APPENDIX L

Infrastructure Technical Report: Wastewater

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MORRISON HOTEL PROJECT
UTILITY INFRASTRUCTURE TECHNICAL REPORT: WASTEWATER
September 23, 2020

PREPARED BY:

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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

The Project would involve the demolition of approximately 32,550 square feet of existing commercial industrial buildings, the adaptive reuse and expansion of an existing 46,626-square-foot, 111-unit single-resident occupancy (SRO) hotel (Existing Hotel) by approximately 174,481 square feet (Hotel Expansion), and construction of an approximately 186,115-square-foot, hotel/residential building (Hotel/Residential Tower). The adaptive reuse of the Existing Hotel would include demolition of an approximately 12,280-square-foot inner wing creating a 29,187-square-foot hotel and 5,155-square-foot ground floor restaurant. The Hotel Expansion would include 165,800 square feet of hotel uses, a 2,838-square-foot lobby/bar, and 11,091-square-foot immersive museum. The Hotel/Residential Tower would include 150,366 square feet of residential uses above 32,997 square feet of hotel uses and a 2,792-square-foot restaurant. The total floor area of the Project would be approximately 420,303 square feet, with 136 dwelling units and 444 guest rooms. The Project includes 222 parking spaces to be located within three subterranean levels.

1.2. SCOPE OF WORK

As a part of the Environmental Impact Report for the Project, the purpose of this report is to analyze the potential impact of the Project to the City's wastewater infrastructure systems.

2. REGULATORY FRAMEWORK

The City of Los Angeles has one of the largest sewer systems in the world including approximately 6,439 miles of sewers serving a population of more than four million. The Los Angeles sewer system is comprised of three smaller systems: Hyperion Sanitary Sewer System, Terminal Island Water Reclamation Plant Sanitary Sewer System, and Regional Sanitary Sewer System.

The Project Site lies within the Hyperion Service Area served by the Hyperion Sanitary Sewer System and the Hyperion Treatment Plant. In January 2019, a Sewer System Management Plan (SSMP) was prepared for the Hyperion Sanitary Sewer System pursuant to the State Water Control Board's (SWRCB) May 2, 2006 Statewide General Waste Discharge Requirements (WDRs).[1]

Sewer permit allocation for projects that discharge into the Hyperion Treatment Plant is regulated by Ordinance No. 166,060 adopted by the City in 1990. This Ordinance established an additional annual allotment of 5.0 million gallons per day, of which 34.5 percent (1.725 million gallons per day) is allocated for priority projects, 8 percent (0.4 million gallons per day) for public benefit projects, and 57.5 percent (2.875 million

[1] City of Los Angeles Department of Public Works, LA Sanitation, Sewer System Management Plan, Hyperion Sanitary Sewer System, January 2019.

gallons per day) for non-priority projects (of which 65 percent is for residential projects and 35 percent for non-residential projects).

The City of Los Angeles Municipal Code (LAMC) includes regulations that allow the City to assure available sewer capacity for new projects and require fees for improvements to the infrastructure system. LAMC Section 64.15(i) requires that the City perform a Sewer Capacity Availability Request (SCAR) analysis when any person seeks a sewer permit to connect a property to the City's sewer collection system, proposes additional discharge through their existing public sewer connection, or proposes a future sewer connection or future development that is anticipated to generate 10,000 gallons or more of sewage per day. A SCAR is an analysis of the existing sewer collection system to determine if there is adequate capacity existing in the sewer collection system to safely convey the newly generated sewage to the appropriate sewage treatment plant.

LAMC Section 64.11.2 requires the payment of fees for new connections to the sewer system to assure the sufficiency of sewer infrastructure. New connections to the sewer system are assessed a Sewerage Facilities Charge. The rate structure for the Sewerage Facilities Charge is based upon wastewater flow strength, as well as volume. The determination of wastewater strength for each applicable project is based on City guidelines for the average wastewater concentrations of two parameters (biological oxygen demand and suspended solids) for each type of land use. Fees paid to the Sewerage Facilities Charge fees are deposited in the City's Sewer Construction and Maintenance Fund for sewer and sewage-related purposes, including but not limited to industrial waste control and water reclamation purposes.

In addition, the City establishes design criteria for sewer systems to assure that new infrastructure provides sewer capacity and operating characteristics to meet City Standards (Bureau of Engineering Special Order No. SO06-0691). Per this Special Order, laterals sewers, which are sewers 18 inches or less in diameter, must be designed for a planning period of 100 years. The Special Order also requires that sewers be designed so that the peak dry weather flow depth during their planning period shall not exceed one- half the pipe diameter.[2]

In 2006 the City approved the Integrated Resources Plan, which incorporates a Wastewater Facilities Plan.[3] The Integrated Resources Plan was developed to meet future wastewater needs of more than 4.3 million residents expected to live within the City by 2020. In order to meet future demands posed by increased wastewater generation, the

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[2] City of Los Angeles, L.A. CEQA Thresholds Guide, Your Resource for Planning CEQA Analysis in Los Angeles, M-Public Utilities, 2006. http://www.environmentla.org/programs/thresholds/M-Public%20Utilities.pdf.

[3] City of Los Angeles, Department of Public Works, LA Sewers Website, Integrated Resources Plan Facilities Plan, Summary Report, December 2006. https://www.lacitysan.org/san/sandocview?docname=CNT025148

City has chosen to expand its current overall treatment capacity, while maximizing the potential to reuse recycled water through irrigation, and other approved uses.

3. EXISTING CONDITIONS

The Project Site is approximately 56,325 sq. ft. (1.29 acres) and is currently occupied by multiple commercial buildings and a four-story residential hotel building. Sanitary sewer service to the Project Site from the surrounding streets is provided by the Bureau of Sanitation (BOS).

The Project Site is located within the Hyperion Service Area, which has an existing design capacity of approximately 550 million gallons per day (consisting of 450 MGDat the Hyperion Treatment Plant, 80 MGD at the Donald C. Tillman Water Reclamation Plant, Reclamation Plant, and 20 MGD at the Los Angeles–Glendale Water Reclamation Plant).[4]

The Project fronts both West Pico Boulevard and South Hope Street. Based on available record data provided by the City, there is a 10-inch vitrified clay pipe (VCP) sewer line in South Hope Street, and a 10-inch VCP sewer line in West Pico Boulevard. Based on the City of Los Angeles Bureau of Engineering's online Navigate LA database, the sewer main in South Hope Street has a calculated capacity of 1.56273 cubic feet per second (cfs) (1.01001 million gallons per day (MGD)), and the sewer main in West Pico Boulevard has a calculated capacity of 1.57591 cfs (1.01853 MGD).[5] Available records indicate that South Hope Street has eight (8) sewer wyes and four (4) active laterals, and West Pico Boulevard has three (3) wyes and no active laterals allocated to the Project Site.

Wastewater generation estimates for the existing Project Site have been prepared based on BOS sewerage generation factors, as summarized in Table 1 below.

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[4] City of Los Angeles Department of Public Works, Bureau of Sanitation, Water Reclamation Plants, https://www.lacitysan.org/san/faces/home/portal, accessed May 7, 2019.

[5] https://navigatela.lacity.org/navigatela/

Table 1 – Estimated Existing Wastewater Generation			
Land Use	**Units**	**Generation Rate (gpd/unit) [1]**	**Total Sewage Generation (gpd)**
Existing			
Commercial	32,550 sf	54.20/KG SF	1,764
Hotel	111 Rooms	120/Room	0[2]
		Subtotal Existing	**1,764**

[1] Generation Rates per Bureau of Sanitation – Sewer Generation Factors for Residential and Commercial Categories https://engpermitmanual.lacity.org/sites/default/files/documents/Sewage%20Generation%20Factors%20Chart.pdf

[2] No sewer generation as this hotel has been vacant for an extended period of time

4. SIGNIFICANCE THRESHOLDS

Appendix G of the CEQA Guidelines provides a set of sample questions that address impacts with regard to wastewater. These questions are as follows:

Would the project:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects?

- Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

In the context of the above questions from the CEQA Guidelines, the *L.A. CEQA Thresholds Guide* states that a project would normally have a significant wastewater impact if:

- The project would cause a measurable increase in wastewater flows at a point where, and a time when, a sewer's capacity is already constrained or that would cause a sewer's capacity to become constrained; or

- The project's additional wastewater flows would substantially or incrementally exceed the future scheduled capacity of any one treatment plant by generating flows greater than those anticipated in the Wastewater Facilities Plan or General Plan and its elements.

These thresholds are applicable to the Project and as such are used to determine if the Project would have significant wastewater impacts.

5. METHODOLOGY

The methodology for determining the significance of a project as it relates to a project's impact on wastewater collection and treatment infrastructure is based on the *L.A. CEQA Thresholds Guide*. This methodology involves a review of the project's environmental setting, project impacts, cumulative impacts, and mitigation measures (if required). The following has been considered as part of the determination for this Project:

Environmental Setting

- Location of the Project and appropriate points of connection to the wastewater collection system on the pertinent Wye Map;
- Description of the existing wastewater system which would serve the Project, including its capacity and current flows.
- Summary of adopted wastewater-related plans and policies that are relevant to the Project area.

Project Impacts

- Evaluate the Project wastewater needs (anticipated daily average wastewater flow), taking into account design or operational features that would reduce or offset service impacts;
- Compare the Project's wastewater needs to the appropriate sewer's capacity and/or the wastewater flows anticipated in the Wastewater Facilities Plan or General Plan.

This report analyzes the potential impacts of the Project on the existing public sewer infrastructure by comparing the estimated Project wastewater generation with the calculated available capacity of the existing facilities.

Pursuant to LAMC Section 64.15, BOS Wastewater Engineering Division made a preliminary analysis of the local and regional sewer conditions to determine if available wastewater conveyance and treatment capacity exists for future development of the Project Site. BOS's approach consisted of a worst-case scenario envisioning peak demands from the relevant facilities occurring simultaneously on the wastewater system. A combination of flow gauging data and computed results from the City's hydrodynamic model were used to project current and future impacts due to additional sewer discharge. The data used in this report are based on the findings of the BOS preliminary analysis. Refer to Exhibit 1 for the sewer will serve letter (Will Serve) for the Project, which contains the results of the BOS preliminary analysis.

6. PROJECT IMPACTS

6.1. CONSTRUCTION

Wastewater generation would occur incrementally throughout construction of the Project as a result of construction workers on-site. However, construction workers would utilize portable restrooms, which would not contribute to wastewater flows to the City's wastewater system. Thus, wastewater generation from Project construction activities is not anticipated to cause any increase in wastewater flows. Therefore, Project impacts associated with construction-period wastewater generation would be less than significant.

The Project will require construction of new on-site infrastructure to serve the new building, and potential upgrade and/or relocation of existing infrastructure. Construction impacts associated with wastewater infrastructure would primarily be confined to trenching for miscellaneous utility lines and connections to public infrastructure. Installation of wastewater infrastructure will be limited to on-site wastewater distribution, and minor off-site work associated with connections to the public main. Although no upgrades to the public main are anticipated, minor off-site work is required in order to connect to the public main. Therefore, as part of the Project, a construction management plan would be implemented to reduce any temporary pedestrian and traffic impacts during construction, ensuring safe vehicle travel and safe pedestrian and emergency vehicle access. Overall, when considering impacts resulting from the installation of any required wastewater infrastructure, all impacts are of a relatively short-term duration (i.e., months) and would cease to occur once the installation is complete. Therefore, Project impacts on wastewater associated with construction activities would be less than significant.

6.2. OPERATION

In accordance with the *L.A. CEQA Thresholds Guide*, the estimated sewer flows were based on the sewer generation factors for the Project's uses. Based on the type of use and generation factors, the Project will generate a net increase of approximately 97,593 gallons per day (gpd) of wastewater. Wastewater generation estimates have been prepared based on the City of LA Bureau of Sanitation sewerage generation factors for residential and commercial categories, and are summarized in Table 2 below.

Table 2 – Estimated Proposed Wastewater Generation[3]			
Land Use	**Units**	**Generation Rate[3] (gpd/unit)**	**Total Sewer Generation (gpd)**
Existing			
Commercial	32,550 sf	54.20/KG SF	1,764
Hotel	111 Rooms	N/A	0
		Subtotal Existing	**1,764**
Proposed			
Apartment: 1 Bedroom	74 DU	110/DU	8,140
Apartment: 2 Bedroom	62 DU	150/DU	9,300
Base Demand Adjustment			2,110
Hotel	444 Rooms	120/Room	53,280
Base Demand Adjustment			4,891
Museum	11,091 SF	30/KGSF	333
Gyms	2,476 SF[5]	650/KGSF	1,610
Ballroom	17,019 SF[6]	120/KGSF	2,042
Bar	2,838 SF	720/KGSF	2,043
Restaurant: Full Service	17,577 SF 586 Seats[4]	30/Seat	17,577
Meeting Rooms	1,372 SF	120/KGSF	165
Lobbies and Amenities[1]	23,727SF	50/KGSF	1,186
Pool/Spa[2]	1,089 SF	102 GAL	102
Covered Parking	81,951 SF	.65/KGSF	53
Cooling Tower	1,200 Ton	21,972 GAL	21,972
		Subtotal Proposed	**124,804**
		Required Water Savings Total	**-21,896**
		Additional Water Savings	**-3,551**
		Net Increase	**97,593**

(1) Lounge was used for hotel lobby, residential lobby, loggia, courtyard, amenity terrace on level 6, and amenity terrace on level 25.

(2) Pool square footage obtained from Architectural Floor Plans, and an assumed maximum allowed depth of 3.5 feet deep per code.

(3) The average daily flow based on 100% of City of Los Angeles BOS Sewerage Generation Factors.

https://engpermitmanual.lacity.org/sites/default/files/documents/Sewage%20Generation%20Factors%20Chart.pdf

and the approved Water Supply Assessment performed by LADWP. Refer to Exhibit 2

(4) Assumes 30 square feet per seat.
(5) Includes both hotel fitness center and residential gym amenities.
(6) Includes all ballroom space as well as all adjacent amenity terraces.

A Will Serve was submitted to see whether the existing public infrastructure can accommodate the Project. The Bureau of Sanitation has analyzed the Project demands in conjunction with existing conditions and forecasted growth. Refer to Exhibit 1 for response from the Bureau of Sanitation-Wastewater Engineering Services Division. As mentioned above, DWP also provided a separate analysis based on their breakout of the program uses. Together, the above Table 2 was generated.

As further discussed below, the existing design capacity of the Hyperion Service Area is approximately 550 million gallons per day (consisting of 450 MGD at the Hyperion Treatment Plant, 80 MGD at the Donald C. Tillman Water Reclamation Plant, Reclamation Plant, and 20 MGD at the Los Angeles–Glendale Water Reclamation Plant).[6] The Project's proposed wastewater generation is approximately 0.098 MGD. Currently up to 300 MGD is treated at the Hyperion Treatment Plant resulting in a treatment capacity of 150 MGD, which means the project would account for approximately 0.07 percent of the available capacity. Consequently, impacts on wastewater treatment capacity are less than significant.

As stated above, the existing capacity of the 10-inch sewer line in South Hope Street is approximately 1.56 cubic feet per second (cfs) (1.01 MGD). The Project's net increase in sewage generation is approximately 0.098 MGD. Assuming the total sewerage flow will discharge to the sewer main in Hope Street, the Project would account for approximately 9.80 percent of the pipe's capacity in South Hope Street. Due to this fact, and the Will Serve letter generated by the Bureau of Sanitation-Wastewater Engineering Services Division, impacts on wastewater infrastructure would be less than significant.

6.3. CUMULATIVE IMPACTS

The Project will result in the additional generation of sewer flow. However, as discussed above, BOS has conducted an analysis of existing and planned capacity as it related to the Project. Similarly, future projects connecting to the same sewer system are required to obtain a sewer connection permit and submit a SCAR to BOS during the design phase of the project. The analysis by BOS takes into consideration previously approved SCARs as part of their review. If system upgrades are required as a result of a given project's additional flow, arrangements would be made between the related project and BOS to construct the necessary improvements.

In addition to the City's SCAR analysis, a related projects list has been generated. There are 171 related projects, which consist of, but are not limited to, residential, schools, retail, restaurants, museums, hotels, offices, industrial, medical offices, gyms, cinemas, pharmacies, manufacturing, bowling alley, bus maintenance, and event space. The total increase in wastewater generation for the related projects is approximately 8.19 million

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[6] City of Los Angeles Department of Public Works, Bureau of Sanitation, Water Reclamation Plants, https://www.lacitysan.org/san/faces/home/portal, accessed May 7, 2019.

gallons per day (MGD). Combined with the Project, the increase in wastewater generation is approximately 8.29 MGD. Refer to Exhibit 3 for a breakdown of the related projects and associated wastewater generation.

Wastewater generated by the Project, and related projects, would be conveyed via the existing wastewater conveyance systems for treatment at the Hyperion Treatment Plant system. As previously stated, based on information from BOS, the existing design capacity of the Hyperion Service Area is approximately 550 million gallons per day (MGD)[7] and the existing average daily flow for the system is approximately 300 mgd.[8] The estimated wastewater generation increase of the Project and related projects combined would be 8.29 MGD, which represents approximately 3.32 percent of the available capacity in the system. The related projects would also be required to adhere to the BOS's annual wastewater flow increase allotment. Therefore, cumulative impacts on wastewater treatment capacity are less than significant.

7. LEVEL OF SIGNIFICANCE

Based on the analysis contained in this report no significant impacts have been identified to wastewater infrastructure for this Project.

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[7] City of Los Angeles Department of Public Works, Bureau of Sanitation, Water Reclamation Plants, https://www.lacitysan.org/san/faces/home/portal, accessed May 7, 2019.

[8] City of Los Angeles Department of Public Works, LA Sanitation, Sewer System Management Plan, Hyperion Sanitary Sewer System, January 2019.

EXHIBIT 1

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

WASTEWATER ENGINEERING SERVICES DIVISION
2714 MEDIA CENTER DRIVE
LOS ANGELES, CA 90065
FAX: (323) 342-6210
WWW.LACITYSAN.ORG

July 10, 2019

Mr. Kyle Trudeau, Project Manager
KPFF Consulting Engineers
700 S Flower Street, #2100
Los Angeles, CA 90017

Dear Mr. Trudeau,

MORRISON HOTEL - REQUEST FOR WASTEWATER SERVICE INFORMATION

This is in response to your July 3, 2019 letter requesting a review of your proposed mixed-use project located at 1220-1246 South Hope Street, Los Angeles, CA 90015. The project will consist of residential units, hotel, and commercial use. LA Sanitation has conducted a preliminary evaluation of the potential impacts to the wastewater and stormwater systems for the proposed project.

WASTEWATER REQUIREMENT

LA Sanitation, Wastewater Engineering Services Division (WESD) is charged with the task of evaluating the local sewer conditions and to determine if available wastewater capacity exists for future developments. The evaluation will determine cumulative sewer impacts and guide the planning process for any future sewer improvement projects needed to provide future capacity as the City grows and develops.

Projected Wastewater Discharges for the Proposed Project:

Type Description	Average Daily Flow per Type Description (GPD/UNIT)	Proposed No. of Units	Average Daily Flow (GPD)
Existing			
Commercial	50 GPD/1000 SQ.FT	32,550 SQ.FT	(1,628)
Hotel	120 GPD/1 Room	111 Rooms	(13,320)
Total			**(14,948)**
Proposed			
Residential: APT- 1 BDRM	110 GPD/ DU	60 DU	6,600
Residential: APT- 2 BDRMS	150 GPD/ DU	72 DU	10,800
Residential: APT- 3 BDRMS	190 GPD/ DU	3 DU	570
Hotel	120 GPD/1 Room	450 Rooms	54,000
BAR	720 GPD/1000	3,060 SQ.FT	2,203

	SQ.FT		
Restaurant-Full Service	30 GPD/Seat	469 Seats	14,070
Retail	25 GPD/ 1000 SQ.FT	1,825 SQ.FT	46
Ballroom	350 GPD/ 1000 SQ.FT	13,122 SQ.FT	4,593
Lounge	50 GPD/ 1000 SQ.FT	50,846 SQ.FT	2,542
GYM	200 GPD/ 1000 SQ.FT	3,225 SQ.FT	645
Pool	7.48 GPD/ 1 CF	5,700 CF	42,636
Total			**138,735**
Net Proposed Flow			**123,757**

SEWER AVAILABILITY

The sewer infrastructure in the vicinity of the proposed project includes an existing 10-inch line on Hope St. The sewage from the existing 10-inch line feeds into a 24-inch line on Hope St before discharging into a 66-inch sewer line on Grand Ave. Figure 1 shows the details of the sewer system within the vicinity of the project. The current flow level (d/D) in the 10-inch line cannot be determined at this time without additional gauging.

The current approximate flow level (d/D) and the design capacities at d/D of 50% in the sewer system are as follows:

Pipe Diameter (in)	Pipe Location	Current Gauging d/D (%)	50% Design Capacity
10	Hope St.	*	504,975 GPD
24	Hope St.	23	5.03 MGD
66	Grand Ave.	25	58.75 MGD
66	Grand Ave.	24	59.61 MGD

* No gauging available

Based on the estimated flows, it appears the sewer system might be able to accommodate the total flow for your proposed project. Further detailed gauging and evaluation will be needed as part of the permit process to identify a specific sewer connection point. If the public sewer has insufficient capacity, then the developer will be required to build sewer lines to a point in the sewer system with sufficient capacity. Any sewer ejector shall be reviewed by LASAN staff prior to City of Los Angeles Department of Building and Safety (LADBS) approval. A final approval for sewer capacity and connection permit will be made at that time. Ultimately, this sewage flow will be conveyed to the Hyperion Water Reclamation Plant, which has sufficient capacity for the project.

If you have any questions, please call Christopher DeMonbrun at (323) 342-1567 or email at chris.demonbrun@lacity.org.

STORMWATER REQUIREMENTS

LA Sanitation, Watershed Protection Program (WPP) is charged with the task of ensuring the implementation of the Municipal Stormwater Permit requirements within the City of Los Angeles. We anticipate the following requirements would apply for this project.

POST-CONSTRUCTION MITIGATION REQUIREMENTS

In accordance with the Municipal Separate Storm Sewer (MS4) National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R4-2012-0175, NPDES No. CAS004001) and the City of Los Angeles Stormwater and Urban Runoff Pollution Control requirements (Chapter VI, Article 4.4, of the Los Angeles Municipal Code), the Project shall comply with all mandatory provisions to the Stormwater Pollution Control Measures for Development Planning (LID Ordinance) and as it may be subsequently amended or modified. Prior to issuance of grading or building permits, the Applicant shall submit a LID Plan to the City of Los Angeles, LA Sanitation, Watershed Protection Division (WPD), for review and approval. The LID Plan shall be prepared consistent with the requirements of the Development Best Management Practices Handbook.

Current regulations prioritize infiltration, capture/use, and then biofiltration as the preferred stormwater control measures. The relevant documents can be found at: www.lacitysan.org. It is advised that input regarding LID requirements be received in the early phases of the project from WPD's plan-checking staff.

GREEN STREETS

The City is developing a Green Street Initiative that will require projects to implement Green Street elements in the parkway areas between the roadway and sidewalk of the public right-of-away to capture and retain stormwater and urban runoff to mitigate the impact of stormwater runoff and other environmental concerns. The goals of the Green Street elements are to improve the water quality of stormwater runoff, recharge local ground water basins, improve air quality, reduce the heat island effect of street pavement, enhance pedestrian use of sidewalks, and encourage alternate means of transportation. The Green Street elements may include infiltration systems, biofiltration swales, and permeable pavements where stormwater can be easily directed from the streets into the parkways and can be implemented in conjunction with the LID requirements. Green Street standard plans can be found at: www.eng2.lacity.org/techdocs/stdplans/

CONSTRUCTION REQUIREMENTS

All construction sites are required to implement a minimum set of BMPs for erosion control, sediment control, non-stormwater management, and waste management. In addition, construction sites with active grading permits are required to prepare and implement a Wet Weather Erosion Control Plan during the rainy season between October 1 and April 15. Additionally, construction sites that disturb more than one-acre of land are subject to the NPDES Construction General Permit issued by the State of California, and are required to prepare, submit, and implement the Storm Water Pollution Prevention Plan (SWPPP).

If there are questions regarding the stormwater requirements, please call WPP's plan-checking counter at (213) 482-7066. WPD's plan-checking counter can also be visited at 201 N. Figueroa, 3rd Fl, Station 18.

GROUNDWATER DEWATERING REUSE OPTIONS

The Los Angeles Department of Water and Power (LADWP) is charged with the task of supplying water and power to the residents and businesses in the City of Los Angeles. One of the sources of water includes groundwater. The majority of groundwater in the City of Los Angeles is adjudicated, and the rights of which are owned and managed by various parties. Extraction of groundwater within the City from any depth by law requires metering and regular reporting to the appropriate Court-appointed Watermaster. LADWP facilitates this reporting process, and may assess and collect associated fees for the usage of the City's water rights. The party performing the dewatering should inform the property owners about the reporting requirement and associated usage fees.

On April 22, 2016 the City of Los Angeles Council passed Ordinance 184248 amending the City of Los Angeles Building Code, requiring developers to consider beneficial reuse of groundwater as a conservation measure and alternative to the common practice of discharging groundwater to the storm drain (SEC. 99.04.305.4). It reads as

follows: "Where groundwater is being extracted and discharged, a system for onsite reuse of the groundwater, shall be developed and constructed. Alternatively, the groundwater may be discharged to the sewer."

Groundwater may be beneficially used as landscape irrigation, cooling tower make-up, and construction (dust control, concrete mixing, soil compaction, etc.). Different applications may require various levels of treatment ranging from chemical additives to filtration systems. When onsite reuse is not available the groundwater may be discharged to the sewer system. This allows the water to be potentially reused as recycled water once it has been treated at a water reclamation plant. If groundwater is discharged into the storm drain it offers no potential for reuse. The onsite beneficial reuse of groundwater can reduce or eliminate costs associated with sewer and storm drain permitting and monitoring. Opting for onsite reuse or discharge to the sewer system are the preferred methods for disposing of groundwater.

