available to the City of Santa Ana during normal, single-dry and multiple dry years within a 20-year projection will meet the projected water demand of the Project in addition to the demand of existing and other planned future uses, including, but not limited to, agricultural and manufacturing uses. This finding is based on the City’s reliable supply of groundwater, continued success with water conservation programs, and the City’s purchase order agreement with Metropolitan Water District of Southern California.

This Water Supply Assessment shall not constitute a “will-serve” or in any way entitles the project to service or to any right, priority or allocation in any supply, capacity or facility, and that the issuance of the Water Supply Assessment shall not affect the City of Santa Ana’s obligation to provide service to its existing customers or any potential future customers including this Project.

WATER SUPPLY ASSESSMENT GENERAL INFORMATION**Purpose of Assessment**

City of Santa Ana has been identified as the public water system that will supply water service to the Civic Center FSP Project. As the public water system, the City of Santa Ana is required by Section 10910 *et seq.* of the Water Code to prepare an assessment of water supply availability (“assessment”) for defined types of projects. The Civic Center FSP Project has been found to be project requiring an assessment in accordance with Section 10912 *et seq.* of the Water Code (the proposed project includes more than 250,000 square feet of office building floor space). This assessment is required to be included in the environmental document for the Project, and, based on the record, make a determination whether projected water supplies are sufficient for the Project and existing and planned uses.

Water Code Section 10910 contains the requirements for the information to be set forth in the assessment.

Prior Water Supply Assessments

City of Santa Ana does not allocate particular supplies to any project, but identifies total supplies for its service area. Because of the City’s aggregation of demands and supplies, each assessment prepared for the City is expected to be generally similar to the most recent assessment, with changes as needed to take into account changes, if any, in demands and supplies, and any updated and corrected information obtained by the City. Previously assessed projects’ water demands have been included within the City’s updated water model and have been found to be consistent with the City’s 2015 Urban Water Management Plan.

Supporting Documentation

City of Santa Ana prepared the 2015 Urban Water Management Plan (UWMP) as required by statute. The UWMP contains the defined elements listed in the statute (Water Code Section 10631, *et seq.*) and includes water supply and demand issues.

In addition, the City recently completed a hydraulic modeling of its existing City’s water system. The model demands were developed and allocated based upon individual account consumption data. This consumption data was then compared and adjusted to be consistent with the 2015 total water demands included within the 2015 UWMP. The City will continue to update this hydraulic model to include near-term and buildout conditions. This hydraulic model and its water demand data can be used to confirm impacts of future projects as well as to confirm if there is adequate water supply to meet the demands of these future projects.

PROJECT DESCRIPTION**County of Orange Civic Center Facilities Strategic Plan**

The County of Orange Facilities Strategic Plan (“FSP Project”) entails the phased demolition, renovation, and new construction of multiple government buildings at the Project Site. The Project Site is in central Santa Ana, California within Orange County, as shown on Figure 1.

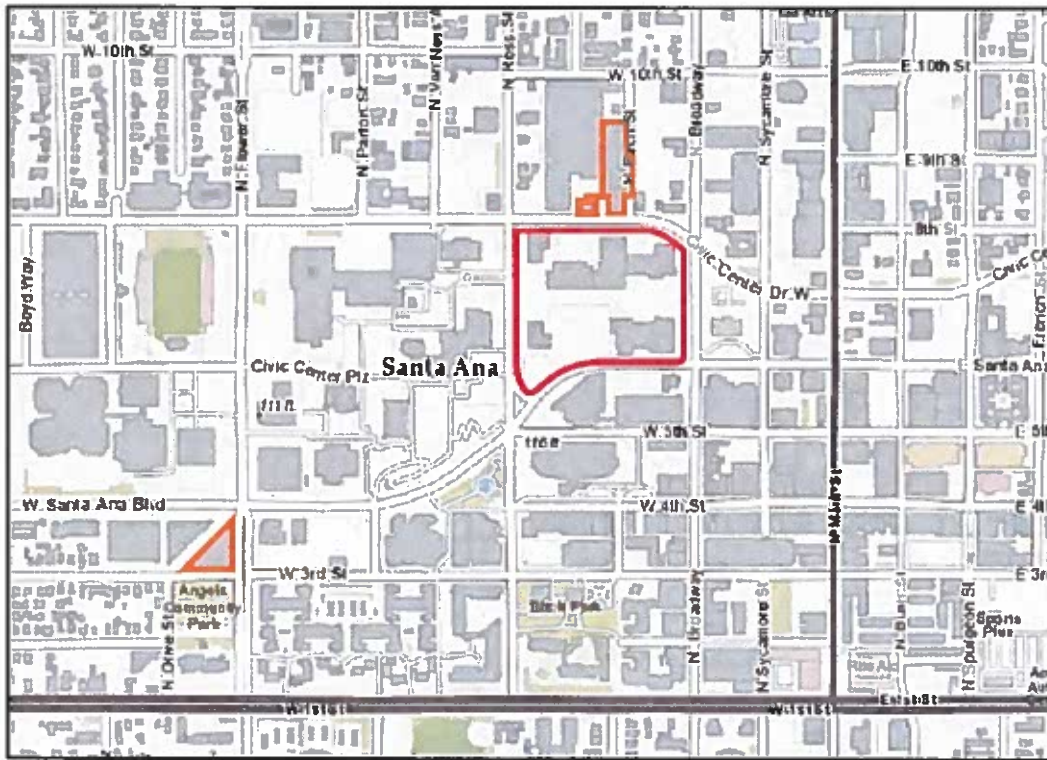


Figure 1 Project Location

The Project Site consists of: an approximate 10.74-acre County facility “superblock”; and County satellite buildings. The “superblock” is bounded by Ross Street to the west, Civic Center Drive to the north, Broadway to the east, and Santa Ana Boulevard to the south. County satellite buildings that would be renovated as part of the FSP Project but are not within the superblock include 401 and 433 W. Civic Center Drive north of the superblock across Civic Center Drive West, and H.G. Osborne Building (300 N. Flower Street) southwest of the superblock. The FSP Project involves the transfer of employees from these County buildings to the superblock. Although the transfer of these employees to the superblock is part of the FSP Project, no construction, renovation, or any other activities that would result in a significant impact on the environment will occur.