To help offset costs of water conservation and reuse systems, LADWP offers Technical Assistance Program (TAP), which provides engineering and technical assistance for qualified projects. Financial incentives are also available. Currently, LADWP provides an incentive of $1.75 for every 1,000 gallons of water saved during the first two years of a five-year conservation project. Conservation projects that last 10 years are eligible to receive the incentive during the first four years. Other water conservation assistance programs may be available from Metropolitan Water District of Southern California. To learn more about available water conservation assistance programs, please contact LADWP Rebate Programs 1-888-376-3314 and LADWP TAP 1-800-544-4498, selection "3".

For more information related to beneficial reuse of groundwater, please contact Greg Reed, Manager of Water Rights and Groundwater Management, at (213)367-2117 or greg.reed@ladwp.com.

SOLID RESOURCE REQUIREMENTS

The City has a standard requirement that applies to all proposed residential developments of four or more units or where the addition of floor areas is 25 percent or more, and all other development projects where the addition of floor area is 30 percent or more. Such developments must set aside a recycling area or room for onsite recycling activities. For more details of this requirement, please contact LA Sanitation Solid Resources Recycling hotline 213-922-8300.

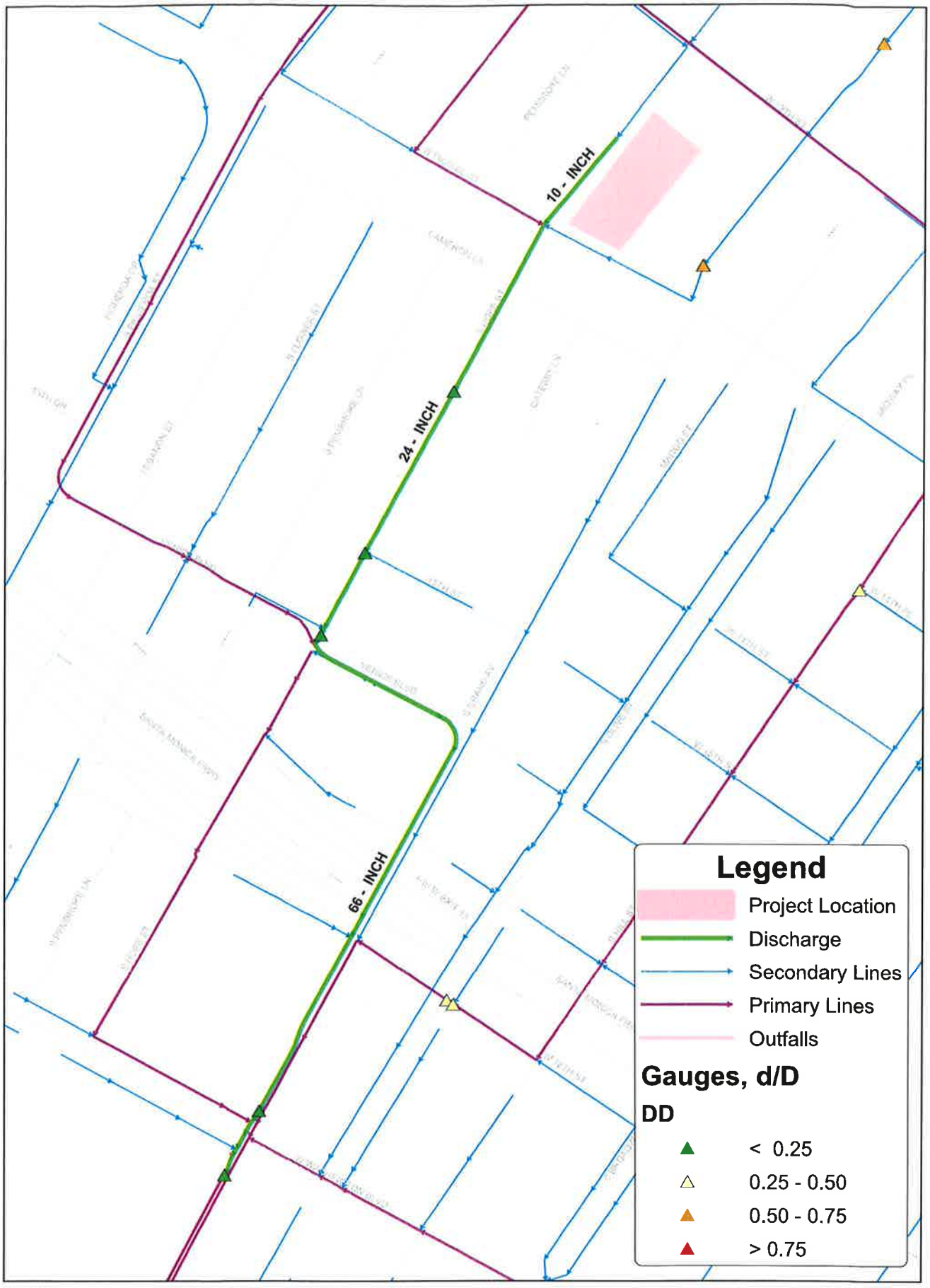
Sincerely,

Ali Poosti, Division Manager
Wastewater Engineering Services Division
LA Sanitation and Environment

AP/CD: sa

Attachment: Figure 1 - Sewer Map

c: Kosta Kaporis, LASAN
Cyrous Gilani, LASAN
Christopher DeMonbrun, LASAN



Wastewater Engineering Services Division
Bureau of Sanitation
City of Los Angeles

Figure 1
Morrison Hotel
Sewer Map

N
W
E
S
0 75 150 300 450 600
Feet

EXHIBIT 2

Los Angeles Department of Water & Power

RESOLUTION NO. _____

BOARD LETTER APPROVAL

RICHARD F. HARASICK
Senior Assistant General Manager
Water System

MARTIN L. ADAMS
General Manager and Chief Engineer

DATE: February 4, 2020

SUBJECT: Water Supply Assessment – Morrison Project

SUMMARY

The Water Supply Assessment (WSA) is for the Morrison Project (Project) located within the Central City Community Plan area of the City of Los Angeles (City). LADWP staff determined the net additional water demand for the Project is 120 acre-feet per year (AFY) and has concluded that this additional water demand can be accommodated by the City's water supply. The Project's base water demand was further reduced by 25 AFY through implementation of the conservation ordinance and code requirements and an additional 4 AFY through the project implementing additional voluntary conservation measures. The WSA will meet the requirements of California Water Code Sections 10910-10915. The governing body of each public water system is required to make a determination on WSAs for major projects.

City Council approval is not required.

RECOMMENDATION

It is recommended that the Board of Water and Power Commissioners (Board) adopt the attached Resolution authorizing the WSA for the Project.

ALTERNATIVES CONSIDERED

LADWP is required by state law, as set forth in California Water Code Sections 10910-10915, to prepare this WSA for the Project. There are no other alternatives.

FINANCIAL INFORMATION

Morrison Hotel, LLC & Morrison Residential LLC (Applicant) paid $17,000 to cover LADWP's expenses for preparation of this WSA.

BACKGROUND

WSAs are prepared in conformance with California law and the City ordinances to ensure proposed projects that utilize water resources are consistent with the City's conservation goals and long-term water supply availability, as detailed in LADWP's 2015 Urban Water Management Plan (UWMP). LADWP's 2015 UWMP is the water supply planning document for the City and is prepared by LADWP.

Each WSA performed by LADWP is carefully evaluated within the context of LADWP's most recent UWMP and current conditions, such as restrictions on State Water Project (SWP) pumping from the Sacramento-San Joaquin River Delta (Delta) imposed by a Federal Court. The Metropolitan Water District of Southern California (MWD), from whom the City purchases its SWP and Colorado River water supplies, has also been actively developing plans and making efforts to provide additional water supply reliability for the entire Southern California region. LADWP coordinates closely with MWD to ensure implementation of MWD's water resource development plans.

Part of MWD's planning effort is the update and implementation of its Integrated Water Resources Plan (IRP) and its UWMP, which are designed to address potential reductions in water supply due to the effects of variable hydrologic conditions and regulatory restrictions on exports from the Delta. The 2015 IRP update resulted in the development of the following six main findings and conclusions:

1. Action is needed to minimize unacceptable level of storage allocation frequency in the future,
2. Maintain Colorado River supplies,
3. Stabilize SWP supplies,
4. Develop/protect local supplies and water conservation,
5. Maximize effectiveness of storage and transfers, and
6. Continue with adaptive management approach.

LADWP's 2015 UWMP contains a water shortage contingency plan for multi-year dry hydrological periods. This water shortage contingency plan was implemented on June 1, 2009, when the Board adopted Shortage Year Rates and the City Council implemented the landscape irrigation and prohibited use restrictions contained in the City's Water Conservation Ordinance. The City's Water Rate Ordinance, adopted June 1995, was last amended by the Board, effective April 15, 2016. The new water rate structure increases the number of tiers from two to four for single-family residential customers. The goal is to incentivize conservation while recovering the higher costs

of providing water to high volume users. In keeping with cost of service principles, the incremental pricing for the tiers is based on the cost of water supply and, for the third and fourth tiers, added pumping and storage costs.

Various conservation measures are also required through the following regulations: the City's Green Building Codes Revision/Use of Greywater Systems/Water Conservation Measures Ordinance No. 184248 (effective June 2016), the City's Water Efficiency Requirements Ordinance No. 180822 (effective December 2009), 2017 Los Angeles Plumbing Code, and 2017 Los Angeles Green Building Code.

Projected Water Use and Conservation

On August 19, 2019, the Los Angeles Department of City Planning (Planning Department), lead agency for the Project, requested LADWP to perform a WSA. Based on information obtained from Planning Department, the Project will redevelop an approximately 1.29-acre site of commercial land uses within the Central City Community Plan area of the City for residential and commercial land uses. The Project site is generally bounded by 12th Street to the north, Grand Avenue to the east, Pico Boulevard to the south, and Hope Street to the west.

The Project site currently includes two one-story and one two-story commercial industrial buildings that occupy approximately 32,550 square feet (sf) of floor area, a surface parking lot, and the four-story Morrison Hotel. As part of the project, the three commercial industrial buildings and the surface parking lot will be demolished, and the Morrison Hotel will be adaptively reused. The existing water demand to be removed is approximately 2 AFY.

The Project will adaptively reuse the existing 46,626 sf hotel, expand the existing hotel with an additional area of 102,680 sf hotel space, and build an approximately 269,403 sf new mixed-use hotel and residential building. The proposed project will include 135 multi-family dwelling units, 450 hotel rooms, residential and hotel amenities, and commercial uses, for a total floor area of 418,709 sf. Residential and hotel amenities include fitness center, conference rooms, ballroom, club room, bar, lobby and amenity space, barbeque area, pool, and spa. Commercial uses include ground floor restaurant and retail space. The Project will also include covered parking, landscaping, and cooling towers.

LADWP staff recommended implementation of additional voluntary water conservation measures to maximize the potential water-use efficiency for the Project. The recommended voluntary conservation measures are in addition to those required by the City's current codes and ordinances. Based on LADWP staff recommendations, the Applicant has voluntarily committed to implement additional measures for the entire project. The Applicant's written commitment of the Morrison Project's planned voluntary water conservation measures is attached with the WSA in Appendix B:

- Fixtures
    1. ENERGY STAR Certified Residential Clothes Washers with Integrated Water Factor less than or equal to 4.1 for capacity less than or equal to 2.5 cubic feet, less than or equal to 3.1 for front-loading and capacity greater than 2.5 cubic feet, and less than or equal to 4.1 for top-loading and capacity greater than 2.5 cubic feet.
    2. ENERGY STAR Certified Residential Dishwashers with gallons per cycle less than or equal to 3.47 for standard and less than or equal to 3.0 for compact.
    3. High Efficiency Toilets with a flush volume of 1.0 gallons per flush (gpf), or less (less than the current 1.28 gpf code requirement).
    4. Showerheads with a flow rate of 1.5 gallons per minute (gpm), or less (less than the current 1.8 gpm code requirement).

- Landscape and Irrigation
    1. California Friendly plants or native plants will be used as needed.
    2. Drip/Subsurface Irrigation (Micro-Irrigation).
    3. Drought tolerant "No Mow Fescue" will be used as needed.
    4. Micro-Spray.
       Proper Hydro-zoning/Zoned Irrigation (groups plants with similar water requirements together).

- Pool
    1. Install a meter on the pool make-up line so water use can be monitored and leaks can be identified and repaired.
    2. Pool/Spa recirculating filtration equipment.
    3. Water-Saving Pool Filter.

- Utilities
    1. Domestic Water Heating System located in close proximity to point(s) of use.
    2. Individual metering and billing for water use for every residential dwelling unit and commercial unit.

With the addition of these voluntary water conservation measures, which yield additional savings of approximately 4 AFY, the total net additional water demand is approximately 120 AFY.

The Applicant has also committed to comply with the City of Los Angeles Low Impact Development Ordinances (City Ordinance Nos. 181899 and 183833) and to implement Best Management Practices that have stormwater recharge or reuse benefits for the entire Project as applicable:

- Catch Basin Insert – A device that can be inserted into an existing catch basin design to provide some level of runoff contaminant removal.
- Catch Basin Screens.
- Cistern – Captures stormwater runoff as it comes down through the roof gutter system.
- Infiltration Basin (drainage area of 5-50 acres) – Captures first-flush stormwater, removes particulate pollutants and some soluble pollutants, and contributes toward recharging groundwater.
- Infiltration Trench (drainage area of less than 5 acres) – Similar to infiltration basin but used for smaller drainage areas to capture and infiltrate rainwater.
- Pervious Pavements – Captures runoff by allowing stormwater to pass through the pavement surface and then infiltrate into the groundwater basin.

Planning Department has determined that the Project conforms with the use and intensity of development permitted by the City's General Plan, and that it is consistent with the demographic projections for the City from both the 2012 and 2016 Regional Transportation Plans (RTP) by the Southern California Association of Governments. The City's water demand projection in 2015 UWMP was developed based on the 2012 RTP demographic projection using the 2010 U.S. Census for the City. LADWP used a modified-unit-use approach to develop its service area-wide water demand projections.

This methodology does not rely on individual development demands to determine area-wide growth. 2015 UWMP concluded there are adequate water supplies to meet projected water demand through 2040. Therefore, projected water supply available during normal, single-dry, and multiple-dry water years as included in the 25-year projection of 2015 UWMP is sufficient to meet the projected water demand associated with the Project, in addition to the existing and planned future demand on LADWP.

ENVIRONMENTAL DETERMINATION

Determine item is exempt pursuant to the California Environmental Quality Act (CEQA) Guidelines 15268 (b) (4). In accordance with Section 15268 (b) (4) of the CEQA Guidelines, Ministerial projects such as approval of individual utility service connections and disconnections are exempt from the requirements of CEQA.

CITY ATTORNEY

The Office of the City Attorney reviewed and approved the Resolution as to form and legality.

ATTACHMENTS

- Resolution
- Water Supply Assessment

RESOLUTION NO. _____

WHEREAS, Los Angeles Department of Water and Power (LADWP) constitutes a "public water system" pursuant to California Water Code Section 10912, subdivision (c); and

WHEREAS, the Morrison Project qualifies as a Project under California Water Code Section 10912, subdivision (a) (7); and

WHEREAS, the Morrison Project is located in the service area of LADWP's water supply system, and LADWP would serve the area of the Morrison Project development; and

WHEREAS, on August 19, 2019, the City of Los Angeles (City) Department of City Planning (Planning Department) requested the LADWP conduct a Water Supply Assessment (WSA) for the Morrison Project pursuant to California Water Code Sections 10910-10915; and

WHEREAS, the Morrison Project would redevelop an approximately 1.29-acre site of commercial land uses within the Central City Community Plan area of the City for residential and commercial land uses; and

WHEREAS, LADWP's Water Resources Division has prepared a WSA for the Morrison Project in compliance with California Water Code Sections 10910-10915; and

WHEREAS, the Morrison Project is determined by the Planning Department to be consistent with the demographic projections for the City from both the 2012 and 2016 Regional Transportation Plans by the Southern California Association of Governments; and

WHEREAS, LADWP staff performed the water demand analysis and determined the net increase in total water demand for the Morrison Project is 120 acre-feet per year; and

WHEREAS, Morrison Hotel, LLC & Morrison Residential LLC (Applicant) has agreed to implement additional conservation measures, as described in WSA, that are in addition to those required by law; and

WHEREAS, LADWP anticipates that its projected water supply available during normal, single-dry, and multiple-dry water years as included in the 25-year projection contained in its adopted 2015 Urban Water Management Plan can accommodate the projected water demand associated with the Morrison Project, in addition to the existing and planned future demands on LADWP; and

WHEREAS, the Board of Water and Power Commissioners (Board) adopted a Water Rate Ordinance for water service effective April 15, 2016. The Board believes that the price signals contained in the Water Rate Ordinance encourages conservation and will help to contribute to reductions in City-wide demands to meet demand projections; and

WHEREAS, in accordance with Water Code Section 10910 (g) (1) the Board has the responsibility for approval and certification of WSA's prepared by LADWP; and

WHEREAS, the Board has independently reviewed and considered the WSA and documentation making up the administrative record; and

WHEREAS, a publicly noticed Board hearing was held with respect to this item on February 25, 2020, and the Board considered evidence presented by LADWP's Water Resources Section staff, the staff recommendation to approve the WSA, and other comments from interested parties at the public hearing.

NOW, THEREFORE, BE IT RESOLVED that the Board finds that LADWP can provide sufficient domestic water supplies to the Morrison Project area and approves the WSA prepared for the Morrison Project, now on file with the Secretary of the Board, and directs that WSA and a certified copy of Resolution be transmitted to Planning Department.

BE IT FURTHER RESOLVED that the Board finds that LADWP'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 demands associated with the Morrison Project in addition to existing and planned future uses including agricultural and industrial uses.

BE IT FURTHER RESOLVED that the Board has considered the WSA prior to making a decision to approve the WSA, and finds that the WSA is adequate and was prepared in accordance with Water Code Section 10910 (c) (2), and meets the requirements of Water Code Section 10910 (d), (e), (f), and (g).

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of a Resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held

_____

Secretary

APPROVED AS TO FORM AND LEGALITY
MICHAEL N. FEUER, CITY ATTORNEY

FEB 03 2020

BY _____
JULIE C. RILEY
DEPUTY CITY ATTORNEY

WATER SUPPLY ASSESSMENT

FOR THE MORRISON PROJECT

Prepared by:
Water Resources Division

February 25, 2020

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- Upper Los Angeles River Area Watermaster Report for 2013/2014, Dated December 2015
- Los Angeles Department of Water and Power 2015 Urban Water Management Plan
- Metropolitan Water District of Southern California Integrated Water Resources Plan 2015 Update
- Metropolitan Water District of Southern California 2015 Urban Water Management Water Plan
- California Code of Regulations Title 23. Waters, Division 2. Department of Water Resources, Chapter 2.7. Model Water Efficient Landscape Ordinance
- City of Los Angeles Department of Public Works Bureau of Sanitation (LASAN) Sewer Generation Rates Table

Appendices

A. The City of Los Angeles Department of City Planning letter, Request for Water Supply Assessment, received on August 19, 2019, and Scope Confirmation e-mail received on December 18, 2019

B. Water Conservation Commitment Letter

C. Project Location Maps

D. Adjudicated Groundwater Basin Judgments

E. Water Supply Assessment Provisions – California Water Code Section 10910-10915

F. MWD of Southern California (Appendix A)

G. Water Supply Assessment Checklist

Introduction

Proposed major projects subject to certain requirements in the California Water Code Sections 10910-10915 require that a city or county identify any public water system that may supply water to the Morrison Project and request the public water system provide a Water Supply Assessment (WSA). The WSA is a determination by the water supplier that the demands associated with the Morrison Project were included in its most recently adopted 2015 Urban Water Management Plan (2015 UWMP) showing that there is an adequate 20-year water supply.

The City of Los Angeles (City) Department of City Planning (Planning Department), serving as the lead agency as prescribed by the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.), for the Morrison Project, has identified LADWP as the public water system that will supply water. In response to Planning Department's request for a WSA, LADWP has performed the assessment contained herein.

LADWP has supplied the City with a safe and reliable water supply for over a century. Over time, the City's water supplies have evolved from primarily local groundwater to predominantly imported supplies. Today, the City relies on over 85 percent of its water from imported sources. In April 2015, the Mayor Eric Garcetti released the City's first ever Sustainability City pLAn (pLAn) that focused on long term improvement to the environment, economy, and equity in Los Angeles. In April 2019, the Mayor released the Los Angeles' Green New Deal (New Deal), which serves as an update to the 2015 pLAn. The New Deal has established new and updated targets, initiatives, and milestones for Local Water, Environmental Justice, and many other sectors such as Renewable Energy. By 2035, the New Deal calls for (1) sourcing 70 percent of City's water locally and increasing stormwater capture capacity, (2) recycling 100 percent of all wastewater for beneficial reuse, (3) building at least 100 new multi-benefit stormwater capture projects, and (4) reducing potable water use per capita by 25 percent. LADWP is committed to incorporating the new targets, initiatives, and milestones in all upcoming planning efforts, including the 2020 Urban Water Management Plan update. The New Deal is available for download at http://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf.

WSA is prepared to meet the applicable requirements of state law as set forth in California State Water Code Sections 10910-10915. Significant references and data for WSA are from the City's 25-year water resource plan, entitled *Los Angeles Department of Water and Power Urban Water Management Plan 2015 (UWMP),* adopted by the Board of Water and Power Commissioners (Board) on June 7, 2016. LADWP's 2015 UWMP is incorporated by reference and is available for review through LADWP's Web site, www.ladwp.com/uwmp.

Findings

The Morrison Project is estimated to increase the total net water demand within the site by 120 acre-feet (AF) annually based on review of information submitted by Planning Department. Morrison Hotel, LLC & Morrison Residential LLC (Applicant) has committed to implement additional water use efficiency measures that are beyond those required by current law.

LADWP's WSA finds adequate water supplies will be available to meet the total additional water demand of 120 AF annually for the Morrison Project. LADWP anticipates the projected water demand from the Morrison Project can be met during normal, single-dry, and multiple-dry water years, in addition to the existing and planned future demands on LADWP.

WSA approval addresses the City's long-term water supply and demand forecasts to accommodate the Morrison Project, and is not an approval for water service connection. A separate request shall be made to LADWP requesting an evaluation of water service connection for the Morrison Project.

The basis for approving WSAs for developments is LADWP's most recently adopted UWMP. LADWP's water demand forecast, as contained in LADWP's 2015 UWMP, uses long-term demographic projections for population, housing, and employment. The California Urban Water Management Planning Act requires water suppliers to develop a UWMP every five years to identify short-term and long-term water resources management measures to meet growing water demands during normal, single-dry, and multiple-dry years. If the projected water demand associated with the Morrison Project was not accounted for in the most recently adopted LADWP 2015 UWMP, WSA must include a discussion with regard to whether LADWP'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 Morrison Project, in addition to LADWP's existing and planned future uses.

The City's water demand projection in LADWP's 2015 UWMP was developed based on the 2012 Regional Transportation Plan (RTP) demographic projection by the Southern California Association of Governments (SCAG) using the 2010 United States (U.S.) Census for the City. LADWP's 2015 UWMP concluded there are adequate water supplies to meet projected water demands through 2040. Therefore, the City's water supply projections in LADWP's 2015 UWMP are sufficient to meet the water demand for projects that are determined by the CEQA lead agency to be consistent with both the 2012 and subsequent 2016 RTPs adopted by SCAG.

Planning Department has determined that the Morrison Project conforms with the use and intensity of development permitted by the City's General Plan, and that it is consistent with the demographic projections for the City from both the 2012 and 2016 RTPs. Based on the information provided by Planning Department, anticipated water demand for the Morrison Project fall within LADWP's 2015 UWMP's projected water supplies for normal, single-dry, and multiple-dry years through the year 2040 and is

within the LADWP 2015 UWMP's 25-year water demand growth projection. This WSA can be approved based on the fact that the Morrison Project's water demand falls within the LADWP 2015 UWMP's projected increase in citywide water demands, while anticipating multi-dry year water supply conditions occurring at the same time.

Additionally, LADWP's 2015 UWMP contains a water shortage contingency plan for multi-year dry hydrological periods. This water shortage contingency plan was implemented on June 1, 2009, when the Board adopted Shortage Year Rates, and the City Council implemented the landscape irrigation and prohibited use restrictions contained in the City's Water Conservation Ordinance.

The City's Water Rate Ordinance, adopted in June 1995, was last amended by the Board, effective April 15, 2016. The revised rate ordinance restructured the rates to help further promote conservation. For example, single family rates switched to a four-tier system that sends a strong price signal to deter against wasteful water use. The Board finds that the price signals contained in the Water Rate Ordinance encourage conservation and support further reduction in City-wide demand. Past and current implementation of water rate price signals and higher ordinance phases have resulted in reducing the total customer water usage.

The Morrison Project Description

The following project information was obtained from Planning Department's WSA Request Letter and the scope confirmation e-mail (Appendix A):

Project Name:	Morrison Project
Lead Agency:	Planning Department
Planning Community:	Central City Community Plan

The Morrison Project will redevelop an approximately 1.29-acre site of commercial land uses within the Central City Community Plan area of the City for residential and commercial land uses. The Morrison Project site is generally bounded by 12th Street to the north, Grand Avenue to the east, Pico Boulevard to the south, and Hope Street to the west.

The Morrison Project site includes two one-story and one two-story commercial industrial buildings that occupy approximately 32,550 square feet (sf) of floor area, a surface parking lot, and the four-story Morrison Hotel. As part of the project, the three commercial industrial buildings and the surface parking lot will be demolished, and the Morrison Hotel will be adaptively reused. The existing water demand to be removed is approximately 2 acre-feet per year (AFY).

The Morrison Project will adaptively reuse the existing 46,626 sf hotel, build an expansion of the existing hotel with the new construction of an approximately 102,680 sf hotel space, and build an approximately 269,403 sf new mixed-use hotel and residential building. The proposed project will include 135 multi-family dwelling units, 450 hotel rooms, residential and hotel amenities, and commercial uses, for a total floor area of

418,709 sf. Residential and hotel amenities include fitness center, conference rooms, ballroom, club room, bar, lobby and amenity space, barbeque area, pool, and spa. Commercial uses include ground floor restaurant and retail space. The Morrison Project will also include covered parking, landscaping, and cooling towers.

LADWP staff performed the water demand analysis and determined the net increase in water demand for the Morrison Project is 120 AFY.