The Project Site is located in an urbanized area and is completely built-out with county-owned government buildings, associated parking and landscaping. The City of Santa Ana General Plan Land Use designates the superblock as INS (Institutional) and GCD (Government Center).

The FSP Project entails the phased demolition, renovation, and new construction of multiple government buildings at the Project Site. The proposed demolition and new construction would occur within the superblock area of the Project Site.

Physical improvements at the County satellite buildings would be limited to renovation. Although the FSP Project includes the construction of new buildings, it is for the purposes of consolidating County facilities and employees. The FSP Project is not expected to generate a substantial change in the total number of County employees. However, since the project would result in a net increase in governmental office space (the majority occurring during the fourth phase of development) employee growth in the area is expected to occur.

The FSP Project includes the renovation of approximately 289,360 square feet, demolition of approximately 429,277 square feet, and construction of approximately 818,676 square feet of building space. This would result in a net increase of 389,399 square feet of new government office uses.

Implementation of the FSP Project is expected to occur in four phases over a period of approximately 18 years. The following table summarizes the buildout by phase:

Table 1: Buildout by Phase

<i>Phase</i>	<i>Schedule</i>	<i>Renovation</i>	<i>Demolition</i>	<i>New Construction</i>
1	2016 to 2021	144,200 sf	<109,939 sf>	258,220 sf
2	2021 to 2027	43,160 sf	<319,338 sf>	264,316 sf
3	2024 to 2030	102,000 sf	<0 sf>	0 sf
4	2030 to 2035	0 sf	<0 sf>	296,140 sf
TOTAL		289,360 sf	<429,277 sf>	818,676 sf
Net New Building				389,399 sf

Water Demands

The following is a summary of the water demands for the proposed FSP Project:

Table 2: Water Demands by Phase

<i>Phase</i>	<i>Average Day (gallons per day)</i>	<i>Average Demand (AF/yr)</i>
Phase 1	203,040 gal/day	227 AF/yr
Phase 2	203,040 gal/day	227 AF/yr
Phase 3	169,920 gal/day	191 AF/yr
Phase 4	172,800 gal/day	194 AF/yr
Total	748,800 gal/day	839 AF/yr

Based on the hydraulic model of the existing water system (2015), the Project Site currently has an average day water demand of 62,000 gal/day.

The following is a summary of the additional water demands the proposed FSP Project will have per phase on the City of Santa Ana's water system:

Table 3: Additional Water Demands by Phase

<i>Phase</i>	<i>Additional Average Day (gallons per day)</i>	<i>Additional Average Demand (AF/yr)</i>
Phase 1	141,040 gal/day	158 AF/yr
Phase 2	203,040 gal/day	227 AF/yr
Phase 3	169,920 gal/day	191 AF/yr
Phase 4	172,800 gal/day	194 AF/yr
Total	686,800 gal/day	770 AF/yr

City of Santa Ana Total Water Demand Projections

Per the City's 2015 Urban Water Management Plan (Table 2-2 and Table 2-4), the following is a summary of the potable water demands projected in acre-foot for the Use Type "Other" ((CII) Comm/Instit/Indust) and the comparison to the additional average demand projected for the FSP Project:

Table 4: Santa Ana Total Water Demand Projects (based on UWMP)

Demands for Potable Water (Acre-foot per year)						
<i>Description</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>
Total Potable Water Demands	36,656	36,678	39,397	39,669	39,658	39,716
Accumulative Additional Total Demand	--	22	2,741	3,013	3,002	3,060
Use Type "Other" (CII) Comm/Instit/Indust	12,025	12,033	12,925	13,014	13,010	13,030
Accumulative "Other" Additional Demand	--	8	900	989	985	1,005
FSP Project Additional Demand	--	158	385	576	770	770

The City's UWMP did not anticipate much of an increase in water demands between 2015 and 2020 due to meeting the State's water reduction goal (SBx7-7 Requirements). As seen above the 2020 FSP Project additional demand is more than the additional demand projected in 2020.

After 2020, the additional demand as the result of the FSP Project is accounted for in the projections for the "Other" Use Type within the UWMP.

2020 Projected Potable Water Demand

Based on the UWMP, the total potable water projected demand for 2020 is 36,678 AF/year. Adding the FSP Project additional water demand projected for 2020 (158 AF/yr), the total potable water projected demand would be increased to 36,836 AFY or an increase of little over 0.4% over the total projected demand. This increase is minimal in comparison to the State's water reduction goal the City has been striving to meet. This is confirmed by comparing to the following City of Santa Ana Historical Water Demands:

- City of Santa 10 year average (1999 to 2009): 46,576 AF/year
(Source: Santa Ana Historical Production Records)
- Metropolitan WSAP April 2009 Base Year Demand for City: 46,809 AF/year

The City of Santa Ana's water system has previously meet system demands well over 46,000 AF/year and will have the ability to meet the additional FSP Project additional demands in 2020.

In addition, as stated in Section 3.6.5 (Multiple-Dry Year Period Reliability Comparison) of the UWMP, the City has available supplies to meet the projected demand with a 6 percent increase due to its diversified supply and conservation measures.

CITY OF SANTA ANA WATER FACILITIES

City of Santa Ana is a public water system, Public Water System No. CA3010038, serving the City of Santa Ana. City of Santa Ana is a local water retailer with 44,610 municipal connections (2015) which supplied 36,656 acre-feet of water in 2015. The City receives its water from two main sources, local well water from the Lower Santa Ana River Groundwater Basin, also known as the Orange County Groundwater Basin (OC Basin), which is managed by Orange County Water District (OCWD), and imported water from Metropolitan Water District of Southern California (Metropolitan). The City is a member agency of Metropolitan.

The City maintains 444 miles of transmission and distribution mains, nine reservoirs with a storage capacity of 49.3 million gallons, seven pumping stations, 20 wells, and seven import water connections.

Thirteen of the City wells pump into surface reservoirs with booster stations pumping the water into the distribution system. The remaining wells pump directly into the City's distribution system. Water pumped from these wells has been naturally filtered as it passes through underlying aquifers of sand, gravel, and soil. This well water only requires disinfectant treatment for system distribution.

The City maintains seven imported water connections to receive water through Metropolitan's Orange County and East Orange County Feeder pipelines. Seven metered connections with a total capacity of 60,580 gallons per minute (gpm) transfer water into the City's distribution system.