A subsequent revised WSA may be required if one or more of the following occurs: (1) changes in the Morrison Project result in a substantial increase in water demand for the Morrison Project; (2) changes in the circumstances or conditions substantially affecting the ability of LADWP to provide a sufficient supply of water for the Morrison Project; or (3) significant new information becomes available which was not known and could not have been known at the time when WSA was prepared. If deemed necessary, Applicant may request a revised WSA through lead agency.

The Morrison Project Water Demand Estimate

Projected total net water demand increase for the Morrison Project is estimated to be 120 AF annually. This amount takes into account savings due to water conservation ordinances which are approximately 25 AFY, and savings due to additional voluntary conservation measures which are approximately 4 AFY.

In evaluating the Morrison Project's water demand, the Sewer Generation Factors (SGF), published by City of Los Angeles Department of Public Works Bureau of Sanitation (LASAN) in 2012, are applied to the Morrison Project scope for calculating indoor water use. SGFs are factors of how much wastewater is generated (gallons per day) per unit (per sf, per dwelling unit, per seat, etc.). LASAN publishes a list of SGFs for approximately 175 different building use types in the City, and updates factors to make adjustments necessary due to water conservation efforts and increased efficiencies in new appliances and plumbing fixtures. Outdoor landscape water demand is estimated per California Code of Regulations Title 23 Division 2 Chapter 2.7 Model Water Efficient Landscape Ordinance. Historical billing records are used to establish existing baseline water demand on the property. LADWP also encouraged the Morrison Project to implement additional water conservation measures above and beyond the current water conservation ordinance requirements.

The net increase in water demand, which is the projected additional water demand of the Morrison Project, is calculated by subtracting the existing baseline water demand and water saving amount from the total proposed water demand.

Table I shows a breakdown of the existing and proposed new types of uses for the Morrison Project, and the corresponding estimated volume of water usage with the implementation of the conservation measures for this project.

Types of use were derived from WSA Request Letter and the scope confirmation e-mail in Appendix A.

Table II estimates the total volume of water conservation based on conservation measures the Applicant has committed to for the Morrison Project (Appendix B).

TABLE I
The Morrison Project
Calculated Total Additional Water Demand

Existing Use to be Removed[1]	Quantity	Unit	Water Use Factor (gpd/unit)			Existing Water Use to be Removed (gpd)	(af/y)
Commercial Industrial Building	32,550	sf				1,764	
Hotel Room[2]	111	room				0	
Existing to be Removed Total[3]						**1,764**	**1.98**

Proposed Use[1]	Quantity	Unit	Water Use Factor[4] (gpd/unit)	Base Demand (gpd)	Required Ordinances Water Savings[5] (gpd)	Proposed Water Demand (gpd)	(af/y)
Residential: 1 bd	60	du	110.00	6,600			
Residential: 2 bd	72	du	150.00	10,800			
Residential: 3 bd	3	du	190.00	570			
Base Demand Adjustment (Residential Units)[6]				2,110			
Residential Units Total	**135**	**du**		**20,080**	3,779	**16,301**	**18.26**
Hotel Room	450	room	120.00	54,000			
Base Demand Adjustment (Hotel Room)[6]				4,891			
Hotel Room Total				**58,891**	6,427	**52,464**	**58.77**
Gym/Fitness Center	3,225	sf	0.65	2,096			
Conference Room	7,197	sf	0.12	864			
Ballroom	15,325	sf	0.12	1,839			
Club Room	559	sf	0.35	196			
Bar	3,060	sf	0.72	2,203			
Restaurant: Full Service	696	seat	30.00	20,880			
Retail	1,825	sf	0.025	46			
Lobbies and Amenity Space	25,728	sf	0.05	1,286			
Barbeque Area	160	seat	10.71	1,714			
Pool/Spa	1,140	sf		107			
Commercial and Amenities Total				**31,231**	6,782	**24,449**	**27.39**
Landscaping[7]	**3,000**	**sf**		**280**	148	**132**	**0.15**
Covered Parking[8]	**90,000**	**sf**	0.02	**59**	0	**59**	**0.07**
Cooling Tower Total	**1,300**	**ton**	18.31	**23,801**	4,760	**19,041**	**21.33**
		Proposed Subtotal		**134,342**	**21,896**	**112,446**	**125.97**
					Less Existing to be Removed Total	-1,764	-1.98
					Less Additional Conservation[9]	-3,551	-3.98
					Net Additional Water Demand	**107,131 gpd**	**120.01 af/y**

[1] Provided by City of Los Angeles Department of City Planning in the Request for Water Supply Assessment letter and Scope Confirmation e-mail. See Appendix A. Proposed Uses that do not have a water demand are not shown here.

[2] The existing Morrison Hotel to be adaptively reused has no water demand since it has been vacant for over 10 years.

[3] The existing water demand is based on the LADWP billing data for the commercial industrial building (from February 2016 to July 2019).

[4] Proposed indoor water uses are based on 2012 City of Los Angeles Department of Public Works, Bureau of Sanitation Sewer Generation Rates table available at http://www.lacitysan.org/fmd/pdf/sfcfeerates.pdf.

[5] The proposed development land uses will conform to City of Los Angeles Ordinance No. 184248, 2017 Los Angeles Plumbing Code, and 2017 Los Angeles Green Building Code.

[6] Base Demand Adjustment is the estimated savings due to Ordinance No. 180822 accounted for in the current version of Bureau of Sanitation Sewer Generation Rates.

[7] Landscaping water use is estimated per California Code of Regulations Title 23. Division 2. Chapter 2.7. Model Water Efficient Landscape Ordinance.

[8] Auto parking water uses are based on City of Los Angeles Department of Public Works, Bureau of Sanitation Sewer Generation Rates table, and 12 times/yr cleaning assumption.

[9] Water conservation due to additional conservation commitments agreed by the Applicant. See Table II.

Abbreviations:

sf- square feet du - dwelling unit gpd - gallons per day af/y - acre feet per year

TABLE II
The Morrison Project
Estimated Additional Water Conservation

Conservation Measures[1]	Quantity[2]	Units	Water Saving Factor[3] (gpd/unit)	Water Saved (gpd)	Water Saved (af/y)
Toilet - Residential: 1 bd	60	du	1.54	92	0.10
Toilet - Residential: 2 bd	72	du	3.85	277	0.31
Toilet - Residential: 3 bd	3	du	6.16	18	0.02
Showerhead - Residential: 1 bd	60	du	1.59	95	0.11
Showerhead - Residential: 2 bd	72	du	3.98	286	0.32
Showerhead - Residential: 3 bd	3	du	6.36	19	0.02
Residential Dishwasher[4]	135	du	0.02	2	0.00
Residential Clothes Washer[5]	135	du	0.58	78	0.09
Residential Unit Conservation Total				**867**	**0.97**
Toilet	450	room	2.31	1,040	1.17
Showerhead	450	room	2.39	1,073	1.20
Hotel Room Conservation Total				**2,113**	**2.37**
Toilet	90	ea	6.09	548	0.61
Showerhead	3	ea	7.50	23	0.03
Commercial and Amenities Conservation Total				**571**	**0.64**
Total Additional Water Conserved =				**3,551**	**3.98**

[1] Water conservation measures agreed to by the Applicant. See Appendix B.

[2] Plumbing fixture quantities were provided by the Applicant. See Appendix B.

[3] Based on LADWP estimates.

[4] For Residential Dishwashers, standard size is assumed for a conservative estimate.

[5] For Residential Clothes washers, front-loading and > 2.5 cubic feet capacity is assumed for a conservative estimate.

Abbreviations: gpd - gallons per day af/y - acre feet per year ea – each

Water Demand Forecast

LADWP's 2015 UWMP projects yearly water demand to reach 675,700 AF by fiscal-year-ending (FYE) 2040 with passive water conservation, or an increase of 31.6 percent from FYE 2015 actual water demand. Water demand projections in five-year increments through FYE 2040 are available in LADWP's 2015 UWMP for each of the major customer classes: single-family, multifamily, commercial/governmental, and industrial. Demographic data from the Southern California Association of Government's 2012 RTP, as well as billing data for each major customer class, weather, conservation, price of water, personal income, family size, economy, and drought conservation effect were factors used in forecasting future water demand growth.

LADWP's 2015 UWMP used a modified-unit-use approach to develop its service area-wide water demand projections. This methodology does not rely on individual development demands to determine area-wide growth, because such an inventory in LADWP service area in the next 25 years is only a subset of the total development potential. Therefore, the growth or decline in population, housing units, and employment for the entire service area was considered in developing long-term water projections for the City through FYE 2040. The historical water demand for a unit of customer class, such as gallons-per-day per single family, is modified to account for future changes, including water conservation, and applied to the 2012 RTP demographic projections by SCAG. This modified-unit-use-approach has proven to be a reliable forecast historically, when compared with actual consumption, excluding the effects of conservation.

Collaboration between LADWP and MWD is critical in ensuring that the City's anticipated water demands are incorporated into the development of Metropolitan Water District of Southern California's long-term Integrated Water Resources Plan (MWD's IRP). MWD's IRP directs a continuous regional effort to develop regional water resources involving all of MWD's member agencies including the City. Successful implementation of MWD's IRP has resulted in reliable supplemental water supplies for the City from MWD.

LADWP – 2015 UWMP

The California Urban Water Management Planning Act (first effective on January 1, 1984) requires every urban water supplier prepare and adopt a UWMP every five years. The main goals of UWMPs are to forecast future water demands and water supplies under average and dry year conditions, identify future water supply projects such as recycled water, provide a summary of water conservation Best Management Practices (BMP), and provide a single and multi-dry year management strategy.[1]

LADWP's 2015 UWMP, available for reference through www.ladwp.com/uwmp, serves two purposes: (1) achieve full compliance with requirements of California's Urban Water

[1] *City of Los Angeles Department of Water and Power 2015 Urban Water Management Plan,* at ES-2.

Management Planning Act; and (2) serve as a master plan for water supply and resources management consistent with the City's goals and policy objectives.[2]

A number of important events have occurred since LADWP prepared its 2010 UWMP:

- The year 2012 marked the start of the historic 5 year drought in California.
- In January 2014 – Governor Jerry Brown proclaimed a drought state of emergency.
- July 2014 – The State Water Resources Control Board (SWRCB) implemented its Emergency Water Conservation Regulation (Emergency Regulation), as directed by Governor Brown, to take actions to reduce water use by 20 percent Statewide, which was later increased to 25 percent statewide.
- October 2014 – Mayor Eric Garcetti issued Executive Directive No. 5 (ED5) Emergency Drought Response which set goals to reduce per capita water use, reduce purchases of imported potable water by 50 percent, and create an integrated water strategy to increase local supplies and improve water security considering climate change and seismic vulnerability.
- April 2019 – The Mayor's Sustainable City pLAn 2019, or the New Deal was released, which updated the 2015 pLAn and established new and updated targets for the City to strengthen and promote sustainability. The New Deal includes a number of water resources goals by year 2035, including sourcing 70 percent of City's water locally and increasing stormwater capture capacity, recycling 100 percent of all wastewater for beneficial reuse, building at least 100 new multi-benefit stormwater capture projects, and reducing potable water use per capita by 25 percent.

A number of new requirements have been added to the Urban Water Management Planning Act since completion of LADWP's 2010 UWMP, including: an extension of the submittal deadline from December 31, 2015 to July 1, 2016, a narrative description of water demand measures implemented over the past five years and future measures planned to meet 20 percent demand reduction targets by 2020, implementation of a standard methodology for calculating system water loss, a mandatory electronic filing of UWMPs, a voluntary reporting of passive conservation savings, energy intensity, and climate change, and a requirement to analyze and define water features that are artificially supplied with water.

[2] *Id.* at ES-2.

Near-Term Conservation Strategies

Enforcing prohibited uses of water. Prohibited uses of water are intended to eliminate waste and increase awareness of the need to conserve water. In effect at all times, prohibited uses have been in place since the early 1990s. Under enforcement, failure to comply would be subject to penalties, which can range from a written warning for a first violation to monetary fines and water service shutoff for continued non-compliance.

Prohibited uses of water. the City's Emergency Water Conservation Plan Ordinance (No. 181288, 183608, and 184250) prohibits uses of water, sets certain water conservation requirements, and contains phases of conservation depending on the severity of water shortages. This Ordinance is expected to improve the City's ability to comply with current regulations and respond to the ongoing drought conditions. Prohibited uses in effect at all times (Phase I) include[3]:

- Outdoor irrigation between the hours of 9 a.m. to 4 p.m.
- Outdoor irrigation during and 48 hours after rain events

For a full list of water conservation Phases and prohibited uses, please refer to LADWP's 2015 UWMP. Currently, LADWP is in Phase II of the Water Conservation Ordinance was enacted in August 2010.

On January 17, 2014, with California facing water shortfalls in the driest year in recorded state history, Governor Brown proclaimed a Drought State of Emergency. Responding to the executive order, in 2015, SWRCB imposed mandatory cutbacks ranging from four percent to 36 percent. LADWP was required to reduce its water use by 16 percent compared to the 2013 levels. LADWP met the state mandated reduction goal and saved 16.1 percent between June 2015 and May 2016.

On October 14, 2014, Mayor Garcetti issued his Executive Directive No. 5 (ED5) to set accelerated short-term conservation targets for the City to address the drought including per capita water use reduction goal of 20 percent by 2017. On January 1, 2017, the City was able to meet the short-term target of 20 percent reduction through drought response measures that dropped per capita water use to 104 gallons per day. While this extraordinary achievement will have lasting effects on the City's water use efficiency, LADWP continues to work together with residents and businesses to achieve additional permanent conservation savings and further reduce per capita water use. On April 7, 2017, Governor Brown issued Executive Order B-40-17 formally ending the drought emergency.

Extending outreach efforts. Over the last several years, LADWP has expanded conservation outreach and education. Some activities to promote conservation include: increased communication with ratepayers through Twitter, Facebook, newspapers,

[3] *Id.* at 3-11.

radio, television, bus benches/shelters, and movie theaters, among other types of media; outreach to Homeowner Associations and Neighborhood Councils; distribution of hotel towel door hangers and restaurant table tent cards; and ramping up marketing of expanded water conservation incentive and rebate programs.

On April 9, 2015, the "Save the Drop" Water Conservation Outreach Campaign was launched. This campaign is a partnership between LADWP and the Mayor's Office. Outreach materials include new public service announcements, radio spots, event handouts, and signage on the sides of LASAN trucks. The campaign has partnered with celebrities for public service announcements airing on TV, cinema, and radio.

Long-Term Local Supply Strategies

In April 2019, the Mayor released the Los Angeles' New Deal, which serves as the update to the 2015 pLAn. The New Deal has established new and updated targets, initiatives, and milestones for Local Water, Environmental Justice, and many other sectors such as Renewable Energy. The New Deal includes a number of water resources goals such as sourcing 70 percent of City's water locally, capturing 150,000 acre feet per year of stormwater by 2035, and reducing imported water purchases from MWD by 50 percent from 2013/14 levels by 2025. It also includes goals of recycling 100 percent of all wastewater for beneficial reuse by 2035, building at least 10 new multi-benefit stormwater capture projects by 2025, 100 by 2035, and 200 by 2050. The New Deal goals also include reducing potable water use per capita by 22.5 percent by 2025, 25 percent by 2035, and maintaining or reducing the 2035 potable per capita water use through 2050.

On May 31, 2018, Governor Brown signed two long-term water-use efficiency bills: Assembly Bill 1668 and Senate Bill 606. These bills are designed to help the State better prepare for droughts and climate change. They require that by January 1, 2025, the indoor residential use will reduce to 55 gallons per day (gpd), 52.5 gpd from 2025 to 2030, and 50 gpd beginning January 1, 2030.

1.0 Increase Water Conservation Through Reduction of Outdoor Water Use and New Technology

Goal

Increase water conservation savings to achieve the New Deal water conservation goals by cutting back on outdoor water use, expanding rebates and incentives, improving water efficiency at public facilities, and enhancing savings through review of new developments**.** LADWP plans to achieve additional water conservation savings to reduce per capita water use by 25 percent by 2035.

Action Plan

***Conservation Rebates and Incentives*.** LADWP is continuing to expand rebates and incentives for homeowners and business owners to encourage them to purchase water-saving technology. Rebate and incentive programs include the following: Commercial Rebate Program, Residential Rebate Program, Direct Install Partnership Program, and Technical Assistance Program. For a full list of LADWP's rebate programs, please refer to www.ladwp.com.

Some highlights from the list of LADWP's numerous water conservation accomplishments as of August 2019 are:

- LADWP's Water Conservation Program has achieved a total cumulative hardware water savings of over 128,000 AFY, through installation of conservation devices subsidized by rebates and incentives.
- Water conservation achievements have helped keep water demand flat for the last 45 years ago despite a population increase of over one million people.
- California Friendly Landscape Incentive Program – In total (Residential and Commercial Turf removal), LADWP has removed over 49 million sf of turf, saving over 1.9 billion gallons of water per year.

***Enhancing Conservation through New Developments*.** LADWP continues to work with the City's Green Building Team to pursue desired changes in local codes and standards to promote water efficiency in new construction projects and major building renovations. Current revision was effective January 1, 2017: 2017 Los Angeles Plumbing Code, and 2017 Los Angeles Green Building Code. On April 8, 2015, the California Energy Commission adopted new efficiency standards for toilets, faucets and other appliances effective January 1, 2016. Also, on July 15, 2015, in response to Governor Brown's Executive Order B-29-15, the California Water Commission approved the revised Model Water Efficient Landscape Ordinance, which reduces the maximum amount of water allowed from the 2009 version of the ordinance. Also, Ordinance No. 184248, *Green Building Codes Revision, Use of Greywater Systems, Water Conservation Measures*, became effective June 6, 2016, and mandates a number of new fixture requirements and methods of construction for plumbing and irrigation systems. California Plumbing Code, Los Angeles City Plumbing Code and amending ordinances apply to all newly constructed buildings, additions and alterations whenever new fixtures are installed in existing buildings. California Building Code (CALGreen), the LA Green Building Code and the amending ordinances also apply to new construction projects, but are limited to additions and alterations that exceed the Building Code's valuation or increase the building's conditioned volume.

In addition, the City adopted Ordinance No. 181899, also known as the "Low Impact Development" Ordinance, and Ordinance No. 183833, entitled "Stormwater and Urban Runoff Pollution Control." The purpose of these Ordinances includes rainwater harvesting and stormwater runoff management, water conservation, and recycled water reuse and gray water use. Ordinance No. 181899 was effective as of November 14, 2011, and Ordinance No. 183833 was effective October 3, 2015.

***Future Programs*[4]. ** In December 2014, LADWP started its Home Water Use Report Pilot Study, which provided 73,000 single family customers bi-monthly home water use reports on their water usage, statistics on how they compare to similar households with average and efficient water use, and customized water saving tips and rebate recommendations. The pilot study group also had access to online on historical water use, estimated breakdown of how the customer is using their water and additional information on how to save water in their homes. LADWP plans to expand the home water use reports for Single Family Residential in 2020.

LADWP is also planning to provide hands-on workshops and training for Single Family Residential customers to have their lawn removed and replaced with California Friendly landscaping. These workshops will demonstrate sustainable best practices used in the landscaping.

***LADWP Water Conservation Potential Study*[5]. ** In Fall 2017, LADWP completed the Water Conservation Potential Study (WCPS), one of the most comprehensive assessments of the potential for future water conservation ever taken by a municipal water utility. The WCPS conducted detailed single-family and multifamily surveys, completed comprehensive onsite audits of City-owned facilities, and developed a sophisticated water conservation model to project future conservation potential. The WCPS determined that approximately 140,000 AFY in additional water conservation potential is achievable by FYE 2035, and meeting the City's aggressive 2025 and 2035 conservation goals will require tapping into most of the remaining conservation potential in the City.

Going forward, LADWP will use the WCPS findings and conservation model to develop a balanced conservation plan that achieves the City's long-term conservation goals. Meeting the goals will require a combination of increased funding for LADWP's conservation programs and continued commitment from LADWP customers to make conservation a way of life for Los Angeles. The WCPS findings show that a large portion of the remaining conservation potential will come from passive water savings through customers' actions to comply with all City conservation codes and ordinances and finding additional opportunities to improve water efficiency for their residential or commercial properties.

[4] *Id.* at 3-33.
[5] *Id.* at 3-34.

2.0 Water Recycling

LADWP's 2015 UWMP set a target of delivering 75,400 AFY of recycled water by 2040 to off-set imported water.[6] The target was subsequently supplemented by the New Deal goal of recycling 100 percent of all wastewater for beneficial use by 2035. Some of the examples of the steps the City is taking in order to achieve this goal are listed below. Other projects not listed below will also contribute to recycled water use in City's service area.

Recycled Water Master Planning (RWMP). In 2012, LADWP completed a three-year RWMP. RWMP documents guide near-term recycled water planning through 2035, as well as long-term recycled water planning for up to 50 years beyond the 2035 horizon. RWMP documents include an evaluation of recycling alternatives that integrate two strategies to increase recycling: Groundwater Replenishment (GWR), and non-potable reuse (NPR). The GWR Project will replenish San Fernando Basin (SFB) with up to 30,000 AFY of recycled water. NPR projects will increase NPR recycled water use to 45,400 AFY by 2040 by increasing deliveries to irrigation and industrial customers throughout the City.

L.A.'s Green New Deal. The New Deal established goals to recycle 100 percent of all wastewater for beneficial use by 2035. It includes the milestones and initiatives of producing 1.5 millions of gallons per day of recycled water at Hyperion Water Reclamation Plan (WRP) for use at the Los Angeles World Airport and other local facilities, recycling 17,000 AFY of water at Donald C. Tillman WRP to recharge into groundwater basins, and increasing non-potable reuse of recycled water by an additional 6,000 AFY by 2025 and by an additional 8,000 AFY by 2035.[7]

***GWR Project*.** The Groundwater Replenishment Project is in the Planning phase. The Environmental Impact Report was certified in December 2016 by the Board of Water and Power Commissioners. The project is transitioning to a phased approach. The Initial Phase of the project will deliver up to 3,500 AFY of recycled water for indirect potable reuse in the San Fernando Valley by 2019. The project remains on schedule to deliver up to 30,000 AFY of purified recycled water for indirect potable reuse in the San Fernando Valley by FY 2023-24.

The Machado Lake Pipeline Project (MLPP). MLPP is a part of a joint agency project between Los Angeles Bureau of Sanitation, Los Angeles Bureau of Engineering, and LADWP to serve the Los Angeles Harbor area customers up to an additional 6 million gallons per day of advanced treated recycled water from an expanded Terminal Island Treatment Plant. The MLPP will construct 8,800 linear feet (LF) of 24-inch ductile iron pipeline that connects two segments of existing pipeline infrastructure within the Los Angeles Harbor Area and creates a loop between the charged southern system and the uncharged northern system. The project is split into two construction phases.

[6] *Id.* at 4-27.
[7] *L.A.'s Green New Deal Sustainability City pLAn 2019* at 47.

Construction on Phase I has been completed in 2019 and Phase II is estimated to be completed by 2020.

***Downtown Water Recycling Project*.** The Los Angeles-Glendale Water Reclamation Plant will supply recycled water for the Downtown Water Recycling Project. Project proposes installation of up to 82,500 LF of 16-inch purple pipe into and through Downtown Los Angeles. The project will supply up to 2,170 AFY of recycled water for non-potable demands – irrigation and industrial uses. Potential anchor customers include University of Southern California and Matchmaster. Anticipated project completion is 2022.

For more information on our existing and planned recycled water pipelines and projects, please see our Recycled Water Annual Report available at the following link: www.ladwp.com/recycledwaterreport.

3.0 Enhancing Stormwater Capture

Stormwater runoff from urban areas is an underutilized resource. Within the City, the majority of stormwater runoff is directed to storm drains and ultimately channeled into the ocean. Unused stormwater reaching the ocean carries with it many pollutants that are harmful to marine life. In addition, local groundwater aquifers that should be replenished by stormwater are receiving less recharge than in the past due to increased urbanization. Urbanization has increased the City's hardscape, which has resulted in less infiltration of stormwater and a decline in groundwater elevations.

LADWP's Stormwater Capture Master Plan (SCMP), which was completed in August 2015, comprehensively evaluated stormwater capture potential within the City. The goals of the SCMP are to quantify stormwater capture potential and identify new projects, programs, and policies to significantly increase stormwater capture for water supply within the 20-year planning period. Achieving these goals, will help the City achieve its long-term strategy of enhancing local water supply through stormwater capture in coordination with the New Deal, which sets a target of obtaining 70 percent of LA's water supply locally, including 150,000 AFY of stormwater capture by 2035.

Through intensive implementation of both centralized projects and distributed programs, SCMP provides a strategy to achieve an annual average capture of 132,000 to 178,000 AFY by 2035, which includes the current baseline capture of 64,000 AFY. These projects include stormwater captured through infiltration type projects and programs that recharge aquifers as well as direct use programs that offset potable water demands, though the bulk of the capture is achieved through infiltration.

LADWP's 2015 UWMP projects that there will be a minimum of 15,000 AFY of increased groundwater pumping in SFB due to water supply augmentation through centralized stormwater infiltration by year 2040. Anticipating that stored groundwater will rebound in response to enhanced groundwater replenishment, LADWP will work with the Upper Los Angeles River Area Watermaster to continue observing actual water

levels and re-evaluate basin safe yield to allow additional increases in groundwater production over time as SFB elevations rebound.[8]

The San Fernando Valley spreading facilities are effective at capturing stormwater flowing down the tributaries; however, they are incapable of capturing significant portions of flow during wet and extremely wet years. Weather patterns in Los Angeles are highly variable, with many periods of dry years and wet years. Some climate studies predict that these patterns may become extreme in the future.

LADWP is currently partnering with other government and non-governmental agencies in various stormwater capture projects that include the following:

Completed Centralized Projects

Implemented centralized projects have increased the amount of stormwater captured by an average of 10,600 AFY during an average rainfall year. Below are recently implemented centralized projects:

- Big Tujunga Seismic Retrofit Project
- Hansen Spreading Grounds Upgrade
- Sheldon-Arleta Gas Management System

Completed Distributed Projects

LADWP's already implemented distributed projects that have increased the amount of stormwater captured by 370 AFY during an average rainfall year. The following are recently implemented distributed projects:

- Elmer Avenue Neighborhood Green Street/Elmer Paseo Green Alley Stormwater Infiltration Projects
- Garvanza Park Stormwater Capture Use and Infiltration Project
- Glenoaks-Sunland Stormwater Infiltration Project
- Hollywood/Los Angeles Beautification Stormwater Capture Project
  This is a demonstration project to encourage stormwater capture. The City of Los Angeles Department of Public Works, Bureau of Street Services and LASAN will provide in-kind design services, while the Sun Valley Beautiful Committee, Council District 6, and the Los Angeles Unified School District (LAUSD) are project sponsors and partners. Project increases regional annual average stormwater capture by 6 AFY.
- Laurel Canyon Green Street
- North Hollywood Alley Retrofit BMP Demonstration Project
- Sun Valley Economic Development Administration Public Improvement Project
- Sun Valley Park Stormwater Infiltration Project
- Woodman Avenue Median Stormwater Infiltration Project

[8] *City of Los Angeles Department of Water and Power 2015 Urban Water Management Plan,* at 7-29.

Future Centralized Projects

By 2024, the following centralized projects are expected to be implemented that will provide an estimated 19,500 AFY of increased stormwater capture annually during an average rainfall year:

- Branford Spreading Basin Upgrade
- Lopez Spreading Grounds Upgrade
- Pacoima Dam Sediment Removal Project
- Tujunga Spreading Grounds Upgrade Enhancement Project
- Whitnall HWY Stormwater Capture Project
- Silver Lake Reservoir Stormwater Capture Project
- Stormwater Capture Parks Program

Current/Future Distributed Projects

By 2021, the following distributed projects are expected to be implemented that will provide an estimated 660 AFY of increased stormwater capture annually during an average rainfall year:

- Agnes and Vanowen Stormwater Capture Project
- Bradley Green Alley
- Burbank Boulevard BMP Capture Project
- Ben and Victory Stormwater Capture Project
- Glenoaks and Filmore Stormwater Capture Project
- Glenoaks-Nettleton Stormwater Infiltration Project
- Great Street – Lankershim Boulevard Project
- Great Street – Van Nuys Boulevard Project
- LAUSD Conserving for Our Kids Program
- Victory and Goodland Stormwater Capture Project

Additional information regarding stormwater capture projects can be found in LADWP's *Stormwater Capture Master Plan (2015)* and *Urban Water Management Plan (2016)*.

4.0 Accelerating Clean-Up of SFB

The SFB is an aquifer that can provide sufficient drinking water to over 800,000 residents within the City. However, LADWP groundwater production wells in SFB have been impacted by contamination caused by improper handling and disposal of hazardous chemicals from the aircraft manufacturing industry and other, commercial activities dating back to the 1940s. The New Deal targets to obtain 70 percent of water locally by 2035 and the primary source of local water is groundwater from the SFB.

Since the 1980 discovery of volatile organic compound (VOC) contamination of groundwater in SFB, LADWP has been working with government agencies to contain and remediate man-made contaminants in SFB. Chlorinated solvents such as

trichloroethylene (TCE), perchloroethylene (PCE) and carbon tetrachloride account for the majority of this groundwater contamination.

From 2009 to 2015[9], LADWP began an $11.5 million, six-year study and development of a comprehensive remediation and cleanup strategy for all groundwater basin contamination in SFB.

Development of State-of-the-Art Groundwater Basin Remediation Facilities

- Based on the available groundwater quality information, a groundwater basin remediation program consisting of centralized as well as localized/well head remediation facilities will be needed for public and environmental benefits as well as to prevent further loss of groundwater.

- Design and construction of the groundwater basin remediation facilities is estimated to cost approximately $600 million, and operation and maintenance is estimated to cost an additional $50 million per year.

Groundwater and Treatment System Monitoring

- In order to fully characterize SFB groundwater quality as required by SWRCB Board's Division of Drinking Water guidelines and policies, LADWP has drilled 25 new monitoring wells in SFB to fill in data gaps and utilized a network of over 70 existing monitoring and production wells.

- Cost to install the monitoring wells is approximately $22 million.

With completion of SFB groundwater characterization, LADWP is proceeding with the necessary environmental reviews, design, permitting, construction, and start-up of the groundwater basin remediation program to effectively clean and remove contaminants from SFB. The groundwater basin remediation program is anticipated to be operational by FYE 2022.

The current groundwater remediation facilities in operation are:

- ***NHOU*****:** The NHOU began operations in the 1980s to treat 4.5 cfs of contaminated groundwater; however, changing groundwater conditions limited the ability of the remedy to contain the VOC plume. A Second Interim Remedy was implemented to contain concentrated areas of the plume, but will not address contamination that has migrated to other well fields.

- ***Liquid-Phase GAC Pilot Treatment Plant at Tujunga Wellfield*****:** The Liquid-Phase GAC Pilot Treatment Plant removes VOC from two of the twelve production wells in the Tujunga Wellfield at 8,000 gpm, and treats the extracted

[9] *Id.* at 6-9.

groundwater for potable use. This pilot facility is a joint project with MWD to demonstrate the effectiveness of utilizing certain liquid phase GAC media for removal of VOC from the groundwater.

- ***Pollock Wells Treatment Plant:*** The plant provides four liquid-phase GAC vessels to remove VOC contamination from two groundwater wellheads. LADWP has identified hexavalent chromium as an emerging contaminant that may impair the operation of the Pollock Wells Treatment Plant.

These facilities will work with the new remediation facilities to clean up the majority of contaminants impacting LADWP's highest producing wellfields, including TCE, PCE, and 1,4-dioxane. The proposed centralized and localized facilities are:

- North Hollywood West Treatment Facility – Operation expected by 2020
- North Hollywood Central Treatment – Operation expected by 2023
- Tujunga Central Treatment – Operation expected by 2023
- Pollock Treatment – September 2018-December 2020

The overall purpose of the San Fernando Groundwater Basin Remediation Project is to restore and protect the full use of the San Fernando Groundwater Basin as a source of water consistent with LADWP's long-term water rights and historic groundwater use.

More information about LADWP's SFB Groundwater Remediation program can be found at www.ladwp.com/remediation

To help meet the City's long-term local supply goals, critical funding from Proposition 1 (Prop 1) – the Water Quality, Supply, and Infrastructure Improvement Act of 2014 was passed on November 4, 2014 to support groundwater cleanup, stormwater capture, recycled water, water conservation, regional water management, and Los Angeles River revitalization projects. Prop 1 is a bond measure that provides $7.545 billion to fund investments in water projects and programs as part of a statewide, comprehensive water plan for California. As of May 2018, LADWP has received a total of $61.2 million in grants and $3 million in a zero-interest loan.

Water Supplies

The Los Angeles Aqueducts (LAA), local groundwater, purchased water from MWD, and recycled water are the primary sources of water supplies for the City. Table III shows LADWP water supplies from 2007 to 2018 from these sources. The total required water supply to meet water demand shows an overall declining trend over this time period due to reductions in total demand. However, sufficient water supplies were available in each of the years to meet the total demand. In 2009, the total water demand decreased due to conservation efforts by mandatory conservation imposed in the City following drier hydrologic conditions coinciding with an economic recession. In 2013, drought conditions returned and have triggered State and City mandatory conservation measures.

TABLE III
LADWP Water Supply

Calendar Year	Los Angeles Aqueducts	Local Groundwater	MWD	Recycled Water	Transfer, Spread, Spills, and Storage	Total
2007	127,392	88,041	439,353	3,595	-57	658,438
2008	148,407	64,604	427,422	7,048	1,664	645,817
2009	137,261	66,998	351,959	7,570	554	563,234
2010	251,126	68,346	205,240	6,900	-938	532,550
2011	357,752	49,915	119,481	7,708	-153	535,009
2012	166,858	59,109	326,123	5,965	1,182	556,873
2013	64,690	66,272	438,534	9,253	-2,404	581,153
2014	63,960	96,394	391,307	11,307	2,020	560,948
2015	33,244	80,155	378,539	9,829	430	501,337
2016	95,573	72,503	314,336	9,095	-981	492,487
2017	380,329	14,695	113,033	8,509	5,730	510,835
2018*	245,942	42,458	212,938	8,832	-858	511,027

Note: Units are in AF.
* 2018 water supply data are estimated.

Los Angeles Aqueducts

Snowmelt runoff from the Eastern Sierra Nevada Mountains is collected and conveyed to the City via Los Angeles Aqueducts (LAA). LAA supplies come primarily from snowmelt and secondarily from groundwater pumping, and can fluctuate yearly due to the varying hydrologic conditions. In recent years, LAA supplies have been less than the historical average because of environmental restoration obligations in Mono and Inyo Counties.

The City holds water rights in the Eastern Sierra Nevada where LAA supplies originate. These supplies originate from both streams and from groundwater. In 1905, the City approved a bond measure for purchase of land and water rights in the Owens River Valley. By 1913, the first LAA began its deliveries of water to the City primarily from

surface water diversions from the Owens River and its tributaries. Historically, these supplies were augmented from time to time by groundwater extractions from beneath the lands that the City had purchased in the Owens Valley.

In 1940, the first LAA was extended north to deliver Mono Basin water to the City pursuant to water rights permits and licenses granted by the SWRCB. In 1970, the second LAA was completed increasing total delivery capacity of the LAA system to approximately 561,000 AFY. The second LAA was to be filled by completing the Mono Basin diversions originally authorized in 1940, by a more effective use of water for agricultural purposes on City-owned lands in the Owens Valley and Mono Basin and by increased groundwater pumping from the City's lands in the Owens Valley.

In 1972, Inyo County filed a CEQA lawsuit challenging the City's groundwater pumping program for the Owens Valley. The lawsuit was finally ended in 1997, with the County of Inyo and the City entering into a long-term water agreement for the management of groundwater in the Owens Valley in 1991. That water agreement, entered as a judgment of the Superior Court in the County of Inyo (County of Inyo vs. City of Los Angeles, Superior Court No. 12908) outlines the management of the City's Owens Valley groundwater resources. As a result of this water agreement and subsequent MOU, LADWP has dedicated approximately 37,000 AF of water annually for enhancement and mitigation projects throughout Owens Valley which includes the re-watering of 62 miles of the Lower Owens River. LADWP also provides approximately 80,000 AF of water annually for other uses in the Owens Valley such as irrigation, town water supplies, stockwater, wildlife and recreational purposes.

Further, in December 1989, the Superior Court entered an injunction, ordering LADWP to allow sufficient flow to pass through the Mono Basin diversion facilities to maintain water level in Mono Lake at 6,377 feet from sea level and also to restore streams and protection of fishery in these streams. As a result, the City did not export any water from Mono Basin until 1994, when SWRCB issued Decision 1631. In September 1994, citing compliance with the public trust doctrine, the SWRCB issued Decision 1631, an amendment to the license for LADWP exports from Mono Basin which placed conditions on LADWP's water gathering activities from Mono Basin. Under Decision 1631, LADWP's allowable amount of export for a given runoff year (RY), April - March is dependent on the Mono Lake elevation. LADWP has implemented an extensive restoration and monitoring programs in Mono Basin to increase the level of Mono Lake and to improve stream conditions, fisheries, and waterfowl habitats in Walker, Parker, Rush and Lee Vining Creeks. With reduced diversions from the Mono Basin and favorable hydrologic conditions, Mono Lake's elevation has risen overtime. Once the elevation of Mono Basin reaches 6,391 feet above mean sea level, a moderate increase in water exports from the Mono Basin may be permitted.

In July 1998, LADWP and the Great Basin Unified Air Pollution Control District (GBUAPCD) entered into a Memorandum of Agreement to mitigate dust emissions from Owens Lake. Diversion of water from Owens River, first by farmers in the Owens Valley and then by the City beginning in 1913, resulted in the exposed lakebed becoming a major source of windblown dust. LADWP has spent $2.2 billion and used substantial quantities of water since it started diverting water from LAA to mitigate dust emissions

at Owens Lake. On November 14, 2014, an historic agreement between LADWP and GBUAPCD was reached which for the first time established an upper limit of 53.4 square miles that LADWP could potentially be ordered to mitigate dust emissions from Owens Lake Playa by the GBUAPCD. Upon completion of the Phase 9/10 Project on December 31, 2017, LADWP has mitigated dust emissions from 48.6 square-miles of Owens Lake. Hence, GBUAPCD's potential future dust mitigation orders to LADWP cannot exceed an additional 4.8 square miles. The agreement allows LADWP to use water efficient and waterless dust mitigation measures, while maintaining existing wildlife habitat on the lakebed. As a result, LADWP expects to save significant amounts of water with implementation of the Owens Lake Master Project and other water conservation projects.

Average deliveries from LAA system have been approximately 111,293 AF of water annually from Fiscal Year (FY) 2011/12 to 2015/16. During this period, the record low snowpack for LAA watershed in the Eastern Sierra Nevada Mountains was recorded on April 1, 2015. Supply conditions have changed drastically since 2015. Snowpack in the Eastern Sierra was at 203 percent of an average year on April 1, 2017. On March 20, 2017, Mayor Garcetti had proclaimed a state of local emergency for LAA as a response to the snowpack levels in the Eastern Sierra. The proclamation was issued to assist LADWP in taking immediate steps to protect infrastructure and manage runoff in the Owens Valley including, but not limited to, protection of facilities and diversion of conveyance flows.

The average annual long-term LAA delivery between 2020 and 2050 is expected to be less than 200,000 AFY, which is much less than the projection made prior to release of the New Deal. The New Deal includes a goal to source 70 percent of City's water locally by 2035.

Groundwater

LADWP pumps from three adjudicated basins within the City. SFB and Sylmar Basin are subject to the judgment in the City of Los Angeles vs. City of San Fernando, et al. Groundwater pumping by LADWP and other parties is tracked and reported to the court-appointed Upper Los Angeles River Area (ULARA) Watermaster. The Central Basin is also subject to court judgment. Pumping is reported to the Water Replenishment District of California (WRD), the administrative member of the Central Basin Water Rights Panel.

The SFB is the largest of four basins within ULARA. The basin consists of 112,000-acres of land and comprises 91.2 percent of ULARA valley fill area. The City has accumulated 523,529 AF of stored groundwater in SFB as of October 1, 2016. A portion of this water is available for the City to withdraw during normal and dry years, or in an emergency, in addition to the City's approximate 87,000 AF annual entitlement. With SFB remediation facilities estimated to be operational by 2023, the groundwater storage credits may be used to optimize pumping beyond the City's annual entitlement.

While the majority of the City's groundwater is extracted from the SFB, the Sylmar Basin also provides local groundwater supply. Sylmar is located in the northern part of ULARA, consists of 5,600 acres, and comprises 4.6 percent of ULARA valley fill area. The City's current annual entitlement per latest Sylmar Safe Yield is 3,570 AF. Sylmar Basin production is anticipated to increase to 4,170 AFY from FYE 2018 to FYE 2033 to utilize groundwater the City has accumulated into storage and then return to the entitlement of 3,570 AFY in FYE 2034.[10]

The ULARA Judgment was adopted through court adjudication on January 26, 1979, dictating the water rights within the basins of ULARA. Enclosed with the assessment are copies of those pages from the judgment showing the entitlements (see Appendix D). Further information about ULARA is detailed in the annual ULARA Watermaster Report. Both the Watermaster Reports and Judgment are available for review at the office of the ULARA Watermaster or on-line at www.ularawatermaster.com.

The City also has adjudicated groundwater extraction rights in the Central Basin. LADWP's annual entitlement is 17,236 AF. The City has also accumulated groundwater storage in the Central Basin, and pumping can be temporarily increased until stored water credits have been expended.[11] See Appendix D for copies of relevant portions of Central Basin third amended judgment. Judgment is available for review on the WRD Web site at http://wrdwater.org/.

For the period of July 2015 to June 2016, the City extracted 73,898 AF and 683 AF from the San Fernando and Central Basins, respectively. The City plans to continue to develop production from its groundwater basins in the coming years to offset reductions in imported supplies. However, extraction from the basins may be limited by water quality, sustainable pumping practices, and groundwater elevations.

Groundwater produced by the City from the San Fernando, Sylmar, and Central Basins for the last available five years are shown on Table IV, as well as groundwater pumping projections for average, single-dry, and multi-year dry weather conditions in five-year increments. Table IV excludes 15,000 AFY of anticipated pumping in SFB from stormwater recharge as well as up to 30,000 AFY of additional groundwater recharge with highly treated water from Donald C. Tillman Water Reclamation Plant planned for 2024 and beyond.

[10] *Id.* at 11-4.
[11] *Id.* at 6-24.

TABLE IV
Local Groundwater Basin Supply

Fiscal Year (July-June)	San Fernando	Sylmar	Central
2014-2015	80,097	1	6,948
2015-2016	75,958	683	8,395
2016-2017	55,116	0	3,005
2017-2018	22,259	0	0.77
2018-2019	36,871	1	5
2019-2020*	90,000	4,170	18,500
2024-2025*	88,000	4,170	18,500
2029-2030*	84,000	4,170	18,500
2034-2035*	92,000	4,170	18,500
2039-2040*	92,000	3,570	18,500

Note: Units are in AF,
*projected production: LADWP 2015 UWMP Exhibit 6I

During recent years of drought, California was challenged with several statewide water shortage issues, including over pumping which results in land subsidence and dry well issues. The State Legislature enacted the Sustainable Groundwater Management Act (SGMA), effective January 1, 2015, in order to equip and empower local agencies with tools to manage local groundwater basins in a sustainable manner. Actions necessary to achieve sustainability will vary with each basin, but SGMA generally requires local agencies to form Groundwater Sustainability Agencies (GSA), develop and implement Groundwater Sustainability Plans (GSP), and monitor and report status of groundwater conditions within each basin. SGMA will mitigate and prevent the occurrence of adverse effects caused by unreasonable use of groundwater, such as groundwater storage depletion, land subsidence, seawater intrusion, water quality degradation, critical overdraft basin conditions, and surface water depletions.

Agencies who fail to comply will risk having their basin(s) being placed on probationary status which authorizes the State to step in and implement SGMA on their behalf. Advancing guidelines for the SGMA, the Department of Water Resources (DWR) is developing its Strategic Plan for a Sustainable Groundwater Management (SGM) Program. DWR's SGM Program is implementing new and expanded responsibilities identified in SGMA. Some of these expanded responsibilities include: (1) developing regulations to revise groundwater basin boundaries, (2) adopting regulations for evaluating and implementing GSPs and coordination agreements, (3) identifying basins subject to critical conditions of overdraft, (4) identifying water available for groundwater replenishment, and (5) publishing best management practices for the sustainable management of groundwater.

The City overlies both adjudicated and unadjudicated basins. LADWP is working with its regional partners towards compliance with the SGMA for the unadjudicated basins that are located within the City's boundaries. These activities include formation of:

- Alternative analysis, approved by DWR, for the unadjudicated northerly area in Central Basin. This effort is led by the Water Replenishment District in collaboration with other agencies like Beverly Hills, Culver City, and the Golden State Water Co.
- Exclusive GSA with other overlaying agencies for the unadjudicated Santa Monica Basin
- GSA for a small area in the eastern San Fernando Basin

Although utilizing these basins for groundwater supply may present certain challenges related to water quantity and quality, it would increase the City's local water supplies.

MWD

MWD is the largest water wholesaler for domestic and municipal uses in Southern California. As one of 26 member agencies, LADWP purchases supplemental water from MWD in addition to the supplies from local groundwater and LAA. MWD imports a portion of its water supplies from Northern California through the State Water Project's (SWP) California Aqueduct and from the Colorado River through MWD's own Colorado River Aqueduct (CRA). LADWP will continue to rely on MWD to meet its current and future water needs.

In ongoing efforts to evaluate MWD's own import reliability, an assessment was done to address changes in demand and supply conditions, and to provide additional resource reserves to mitigate against uncertainties in demand projections and risks in implementing supply programs. All these efforts went into MWD's 2015 UWMP. http://www.mwdh2o.com/PDF_About_Your_Water/2.4.2_Regional_Urban_Water_Management_Plan.pdf

All 26 member agencies have preferential rights to purchase water from MWD. Pursuant to Section 135 of MWD Act, "Each member public agency shall have a preferential right to purchase from the district for distribution by such agency, or any public utility therein empowered by such agency for the purpose, for domestic and municipal uses within the agency a portion of the water served by the district which shall, from time to time, bear the same ratio to all of the water supply of the district as the total accumulation of amounts paid by such agency to the district on tax assessments and otherwise, excepting purchase of water, toward the capital cost and operating expense of the district's works shall bear to the total payments received by the district on account of tax assessments and otherwise, excepting purchase of water, toward such capital cost and operating expense." This is known as preferential rights. As of June 30, 2019, LADWP has a preferential right to purchase 18.25 percent of MWD's total water supply.

LADWP has worked with MWD in developing a plan for allocating water supplies during periods of shortage. On February 12, 2008, MWD Board adopted its Water Supply Allocation Plan (WSAP). LADWP supported the adoption of this plan to acquire its dry weather condition supplies from MWD.

The record dry and hot conditions of 2014 significantly impacted the water resources of both the State of California and MWD. DWR limited supplies from SWP to only five percent of the contractors' SWP Table A amounts in 2014. This allocation was the lowest ever in the history of SWP. MWD was able to meet demands in 2014 by relying heavily on storage reserves to make up for the historically low allocation on SWP. MWD's dry-year storage reserves ended 2014 at approximately 1.2 million AF.

On April 14, 2015, to support Governor Brown's Executive Order B-29-15, and to reduce withdrawals from MWD's dry-year storage reserves, MWD implemented WSAP at a Level 3 Regional Shortage Level, effective July 1, 2015, though June 30, 2016. MWD's dry-year storage reserves ended 2015 at approximately 0.87 million AF.

On May 10, 2016, citing the improved water supply conditions and reduced water use due to conservation, MWD voted to end the current WSAP allocation and rescind WSAP Regional Shortage Level 3 and declared a Condition 2 Water Supply Alert for allocation year 2016/17. MWD, however, called for member agencies to continue with conservation efforts to safeguard against future dry years. On April 9, 2017, citing the improved water supply conditions, the actions taken by the Governor and the projected storage reserves, MWD voted to declare a Condition 1 Water Supply Watch.

The New Deal calls for a reduction in purchased imported water by 50 percent by 2025 from the FY 2013/14 level, which was approximately 441,870 AF. To meet targets established by the New Deal, LADWP plans to increase conservation, enhance the ability for groundwater pumping through increased stormwater capture projects and groundwater replenishment with highly treated recycled water as well as remediation of contaminated groundwater supplies in SFB. LADWP also plans to increase recycled water use for non-potable purposes. With these initiatives and under average hydrologic conditions, the projected MWD purchases is less than the MWD purchase projection shown in LADWP's 2015 UWMP.

State Water Project

SWP is owned by the State of California and operated by DWR, delivering water to two-thirds of the population of California and 750,000 acres of farmland. The SWP facilities include 30 dams, 20 reservoirs, 29 pumping and generating plants, and approximately 700 miles of aqueducts and pipelines. The water stored and delivered by the SWP originates from Northern California's watersheds, where most of the State's precipitation occurs. SWP facilities originate in Northern California at Lake Oroville on the Feather River and is pumped from the Bay-Delta region to contractors in areas north and south of the San Francisco Bay and south of the Bay-Delta.

MWD receives SWP water at three locations: Castaic Lake in Los Angeles County at the terminus of SWP West Branch, Devil Canyon Afterbay in San Bernardino County at the terminus of SWP East Branch Extension, and Box Springs Turnout at Lake Perris in Riverside County at the terminus of SWP East Branch.

MWD began receiving water from the SWP in 1972. MWD is the largest of the 29 SWP contractors, holding a contract for 1.912 MAF per year, or 46 percent of the total

contracted amount of the 4.173 MAF ultimate delivery capacity of the project. Variable hydrology, environmental issues, and regulatory restrictions in the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) have periodically reduced the quantity of water that the SWP delivers to MWD.

Contract allocations for SWP contractors are provided by DWR in "Table A," based on the original projected SWP maximum yield of 4.173 MAF. DWR annually approves the amount of contract allocations SWP contractors will receive. The contract allocation amount received by contractors varies based on contractor demands and projected available water supplies. Variables impacting projected water supplies include snowpack in the Sierra Nevada, capacity available in reservoirs, operational constraints, and demands of other water users.

Recent Issues Related to the State Water Project

The United States Fish and Wildlife Service released a biological opinion on December 15, 2008, on the impacts of the State Water Project and the federal Central Valley Project on Delta smelt. On June 4, 2009, the National Marine Fisheries Service (NMFS) released a biological opinion for salmonid species. The water supply restrictions imposed by these biological opinions on Delta smelt and salmonid species have a range of impacts on Metropolitan's deliveries from the State Water Project, depending on hydrologic conditions. The impact on total State Water Project deliveries to State Water Contractors attributable to the Delta smelt and salmonid species biological opinions combined is estimated to be one million AF in an average year, reducing total State Water Project deliveries to State Water Contractors from approximately 3.3 million acre-feet to approximately 2.3 million AF for the year under average hydrology.

Colorado River

MWD owns and operates the CRA, which since 1942 has delivered water from the Colorado River to Southern California. The Colorado River currently supplies approximately 17 percent of Southern California's water needs, and on average makes up about 15 percent of LADWP's purchases from MWD. This source of supply has been secured to MWD through long-standing legal entitlements. However, extended drought conditions and increased demands by other users have recently impacted its reliability.

The Colorado River supplies come from watersheds of the Upper Colorado River Basin in the states of Colorado, Utah, and Wyoming. Due to the way that Colorado River supplies are apportioned, snowpack and runoff levels do not impact MWD water supplies in the current year. Instead, snowpack and runoff would impact storage levels at Lake Powell and Lake Mead, which would then affect the likelihood of surplus or shortage conditions in the future.

By MWD having two principal sources of supply that draw from two different watersheds, MWD is able to utilize supplies from the Colorado River to offset reductions in SWP supplies and buffer impacts of the California drought. MWD plans to use CRA

deliveries, storage reserves and supplemental water transfers and purchases to meet regional demands.

Under a permanent service contract with the U.S. Secretary of the Interior, MWD is entitled to receive water from the Colorado River and its tributaries. This water is also available to other users in California, as well as users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. Under a 1944 treaty, Mexico is allotted 1.5 million AF annually, except in extraordinary circumstances. There is long history of competition among users, but current conditions necessitate increased cooperation.