System Pressures – The City has two distinct pressure zones, the main zone and the high zone.

Peak Demand – Water system demand patterns are a result of climatological, land use, sociological, and institutional factors, all of which affect the amount of water consumed. Reduction in peak demands can reduce the need for construction of new water storage and conveyance facilities and, in certain instances, the development of new water sources. The City's computerized telemetry system allows water system operators to operate the system more efficiently through the ability to stage and prioritize water production facilities usage to meet these ever changing demand patterns.

CITY OF SANTA ANA 2015 URBAN WATER MANAGEMENT PLAN

City of Santa Ana 2015 Urban Water Management Plan (UWMP) provides a detailed summary of present and future water resources and demands and provides an assessment of the City's water resource needs. Specifically, the UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis identified supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years.

In addition, the 2015 UWMP details the City's SBx7-7 target-setting process to achieve the 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.

The 2015 UWMP is an individual UWMP for a retail water agency, but the City is also a member of the Orange County 20x2020 Regional Alliance.

CITY WATER DEMANDS OVERVIEW

Southern California's urban water demands has been largely shaped by the efforts to comply with SBx7-7. This law requires all California retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve a 20 percent water demand reduction (from a historical baseline) by 2020. The City has been actively engaged in efforts to reduce water use in its service area to meet the 2015 interim 10 percent reduction and the 2020 final water use target.

Section 2 of the City's 2015 UWMP summarizes the analysis of the City's current water demands, factors that influence those demands, and projections of future water demands for the next 20 years. In addition, to satisfy SBx7-7 requirements, the section provides details of the City's SBx7-7 compliance method selection, baseline water use calculation, and 2015 and 2020 water use targets.

There are 44,551 current customer active and inactive service connections in the City's water distribution system with all existing connections metered. Approximately 66.8 percent of the City's water demand is residential; commercial, including dedicated landscape, accounts for the remaining 33.2 percent of the total demand.

The following table is a summary of the City's total water demand in for potable water (2015):

Table 5: Demands for Potable Water – 2015 Actual

<i>Use Type</i>	<i>Additional Description</i>	<i>Volume</i>
Single Family		14,084 AFY
Multi-Family		10,399 AFY
Other	(CII) Commercial/Institution/Industry	12,025 AFY
Landscape	Large	147 AFY
TOTAL		36,656 AFY

The water demand projections included within the City's 2015 UWMP were an outcome of the Orange County (OC) Reliability Study led by MWDOC. The OC Reliability study accounted for drought impacts but excluded any changes as result of new conservation methods (new passive and active conservation as a result of plumbing codes, water model efficiency landscape ordinance, etc.). However, the demand projections account for passive savings in the future as described in the UWMP.

The following table is a projection of the City's water demand for the next 25 years:

Table 6: Projected Demands for Potable Water (AFY)

<i>Use Type</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>
Single Family	14,084	14,092	15,137	15,241	15,237	15,259
Multi-Family	10,399	10,405	11,177	11,254	11,251	11,267
Other	12,025	12,033	12,925	13,014	13,010	13,030
Landscape	147	148	158	160	160	160
TOTAL	36,656	36,678	39,397	39,669	39,658	39,716

SBx7-7 Requirements

The Water Conservation Act of 2009, SBx7-7 requires the State of California to reduce urban water use by 20 percent by the year 2020. Within Section 2.5 of the 2015 UWMP, the target methods and determination of the 2015 and 2020 targets are described. The City selected to comply with Option 3 which is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan. The City is in compliance with its 2015 interim target and has also already met the 2020 water use target.

The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. Based on the actual 2015 water use in the region, the Regional Alliance has already met its 2020 GPCD goal.

WATER SOURCES AND SUPPLY RELIABILITY

The City relies on a combination of imported water, local groundwater, and recycled water to meet its water needs. The City works together with two primary agencies, Metropolitan Water District and OCWD to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the SWP provided by Metropolitan.

The City’s main source of water supply is groundwater from the OC Basin. Imported water and recycled water make up the rest of the City’s water supply portfolio. Currently, the City relies on approximately 71 percent groundwater, 28 percent imported water, and 1 percent recycled water. The City’s water supply portfolio is expected to change slightly to 70 percent groundwater, 29 percent imported water, and 0.7 percent recycled water by the year 2040. The sources of imported water supply include the Colorado River and the SWP. The City’s projected water supply portfolio is shown on Figure 2

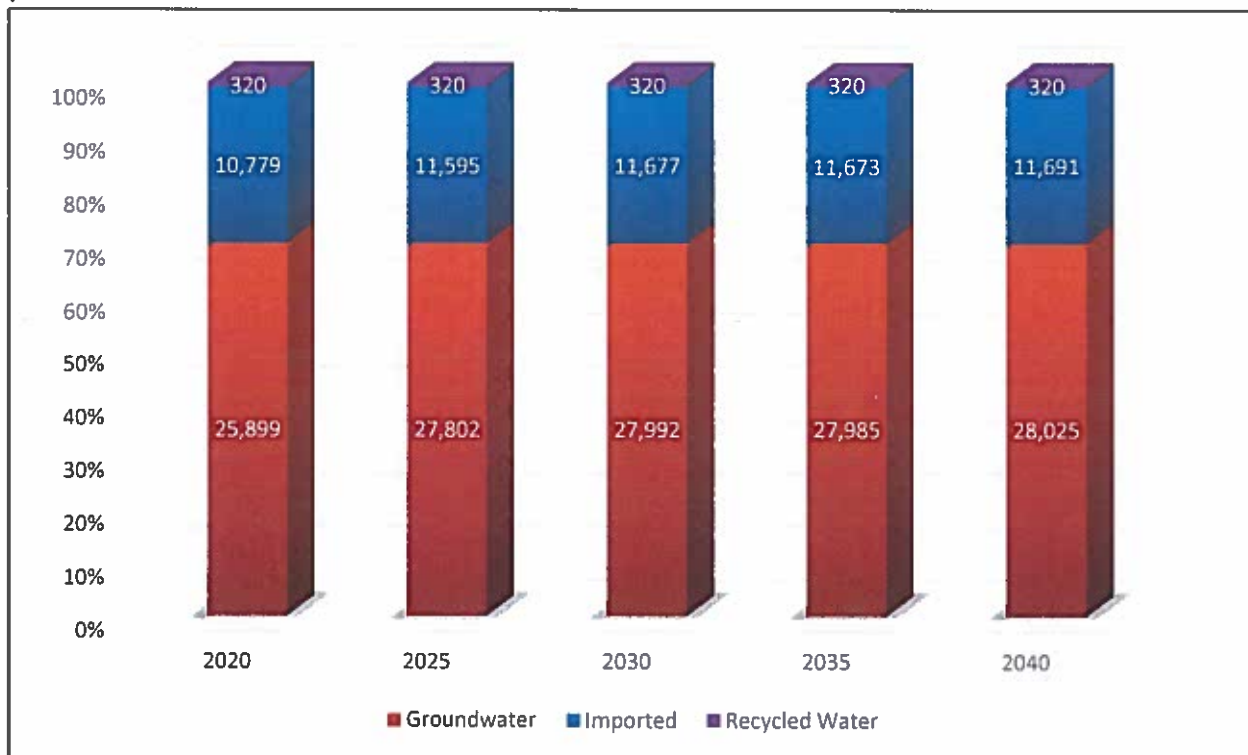


Figure 2: Water Supply Sources in the City (AF)

Section 3 of the UWMP provides a detailed discussion of the City’s water sources as well as the future water supply portfolio for the next 25 years. Additionally, the City’s projected supply and demand under various hydrological conditions are compared to determine the City’s supply reliability for the 25 year planning horizon.

Imported Water

The City supplements its water supply with imported water purchased from Metropolitan Water District of Southern California (MWD). Included within Appendix A is a copy of the City of Santa Ana’s Purchase Order for system water to be provided by MWD for the next 10 years.

The City currently maintains seven imported water connections to the Metropolitan System. The following is a summary of these seven connections and their normal and design capacities.

Table 7: Metropolitan Water District Connections

<i>MWD Connection</i>	<i>Name of Connection</i>	<i>Normal Operating Capacity (MGD)</i>	<i>Design Capacity (MGD)</i>
SA-1	Bristol	5.17	6.46
SA-2	First	5.17	9.69
SA-3	McFadden	5.17	6.46
SA-4	Warner	4.85	6.46
SA-5	Alton	4.85	12.93
SA-6	Santa Clara	7.76	12,93
SA-7	Red Hill	4.85	32,31

Metropolitan's principal sources of water are the Colorado River via the Colorado River Aqueduct (CRA) and the Lake Oroville watershed in Northern California through the State Water Project (SWP). The water obtained from these sources is treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Matthews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder.

Section 3.2.1 (Colorado River Supplies) of the UWMP summarizes the Colorado River supplies, Metropolitan's basic entitlement, the Colorado River Basin Water Supply and Demand Study, and the future actions that must be taken to implement solutions and help resolve the imbalance between water supply and demand in areas that use Colorado River water.

Section 3.2.2 (State Water Project Supplies) of the UWMP summarizes the State Water Project supplies, issues with the Sacramento-San Joaquin River Delta, ongoing regulatory restrictions, Metropolitan's Delta Action Plan, summary of SWP water deliveries, and the Delta Risk Management Strategy evaluating alternatives to reduce the risk to the Delta.

For additional information, it is included within Metropolitan's 2015 Urban Water Management Plan.

Groundwater

Historically, local groundwater has been the cheapest and most reliable source of supply for the City. The City draws groundwater from the Orange County Groundwater Basin (OC Basin). This source of water meets approximately 71 percent of the City's total annual demand.

Section 3.3.1 of the UWMP provides a summary of the basin characteristics. Orange County Water District (OCWD) was formed in 1933 by a special legislative act of the California State Legislature to protect and manage the County's vast, natural, groundwater supply using the best available technology and defend its water rights to the OC Basin. This legislation is found in the State of California Statutes, Water – Uncodified Acts, Act 5683, as amended.

The OC Basin is managed by OCWD under the Act, which functions as a statutorily-imposed physical solution. Groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the OC Basin and to protect against land subsidence. OCWD regulates groundwater levels in the OC Basin by regulating the annual amount of pumping. This is summarized in Orange County Water District Groundwater Management Plan 2015 Update.

The OC Basin is not adjudicated and as such, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. The framework for the financial incentives is based on establishing the basin production percentage (BPP), the percentage of each Producer's total water supply that comes from groundwater pumped from the OC Basin. Groundwater production at or below the BPP is assessed a Replenishment Assessment (RA). While there is no legal limit as to how much an agency pumps from the OC Basin, there is a financial disincentive to pump above the BPP. Agencies that pump above the BPP are charged the RA plus the Basin Equity Assessment (BEA), which is calculated so that the cost of groundwater production is greater than MWDOC's full service rate. The BEA can be increased to discourage production above the BPP. The BPP is set uniformly for all Producers by OCWD on an annual basis.

The BPP is set based on groundwater conditions, availability of imported water supplies, and basin management objectives. The supplies available for recharge must be estimated for a given year. The supplies of recharge water that are estimated are: 1) Santa Ana River stormflow, 2) Natural incidental recharge, 3) Santa Ana River baseflow, 4) GWRS supplies, and 5) other supplies such as imported water and recycled water purchased for the Alamitos Barrier. The BPP is a major factor in determining the cost of groundwater production from the OC Basin for that year.

In some cases, OCWD encourages treating and pumping groundwater that does not meet drinking water standards in order to protect water quality. This is achieved by using a financial incentive called the BEA Exemption. A BEA Exemption is used to clean up and contain the spread of poor quality water. OCWD uses a partial or total exemption of the BEA to compensate a qualified participating agency or Producer for the costs of treating poor quality groundwater. When OCWD authorizes a BEA exemption for a project, it is obligated to provide the replenishment water for the production above the BPP and forgoes the BEA revenue that OCWD would otherwise receive from the producer.