California is apportioned 4.4 million AF, annually, 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 or Nevada. Since 2003, due to increased consumption, there has been no such unused, apportioned water available to California. Of the California apportionment, MWD holds the fourth priority right to 550,000 AFY under a 1931 priority system governing allotments to California. This is the last priority within California's basic apportionment of 4.4 million AF. Beyond the basic apportionment, MWD holds the fifth priority right to 662,000 AF of water. See Appendix F for more details.

Historically, MWD has been able to claim most of its legal entitlement of Colorado River water and could divert over 1.2 million AF in any year, but persistent drought conditions since 1999 have contributed to a decrease in these claims. The recent 16-year drought has been so severe that it has resulted in major reductions in water deliveries from the Colorado River. In response, the federal government, states and urban and agricultural water districts that depend on the Colorado River worked together toward a solution. Their efforts resulted in the Drought Contingency Plan adopted and enacted in 2019. The Drought Contingency Plan is a collection of agreements within and among the seven western states in the Colorado River Basin to boost storage levels in Lake Mead and Lake Powell and prevent the reservoirs from reaching critically low levels.

Reliability Efforts for Southern California

MWD has been developing plans and making efforts to provide additional water supply reliability for the entire Southern California region. LADWP coordinates closely with MWD to ensure implementation of these water resource development plans. MWD's long-term plans to meet its member agencies' growing reliability needs are through: improvements to SWP as outlined in the California WaterFix and EcoRestore plans, conjunctive management efforts on the Colorado River, water transfer programs, outdoor conservation measures, and development of additional local resources, such as recycling, brackish water desalination, and seawater desalination. These plans are contained in MWD's 2015 IRP and 2015 UWMP, which can be found at the following links:

- MWD 2015 IRP: http://mwdh2o.com/PDF_About_Your_Water/2015%20IRP%20Update%20Report%20(web).pdf

- MWD 2015 UWMP: http://www.mwdh2o.com/PDF_About_Your_Water/2.4.2_Regional_Urban_Water Management_Plan.pdf

Additionally, MWD has more than 5.0 million AF of storage capacity available in reservoirs and banking/transfer programs. MWD was estimated to have 2.46 million AF of water in Water Surplus Drought Management storage and additional 626,000 AF in emergency storage as of January 1, 2018. Continued efficiency in the region kept demands low in 2018, resulting in available water supplies far exceeding demands. With implementation of new and modified existing storage programs to manage the available surplus supplies, MWD was able to add to storage in 2018. MWD began CY 2019 with approximately 2.5 million AF of water in its dry-year storage portfolio.

MWD's 2015 IRP builds upon the strong foundation of diversification and adaptation developed in previous IRPs. 2015 IRP reinforces MWD commitment to meeting the region's water supply needs through an evolving long-term strategy that calls for maintaining and stabilizing existing resources along with developing more conservation and new local supplies.

MWD's 2015 UWMP reports on water reliability and identifies projected supplies to meet the long-term demand within MWD's service area. Table V summarizes MWD's reliability in five-year increments extending to 2040 and is based on information contained in MWD's 2015 UWMP. As reported, MWD has supply capabilities that would be sufficient to meet expected demands from 2020 through 2040 under average year, single dry-year and multiple dry-year hydrologic conditions. An in depth discussion on MWD is attached in Appendix F.

Table V
MWD System Forecast Supplies and Demands
Average Year (1922 - 2012 Hydrology)

	Supply (Thousands of AF per Year)				
Forecast year	**2020**	**2025**	**2030**	**2035**	**2040**
Current Programs					
In-Region Supplies and Programs	693	774	852	956	992
State Water Project[1]	1,555	1,576	1,606	1,632	1,632
Colorado River Aqueduct					
Colorado River Aqueduct Supply[2]	1,468	1,488	1,484	1,471	1,460
Aqueduct Capacity Limit[3]	1,200	1,200	1,200	1,200	1,200
Colorado Aqueduct Capability	1,200	1,200	1,200	1,200	1,200
Capability of Current Programs	**3,448**	**3,550**	**3,658**	**3,788**	**3,824**
Demands					
Total Demands on MWD	1,586	1,636	1,677	1,726	1,765
Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings[4]	274	282	282	282	282
Total Demands on MWD	**1,860**	**1,918**	**1,959**	**2,008**	**2,047**
Surplus	**1,588**	**1,632**	**1,699**	**1,780**	**1,777**
Programs Under Development					
In-Region Supplies and Programs	43	80	118	160	200
State Water Project	20	20	268	268	268
Colorado River Aqueduct					
Colorado River Aqueduct Supply	5	25	25	25	25
Aqueduct Capacity Limit[2]	0	0	0	0	0
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Programs Under Development	**63**	**100**	**386**	**428**	**468**
Maximum MWD Supply Capability	**3,511**	**3,650**	**4,044**	**4,216**	**4,292**
Potential Surplus	**1,651**	**1,732**	**2,085**	**2,208**	**2,245**

1. Includes water transfers and groundwater banking associated with SWP.
2. Includes 296 TAF of non-MWD supplies conveyed in CRA for Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings.
3. CRA has a capacity constraint of 1.20 MAF per year.
4. Does not include 16 TAF subject to satisfaction of conditions specified in agreement among MWD, the US, and the San Luis Rey Settlement.

Secondary Sources and Other Considerations

Stormwater capture, water conservation, and recycling will play an increasing role in meeting future water demands. LADWP has implemented stormwater capture, conservation, and recycling programs with efforts under way to further promote and increase the level of these programs. LADWP is committed to supply a higher percentage of the City's water demand through local water supply development.

LADWP works closely with MWD, LASAN, other regional water providers, and various stakeholders to develop and implement programs that reduce overall water use. One example of such collaboration is an integrated resources planning process.

City's Integrated Resources Plan (IRP) is a unique approach of technical integration and community involvement to guide policy decisions and water resources facilities planning. IRP recognizes the inter-relationship of water, wastewater, and runoff management. Initiation of IRP began in 1999 and culminated in its adoption in 2006. Through the stakeholder driven IRP process, detailed facilities plans were developed for the City's wastewater and stormwater systems through the planning horizon of 2020.

One Water LA 2040 (One Water LA) plan is an initiative building upon the success of the IRP. One Water LA extends IRP planning period to year 2040 and takes into consideration an additional emphasis on environmental, social, and sustainability factors. The overarching goal of One Water LA is to maximize resources through the integration of multi-beneficial collaborative programs and projects to make the City greener and more sustainable. One Water LA will follow in the footsteps of IRP and will be a stakeholder driven process with a goal of increased public involvement to represent Los Angeles' diversity in geography, interests, and demographics.

Summary of Water Demand and Supply Projections for 20 Years

Table VI tabulates the service reliability assessment for average weather year. Existing water conservation has been subtracted already from projected demands, but new water conservation is included as a supply source.

Table VI
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	Average Weather Conditions (FY 1961/62 to 2010/11) Fiscal Year Ending on June 30				
	2020	2025	2030	2035	2040
Total Water Demand[1]	611,800	644,700	652,900	661,800	675,700
pLAn Water Demand Target	485,600	533,000	540,100	551,100	565,600
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100
Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	536,370	578,770	587,470	601,170	600,770
MWD Water Purchases					
With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930
Total Supplies	611,800	644,700	652,900	661,800	675,700
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930
Total Supplies	611,800	644,700	652,900	661,800	675,700

[1] Total Demand with existing passive conservation

[2] Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.

[3] Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.

[4] LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.

[5] Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.

[6] Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Service area reliability assessments for single-dry year and multiple-dry year conditions are shown in LADWP 2015 UWMP Exhibits 11F through 11H. Demands are met by the available supplies under all scenarios.

Rates

Capital costs to finance facilities for the delivery of water supply to LADWP's service area are supported through customer-billed water rates. The Board sets rates subject to approval of City Council by ordinance. The Board is obligated by City Charter to establish water rates and collect charges in an amount sufficient to service the water system indebtedness and to meet its expenses for operation and maintenance.

On March 15, 2016, City Council approved the new water rates and rate structure. New water rates, which became effective April 15, 2016, through Ordinance 184130 provide for modest rate increases each year over a five-year period for infrastructure improvements, meeting regulatory water quality requirements, Owens Valley mitigation measures, and expanding the local water supply, which includes recycled water, stormwater capture, conservation, and groundwater remediation. New water rate structure increases the number of tiers from two to four for single-family residential customers. Goal is to incentivize conservation while recovering the higher costs of providing water to high volume users. In keeping with cost of service principles, the incremental pricing for the tiers is based on the cost of water supply.

Findings

The Morrison Project is estimated to increase the total water demand within the site by 120 AF annually. This additional water demand has been accounted for in the City's overall total demand projections in the LADWP 2015 UWMP using a service area-wide approach that does not rely on individual development demand. The LADWP 2015 UWMP utilized SCAG's RTP data that provide for more reliable water demand forecasts, taking into account changes in population, housing units, and employment.

Based on Planning Department's determination that the Morrison Project is consistent with the demographic forecasts for the City from the 2012 SCAG RTP, LADWP finds that the Morrison Project water demand is included in the City's LADWP 2015 UWMP water demand projection. Furthermore, the LADWP 2015 UWMP forecasts adequate water supplies to meet all projected water demands in the City through the year 2040.

LADWP therefore concludes that the 120 AFY increase in the total water demand for single-dry, and multiple-dry years through the year 2040, as described in LADWP's 2015 UWMP. LADWP finds it will be able to meet the proposed water demand of the Morrison Project as well as existing and planned future water demands of its service area.

Appendix A

City of Los Angeles Department of City Planning
Request for Water Supply Assessment,
and Scope Confirmation e-mail

DEPARTMENT OF CITY PLANNING

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August 19, 2019

Mr. Richard F. Harasick
Senior Assistant General Manager for Water Systems
City of Los Angeles Department of Water and Power
111 North Hope Street, Room 1455
Los Angeles, CA 90012

RE: REQUEST FOR WATER SUPPLY ASSESSMENT—THE MORRISON PROJECT (Case No. ENV-2018-2294-EIR)

Dear Mr. Harasick,

California Senate Bill (SB) 610, effective January 1, 2002, states that a water supply assessment must be provided to local governments for inclusion in any environmental documentation for certain projects subject to the California Environmental Quality Act (CEQA). Specifically, SB 610 requires that for certain projects, the CEQA lead agency must identify any public water system that may supply water to the proposed project and request the public water system to determine the water demand associated with the project and whether such demand was included as part of the most recently adopted Urban Water Management Plan (UWMP). Per Section 10912 of the California Water Code (CWC), a project which is subject to the requirements of SB 610 includes, but is not limited to: (1) A proposed residential development of more than 500 dwelling units; (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; (4) A proposed hotel or motel, or both, having more than 500 rooms; (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; (6) A mixed-use project that includes one or more of the projects specified in this subdivision; (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

The Morrison Project (hereafter referred to as the Project) meets Criteria 6 and 7 above. The Los Angeles Department of Water and Power (LADWP) has been identified as the public water system (as defined in CWC Section 10912 and CEQA Guidelines Section 15083.5(e)) that would serve the Project. Accordingly, the Department of City Planning (CEQA lead agency for the Project) requests that the LADWP: (1) determine whether the estimated water demand associated with the Project was included as part of LADWP's most recently adopted UWMP; and (2) prepare and approve a water supply assessment using the UWMP or new analyses for the Project pursuant to CWC Section 10910 et. seq.

The requirements for a water supply assessment include the identification of existing water supply entitlements, water rights, or water service contracts held by LADWP's public water system, and prior years' water deliveries received by LADWP's public water system, and prior years' water

deliveries received by LADWP's public water system. Please refer to CWC Section 10910 (d)(2) for the documentation required to verify any identified rights to a water supply. If the LADWP has not received water in prior years as described in CWC Section 10910 (e) or if groundwater is a source of supply as described in CWC Section 10910 (f), please comply with the requirements of those sections.

The Department of City Planning, which is preparing an Environmental Impact Report (EIR) for the Project in accordance with CEQA, requests that the water supply assessment include a discussion of whether LADWP's public water system's total projected water supplies available during normal, single dry, and multiple dry water years will meet the projected water demand associated with the Project, in addition to LADWP's public water system's existing and planned future uses, including agricultural and manufacturing uses, pursuant to CWC Section 10910 (c)(3).

Development Information

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633 West 5th Street, 26th Floor
Los Angeles, CA 90071
c/o Brad Perrine

Project Location

The Project Site is located at 1220 – 1246 Hope Street and 427 – 435 Pico Boulevard, in the City of Los Angeles, 90015. The Project Site is also located in the South Park neighborhood of the Central City Community Plan area. The Project Site is 1.29 acres in size bounded by 12th Street to the north, Grand Avenue to the east, Pico Boulevard to the south, and Hope Street to the west.

Existing Uses

The Project Site is currently totally developed with two one-story and one two-story commercial industrial buildings that occupy approximately 32,550 square feet of floor area; the four-story Morrison Hotel which occupies approximately 46,626 square feet of floor area; and a surface parking lot. The three commercial industrial buildings on the Project Site are currently used as office/warehouse buildings. The Morrison Hotel has 111 single-resident occupancy (SRO) units. The three commercial industrial buildings would be demolished and removed as well as the surface parking lot. The Morrison Hotel building would be adaptively reused. All former uses were supplied water by the City of Los Angeles. Existing meter information at the Project Site is as follows:

Customer: Morrison Residential LLC
Water Meter: 90493389/96129823

Project Characteristics

The Project proposes the demolition of the approximately 32,550 square feet of existing commercial industrial buildings, the adaptive reuse of the existing 46,626 square-foot SRO hotel, the expansion of the existing hotel with the new construction of an approximately 102,680 square-foot hotel, and the new construction of approximately 269,403 square-foot, mixed-use hotel and residential building. The Project would include a 3,060 square-foot basement bar and lounge, 15,891 square feet of ground floor restaurant and retail space, 10,415 square feet of ground floor hotel and residential lobby space, 14,052 square feet of event and meeting room space, 39,189 square feet of amenity spaces, and three subterranean levels of parking. The total floor area of the Project would be approximately 418,709 square feet, with 135 dwelling units and 450 guest rooms. The Project would include 159 spaces of residential parking and 52 commercial parking spaces provided on three subterranean levels. The Project would also provide for 147 long-term and 63 short-term bicycle parking provided at-grade in the residential and commercial parking structures. The Project's demolition summary and development summary are presented below in **Table 1, Demolition Summary**, and **Table 2, Development Summary**, respectively.

Table 1
Demolition Summary

Address	Existing Land Use	APN	Amount
1220 South Hope Street	Commercial Industrial	5139022003	9,300 sf
1224 South Hope Street	Commercial Industrial	5139022004	7,750 sf
1240 South Hope Street	Commercial Industrial	5139022020	15,500 sf
427 West Pico Boulevard	Surface Parking Lot	5139022021	9,461 sf
APN = Assessor's Parcel Number; sf = square feet *Source: EcoTierra Consulting, June 2019.*			

Table 2
Development Summary

Land Use	Size
Hotel Rooms	
Existing Hotel – Phase I (Adaptive Reuse)	69 rm
New Construction – Phase I Expansion	231 rm
New Construction – part of Phase II Hotel and Residential Tower	150 rm
Total Hotel Rooms	**450 rm**
Residential Units - part of Phase II Hotel and Residential Tower	
1 bedroom	60 du
2 bedrooms	72 du
3 bedrooms (Penthouse units)	3 du
Total Residential Units	**135 du**
Provided Open Space	
Common Open Space	11,450 sf
Recreation Room	2,167 sf
Private Open Space (Balconies)	3,750 sf
Total Open Space	**17,367 sf**

Table 2
Development Summary

Land Use	Size
Commercial and Amenity Space	
Basement Level – Bar/Lounge	3,060 sf
Level 1 – Restaurant	6,600 sf
Level 1 – Restaurant/Retail	7,466 sf
Level 1 – Retail	1,825 sf
Level 1 – Hotel Lobby (Existing Hotel)	6,698 sf
Level 1 – Residential Lobby	1,310 sf
Level 1 – Hotel Lobby (Future Hotel)	2,407 sf
Level 2 – Event/Ballroom	6,855 sf
Level 2 – Meeting Space	1,232 sf
Level 2 – Amenity Terrace	2,203 sf
Level 2 – Hotel Amenity	7,806 sf
Level 3 – Amenity Terrace Ballroom (Functions)	6,267 sf
Level 3 – Amenity (Gym)	3,225 sf
Level 13 – Amenity Terrace (Residential)	3,121 sf
Level 13 – Covered Amenity Terrace (Residential)	2,907 sf
Level 13 – Club Room (Residential)	559 sf
Level 13 – Meeting Space	5,965 sf
Level 14 – Amenity Terrace (Hotel)	6,826 sf
Level 27 – Amenity Terrace (Residential)	1,685 sf
Level 27 – Amenity Terrace (Residential)	1,253 sf
Level 27 – Covered Amenity Terrace (Residential)	940 sf
Level 27 – Resident Lounge	976 sf
Level 27 – Resident Lounge	1,431 sf
Total Commercial and Amenity Space (excluding rooms and units)	**82,617 sf**

du = dwelling units; rm = rooms; sf = square feet
Source: Steinberg Architects, April 2019.

Landscaping

Based on the total number of residential units proposed, the Project is required to provide 15,525 square feet of open space pursuant to LAMC Section 12.21 G.2. The Project would meet this requirement by providing 11,450 square feet of outdoor common open space located on Level 1 (approximately 4,451 square feet of outdoor seating and landscaping), on Level 13 (approximately 3,121 square feet of outdoor terrace space with swimming pool and spa), and Level 27 (approximately 3,878 square feet of terrace space); 2,167 square feet of interior common open space via a recreation room located on Level 27; and 3,750 square feet of private residential balconies located on Levels 9 through 26, for a total of 17,367 square feet of usable open space (see **Table 2** above), thereby exceeding LAMC requirements by approximately 1,841 square feet. The Project would provide up to approximately 25,202 square feet of amenity space (covered and uncovered) throughout levels 2, 3, 13, 14, and 27, inclusive of the aforementioned common open space. A public paseo would provide pedestrian mid-block access from Hope Street to the existing alleyway and include outdoor seating and landscaping. The paseo would be open to the sky and would connect the proposed outdoor dining areas with the indoor dining, retail, and lobby spaces.

The Project would include site landscaping, including site and street trees, groundcover, and shrubs. Trees would include Fruitless Olive, Yew Podocarpus, Long Leaf Yellow Wood, and California Fan Palm.

Environmental Design Features

The Project would comply with the requirements in the City's Green Building Code and Title 24, which requires buildings to be designed to include green building measures for energy efficiency, water conservation, recycling, light pollution reduction, electric vehicle charging stations, Energy Star-rated appliances, eco-friendly building materials, non-volatile organic compound paints/adhesives, drought-tolerant planting, high performance building envelopment, etc. to the extent feasible.

The Project is designed to have a minimum capability of 20 percent electrical vehicle charging. Space for future photovoltaic panels would be incorporated on the rooftops of the residential and commercial buildings to provide a future alternative energy source.

No LEED certification is being pursued by the Project Applicant.

Land Use Consistency

The Project Site has a General Plan land use designation of High Density Residential under the Central City Community Plan. The Los Angeles Municipal Code (LAMC) establishes the zoning for the Project Site as [Q]R5-4D-O.

The High-Density Residential land use designation corresponds with the R5 and [Q]R5 zoning classification. The R5 designation allows for residential uses, including, multi-family dwelling units, and hotels. Pursuant to LAMC Section 12.21 A.18, uses permitted in the C2 zone are permitted on lots zoned R5 within the Central City Community Plan area. The C2 zone allows for commercial land uses such as retail and restaurants.

The Q Condition on the Project Site limits the permitted uses to: (i) residential uses permitted in the R5 Zone; (ii) hotels, motels, and apartment hotels; (iii) parking buildings, provided such parking is accessory to the main use of the lot; (iv) any other uses permitted in the C4 Zone within buildings which were in existence on the lot upon the effective date of this ordinance; (v) any other use permitted in the C4 Zone provided the floor area ratio of such use does not exceed 2:1; and (vi) any other uses permitted in the C4 Zone provided the development plan is approved by the City Planning Commission and California Redevelopment Agency. The Project would include hotel, restaurant, retail, and multi-family dwelling unit uses and would be consistent with both the High Density Residential and R5 designations as well as the Q Condition on the Project Site.

The D Limitation on the site restricts the Floor Area Ratio (FAR) to 6:1 unless: (i) the project is approved under Section 512.4 for the transfer of floor area (TFAR) under the City Center Redevelopment Plan ("Redevelopment Plan"); (ii) the project is approved under Section 512.2 of the Redevelopment Plan for the rehabilitation and/or remodeling of existing buildings; or (iii) the project is approved pursuant to any TFAR procedure adopted by the City. Section 512.2 states that "[n]ot withstanding the maximum Floor Area Ratios [...] structures which existed in the Project Area prior to the adoption of this Plan may be expanded in size in connection with the rehabilitation or remodeling of such structures." This Section further provides that if the existing structure has a FAR of less than 6:1, then the expansion is limited to no more than 25 percent above the maximum FAR, or 7.5:1. The Project proposes a FAR of 7.5:1, consistent with the Redevelopment Plan exemption for the Project Site.

The Project Site is also located in the Greater Downtown Housing Incentive Area (GDHIA). Pursuant to Zoning Information Bulletin (ZI) 2385, as part of the GDHIA, the permissible density of the Project is unlimited.

Approvals required for the Project would include, but may not be limited to:

(1) A Vesting Tentative Tract (VTT) for the merger of lots and the subdivision of airspace for condominium purposes; a waiver of the dedication requirement for Pico Boulevard and Hope Street to permit the continued maintenance of the 12-foot wide sidewalk and existing street wall on said streets in lieu of the required dedications to the public right-of-way; and a haul route approval;

(2) A Master Conditional Use Permit (MCUP) to permit the sale of alcoholic beverages for on-site consumption within: (1) the basement bar and lounge; (2) the two ground-floor restaurants; and (3) throughout the hotel, including in-room mini-bars and on rooftop amenity decks;

(3) A Conditional Use Permit for Live Entertainment (CUX) to permit dancing and live-entertainment in the bar/lounge, restaurant and hotel uses;

(4) A request for a 20-percent reduction in required vehicle parking in conjunction with the request for other Conditional Use approvals;

(5) Site Plan Review (SPR) to permit the development consisting of more than 50 residential units and guest rooms;

(6) Any other permits or approvals by other City agencies regarding findings of consistency with the City Center Redevelopment Plan; and

(7) Other discretionary and ministerial permits and approvals that may be deemed necessary, including, but not limited to, temporary street closure permits, grading permits, excavation permits, foundation permits, building permits, and sign permits in order to execute and implement the Project.

No General Plan amendment is required or requested; therefore, the project land uses and population projections are consistent with both the City's General Plan and the Southern California Association of Governments' (SCAG) 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

Existing Water Consumption

As discussed above, the Project Site is currently developed with two one-story and one two-story commercial industrial buildings that occupy approximately 32,550 square feet of floor area; the four-story Morrison Hotel which occupies approximately 46,626 square feet of floor area; and a surface parking lot. The three commercial industrial buildings would be demolished and removed as well as the surface parking lot, and the Morrison Hotel building would be adaptively reused. As shown below in **Table , Existing Daily Water Consumption**, the Project Site currently generates a water demand of approximately 17,937 gallons per day.

Table 3
Existing Daily Water Consumption

Land Use	Size	Water Demand Rate[a]	Demand (gpd)
Commercial	32,550 sf	60 gpd/1,000 sf	1,953

Table 3
Existing Daily Water Consumption

Land Use	Size	Water Demand Rate[a]	Demand (gpd)
Hotel	111 rooms	144 gpd/room	15,984
		Total	**17,937**

Notes: sf = square feet; gpd = gallons per day

[a] *The daily consumption rate is based on 120% of City of Los Angeles Bureau of Sanitation sewerage generation factors.*

Source (table): KPFF Engineering Consultants, Morrison Hotel Project, Utility Infrastructure Technical Report: Water, 2019.

Forecast of Project Water Demand

Error! Reference source not found.**, Estimated Project Daily Water Consumption**, below, provides the estimated water demand forecast for the Project using the City's Bureau of Sanitation standard factors for wastewater generation. As shown in Error! Reference source not found., the Project is estimated to result in a domestic water demand of approximately 117,625 gallons per day, which represents an increase of approximately **99,688** gallons per day compared to existing conditions.

Table 4
Estimated Project Daily Water Consumption

Land Use	Size	Water Consumption Rate[a]	Total Consumption (gpd)
Apartment: 1 Bedroom	60 du	132/du	7,920
Apartment: 2 Bedroom	72 du	180/du	12,960
Apartment: 3 Bedroom	3 du	228/du	684
Hotel	450 rooms	144/room	64,800
Bar	3,060 sf	864 gpd/1,000 sf	2,644
Restaurant: Full Service	469 seats[b]	36/seat	16,884
Retail	1,825 sf	30 gpd/1,000 sf	55
Ballroom	13,122 sf	420 gpd/1,000 sf	5,511
Lounge[c]	50,846 sf	60 gpd/1,000 sf	3,051
Gym	3,225 sf	780 gpd/1,000 sf	2,516
Pool[d]	1,140 sf	600	600
		Total Project Water Consumption	*117,625*
		Existing Water Consumption	***17,937***
		Net Total Water Consumption	**99,688**

Notes: du = dwelling unit; sf = square feet; gpd = gallons per day

[a] *The daily consumption rate is based on 120 percent of City of Los Angeles Bureau of Sanitation sewerage generation factors.*

[b] *Assumes 30 square feet per seat.*

[c] *Lounge was used for all amenity spaces that do not have a designation as specific in the City of Los Angeles Bureau of Sanitation Sewer Generation Factors.*

[d] *Pool square footage obtained from Architectural Floor Plans.*

Source (table): KPFF Engineering Consultants, Morrison Hotel Project, Utility Infrastructure Technical Report: Water, 2019.