As previously mentioned, the BPP is the primary mechanism used by OCWD to manage pumping in the OC Basin. In 2013, OCWD's Board of Directors adopted a policy to establish a stable BPP with the intention to work toward achieving and maintaining a 75 percent BPP by FY 2015-16. Although BPP is set at 75 percent, based on discussions with OCWD a conservative BPP of 70 percent is assumed through 2040. Principles of this policy include:

- OCWD's goal is to achieve a stable 75 percent BPP, while maintaining the same process of setting the BPP on an annual basis, with the BPP set in April of each year after a public hearing has been held and based upon the public hearing testimony, presented data, and reports provided at that time.
- OCWD would endeavor to transition to the 75 percent BPP between 2013 and 2015 as construction of the GWRS Initial Expansion Project is completed. This expansion will provide an additional 31,000 AFY of water for recharging the groundwater basin.
- OCWD must manage the OC Basin in a sustainable manner for future generations. The BPP will be reduced if future conditions warrant the change.
- Each project and program to achieve the 75 percent BPP goal will be reviewed individually and assessed for their economic viability.

The OC Basin's storage levels would be managed in accordance to the 75 percent BPP policy. It is presumed that the BPP will not decrease as long as the storage levels are between 100,000 and 300,000 AF from full capacity. If the OC Basin is less than 100,000 AF below full capacity, the BPP will be raised. If the OC Basin is over 350,000 AF below full capacity, additional supplies will be sought after to refill the OC Basin and the BPP will be lowered.

The OC Basin is managed to maintain water storage levels of not more than 500,000 AF below full condition to avoid permanent and significant negative or adverse impacts. Operating the OC Basin in this manner enables OCWD to encourage reduced pumping during wet years when surface water supplies are plentiful and increase pumping during dry years to provide additional local water supplies during droughts. OCWD determines the optimum level of storage for the following year when it sets the BPP each year. Factors that affect this determination include the current storage level, regional water availability, and hydrologic conditions. When the OC Basin's storage approaches the lower end of the operating range, immediate issues that must be addressed include seawater intrusion, increased risk of land subsidence, and potential for shallow wells to become inoperable due to lower water levels.

The OCWD's Engineer's Report reports on the groundwater conditions and investigates information related to water supply and OC Basin usage within OCWD's service area. The overall BPP achieved in the 2013 to 2014 water year within OCWD for non-irrigation use was 75.2 percent. However, a BPP level above 75 percent may be difficult to achieve. Therefore, a BPP ranging from 65 percent to 70 percent is currently being proposed for the ensuing FY 2015-16. Analysis of the OC Basin's projected accumulated overdraft, the available supplies to the OC Basin (assuming average hydrology) and the projected pumping demands indicate that this level of pumping can be sustained for 2015-16 without harming the OC Basin.

A BPP of 70 percent corresponds to approximately 320,000 AF of groundwater production including 22,000 AF of groundwater production above the BPP to account for several groundwater quality enhancement projects discussed earlier.

In FY 2015-16 additional production of approximately 22,000 AF above the BPP will be undertaken by the City of Tustin, City of Garden Grove, Mesa Water District, and Irvine Ranch Water District. These agencies use the additional pumping allowance in order to accommodate groundwater quality improvement projects. As in prior years, production above the BPP from these projects would be partially or fully exempt from the BEA as a result of the benefit provided to the OC Basin by removing poor-quality groundwater and treating it for beneficial use.

Section 3.3.3 of the UWMP describes the Groundwater Recharge Facilities which are essential to support pumping from the OC Basin.

Section 3.3.4 of the UWMP describes the Metropolitan Groundwater Replenishment Program to increase storage in the OC Basin.

Section 3.3.5 of the UWMP describes the Metropolitan Conjunctive Use Program which allows for the storage of Metropolitan water in the OC Basin.

Section 3.3.7 of the UWMP summarizes the annual analysis of basin storage change and accumulated overdraft for the recent years.

City of Santa Ana Groundwater Historical Extraction

The City pumps groundwater through its twenty (20) operating groundwater wells. The following table summarizes the groundwater volume pumped by the City during the last five years.

Table 8: Historical City Groundwater Volume Pumped

Groundwater Volume Pumped in AFY					
Groundwater Basin	2011	2012	2013	2014	2015
OC Groundwater Basin	24,293	20,236	26,613	27,953	26,351

Summary of Existing and Planned Sources of Water

The following is a summary of the current and planned sources of water for the City as included in the UWMP.

Table 9: City Actual and Projected Water Supplies

Water Supply	Actual (AFY) 2015	Projected Water Supply (Reasonably Available) (AFY)				
		2020	2025	2030	2035	2040
Groundwater OC Basin	26,351	25,899	27,802	27,992	27,985	28,025
Imported Water Metropolitan	10,305	10,799	11,615	11,697	11,693	11,711
Recycled Water OCWD GAP	352	300	300	300	300	300
TOTAL	37,008	36,998	39,717	39,989	39,978	40,036

The City does receive recycled water from the OCWD's Green Acres Project (GAP) that is used for non-potable applications. Section 6 of the UWMP summarizes the recycled water usage and potential within the City of Santa Ana.

Supply Reliability

Every urban water supplier is required to assess the reliability of their water service to its customers under normal, dry, and multiple dry water years. The City depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. Development of numerous local augment the reliability of the imported water system. The water supplies are projected to meet full-service demands; Metropolitan's 2015 UWMP finds that Metropolitan is able to meet, full-service demands of its member agencies starting 2020 through 2040 during normal years, single dry year, and multiple dry years.

Metropolitan's 2015 Integrated Water Resources Plan (IRP) update describes the core water resources that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2020 through 2040. The foundation of Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix.

This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements.

There are various factors that may impact reliability of supplies such as environmental, legal, imported water quality, groundwater water quality, and climate change. These factors are discussed in Section 3.6.2 of the City's UWMP.

The City's UWMP provides a description of water supply reliability and vulnerability to seasonal or climatic shortage. The City's ability to meet supply demands is contingent upon its ability to maintain its water production assets in proper working order.

Normal-Year Reliability Comparison

The water demand forecasting model, developed for the OC Reliability Study to project the 25-year demand for Orange County water agencies, also isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The explanatory variables of population, temperature, precipitation, unemployment rate, drought restrictions, and conservation measures were used to create the statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition. The average (normal) demand is represented by the average water demand of 1990 to 2014 (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016).

The City is 100 percent reliable for normal year demands from 2020 through 2040. The City has entitlements to receive imported water from Metropolitan via the regional distribution system. Although pipeline and connection capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies are assumed available to the City from existing water transmission facilities. The demand and supplies listed below also include local groundwater supplies that are available to the City through OCWD by a pre-determined pumping percentage.

Single-Dry Year Reliability Comparison

A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. The water demand forecasting model developed for the OC Reliability Study isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a six percent increase in demand for the OC Basin area where the City's service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). Detailed information of the model can be obtained from the City of Santa Ana.

The City has documented that it is 100 percent reliable for single dry year demands from 2020 through 2040 with a demand increase of six percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation.

Multi-Dry Year Period Reliability Comparison

Multiple-dry years are defined as three or more consecutive years with minimal rainfall within a period of average precipitation. The water demand forecasting model developed for the OC Reliability Study isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a six percent increase in demand for the OC Basin area where the City's service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). It is conservatively assumed that a three-year multi dry year scenario is a repeat of the single dry year over three consecutive years (FY 2011-12 through FY 2013-14).

The City is capable of meeting all customers' demands with significant reserves held by Metropolitan, local groundwater supplies, and conservation in multiple dry years from 2020 through 2040 with a demand increase of six percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation. The basis of the water year is displayed in Table 10.

Table 10: Basis of Water Year Data

<i>Year Type</i>	<i>Base Year</i>	<i>Volume Available (AFY)</i>	<i>% of Average Supply</i>
Average Year	2015	37,008	100%
Single-Dry Year	2014	39,228	106%
Multiple-Dry Years 1 st Year	2012	39,228	106%
Multiple-Dry Years 2 nd Year	2013	39,228	106%
Multiple-Dry Years 3 rd Year	2014	39,228	106%

Supply and Demand Assessment

A comparison between the supply and the demand for projected years between 2020 and 204 is shown in Table 11. As stated above, the available supply will meet the projected demand due to diversified supply and conservation measures.

Table 11: Normal Year Supply and Demand Comparison (in AFY)

<i>Description</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>
Supply Totals	36,998	39,717	39,989	39,978	40,036
Demand Totals	36,998	39,717	39,989	39,978	40,036
Difference	0	0	0	0	0

A comparison between the supply and the demand in a single dry year and multiple dry years are shown in Table 12 and Table 13 respectively. As stated above, the available supply will meet projected demand due to diversified supply and conservation measures.

Table 12: Single Dry Year Supply and Demand Comparison (in AFY)

<i>Description</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>
Supply Totals	39,218	42,100	42,388	42,377	42,438
Demand Totals	39,218	42,100	42,388	42,377	42,438
Difference	0	0	0	0	0

Table 13: Multiple Dry Years Supply and Demand Comparison (in AFY)

		<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>
First Year	Supply Totals	39,218	42,100	42,388	42,377	42,438
	Demand Totals	39,218	42,100	42,388	42,377	42,438
	Difference	0	0	0	0	0
Second Year	Supply Totals	39,218	42,100	42,388	42,377	42,438
	Demand Totals	39,218	42,100	42,388	42,377	42,438
	Difference	0	0	0	0	0
Third Year	Supply Totals	39,218	42,100	42,388	42,377	42,438
	Demand Totals	39,218	42,100	42,388	42,377	42,438
	Difference	0	0	0	0	0

DEMAND MANAGEMENT MEASURES

Section 4 of the UWMP provides a comprehensive description of the water conservation programs that the City of Santa Ana has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets. The City of Santa Ana Council adopted the Water Conservation and Supply Shortage Program Ordinance No. NS-2877 in May 2015. Ordinance No. NS-2877 establishes permanent water conservation requirements and prohibition against waste that are effective at all times and is not dependent upon a water shortage for implementation.

In an event of a water supply shortage, the ordinance further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies. The provisions and water conservation measures to be implemented in response to each shortage level are described in Section 5 of the UWMP. The City's Water Conservation and Supply Shortage Program Ordinance can be obtained from the City.

The City maintains active water wasting prohibition measures at all times and has the ability to implement additional measures as water conservation needs dictate. In 2015, as a result of the Governor's drought mandates, the City began to track its water wasting prohibition enforcement activities. On June 2, 2015 the City declared a Phase 2 water supply shortage in Resolution No. 2015-025 by formally requiring all water consumers to reduce use by 12 percent relative to their 2013 consumption. Additionally, on August 4, 2015, a water wasting penalty rate was established by Resolution No. 2015-047. This new penalty rate permits City staff to penalize those users not meeting their water use reduction targets of 12 percent. The City of Santa Ana as a whole has been meeting its State mandated target; as a result the City has yet to impose any monetary penalties on any of its users.

The City has communicated the water wasting prohibitions and water conservation measures via various communication outlets available including messaging on water bills, bill inserts, bill envelopes, the City website, bus shelter advertisements, City newsletters, pole banners across the City, and a water conservation booth at community events. As a result, in 2015 the City received 1,064 water waster complaints: a dramatic increase from prior years. The City intends to continue both its water waste enforcement efforts and water conservation messaging in the future; however, the intensity of both activities will be directly related to the level of water conservation required to meet stated use reductions.

Part of the City's public education and outreach program is administered by MWDOC, although the City is not one of its retail agencies. MWDOC has established an extensive public education and outreach program to assist retail agencies in Orange County to promote water use efficiency awareness within their service areas. MWDOC's public education and outreach programs consist of five primary activities: school education programs; value of water communication program; quarterly water policy dinners and water inspection trips; and organized community events. These activities are further described in Section 4.4 of the UWMP.

In addition to the primary programs it administers, MWDOC also maintains a vibrant public website (www.mwdoc.com) as well as a social media presence on Facebook, Twitter and Instagram. MWDOC's Facebook page has more than 1,200 followers. The social media channels are used to educate the public about water-efficiency, rates and other water-related issues.

WATER SHORTAGE CONTINGENCY PLAN

Within Section 5 of the UWMP, the water supply shortage policies Metropolitan and the City have in place to respond to events including catastrophic interruption and reduction in water supply are described. These include: Metropolitan Water Surplus and Drought Management Plan; Metropolitan Water Supply Allocation Plan; and City of Santa's Water Conservation Ordinance No. NS-2877.

City of Santa Ana's Water Conservation Ordinance

The City's Water Conservation Ordinance No. NS-2877 was passed by the City on May 19, 2015. The purpose of the Water Conservation Ordinance is to encourage reduced water consumption within the City through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City. It provides procedures, rules, and regulations for mandatory water conservation that gain results while minimizing the effect of a water shortage on the City's water customers.