Thank you for your assistance with this request. Your expert evaluation will help to ensure that our analysis of the proposed project's impacts on water demand is accurate and complete. CWC Section 10910 (g)(1) requires submission of the assessment within 90 days of this request. We would appreciate the receipt of the water assessment within that timeframe. If you have any questions or comments, please contact Mindy Nguyen at (213) 847-3674 or mindy.nguyen@lacity.org; or the environmental consultant, Brad Perrine of EcoTierra Consulting, at (213) 235-4770 or brad@ecotierraconsulting.com.

Sincerely,

VINCE P. BERTONI, AICP
Director of Planning

Mindy Nguyen
Major Projects Section
Department of City Planning

Enclosure:

Notice of Preparation of an Environmental Impact Report for the Morrison Project

LOS ANGELES DEPARTMENT OF CITY PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

NOTICE OF PREPARATION
OF ENVIRONMENTAL IMPACT REPORT

April 12, 2019

ENVIRONMENTAL CASE NO.:	ENV-2018-2294-EIR
PROJECT NAME:	The Morrison Project
PROJECT APPLICANT:	Morrison Hotel, LLC and Morrison Residential, LLC
PROJECT ADDRESS:	1220-1246 South Hope Street, Los Angeles, CA 90015
COMMUNITY PLAN AREA:	Central City
COUNCIL DISTRICT:	14 – Huizar
PUBLIC COMMENT PERIOD:	April 12, 2019 – May 13, 2019

The City of Los Angeles (City) intends to prepare an Environmental Impact Report (EIR) for the proposed Morrison Project (Project). In accordance with Section 15082 of the California Environmental Quality Act (CEQA) Guidelines, the City has prepared this Notice of Preparation to provide the public, nearby residents and property owners, responsible agencies, and other interested parties with information regarding the Project and its potential environmental effects. The EIR will be prepared by outside consultants under the supervision of the City of Los Angeles, Department of City Planning.

The City requests your written comments as to the scope and contents of the EIR, including mitigation measures or project alternatives to reduce potential environmental impacts from the Project. Comments must be submitted in writing according to directions below. If you represent a public agency, the City seeks written comments as to the scope and content of the environmental information in the EIR that are germane to your agency's statutory responsibilities in connection with the Project. Your agency may need to use the EIR prepared by the City when considering your permit or other approval for the Project.

PROJECT LOCATION AND EXISTING ON-SITE USES:
The Project is located at 1246 South Hope Street and 1248 South Hope Street, in downtown Los Angeles ("Project Site"), within the Central City Community Plan. The Project Site comprises five (5) contiguous parcels associated with Assessor Parcel Numbers 5139-022-003, 5139-022-004, 5139-022-020, 5139-022-006, and 5139-022-021, located along the southwest side of the block, and is generally bounded by 12th Street to the north, Grand Avenue to the east, Pico Boulevard to the south, and Hope Street to the west. The Project Site is flat and approximately 56,325 square feet (1.29 acres) in size. The Project Site is currently developed with a surface parking lot, the vacant four-story Morrison Hotel building, and three commercial industrial buildings. (See attached Project Location Map.)

PROJECT DESCRIPTION:
The Project consists of the demolition of approximately 32,550 square feet of existing commercial industrial buildings, the adaptive reuse of an existing 46,626 square-foot, single-resident occupancy (SRO) hotel ("Phase I Existing"), the expansion of the existing hotel with the new construction of an approximately 102,706 square-foot hotel ("Phase I Expansion"), and the new construction of an approximately 273,106 square-foot, mixed-use hotel and residential building ("Phase II Hotel and Residential Tower"). The total floor area of the Project would be approximately 422,438 square feet, with 135 dwelling units and 450 guest rooms. The Project would also

include a 3,060 square-foot basement bar and lounge, 15,891 square feet of ground floor restaurant and retail space, 10,415 square feet of ground floor hotel and residential lobby space, 14,052 square feet of event and meeting room space, and 39,199 square feet of amenity spaces. The Project includes 215 parking spaces to be located within three levels of subterranean parking. (See attached Plot Plan.) See the Existing Uses and Proposed Uses tables below for Project Summary.

Existing Uses

Existing Uses	Sizes
Vacant Single-Resident Occupancy Hotel (1246-48 South Hope St.; 433-35 West Pico Blvd.)	46,626 sf
Commercial Industrial (1220 South Hope St.)	9,300 sf
Commercial Industrial (1224 South Hope St.)	7,750 sf
Commercial Industrial (1230-40 South Hope St.)	15,500 sf
Surface Parking Lot (427 West Pico Blvd.)	9,461 sf (Lot area)

Existing Uses to be Removed

Existing Uses to be Removed	Sizes
Commercial Industrial Land Uses	
Commercial Industrial (1220 South Hope St.)	9,300 sf
Commercial Industrial (1224 South Hope St.)	7,750 sf
Commercial Industrial (1230-40 South Hope St.)	15,500 sf
Total Commercial Industrial	**32,550 sf**
Surface Parking Lot (427 West Pico Blvd.)	9,461 sf (Lot area)

Proposed Uses

Proposed Uses	Maximum Sizes
Hotel Rooms	
Existing Hotel – Phase I (Adaptive Reuse)	69 rm
New Construction – Phase I Expansion	231 rm
New Construction – part of Phase II Hotel and Residential Tower	150 rm
Total Hotel Rooms	**450 rm**
Residential Units - *part of Phase II Hotel and Residential Tower*	
1 bedroom	60 du
2 bedrooms	72 du
3 bedrooms (Penthouse units)	3 du
Total Residential Units	**135 du**
Provided Open Space	
Common Open Space	11,450 sf
Recreation Room	2,167 sf
Private Open Space (Balconies)	3,750 sf
Total Open Space	**17,367 sf**

Proposed Uses

Proposed Uses	Maximum Sizes
Commercial and Amenity Space	
Hotel Lobby	9,105 sf
Hotel Bar / Lounge	3,060 sf
Hotel Retail / Restaurant #1	7,466 sf
Hotel Restaurant #2	6,600 sf
Retail	1,825 sf
Residential Lobby	1,310 sf
Event/Ballroom	6,855 sf
Amenity Terrace (2nd Floor, uncovered)	2,203 sf
Meeting Space (2nd floor)	1,232 sf
Amenity (2nd floor, covered)	7,806 sf
Amenity (3rd floor, covered)	3,225 sf
Amenity Terrace (3rd floor, uncovered)	6,267 sf
Meeting Space (13th floor)	5,965 sf
Amenity Terrace (13th floor, uncovered)	3,121 sf
Amenity Terrace (13th floor, covered)	2,907 sf
Club Room	559 sf
Amenity Terrace (14th floor, uncovered)	5,383 sf
Amenity Terrace (14th floor, covered)	1,443 sf
Amenity Terrace (27th floor, uncovered)	2,938 sf
Amenity Terrace (27th floor, covered)	940 sf
Resident Lounge (27th floor)	2,407 sf
Total Commercial and Amenity Space (excluding rooms and units)	**82,617 sf**

du = dwelling units; rm = rooms; sf = square feet
Source: Steinberg Architects, March 2019.

REQUESTED ACTIONS:

1. Vesting Tentative Tract (VTT) for the merger of lots and the subdivision of airspace for condominium purposes; a waiver of the dedication requirement for Pico Boulevard and Hope Street to permit the continued maintenance of the 12-foot wide sidewalk and existing street wall on said streets in lieu of the required dedications to the public right-of-way; and a haul route approval;
2. Master Conditional Use Permit (MCUP) to permit the sale of alcoholic beverages for on-site consumption within: (1) the basement bar and lounge; (2) the two ground-floor restaurants; and (3) throughout the hotel, including in-room mini-bars and on rooftop amenity decks;
3. Conditional Use Permit for Live Entertainment (CUX) to permit dancing and live-entertainment in the bar/lounge, restaurant and hotel uses;
4. Request for a 20-percent reduction in required vehicle parking in conjunction with the request for other Conditional Use approvals;
5. Site Plan Review (SPR) to permit the development of consisting of more than 50 residential units and guest rooms;
6. Any other permits or approvals by other City agencies regarding findings of consistency with the City Center Redevelopment Plan; and
7. Other discretionary and ministerial permits and approvals that may be deemed necessary, including, but not limited to, temporary street closure permits, grading permits, excavation permits, foundation permits, building permits, and sign permits in order to execute and implement the Project.

POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROJECT:
Based on an Initial Study, the proposed project could have potentially significant environmental impacts in the following topic areas, which will be addressed in the EIR:

Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hydrology and Water Quality, Land Use and Planning, Noise, Population and Housing, Public Services [Police, Fire, and Library Facilities], Transportation, Tribal Cultural Resources, and Utilities and Service Systems [Water, Wastewater, Solid Waste].

FILE REVIEW AND COMMENTS:
The enclosed materials reflect the scope of the Project. The environmental file is available for public review at the City of Los Angeles, Department of City Planning, 221 North Figueroa Street, Suite 1350, Los Angeles, CA 90012, during office hours Monday - Friday, 9:00 a.m. - 4:00 p.m. To review the file, please contact the Staff Planner listed below to schedule an appointment. A copy of this notice and the Initial Study prepared for the Project may be viewed with the environmental file or online at http://planning.lacity.org by clicking on the "Environmental Review" tab, then "Notice of Preparation & Public Scoping Meetings", and clicking on the links below the Project title.

The City will consider all written comments regarding the potential environmental impacts of the Project and issues to be addressed in the EIR. If you wish to submit comments, please reference the Environmental Case No. above, and submit them in writing by Monday, May 13, 2019, **no later than 4:00 p.m.**

Please direct your comments to:

Mail: Mindy Nguyen
City of Los Angeles, Department of City Planning
221 North Figueroa Street, Suite 1350
Los Angeles, CA 90012

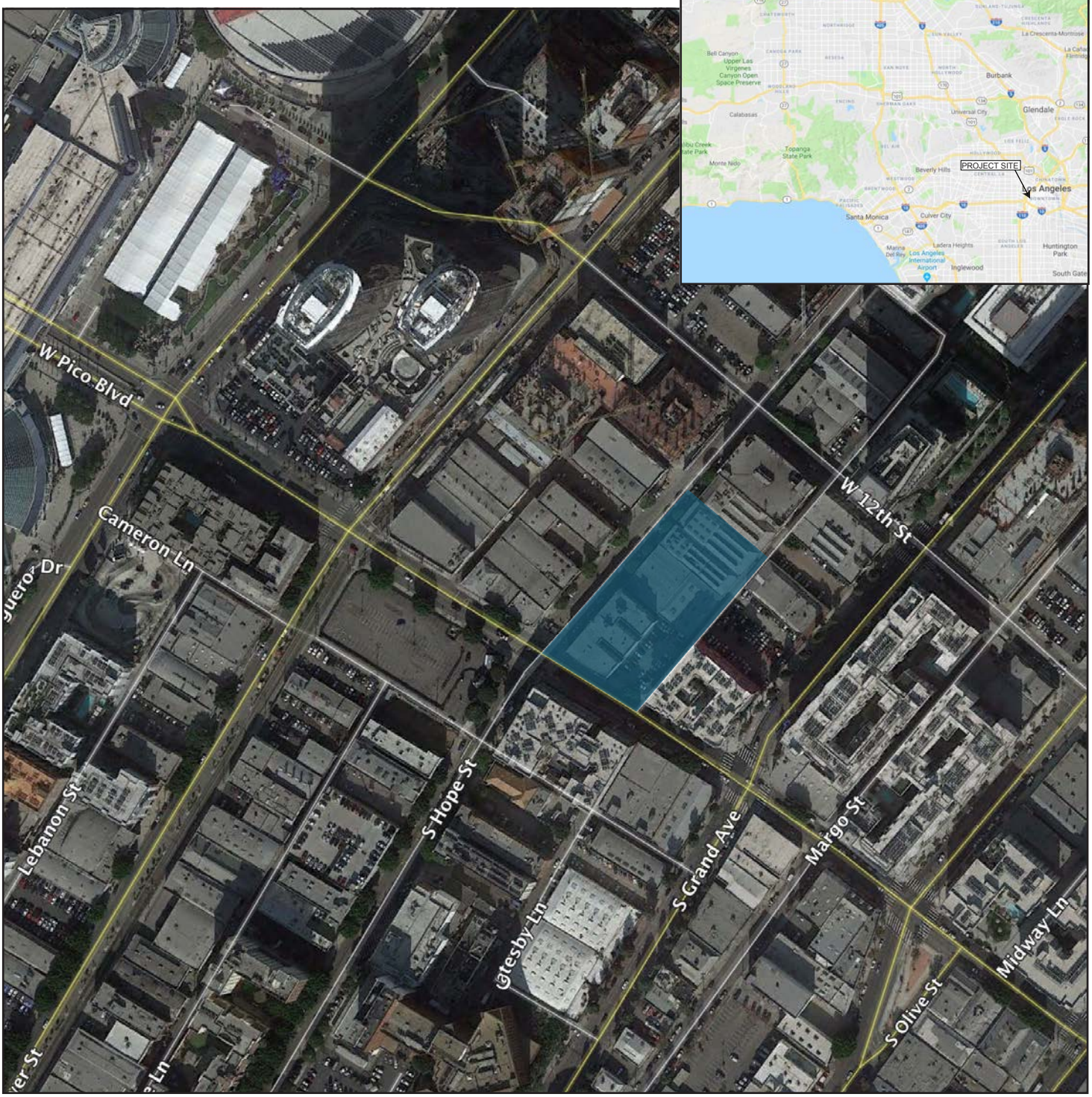
Email: mindy.nguyen@lacity.org

VINCENT P. BERTONI, AICP
Director of Planning

Mindy Nguyen
Major Projects Section
Department of City Planning
(213) 847-3674

Attachments:
Project Location Map
Plot Plan

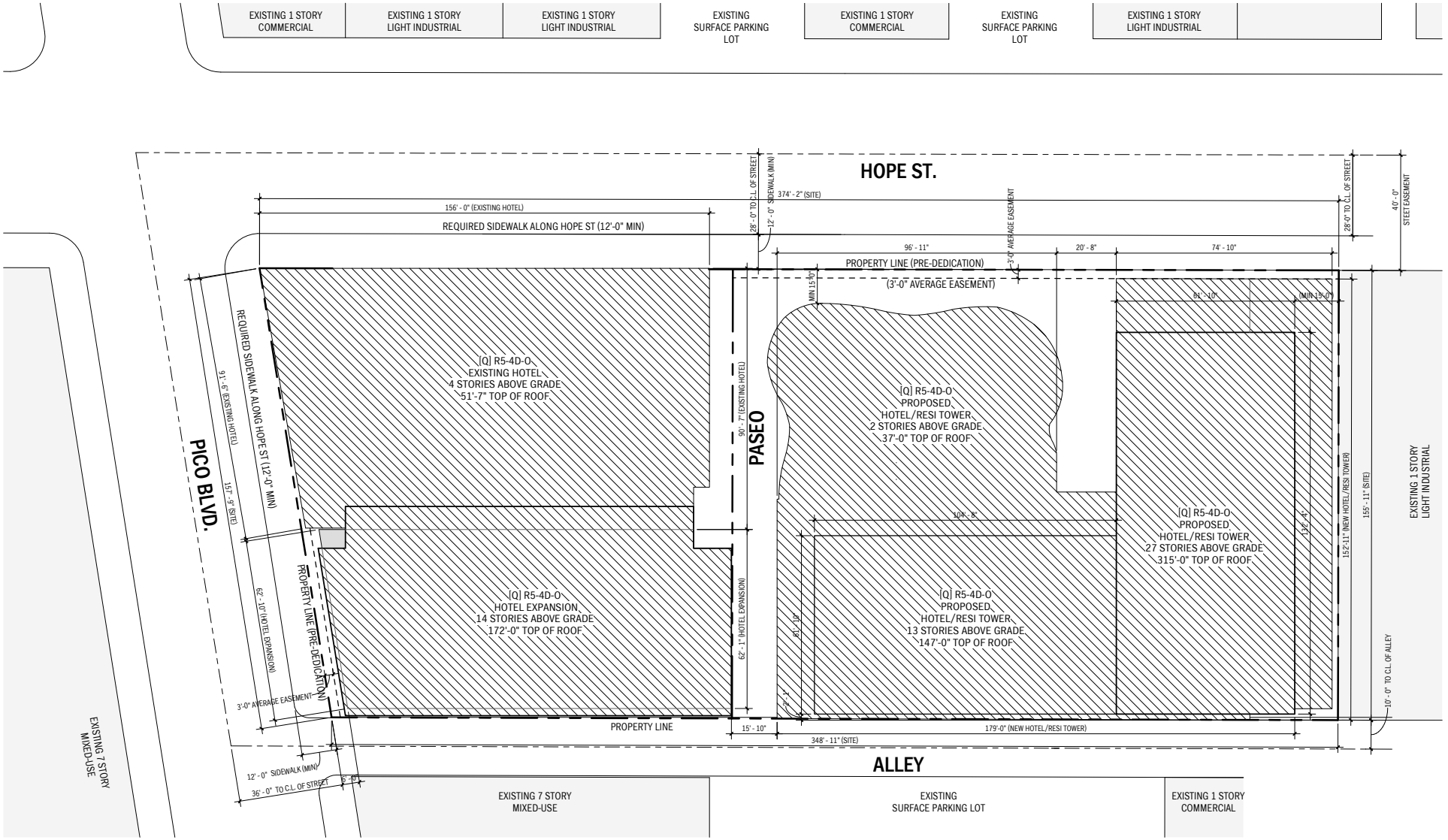
Puede obtener información en Español acerca de esta junta llamando al (213) 978-1454.



Project Site

Source: GoogleEarth, August 2018.

Project Location Map



Source: Steinberg Hart, July 2018.

Hwang, Jin

From: Mindy Nguyen <Mindy.Nguyen@lacity.org>
Sent: Wednesday, December 18, 2019 4:31 PM
To: Hwang, Jin
Cc: Kim, Theresa; Lauren Chang (lchang@sheppardmullin.com)
Subject: [EXTERNAL] Re: The Morrison Project WSA - Scope Confirmation

Hi Jin,

Yes, the detailed scope provided for the Proposed Project is correct.

Let me know if you need anything else.

Thanks,

On Mon, Dec 16, 2019 at 1:41 PM Hwang, Jin <Jin.Hwang@ladwp.com> wrote:

> Hello Ms. Mindy Nguyen,
>
> We are in the process of completing the Water Supply Assessment (WSA) Board Package for the Morrison Project (Proposed Project). The Los Angeles Department of Water and Power (LADWP) requests that the Department of City Planning (Planning Department) confirm, by e-mail, the correct detailed scope (shown below) for the Proposed Project. Your scope confirming e-mail will be included as part of the WSA, and the confirmed scope will be used for calculating the water demand in the WSA.
>
> LADWP received the WSA Request Letter for the Proposed Project on August 19, 2019. The scope considered in LADWP's water demand calculations, as received in the WSA Request Letter and from the Applicant team, is as follows:
>
> **Existing uses to be Removed:**
>
> | Existing to be Removed | Quantity |
> |---|---|
> | Commercial Industrial Building | 32,550 sf |
> | Hotel Room[1] | 111 room |
>
> 1. The existing Morrison Hotel to be adaptively reused has no water demand since it has been vacant for more than 10 years.
>
> **Proposed:**
>
> | Proposed Use[1] | Quantity |
> |---|---|

Residential Units	
Residential: 1 bd	60 du
Residential: 2 bd	72 du
Residential: 3 bd	3 du
Residential Units Total	**135 du**
Hotel Rooms	**450 room**
Gym	3,225 sf
Conference Room	7,197 sf
Ballroom	15,325 sf
Club Room	559 sf
Bar	3,060 sf
Restaurant: Full Service	696 seat
Retail	1,825 sf
Lobbies and Amenity Space	25,728 sf
Barbeque Area	160 Seat
Pool/Spa	1,140 sf
Landscaping:	3,000 sf
Covered Parking	90,000 sf
Cooling Towers:	
Chiller Capacity	1,300 tons
Operating Hours	24 hrs/day, 365 days/yr

du = dwelling unit sf = square feet hrs = hours yr = year

1. Proposed Uses that do not have a water demand are not shown here.

The Proposed Project does not require a General Plan amendment, and it is consistent with the demographic projections in the 2012 and 2016 Regional Transportation Plan (RTP) by Southern California Association of Governments (SCAG) for the City of Los Angeles.

If the above listed scope is accurate and consistent with the Proposed Project, please e-mail reply. If not, please edit the scope accordingly and send back to me by e-mail.

Thank you.

Jin Hwang

Civil Engineering Associate

Los Angeles Department of Water and Power

Water Resources Division

111 N. Hope St. Room 308

Los Angeles, CA 90012

213-367-4845

--

Mindy Nguyen
City Planner
Los Angeles City Planning
221 N. Figueroa St., Suite 1350
Los Angeles, CA 90012
Planning4LA.org
T: (213) 847-3674

Appendix B

Water Conservation Commitment Letter

RELEVANT
GROUP

1/7/2020

Richard F. Harasick
Senior Assistant General Manager for Water Systems
Los Angeles Department of Water & Power
111 North Hope Street, Room 1455
Los Angeles, CA 90012-5701

Re: WATER CONSERVATION COMMITMENTS FOR THE MORRISON PROJECT

Dear Mr. Harasick:

The Morrison Hotel, LLC & Morrison Residential LLC (Applicant) proposes to develop the Morrison Project (Project) within the Central City Community Plan Area of the City of Los Angeles. The project site, which encompasses approximately 1.29 acres, is generally bounded by W. 12th Street to the north, S. Hope Street to the west, Pico Boulevard to the south, and S. Grand A venue to the east.

The Project proposes the demolition of the approximately 32,550 square feet of existing commercial industrial buildings, the adaptive reuse of the existing 46,626 square-foot single-resident occupancy hotel, the expansion of the existing hotel with the new construction of an approximately 102,680 square-foot hotel, and the new construction of approximately 269,403 square-foot, mixed-use hotel and residential building. The total floor area of the Project would be approximately 418,709 square feet, with 135 dwelling units and 450 guest rooms. The Project would include approximately 3,060 square-foot basement bar and lounge, 15,891 square feet of ground floor restaurant and retail space, 7,197 square feet of meeting room space, 15,325 square feet of ballroom space, 559 square feet of club room space, 3,225 square feet of gym space, and 25,728 square feet of lobby and amenity spaces. The Project would also include approximately 9,906 square feet of outdoor residential amenity space on Floors 13 and 27 and 6,826 square feet of publicly-accessible outdoor amenity space on Floor 14. The Project would include 159 spaces of residential parking and 52 commercial parking spaces provided on three subterranean levels. The Project would also provide for 147 long-term and 63 short-term bicycle parking provided at-grade in the residential and commercial parking structures. The Project would also include cooling towers and approximately 3,000 square feet of landscaping.

The Applicant understands the City of Los Angeles' policy that future water needs shall be met by expanding water recycling and conservation. The Applicant has committed to implement the following water conservation measures that are in addition to those required by codes and ordinances for the entire Project:

- Fixtures
  - High Efficiency Toilets with a flush volume of 1.0 gallons per flush, or less (less than the current 1.28 gpf code requirement).
  - Showerheads with a flow rate of 1.5 gallons per minute, or less (less than the current 1.8 gpm code requirement).
  - ENERGY STAR Certified Residential Dishwashers
    - If dishwasher is standard, gallons per cycle shall be <= 3.47 (lower than the current ENERGY STAR Certified Dishwasher criteria of 3.5 gallons per cycle). *Model WDT710PAY by Whirlpool or similar.*
    - If dishwasher is compact, gallons per cycle shall be <= 3.0 gallons per cycle (lower than the current ENERGY STAR Certified Dishwasher criteria of 3.10 gallons per cycle). *Model DD24SCHT9 by Fisher & Paykel or similar.*
  - ENERGY STAR Certified Residential Clothes Washers
    - If clothes washer has capacity <= 2.5 cubic feet, Integrated Water Factor shall be <= 4.1 (lower than the current ENERGY STAR Certified Residential Clothes Washer criteria of 4.2). *Model WCVH4800 or similar.*
    - If clothes washer has capacity > 2.5 cubic feet and is front-loading, Integrated Water Factor shall be <= 3.1 (lower than the current ENERGY STAR Certified Residential Clothes Washer criteria of 3.2). *Model W6124X.W.U. by ASKO or similar.*
    - If clothes washer has capacity > 2.5 cubic feet and is top-loading, Integrated Water Factor shall be <= 4.1 (lower than the current ENERGY STAR Certified Residential Clothes Washer criteria of 4.3). *Model GTW490ACJ4WS by GE or similar.*
- Utilities
  - Domestic Water Heating System located in close proximity to point(s) of use.
  - Individual metering and billing for water use for every residential dwelling unit and commercial unit.
- Pool
  - Water-Saving Pool Filter.
  - Pool/Spa recirculating filtration equipment.
  - Install a meter on the pool make-up line so water use can be monitored and leaks can be identified and repaired.
- Landscape and Irrigation
  - Drip/ Subsurface Irrigation (Micro-Irrigation).
  - Micro-Spray.
  - Proper Hydro-zoning/Zoned Irrigation (groups plants with similar water requirements together).
  - California Friendly® plants or native plants will be used as needed to bring the project Estimated Total Water Use (ETWU) below or equal to the Maximum Applied Water Allowance (MAWA). This includes but is not limited to the following plants:
    - Dietes iridiodes (African Iris)
    - Juncus patens (California Gray Rush)
    - Callistemon citrinus "Little John" (Dwarf Bottlebrush)
    - Rhaphiolepsis indica "Ballerina" (Ballerina Indian Hawthorn)

- Festuca glauca "Elija Blue" (Blue Fescue)
- Olea Europaea "Fruitless" (Fruitless Olive Tree)

- Drought tolerant "No Mow Fescue" will be used as needed to bring the project DTWU below or equal to the MAWA.

The Applicant has also committed to comply with the City of Los Angeles Low Impact Development Ordinances (City Ordinance No. 181899 and No. 183833) and to implement Best Management Practices that have stormwater recharge or reuse benefits for the entire Project as applicable:

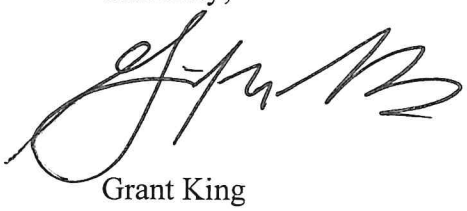
- Infiltration Basin (drainage area of 5-50 acres) – Captures first-flush stormwater, removes particulate pollutants and some soluble pollutants, and contributes toward recharging groundwater.
- Infiltration Trench (drainage area of less than 5 acres) – Similar to infiltration basin but used for smaller drainage areas to capture and infiltrate rainwater.
- Catch Basin Insert – A device that can be inserted into an existing catch basin design to provide some level of runoff contaminant removal.
- Catch Basin Screens
- Pervious Pavements – Captures runoff by allowing stormwater to pass through the pavement surface and then infiltrate into the groundwater basin.
- Cistern – Captures stormwater runoff as it comes down through the roof gutter system.