The City is fully dependent on Metropolitan and OCWD for its water supply. Confirmation of an extended water shortage emergency would generally be received from one or both of these agencies. An actual shortage does not have to exist; merely the threat of a shortage is sufficient cause to impose sanctions.

When a water shortage appears imminent, the City Manager notifies the City Council and recommends holding a public hearing for the purpose of determining whether a water shortage emergency exists. If the City Council determines that a water shortage exists, it then makes the decision as to the appropriate phase of the Ordinance to implement. There are three Water Shortage Stages that the City can implement. A summary of the stages of water shortage is summarized in Section 5.2.3 of the UWMP. The City does not have a set percent supply reduction for each stage but will determine the percent reduction as it enters into each stage.

Three-Year Minimum Water Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates.

Section 135 of the Metropolitan Water District Act declares that a member agency has the right to invoke its "preferential right" to water, which grants each member agency a preferential right to purchase a percentage of Metropolitan's available supplies based on specified, cumulative financial contributions to Metropolitan. Each year, Metropolitan calculates and distributes each member agency's percentage of preferential rights. However, since Metropolitan's creation in 1927, no member agency has ever invoked these rights as a means of acquiring limited supplies from Metropolitan.

As captured in its 2015 UWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands through the year 2040. Additionally, through a variety of groundwater reliability programs conducted by OCWD and participated in by the City, local supplies are projected to be maintained at demand levels.

Based on Metropolitan's WSAP, the City is expected to fully meet demands for the next three years assuming Metropolitan is not in shortage, a BPP of 70 percent for Local Supplies, and zero allocations are imposed for Imported Supplies. The Three Year Estimated Minimum Water Supply is summarized below:

2016 Available Water Supply: 38,642 AFY

2017 Available Water Supply: 38,642 AFY

2018 Available Water Supply: 38,642 AFY

Catastrophic Supply Interruption

Given the great distances that imported water supplies travel to Orange County, the region is vulnerable to interruptions along hundreds of miles of aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, the infrastructure in place to deliver supplies are susceptible to damage from earthquake and other disasters. Section 5.4 of the UWMP describes the various emergency response plans, including: Metropolitan's, Water Emergency Response of Orange County; and the City of Santa Ana.

FUTURE WATER SUPPLY PROJECTS AND PROGRAMS

Section 7 of the UWMP describes various future water supply projects and programs. These include: transfer or exchange opportunities; City's plan to expand usage of recycled water and construction of advanced meter infrastructure; and desalination opportunities.

APPENDIX A

**Purchase Order for System Water
To Be Provided By
Metropolitan Water District of Southern California**

**PURCHASE ORDER FOR SYSTEM WATER TO BE PROVIDED BY
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

PURCHASER: City of Santa Ana	TERM 10 years: January 1, 2015 – December 31 2024
INITIAL BASE PERIOD DEMAND: acre-feet 13,476	EFFECTIVE DATE: January 1, 2015
INITIAL TIER 1 MAXIMUM—Annual Average: acre-feet 19,617	INITIAL TIER 1 MAXIMUM—Cumulative: acre-feet 196,170
PURCHASE ORDER COMMITMENT— Annual Average: acre-feet 8,086	PURCHASE ORDER COMMITMENT— Cumulative: acre-feet 80,860

Definitions of capitalized terms used in this Purchase Order are provided in Attachment 1. Terms used in this Purchase Order and not defined in Attachment 1 are defined in Metropolitan's Administrative Code.

COMMITMENT TO PURCHASE:

In consideration of Purchaser's commitment to purchase System Water pursuant to this Purchase Order, Metropolitan agrees to sell such System Water to Purchaser at the Tier 1 Supply Rate in an amount up to the Tier 1 Maximum—Cumulative. All System Water sold to Purchaser in an amount greater than the Tier 1 Maximum—Cumulative shall be sold to the Purchaser at the Tier 2 Supply Rate. In connection with the purchase of System Water, the Purchaser also agrees to pay all other applicable rates and charges, as established by Metropolitan from time to time. The rates and charges applicable to System Water as of the Effective Date are shown in Attachment 2.

If Purchaser's applicable System Water purchases during the Term exceed Purchaser's Tier 1 Maximum, Purchaser may elect to:

- a.) Subject to the provisions of paragraph c) below, pay any Tier 2 Supply obligations at the end of the Term, in an amount equal to the difference between the Purchaser's applicable System Water purchases and the Tier 1 Maximum—Cumulative during the Term times the average of the Tier 2 Supply Rate in effect during the Term; or,
- b.) pay any Tier 2 Supply obligations, annually as purchases are incurred, in an amount equal to the difference between the Purchaser's applicable annual System Water purchases and the Tier 1 Maximum—Annual times the Tier 2 Supply Rate in effect during the calendar year. A true-up at the end of the Term will be performed to ensure that the Purchaser has received all Tier 1 Maximum—Cumulative purchases allowed by the Purchase Order.
- c.) if, after the end of the first five years, Purchaser has accrued a cumulative Tier 2 Supply Rate obligation, Purchaser may elect to pay the initial five year cumulative Tier 2

System Water provided to the Purchaser under the terms of this Purchase Order shall be subject to reduction in accordance with the shortage allocation provisions of the Water Surplus and Drought Management Plan (the "WSDM Plan") or other such policies and principles governing the allocation of System Water as adopted by the Board.

In the event that Metropolitan's Board determines to reduce, interrupt or suspend deliveries of System Water, any outstanding balance of the Purchase Order Commitment at the end of the Term shall be reduced by the Purchase Order Commitment—Annual Average for each and every fiscal or calendar year that a reduction, interruption or suspension occurred.

MISCELLANEOUS:

This Purchase Order will be interpreted, governed and enforced in accordance with the laws of the State of California.

This Purchase Order will apply to and bind the successors and assigns of the Purchaser and Metropolitan.

No assignment or transfer of the rights of the Purchaser under this Purchase Order will be valid and effective against Metropolitan or the Purchaser without the prior written consent of Metropolitan and the Purchaser.