The following is the information on plumbing fixture/appliance counts/estimates for the Project:

	Residential Dwelling Unit	Hotel Rooms	Lobbies	Restaurant and Retail	Event Space	Amenity / Recreation Area	Hotel Linen Room
Water Closets	N/A	N/A	11	19	18	42	0
Urinals	N/A	N/A	3	3	6	12	0
Lavatory Faucets	N/A	N/A	6	8	11	20	0
Kitchen Faucets	N/A	N/A	4	16	4	12	0
Commercial Kitchen Pre-Rinse Spray Faucets	N/A	N/A	2	8	2	8	0
Showerheads	N/A	N/A	0	0	0	3	0
Clothes washer (Residential)	135	0	0	0	0	0	0
Clothes washer (Commercial)	0	0	0	0	0	0	4
Dishwasher (Residential)	135	0	0	0	0	0	0
Dishwasher (Commercial)	0	0	1	6	1	5	0

Should you have any questions, please do not hesitate to call at 323-466-1400.

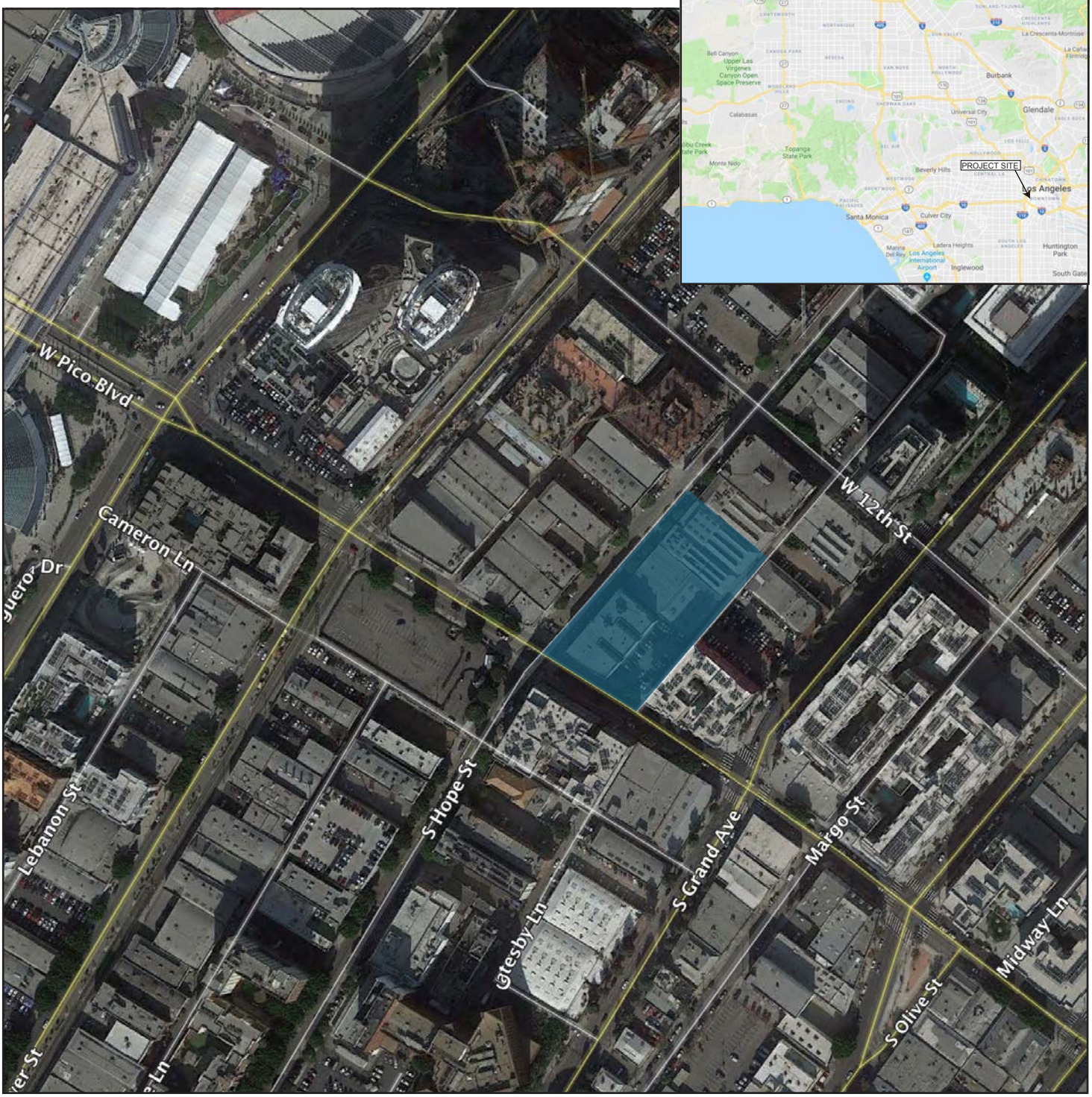
Sincerely,



Grant King

Appendix C

Project Location Maps



Project Site

Source: GoogleEarth, August 2018.

Project Location Map

Appendix D

Adjudicated Groundwater Basin Judgments

- San Fernando Basin – Judgment No. 650079
- Sylmar Basin – Judgment No. 650079
- Central Basin – Judgment No, 786656

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES, Plaintiff, vs. CITY OF SAN FERNANDO, ET AL. Defendants.	No. 650079 JUDGMENT

There follows by consecutive paging Recitals (page 1), Definitions and List of Attachments (pages 1 to 6), Designation of Parties (page 6), Declaration re Geology and Hydrology (pages 6 to 12), Declaration of Rights (pages 12 to 21), Injunctions (pages 21 to 22), Continuing Jurisdiction (page 23), Watermaster (pages 23 to 29), Physical Solution (pages 29 to 34), and Miscellaneous Provisions (pages 34 to 35), and Attachments (pages 36 to 46). Each and all of said several parts constitute a single integrated Judgment herein.

4.2.3 Separate Ground Water Basins. The physical and geologic characteristics of each of the ground water basins, Eagle rock, Sylmar, Verdugo and San Fernando, cause impediments to inter-basin ground water flow whereby there is created separate underground reservoirs. Each of said basins contains a common source of water supply to parties extracting ground water from each of said basins. The amount of underflow from Sylmar Basin, Verdugo Basin and Eagle Rock Basin to San Fernando Basin is relatively small, and on the average has been approximately 540 acre feet per year from the Sylmar Basin; 80 acre feet per year from Verdugo Basin; and 50 acre feet per year from Eagle Rock Basin. Each has physiographic, geologic and hydrologic differences, one from the other, and each meets the hydrologic definition of "basin". The extractions of water in the respective basins affect the other water users within that basin but do not significantly or materially affect the ground water levels in any of the other basins. The underground reservoirs of Eagle Rock, Verdugo and Sylmar Basins are independent of one another and of the San Fernando Basin.

4.2.4 Safe Yield and Native Safe Yield. The safe yield and native safe yield, stated in acre feet, of the three largest basins for the year 1964-65 was as follows:

Basin	Safe Yield	Native Safe Yield
San Fernando	90,680	43,660
Sylmar	6,210	3,850
Verdugo	7,150	3,590

The safe yield of Eagle Rock Basin is derived from imported water delivered by Los Angeles. There is no measurable native safe yield.

4.2.5 Separate Basins -- Separate Rights. The rights of the parties to extract ground water within ULARA are separate and distinct as within each of the several ground water basins within said watershed.

4.2.6 Hydrologic Condition of Basins. The several basins within ULARA are in varying hydrologic conditions, which result in different legal consequences.

4.2.6.1 San Fernando Basin. The first full year of overdraft in San Fernando Basin was 1954-55. It remained in overdraft continuously until 1968, when an injunction

LAGERLOF, SENICAL, DRESCHER & SWIFT
301 North Lake Avenue, 10th Floor
Pasadena, California 91101
(818) 793-9400 or (213) 385-4345

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER REPLENISHMENT DISTRICT, etc., Plaintiff, v. CHARLES E. ADAMS, et al., Defendants. CITY OF LAKEWOOD, a municipal corporation, Cross-Complaint, v. CHARLES E. ADAMS, et al., Cross-Defendants.	No. 786,656 SECOND AMENDED JUDGMENT (Declaring and establishing water rights in Central Basin and enjoining extractions therefrom in excess of specified quantities.)

The above-entitled matter duly and regularly came on for trial in Department 73 of the above-entitled Court (having been transferred thereto from Department 75 by order of the presiding Judge), before the Honorable Edmund M. Moor, specially assigned Judge, on May 17, 1965, at 10:00 a.m. Plaintiff was represented by its attorneys BEWLEY, KNOOP,

of the close of the water year ending September 30, 1978 in accordance with the Watermaster Reports on file with this Court and the records of the Plaintiff. This tabulation does not take into account additions or subtractions from any Allowed Pumping Allocation of a producer for the 1978-79 water year, nor other adjustments not representing change in fee title to water rights, such as leases of water rights, nor does it include the names of lessees of landowners where the lessees are exercising the water rights. The exercise of all water rights is subject, however, to the provisions of this Judgment is hereinafter contained. All of said rights are of the same legal force and effect and are without priority with reference to each other. Each party whose name is hereinafter set forth in the tabulation set forth in Appendix "2" of this judgment, and after whose name there appears under the column "Total Water Right" the figure "0" owns no rights to extract any ground water from Central Basin, and has no right to extract any ground water from Central Basin.

(b) Defendant The City of Los Angeles is the owner of the right to extract fifteen thousand (15,000) acre feet per annum of ground water from Central Basin. Defendant Department of Water and Power of the City of Los Angeles has no right to extract ground water from Central Basin except insofar as it has the right, power, duty or obligation on behalf of defendant The City of Los Angeles to exercise the water rights in Central Basin of defendant The City of Los Angeles. The exercise of said rights are subject, however, to the provisions of this judgment hereafter contained, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet bears to the Allowed Pumping Allocations of the other parties.

(c) No party to this action is the owner of or has any right to extract ground water from Central Basin except as herein affirmatively determined.

2. Parties Enjoined as Regards Quantities of Extractions.

Appendix E

Water Supply Assessment Provisions
California Water Code Section 10910-10915

State of California

WATER CODE

Section 10910

10910. (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system whose service area includes the project site and any water system adjacent to the project site that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) 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 required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project 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 existing and planned future uses, including agricultural and manufacturing uses.

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(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.

(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contractholders 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, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) (A) A description of any groundwater basin or basins from which the proposed project will be supplied.

(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city

or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.

(C) For a basin that has not been adjudicated that is a basin designated as high- or medium-priority pursuant to Section 10722.4, information regarding the following:

(i) Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924.

(ii) If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.

(D) For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

(g) (1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water

system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.

(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:

(1) Changes in the project that result in a substantial increase in water demand for the project.

(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.

(3) Significant new information becomes available that was not known and could not have been known at the time when the assessment was prepared.

(i) For the purposes of this section, hauled water is not considered as a source of water.

(Amended by Stats. 2016, Ch. 594, Sec. 2. (SB 1262) Effective January 1, 2017.)

State of California

WATER CODE

Section 10911

10911. (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.

(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.

(3) Based on the considerations set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.

(b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

(c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.

(Amended by Stats. 2001, Ch. 643, Sec. 5. Effective January 1, 2002.)

State of California

WATER CODE

Section 10912

10912. For the purposes of this part, the following terms have the following meanings:

(a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

(b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

(c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections. A public water system includes all of the following:

(1) Any collection, treatment, storage, and distribution facility under control of the operator of the system that is used primarily in connection with the system.

(2) Any collection or pretreatment storage facility not under the control of the operator that is used primarily in connection with the system.

(3) Any person who treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

(d) This section shall become operative on January 1, 2018.

(Amended (as added by Stats. 2011, Ch. 588, Sec. 2) by Stats. 2016, Ch. 669, Sec. 2. (AB 2561) Effective September 26, 2016. Section operative January 1, 2018, by its own provisions.)

State of California

WATER CODE

Section 10914

10914. (a) Nothing in this part is intended to create a right or entitlement to water service or any specific level of water service.

(b) Nothing in this part is intended to either impose, expand, or limit any duty concerning the obligation of a public water system to provide certain service to its existing customers or to any future potential customers.

(c) Nothing in this part is intended to modify or otherwise change existing law with respect to projects which are not subject to this part.

(d) This part applies only to a project for which a notice of preparation is submitted on or after January 1, 1996.

(Added by Stats. 1995, Ch. 881, Sec. 4. Effective January 1, 1996.)

State of California

WATER CODE

Section 10915

10915. The County of San Diego is deemed to comply with this part if the Office of Planning and Research determines that all of the following conditions have been met:

(a) Proposition C, as approved by the voters of the County of San Diego in November 1988, requires the development of a regional growth management plan and directs the establishment of a regional planning and growth management review board.

(b) The County of San Diego and the cities in the county, by agreement, designate the San Diego Association of Governments as that review board.

(c) A regional growth management strategy that provides for a comprehensive regional strategy and a coordinated economic development and growth management program has been developed pursuant to Proposition C.

(d) The regional growth management strategy includes a water element to coordinate planning for water that is consistent with the requirements of this part.

(e) The San Diego County Water Authority, by agreement with the San Diego Association of Governments in its capacity as the review board, uses the association's most recent regional growth forecasts for planning purposes and to implement the water element of the strategy.

(f) The procedures established by the review board for the development and approval of the regional growth management strategy, including the water element and any certification process established to ensure that a project is consistent with that element, comply with the requirements of this part.

(g) The environmental documents for a project located in the County of San Diego include information that accomplishes the same purposes as a water supply assessment that is prepared pursuant to Section 10910.

(Amended by Stats. 2001, Ch. 643, Sec. 8. Effective January 1, 2002.)

Appendix F

Metropolitan Water District of Southern California

(APPENDIX A)

APPENDIX A

The Metropolitan Water District

of Southern California

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INTRODUCTION

This Appendix A provides general information regarding The Metropolitan Water District of Southern California ("Metropolitan"), including information regarding Metropolitan's operations and finances. Certain statements included or incorporated by reference in this Appendix A constitute "forward-looking statements." Such statements are generally identifiable by the terminology used such as "plan," "project," "expect," "estimate," "budget" or other similar words. Such statements are based on facts and assumptions set forth in Metropolitan's current planning documents including, without limitation, its most recent biennial budget. The achievement of results or other expectations contained in such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Actual results may differ from Metropolitan's forecasts. Metropolitan is not obligated to issue any updates or revisions to the forward-looking statements in any event.

Metropolitan maintains a website that may include information on programs or projects described in this Appendix A; however, none of the information on Metropolitan's website is incorporated by reference or intended to assist investors in making an investment decision or to provide any additional information with respect to the information included in this Appendix A. The information presented on Metropolitan's website is not part of the Official Statement and should not be relied upon in making investment decisions.

Formation and Purpose

Metropolitan is a metropolitan water district created in 1928 under authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended (herein referred to as the "Act")). The Act authorizes Metropolitan to: levy property taxes within its service area; establish water rates; impose charges for water standby and service availability; incur general obligation bonded indebtedness and issue revenue bonds, notes and short-term revenue certificates; execute contracts; and exercise the power of eminent domain for the purpose of acquiring property. In addition, Metropolitan's Board of Directors (the "Board") is authorized to establish terms and conditions under which additional areas may be annexed to Metropolitan's service area.

Metropolitan's primary purpose is to provide a supplemental supply of water for domestic and municipal uses at wholesale rates to its member public agencies. If additional water is available, such water may be sold for other beneficial uses. Metropolitan serves its member agencies as a water wholesaler and has no retail customers.

The mission of Metropolitan, as promulgated by the Board, is to provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way.

Metropolitan's charges for water transactions and availability are fixed by its Board, and are not subject to regulation or approval by the California Public Utilities Commission or any other state or federal agency. Metropolitan imports water from two principal sources: northern California via the Edmund G. Brown California Aqueduct (the "California Aqueduct") of the State Water Project owned by the State of California (the "State" or "California") and the Colorado River via the Colorado River Aqueduct ("CRA") owned by Metropolitan.

Member Agencies

Metropolitan is comprised of 26 member public agencies, including 14 cities, 11 municipal water districts, and one county water authority, which collectively serve the residents and businesses of more than 300 cities and numerous unincorporated communities. Member agencies request water from Metropolitan at

various delivery points within Metropolitan's system and pay for such water at uniform rates established by the Board for each class of water service. Metropolitan's water is a supplemental supply for its member agencies, most of whom have other sources of water. See "METROPOLITAN REVENUES–Principal Customers" in this Appendix A for a listing of the ten member agencies representing the highest level of water transactions and revenues of Metropolitan during the fiscal year ended June 30, 2018. Metropolitan's member agencies may, from time to time, develop additional sources of water. No member is required to purchase water from Metropolitan, but all member agencies are required to pay readiness-to-serve charges whether or not they purchase water from Metropolitan. See "METROPOLITAN REVENUES–Rate Structure," "–Member Agency Purchase Orders" and "–Other Charges" in this Appendix A.

The following table lists the 26 member agencies of Metropolitan.

Municipal Water Districts		Cities		County Water Authority
Calleguas	Las Virgenes	Anaheim	Los Angeles	San Diego[1]
Central Basin	Orange County	Beverly Hills	Pasadena	
Eastern	Three Valleys	Burbank	San Fernando	
Foothill	West Basin	Compton	San Marino	
Inland Empire Utilities Agency		Fullerton	Santa Ana	
Upper San Gabriel Valley		Glendale	Santa Monica	
Western of Riverside County		Long Beach	Torrance	

[1] The San Diego County Water Authority, currently Metropolitan's largest customer based on water transactions, is a plaintiff in litigation challenging the allocation of costs to certain rates adopted by the Board and asserting other claims. See "METROPOLITAN REVENUES–Litigation Challenging Rate Structure" in this Appendix A.

Service Area

Metropolitan's service area comprises approximately 5,200 square miles and includes all or portions of the six counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura. When Metropolitan began delivering water in 1941, its service area consisted of approximately 625 square miles. Its service area has increased by 4,575 square miles since that time. The expansion was primarily the result of annexation of the service areas of additional member agencies.

Metropolitan estimates that approximately 19 million people lived in Metropolitan's service area in 2018, based on official estimates from the California Department of Finance and on population distribution estimates from the Southern California Association of Governments ("SCAG") and the San Diego Association of Governments ("SANDAG"). Population projections prepared by SCAG in 2012 and SANDAG in 2013, as part of their planning process to update regional transportation and land use plans, show expected population growth of about 18 percent in Metropolitan's service area between 2010 and 2035. The economy of Metropolitan's service area is exceptionally diverse. In 2017, the economy of the six counties which contain Metropolitan's service area had a gross domestic product larger than all but twelve nations of the world. Metropolitan has historically provided between 40 and 60 percent of the water used annually within its service area. For additional economic and demographic information concerning the six county area containing Metropolitan's service area, see Appendix E–"SELECTED DEMOGRAPHIC AND ECONOMIC INFORMATION FOR METROPOLITAN'S SERVICE AREA."

The climate in Metropolitan's service area ranges from moderate temperatures throughout the year in the coastal areas to hot and dry summers in the inland areas. Since 2000, annual rainfall has ranged from approximately 4 to 27 inches along the coastal area, 6 to 38 inches in foothill areas, and 5 to 20 inches in inland areas.

GOVERNANCE AND MANAGEMENT

Board of Directors

Metropolitan is governed by a 38-member Board of Directors, made up of representatives from all of Metropolitan's member agencies. Each member public agency is entitled to have at least one representative on the Board, plus an additional representative for each full five percent of the total assessed valuation of property in Metropolitan's service area that is within the member public agency. Changes in relative assessed valuation do not terminate any director's term. Accordingly, the Board may, from time to time, have more or fewer than 38 directors.

The Board includes business, professional and civic leaders. Directors are appointed by member agencies in accordance with those agencies' processes and the Act. They serve on the Board without compensation from Metropolitan. Voting is based on assessed valuation, with each member agency being entitled to cast one vote for each $10 million or major fractional part of $10 million of assessed valuation of property within the member agency, as shown by the assessment records of the county in which the member agency is located. The Board administers its policies through the Metropolitan Water District Administrative Code (the "Administrative Code"), which was adopted by the Board in 1977. The Administrative Code is periodically amended to reflect new policies or changes to existing policies that occur from time to time.

Management

Metropolitan's day-to-day management is under the direction of its General Manager, who serves at the pleasure of the Board, as do Metropolitan's General Counsel, General Auditor and Ethics Officer. Following is a biographical summary of Metropolitan's principal executive officers.

Jeffrey Kightlinger, General Manager – Mr. Kightlinger was appointed as General Manager in February 2006, leaving the position of General Counsel, which he had held since February 2002. Before becoming General Counsel, Mr. Kightlinger was a Deputy General Counsel and then Assistant General Counsel, representing Metropolitan primarily on Colorado River matters, environmental issues, water rights and a number of Metropolitan's water transfer and storage programs. Prior to joining Metropolitan in 1995, Mr. Kightlinger worked in private practice representing numerous public agencies including municipalities, redevelopment agencies and special districts. Mr. Kightlinger earned his bachelor's degree in history from the University of California, Berkeley, and his law degree from Santa Clara University.

Marcia Scully, General Counsel – Ms. Scully assumed the position of General Counsel in March 2012. She previously served as Metropolitan's Interim General Counsel from March 2011 to March 2012. Ms. Scully joined Metropolitan in 1995, after a decade of private law practice, providing legal representation to Metropolitan on construction, employment, Colorado River and significant litigation matters. From 1981 to 1985 she was assistant city attorney for the City of Inglewood. Ms. Scully served as president of University of Michigan's Alumnae Club of Los Angeles and is a recipient of the 1996 State Bar of California, District 7 President's Pro Bono Service Award and the Southern California Association of Non-Profit Housing Advocate of the Year Award. She is also a member of the League of Women Voters for Whittier and was appointed for two terms on the City of Whittier's Planning Commission, three years of which were served as chair. Ms. Scully earned a bachelor's degree in liberal arts from the University of Michigan, a master's degree in urban planning from Wayne State University and law degree from Loyola Law School.

Gerald C. Riss, General Auditor and Acting Ethics Officer – Mr. Riss was appointed as Metropolitan's General Auditor in July 2002 and has served as Acting Ethics Officer since September 2017. As General Auditor, he is responsible for the independent evaluation of the policies, procedures and systems of control throughout Metropolitan. As Acting Ethics Officer, he is responsible for helping to establish internal disclosure, lobbying, conflicts of interest, contracts, campaign contributions, and other internal ethics

rules and policies. Mr. Riss is a certified fraud examiner, certified financial services auditor and certified risk professional with more than 25 years of experience in accounting, audit and risk management. Prior to joining Metropolitan, Mr. Riss was Vice President and Assistant Division Head of Risk Management Administration at United California Bank/Bank of the West. He also served as Senior Vice President, director of Risk Management and General Auditor of Tokai Bank of California from 1988 until its reorganization as United California Bank in 2001. He earned a bachelor's degree in accounting and a master's degree in business administration from Wayne State University

June Skillman, Interim Assistant General Manager/Chief Financial Officer – Ms. Skillman has been serving as the Interim Assistant General Manager/Chief Financial Officer since July 2018. She has 30 years of experience in the water, electric and natural gas utility industries and has worked at Metropolitan for 15 years. In December 2016 she was promoted to Budget and Treasury Manager and is responsible for the development of Metropolitan's biennial budget and rates and charges; financial planning and analyses; management of Metropolitan's debt program; and treasury operations and investments. Ms. Skillman has a master's degree in business administration from the California State University, Fullerton.

Deven Upadhyay, Assistant General Manager/Chief Operating Officer – Mr. Upadhyay was appointed to his current position in November 2017. In this capacity, he oversees the management of Metropolitan's Water System Operations, Engineering Services and Water Resource Management. Mr. Upadhyay has over 20 years of experience in the water industry. He joined Metropolitan in 1996, beginning as a Resource Specialist and then left Metropolitan in 2005 to work at the Municipal Water District of Orange County. In 2008, he returned to Metropolitan as a Budget and Financial Planning Section Manager and became a Water Resource Management Group Manager in 2010. Mr. Upadhyay has a Bachelor of Arts degree in economics from the California State University, Fullerton and a master's degree in public administration from the University of La Verne.

Roger Patterson, Assistant General Manager/Strategic Water Initiatives – Mr. Patterson was appointed to his current position in March 2006. He is responsible for overseeing water supply and planning issues, including the Colorado River and State Water Project. He previously served as a consultant to Metropolitan on Colorado River issues. Mr. Patterson was the director of the Nebraska Department of Natural Resources from 1999 to 2005, where he was responsible for water administration, water planning, flood-plain delineation, dam safety and the state databank. Prior to his work in Nebraska, Mr. Patterson spent 25 years with the U.S. Bureau of Reclamation ("Bureau of Reclamation"), retiring from the Bureau of Reclamation as the Regional Director for the Mid-Pacific Region. He is a registered professional engineer in Nebraska and Colorado, and earned bachelor's and master's degrees in engineering from the University of Nebraska.

Shane Chapman, Assistant General Manager/Chief Administrative Officer – Mr. Chapman was appointed to his current position in January 2018 and is responsible for the strategic direction and management of Metropolitan's administrative functions. His primary responsibilities include managing human resources, information technology, real property, environmental planning, and administrative services. Mr. Chapman joined Metropolitan as a Resource Specialist in 1991, progressing to the level of Program Manager in 2001. He became the Revenue, Rates and Budget Manager in 2003 and Assistant Group Manager in Water System Operations in 2006. Mr. Chapman served as General Manager of the Upper San Gabriel Valley Municipal Water District for seven years. Mr. Chapman has a Bachelor of Arts degree in economics from Claremont McKenna College and a master's degree in public administration from the University of Southern California.