If at any time during the Term, by reason of error in computation or other causes, there is an overpayment or underpayment to Metropolitan by the Purchaser of the charges provided for under this Purchase Order, which overpayment or underpayment is not accounted for and corrected in the annual re-determination or reconciliation of said charges, the amount of such overpayment or underpayment shall be credited or debited, as the case may be, to the Purchaser. Metropolitan will notify the Purchaser in writing regarding the amount of such credit or debit, as the case may be. In no case will credits or debits for charges provided for under this Purchase Order be administered beyond the limit for billing adjustments as specified in Metropolitan's Administrative Code.

Attachment 1
Purchase Order for System Water
DEFINITIONS

"Act" means the Metropolitan Water District Act, California Statutes 1969, Chapter 209, as amended and supplemented from time to time.

"Base Period Demand" means the greater of (i) the Initial Base Period Demand or (ii) the five-year rolling average of the Purchaser's System Water purchases, measured on a fiscal year basis.

"Effective Date" means the effective date of this Purchase Order as specified above.

"Demand" means the Purchaser's purchases of System Water supplies, including full service, seasonal shift, Conjunctive Use Program, Surface Storage Operating Agreement water, Recharge and Recovery Operating Agreement water, or any other water program deemed to be a purchase of water.

"Initial Base Period Demand" means the Purchaser's highest annual Demand, as determined by Metropolitan, in:

- a). any fiscal year during the period from fiscal year 1989/90 through fiscal year 2001/02; or
- b). any fiscal year during the period from fiscal year 2002/03 through fiscal year 2013/14.

"Metropolitan" means The Metropolitan Water District of Southern California.

"Purchase Order Commitment" means:

- a). if the Purchaser elects option a), under the Initial Base Period Demand, then 60% of the Purchaser's Initial Base Firm Demand as previously calculated by Metropolitan, which is the highest fiscal year firm Demand during the period from fiscal year 1989/90 through fiscal year 2001/02, times 10; or
- b). if the Purchaser elects option b), under the Initial Base Period Demand, then 60% of the Purchaser's highest fiscal year Demand during the period from fiscal year 2002/03 through fiscal year 2013/14, times 10.

"Purchase Order" means this Purchase Order for System Water.

"Purchaser" means the member public agency specified above, a duly organized [city/water district/county water authority] of the State of California.

"System" means the properties, works and facilities of Metropolitan necessary for the supply, development, storage, conveyance, distribution, treatment or sale of water.

"System Water" means water supplies developed by Metropolitan and delivered to the Purchaser through the System or other means (e.g. conjunctive use storage).

"Term" means the term of this Purchase Order as specified above.

**Attachment 2
Purchase Order for System Water
RATES AND CHARGES**

	Effective January 1, 2015	Effective January 1, 2016
Tier 1 Supply Rate (\$/AF)	\$158	\$156
Tier 2 Supply Rate (\$/AF)	\$290	\$290
System Access Rate (\$/AF)	\$257	\$259
System Power Rate (\$/AF)	\$126	\$138
Water Stewardship Rate (\$/AF)	\$41	\$41
Full Service Untreated Rate (\$/AF):		
Tier 1	\$582	\$594
Tier 2	\$714	\$728
Treatment Surcharge (\$/AF)	\$341	\$348
Full Service Treated Rate (\$/AF):		
Tier 1	\$923	\$942
Tier 2	\$1,055	\$1,076
Readiness-to-Serve Charge (\$ millions)	\$158	\$153
Capacity Charge (\$/cfs)	\$11,100	\$10,900

APPENDIX A

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If Purchaser's applicable System Water purchases during the Term exceed Purchaser's Tier 1 Maximum, Purchaser may elect to:

- a.) Subject to the provisions of paragraph c) below, pay any Tier 2 Supply obligations at the end of the Term, in an amount equal to the difference between the Purchaser's applicable System Water purchases and the Tier 1 Maximum—Cumulative during the Term times the average of the Tier 2 Supply Rate in effect during the Term; or,
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- c.) if, after the end of the first five years, Purchaser has accrued a cumulative Tier 2 Supply Rate obligation, Purchaser may elect to pay the initial five year cumulative Tier 2

System Water provided to the Purchaser under the terms of this Purchase Order shall be subject to reduction in accordance with the shortage allocation provisions of the Water Surplus and Drought Management Plan (the "WSDM Plan") or other such policies and principles governing the allocation of System Water as adopted by the Board.

In the event that Metropolitan's Board determines to reduce, interrupt or suspend deliveries of System Water, any outstanding balance of the Purchase Order Commitment at the end of the Term shall be reduced by the Purchase Order Commitment—Annual Average for each and every fiscal or calendar year that a reduction, interruption or suspension occurred.

MISCELLANEOUS:

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No assignment or transfer of the rights of the Purchaser under this Purchase Order will be valid and effective against Metropolitan or the Purchaser without the prior written consent of Metropolitan and the Purchaser.

If at any time during the Term, by reason of error in computation or other causes, there is an overpayment or underpayment to Metropolitan by the Purchaser of the charges provided for under this Purchase Order, which overpayment or underpayment is not accounted for and corrected in the annual re-determination or reconciliation of said charges, the amount of such overpayment or underpayment shall be credited or debited, as the case may be, to the Purchaser. Metropolitan will notify the Purchaser in writing regarding the amount of such credit or debit, as the case may be. In no case will credits or debits for charges provided for under this Purchase Order be administered beyond the limit for billing adjustments as specified in Metropolitan's Administrative Code.

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- b). any fiscal year during the period from fiscal year 2002/03 through fiscal year 2013/14.

"Metropolitan" means The Metropolitan Water District of Southern California.

"Purchase Order Commitment" means:

- a). if the Purchaser elects option a). under the Initial Base Period Demand, then 60% of the Purchaser's Initial Base Firm Demand as previously calculated by Metropolitan, which is the highest fiscal year firm Demand during the period from fiscal year 1989/90 through fiscal year 2001/02, times 10; or
- b). if the Purchaser elects option b). under the Initial Base Period Demand, then 60% of the Purchaser's highest fiscal year Demand during the period from fiscal year 2002/03 through fiscal year 2013/14, times 10.

"Purchase Order" means this Purchase Order for System Water.

"Purchaser" means the member public agency specified above, a duly organized [city/water district/county water authority] of the State of California.

"System" means the properties, works and facilities of Metropolitan necessary for the supply, development, storage, conveyance, distribution, treatment or sale of water.

"System Water" means water supplies developed by Metropolitan and delivered to the Purchaser through the System or other means (e.g. conjunctive use storage).

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