Dee Zinke, Assistant General Manager/Chief External Affairs Officer – Ms. Zinke was appointed to her current position in January 2016. She is responsible for Metropolitan's communications, business outreach, education and legislative matters. She joined Metropolitan in 2009 as Manager of the Legislative Services Section. Before coming to Metropolitan, Ms. Zinke was the Manager of Governmental and

Legislative Affairs at the Calleguas Municipal Water District for nearly 10 years, where she received recognition for her significant contributions to the Association of California Water Agencies, the Ventura County Special Districts Association and the Association of Water Agencies of Ventura County. During her tenure at Calleguas, she was named Chair of the Ventura County Watersheds Coalition and appointed by then-Secretary of Resources Mike Chrisman to the State Watershed Advisory Committee. Prior to her public service, she worked in the private sector as the Executive Officer and Senior Legislative Advocate for the Building Industry Association of Greater Los Angeles and Ventura Counties and as Director of Communications for E-Systems, a defense contractor specializing in communication, surveillance and navigation systems in Washington, D.C. Ms. Zinke holds a Bachelor of Arts degree in communication and psychology from Virginia Polytechnic Institute and State University.

Employee Relations

The total number of regular full-time Metropolitan employees on April 1, 2019 was 1,757 of whom 1,230 were represented by AFSCME Local 1902, 87 by the Supervisors Association, 286 by the Management and Professional Employees Association and 125 by the Association of Confidential Employees. The remaining 29 employees are unrepresented. The four bargaining units represent 98 percent of Metropolitan's employees. The Memorandum of Understanding ("MOU") with each of AFSCME Local 1902, the Supervisors Association, the Management and Professional Employees Association and the Association of Confidential Employees were updated through negotiations and cover the period January 1, 2017 through December 31, 2021.

Risk Management

Metropolitan is exposed to various risks of loss related to, among other things, the design and construction of facilities, and the treatment and delivery of water. With the assistance of third party claims administrators, Metropolitan is self-insured for liability, property and workers' compensation. Metropolitan self-insures the first $25 million per liability occurrence, with commercial liability coverage of $75 million in excess of the self-insured retention. The $25 million self-insured retention is maintained as a separate restricted reserve. Metropolitan is also self-insured for loss or damage to its property, with the $25 million self-insured retention also being accessible for emergency repairs and Metropolitan property losses. In addition, Metropolitan obtains other excess and specialty insurance coverages such as directors' and officers' liability, fiduciary liability and aircraft hull and liability coverage.

Metropolitan self-insures the first $5 million for workers' compensation with statutory excess coverage. The self-insurance retentions and reserve levels currently maintained by Metropolitan may be modified by the Board at its sole discretion.

Cybersecurity

Metropolitan has adopted and maintains an active Cybersecurity Program ("CSP") that includes policies reviewed annually by its internal Cybersecurity Team, Audit department and independent third party auditors and consultants. Metropolitan has appointed an Information Security Officer who is responsible for overseeing the annual review of the CSP and its alignment with Metropolitan's Strategic Plan. Metropolitan's policies and procedures on information governance, risk management, and compliance are consistent with the U.S. Commerce Department's National Institute of Standards and Technology Cybersecurity Framework. Metropolitan's Cybersecurity Team is responsible for identifying cybersecurity risks to Metropolitan, preventing, investigating, and responding to any cybersecurity incidents, and providing guidance and education on the implementation of new technologies at Metropolitan. All persons or entities authorized to use Metropolitan's computer resources are required to participate in Metropolitan's Cybersecurity Awareness Training.

METROPOLITAN'S WATER SUPPLY

General

Metropolitan's principal sources of water supplies are the State Water Project and the Colorado River. Metropolitan receives water delivered from the State Water Project under State Water Contract provisions, including contracted supplies, use of carryover storage in San Luis Reservoir, and surplus supplies. Metropolitan holds rights to a basic apportionment of Colorado River water and has priority rights to an additional amount depending on availability of surplus supplies. Water management programs supplement these Colorado River supplies. To secure additional supplies, Metropolitan also has groundwater banking partnerships and water transfer and storage arrangements within and outside its service area. Metropolitan's principal water supply sources, and other supply arrangements and water management are more fully described herein.

Metropolitan faces a number of challenges in providing adequate, reliable and high quality supplemental water supplies for Southern California. These include, among others: (1) population growth within the service area; (2) increased competition for low-cost water supplies; (3) variable weather conditions; (4) increased environmental regulations; and (5) climate change. Metropolitan's resources and strategies for meeting these long-term challenges are set forth in its Integrated Water Resources Plan, as updated from time to time. See "–Integrated Water Resources Plan." In addition, Metropolitan manages water supplies in response to the prevailing hydrologic conditions by implementing its Water Surplus and Drought Management ("WSDM") Plan, and in times of prolonged or severe shortages, the Water Supply Allocation Plan (the "Water Supply Allocation Plan"). See "CONSERVATION AND WATER SHORTAGE MEASURES–Water Surplus and Drought Management Plan" and "–Water Supply Allocation Plan" in this Appendix A.

Hydrologic conditions can have a significant impact on Metropolitan's imported water supply sources. For Metropolitan's State Water Project supplies, precipitation in California's northern Sierra Nevada during the fall and winter helps replenish storage levels in Lake Oroville, a key State Water Project facility. The subsequent runoff from the spring snowmelt helps satisfy regulatory requirements in the San Francisco Bay/Sacramento-San Joaquin River Delta ("Bay-Delta") bolstering water supply reliability in the same year. See "–State Water Project – Bay-Delta Proceedings Affecting State Water Project." The source of Metropolitan's Colorado River supplies is primarily the watersheds of the Upper Colorado River Basin in the states of Colorado, Utah, and Wyoming. Although precipitation is primarily observed in the winter and spring, summer storms are common and can affect water supply conditions.

Uncertainties from potential future temperature and precipitation changes in a climate driven by increased concentrations of atmospheric carbon dioxide also present challenges. Areas of concern to California water planners identified by researchers include: reduction in Sierra Nevada and Colorado Basin snowpack; increased intensity and frequency of extreme weather events; and rising sea levels resulting in increased risk of damage from storms, high-tide events, and the erosion of levees and potential cutbacks of deliveries of imported water. While potential impacts from climate change remain subject to study and debate, climate change is among the uncertainties that Metropolitan seeks to address through its planning processes.

Current Water Conditions

As of May 7, 2019, the northern Sierra precipitation was 129 percent of the 50-year average for the time of year, and northern Sierra snow water content measured 163 percent of the 30-year seasonal peak average. On March 20, 2019, the California Department of Water Resources ("DWR") notified State Water Contractors (defined below) that its calendar year 2019 allocation estimate of State Water Project water was increased to 70 percent of contracted amounts, or 1,338,050 acre-feet for Metropolitan. (An acre-foot is the amount of water that will cover one acre to a depth of one foot and equals approximately 325,851 gallons,

which represents the needs of three average families in and around the home for one year within Metropolitan's service area.) Changes to the 2019 allocation may occur and are dependent on the developing hydrologic conditions. See "–State Water Project."

As of May 7, 2019, the Upper Colorado River Basin peak snowpack accumulation measured 133 percent of the 30-year median value. On May 8, 2019, the total system storage in the Colorado River Basin was 49 percent of capacity. As of such date, the projected base supply of Colorado River water in calendar year 2019 was estimated to be 963,209 acre-feet. See "–Colorado River Aqueduct."

See also "–Storage Capacity and Water in Storage."

Integrated Water Resources Plan

Overview. The Integrated Water Resources Plan ("IRP") is Metropolitan's principal water resources planning document. Metropolitan, its member agencies, subagencies and groundwater basin managers developed their first IRP as a long-term planning guideline for resources and capital investments. The purpose of the IRP was the development of a portfolio of preferred resources to meet the water supply reliability and water quality needs for the region in a cost-effective and environmentally sound manner. The first IRP was adopted by the Board in January 1996 and has been subsequently updated in 2004, 2010 and 2015. The next IRP update is expected to occur in 2020.

On January 12, 2016, Metropolitan's Board adopted the most recent IRP update (the "2015 IRP Update") as a strategy to set goals and a framework for water resources development. This strategy enables Metropolitan and its member agencies to manage future challenges and changes in California's water conditions and to balance investments with water reliability benefits. The 2015 IRP Update provides an adaptive management approach to address future uncertainty, including uncertainty from climate change. It was formulated with input from member agencies, retail water agencies, and other stakeholders including water and wastewater managers, environmental and business interests and the community.

The 2015 IRP Update seeks to provide regional reliability through 2040 by stabilizing Metropolitan's traditional imported water supplies and continuing to develop additional conservation programs and local resources, with an increased emphasis on regional collaboration. It also advances long-term planning for potential future contingency resources, such as storm water capture and seawater desalination.

Specific projects that may be developed by Metropolitan in connection with the implementation of the 2015 IRP Update will be subject to future Board consideration and approval, as well as environmental and regulatory documentation and compliance. The 2015 IRP Update and associated materials are available on Metropolitan's website at: http://www.mwdh2o.com/AboutYourWater/Planning/Planning-Documents/Pages/default.aspx. The information set forth on Metropolitan's website is not incorporated by reference.

An Adaptive Management Strategy. Adaptive water management, as opposed to a rigid set of planned actions over the coming decades, is the most nimble and cost-effective manner for Metropolitan and local water districts throughout Southern California to effectively prepare for the future. An adaptive management approach began to evolve with Metropolitan's first IRP in 1996, after drought-related shortages in 1991 prompted a rethinking of Southern California's long-term water strategy. Reliance on imported supplies to meet future water needs has decreased steadily over time, replaced by plans for local actions to meet new demands. The 2015 IRP Update continues to build a robust portfolio approach to water management.

The following paragraphs describe the goals, approaches and targets for each of the resource areas that are needed to ensure reliability under planned conditions.

State Water Project. The State Water Project is one of Metropolitan's two major sources of water. The goal for State Water Project supplies is to adaptively manage flow and export regulations in the near term and to achieve a long-term Bay-Delta solution that addresses ecosystem and water supply reliability challenges. In furtherance of this goal, Metropolitan continues to participate and seek successful outcomes for a potential Bay-Delta conveyance project and the California EcoRestore efforts. See "–State Water Project" and "REGIONAL WATER RESOURCES–Local Water Supplies" in this Appendix A. The stated goal of the IRP is to manage State Water Project supplies in compliance with regulatory restrictions in the near-term for an average of 980,000 acre-feet of annual supplies, and to pursue an outcome for a potential Bay-Delta conveyance project and California EcoRestore efforts aimed towards achieving long-term average supplies of approximately 1.2 million acre-feet annually from this resource. See "–State Water Project –Bay-Delta Proceedings Affecting State Water Project."

Colorado River Aqueduct. The CRA delivers water from the Colorado River, Metropolitan's original source of supply. Metropolitan has helped to fund and implement agricultural conservation programs, improvements to river operation facilities, land management programs and water transfers and exchanges through agreements with agricultural water districts in Southern California, entities in Arizona and Nevada that use Colorado River water, and the Bureau of Reclamation. See "–Colorado River Aqueduct" and "–Water Transfer, Storage and Exchange Programs – Colorado River Aqueduct Agreements and Programs." The stated goal of the IRP for the CRA supplies is to maintain current levels of water supplies from existing programs, while also developing flexibility through dry-year programs and storage to ensure that a minimum of 900,000 acre-feet of CRA deliveries are available when needed, with a target of 1.2 million acre-feet in dry years.

Water Transfers and Exchanges. Under voluntary water transfer or exchange agreements, agricultural communities using irrigation water may periodically sell or conserve some of their water allotments for use in urban areas. The water may be delivered through existing State Water Project or CRA facilities, or may be exchanged for water that is delivered through such facilities. Metropolitan's policy toward potential transfers states that the transfers will be designed to protect and, where feasible, enhance environmental resources and avoid the mining of local groundwater supplies. See "–Water Transfer, Storage and Exchange Programs." The stated goal of the IRP is to pursue transfers and exchanges to hedge against shorter-term water demand and supply imbalances while long-term water supply solutions are developed and implemented.

Water Conservation. Conservation and other water use efficiencies are integral components of Metropolitan's IRP. Metropolitan has invested in conservation programs since the 1980s. Historically, most of the investments have been in water efficient fixtures in the residential sector. With outdoor water use comprising at least 50 percent of residential water demand, Metropolitan has increased its conservation efforts to target outdoor water use reduction in its service area. See "CONSERVATION AND WATER SHORTAGE MEASURES" in this Appendix A. The stated goal of the IRP is to pursue further water conservation savings of 485,000 acre-feet annually by 2040 through continued increased emphasis on outdoor water-use efficiency using incentives, outreach/education and other programs. The conservation program is regularly reviewed and revised in order to meet the IRP goal. During the last review process, a disadvantaged communities program was identified as a way to increase conservation and a pilot program has been implemented.

Local Water Supplies. Local supplies are a significant and growing component of the region's diverse water portfolio. While the extent to which each member agency's water supply is provided by imported water purchased from Metropolitan varies, in the aggregate, local supplies can provide over half of the region's water in a given year, and the maintenance of these supplies remain an integral part of the IRP. Similar to water conservation, local supplies serve the important function of reducing demands for imported water supplies and thereby making regional water system capacity and storage available and accessible to meet the needs of the region. Local water supply projects may include, among other things, recycled water,

groundwater recovery, conjunctive use, stormwater, and seawater desalination. Metropolitan offers financial incentives to member agencies to help fund the development of a number of these types of local supply projects. The stated goal of the IRP is to seek to develop 227,000 acre-feet of additional local supplies produced by existing and future projects, with the region reaching a target of 2.4 million acre-feet of total dependable local supplies by 2040. Additionally, in 2018, an interim Local Resources Program target was adopted to spur development of additional local supplies to meet the IRP goal. See "REGIONAL WATER RESOURCES–Local Water Supplies" in this Appendix A.

State Water Project

Background

One of Metropolitan's two major sources of water is the State Water Project, which is owned by the State, and managed and operated by DWR. The State Water Project is the largest state-built, multipurpose, user-financed water project in the country. It was designed and built primarily to deliver water, but also provides flood control, generates power for pumping, is used for recreation, and enhances habitat for fish and wildlife. The State Water Project provides irrigation water to 750,000 acres of farmland, mostly in the San Joaquin Valley, and provides municipal and industrial water to approximately 27 million of California's estimated 39.8 million residents, including the population within the service area of Metropolitan.

The State Water Project's watershed encompasses the mountains and waterways around the Feather River, the principal tributary of the Sacramento River, in the Sacramento Valley of Northern California. Through the State Water Project, Feather River water stored in and released from Oroville Dam (located about 70 miles north of Sacramento, east of the city of Oroville, California) and unregulated flows diverted directly from the Bay-Delta are transported south through the Central Valley of California, over the Tehachapi Mountains and into Southern California, via the California Aqueduct, to four delivery points near the northern and eastern boundaries of Metropolitan's service area. The total length of the California Aqueduct is approximately 444 miles. See "METROPOLITAN'S WATER DELIVERY SYSTEM–Primary Facilities and Method of Delivery –State Water Project" in this Appendix A.

State Water Contract

Terms of the Contract. In 1960, Metropolitan signed a water supply contract (as amended, the "State Water Contract") with DWR to receive water from the State Water Project. Metropolitan is one of 29 agencies and districts that have long-term contracts for water service from DWR (known collectively as the "State Water Contractors" and sometimes referred to herein as "Contractors"). Metropolitan is the largest of the State Water Contractors in terms of the number of people it serves (approximately 19 million), the share of State Water Project water that it has contracted to receive (approximately 46 percent), and the percentage of total annual payments made to DWR by agencies with State water supply contracts (approximately 49 percent for 2018). Metropolitan received its first delivery of State Water Project water in 1972.

Pursuant to the terms of the State water supply contracts, all water-supply related expenditures for capital and operations, maintenance, power, and replacement costs associated with the State Water Project facilities are paid for by the State Water Contractors as components of their annual payment obligations to DWR. In exchange, Contractors have the right to participate in the system, with an entitlement to water service from the State Water Project and the right to use the portion of the State Water Project conveyance system necessary to deliver water to them. Each year DWR estimates the total State Water Project water available for delivery to the State Water Contractors and allocates the available project water among the State Water Contractors in accordance with the State water supply contracts. DWR's total water supply availability projections are refined over the course of the calendar year based upon updated rainfall and snowpack values and allocations to the State Water Contractors are adjusted accordingly.

Metropolitan's State Water Contract has been amended a number of times since its original execution and delivery. Several of the amendments, entered into by DWR and various subsets of State Water

Contractors, relate to the financing and construction of a variety of State Water Project facilities and improvements and impose certain cost responsibility therefor on the affected Contractors, including Metropolitan. For a description of Metropolitan's financial obligations under its State Water Contract, including with respect to such amendments, see "METROPOLITAN EXPENSES–State Water Contract Obligations" in this Appendix A.

Amendments, approved by Metropolitan's Board in 1995, and since executed by DWR and 27 of the State Water Contractors (collectively known as the "Monterey Amendment"), among other things, made explicit that the Contractors' rights to use the portion of the State Water Project conveyance system necessary to deliver water to them also includes the right to convey non-State Water Project water at no additional cost as long as capacity exists. These amendments also expanded the ability of the State Water Contractors to carry over State Water Project water in State Water Project storage facilities, allowed participating Contractors to borrow water from terminal reservoirs, and allowed Contractors to store water in groundwater storage facilities outside a Contractor's service area for later use. These amendments provided the means for individual Contractors to increase supply reliability through water transfers and storage outside their service area. Metropolitan has subsequently developed and actively manages a portfolio of water supplies to convey through the California Aqueduct pursuant to these contractual rights. See "–Water Transfer, Storage and Exchange Programs." The Monterey Amendment is the subject of ongoing litigation. See "– Related Litigation–Monterey Amendment" below.

Under its State Water Contract, Metropolitan has a contractual right to its proportionate share of the State Water Project water that DWR determines annually is available for allocation to the Contractors. This determination is made by DWR each year based on existing supplies in storage, forecasted hydrology, and other factors, including water quality and environmental flow obligations and other operational considerations. Available State Water Project water is then allocated to the Contractors in proportion to the amounts set forth in "Table A" of their respective State water supply contract. Pursuant to Table A of its State Water Contract, Metropolitan is entitled to approximately 46 percent of the total annual allocation made available to State Water Contractors each year.

DWR operates the State Water Project in coordination with the federal Central Valley Project, which is operated by the Bureau of Reclamation. Since 1986, the coordinated operations have been undertaken pursuant to a Coordinated Operations Agreement for the Central Valley Project and State Water Project (the "COA"). The COA defines how the State and federal water projects share water quality and environmental flow obligations imposed by regulatory agencies. The agreement calls for periodic review to determine whether updates are needed in light of changed conditions. After completing a joint review process, DWR and the Bureau of Reclamation agreed to amend the COA to reflect water quality regulations, biological opinions and hydrology updated since the 1986 agreement was signed. On December 13, 2018, DWR and the Bureau of Reclamation executed an Addendum to the COA (the "COA Addendum"). Through the COA Addendum, DWR will adjust current State Water Project operations to modify pumping operations, as well as project storage withdrawals to meet in-basin uses pursuant to revised calculations based on water year types. The COA Addendum will shift responsibilities for meeting obligations between the Central Valley Project and the State Water Project, resulting in a shift of approximately 120,000 acre-feet in long-term average annual exports from the State Water Project to the Central Valley Project. In executing the COA Addendum, DWR found the agreement to be exempt from CEQA as an ongoing project and that the adjustments in operations are within the original scope of the project. On January 16, 2019, commercial fishing groups and a tribe filed a lawsuit against DWR alleging that entering into the COA Addendum violated CEQA, the Delta Reform Act, and the public trust doctrine. The effect of this lawsuit on the COA Addendum and State Water Project operations cannot be determined at this time.

Metropolitan's State Water Contract, under a 100 percent allocation, provides Metropolitan 1,911,500 acre-feet of water. The 100 percent allocation is referred to as the contracted amount. Late each year, DWR announces an initial allocation estimate for the upcoming year, but periodically provides

subsequent estimates throughout the year if warranted by developing precipitation and water supply conditions. From calendar years 2004 through 2018, the amount of water received by Metropolitan from the State Water Project, including water from water transfer, groundwater banking and exchange programs delivered through the California Aqueduct (described under "–Water Transfer, Storage and Exchange Programs" below), varied from a low of 593,000 acre-feet in calendar year 2015 to a high of 1,800,000 acre-feet in 2004. In calendar year 2018, DWR's allocation to State Water Contractors was 35 percent of contracted amounts, or 669,025 acre-feet, for Metropolitan.

On November 30, 2018, DWR announced an initial calendar year 2019 allocation of 10 percent. On January 25, 2019, DWR increased the allocation estimate to 15 percent. Improved hydrologic conditions, including above-average precipitation in the month of January, led to a further allocation increase to 35 percent on February 20, 2019. DWR again increased the allocation estimate on March 20, 2019 to 70 percent. The current allocation estimate of 70 percent reflects substantial improvements in runoff forecasts and storage in State Water Project conservation reservoirs aided by the third wettest February on record in the Northern Sierra since 1921. In light of current water conditions in California and the estimated 2019 allocation, projected supplies are expected to exceed projected demands. If available, Metropolitan can utilize its storage programs to store supplies to meet future demands. Changes to the 2019 allocation may occur and are dependent on the developing hydrologic conditions.

The term of Metropolitan's State Water Contract currently extends to December 31, 2035 or until all DWR bonds issued to finance construction of project facilities are repaid, whichever is longer. Upon expiration of the State Water Contract term, Metropolitan has the option to continue service under substantially the same terms and conditions. Metropolitan and other State Water Contractors have undertaken negotiations with DWR to extend their State water supply contracts. In June 2014, DWR and the State Water Contractors reached an Agreement in Principle (the "Agreement in Principle") on an amendment to the State water supply contract to extend the contract and to make certain changes related to financial management of the State Water Project in the future. DWR and 25 of the State Water Contractors, including Metropolitan, have signed the Agreement in Principle. Under the Agreement in Principle, the term of the State water supply contract for each Contractor that signs an amendment would be extended until December 31, 2085. The Agreement in Principle served as the "proposed project" for purposes of environmental review under the California Environmental Quality Act ("CEQA"). DWR issued a Notice of Availability of the Draft Environmental Impact Report ("EIR") for the proposed project on August 17, 2016. The public review period ended October 17, 2016. State law requires DWR to make a presentation to the State Legislature at an informational hearing at least 60 days prior to final approval of a State water supply contract extension. That hearing occurred on September 11, 2018. DWR released the Final EIR on November 16, 2018, and certified the Final EIR and issued a Notice of Determination on December 11, 2018. Concurrently, Metropolitan considered the certified Final EIR and approved the water supply contract extension amendment at its December 11, 2018 board meeting. On January 8, 2019, North Coast Rivers Alliance and others filed petition for writ of mandate and complaint for declaratory and injunctive relief challenging DWR's final EIR and approval of the State Water Contract Extension Amendment. On January 10, 2019, Planning and Conservation League and others filed petition for writ of mandate challenging DWR's final EIR and approval of the State Water Contract Extension Amendment. Mandatory settlement conferences were held on February 22, 2019 but the administrative records have not been prepared and no briefing has occurred in either action. Any adverse impact of this litigation and rulings on Metropolitan's State Water Project supplies cannot be determined at this time.

Metropolitan and other State Water Contractors have been undertaking separate negotiations with DWR to amend their State water supply contracts to clarify how costs for California WaterFix will be allocated. Contractors are also negotiating modifications to the terms of the existing State water supply contract to clarify the criteria applicable to single and multi-year water transfers and exchanges. On April 29, 2019, Governor Newsom issued an executive order directing State agencies to develop a comprehensive statewide strategy to build a climate-resilient water system. In light of this order, DWR and the State Water

Contractors plan to resume the public process to further negotiate the proposed amendments related to water management actions and financial provisions and related costs of Bay-Delta conveyance. Any modifications to the State water supply contract will have to be approved by all State Water Contractors. See "– Bay-Delta Proceedings Affecting State Water Project" below.

Related Litigation–Monterey Amendment. On May 4, 2010, DWR completed an EIR and concluded a remedial CEQA review for the Monterey Amendment (described under " – Terms of the Contract" above), which reflects the settlement of certain disputes regarding the allocation of State Water Project water. Central Delta Water Agency, South Delta Water Agency, California Water Impact Network, California Sportfishing Protection Alliance, and the Center For Biological Diversity filed a lawsuit against DWR in Sacramento County Superior Court challenging the validity of the EIR under CEQA and the validity of underlying agreements under a reverse validation action (the "Central Delta I" case). In January 2013, the Court ruled that the validation cause of action in Central Delta I was time barred by the statute of limitations. The court also held that DWR must complete a limited scope remedial CEQA review addressing the potential impacts of the Kern Water Bank, a portion of the Monterey Amendment that does not directly affect Metropolitan. The court also ruled that the State Water Project may continue to be operated under the terms of the Monterey Amendment while the remedial CEQA review is prepared and leaves in place the underlying project approvals while DWR prepares the remedial CEQA review. Plaintiffs appealed. Briefing by the parties was completed, but no date for oral argument has been set.

In September 2016, DWR certified the Final Revised Draft EIR for the Monterey Amendment, recorded a Notice of Determination, and filed papers in the trial demonstrating compliance with the court's order for remedial CEQA review. On October 21, 2016, the petitioner group from Central Delta I and a new lead petitioner, Center for Food Safety, filed litigation against DWR challenging this EIR and named Metropolitan and the other State Water Project contractors as respondent parties. On October 2, 2017, the court denied Center for Food Safety's petition. Plaintiffs appealed. Briefing in this appeal has been completed. No date for oral argument has been set. Any adverse impact of any of the litigation and rulings relating to the Monterey amendment on Metropolitan's State Water Project supplies cannot be determined at this time.

2017 Oroville Dam Spillway Incident

Oroville Dam, the earthfill embankment dam on the Feather River which impounds Lake Oroville, is operated by DWR as a facility of the State Water Project. On February 7, 2017, the main flood control spillway at Oroville Dam, a gated and concrete lined facility, experienced significant damage as DWR released water to manage higher inflows driven by continued precipitation in the Feather River basin. The damaged main spillway impaired DWR's ability to manage lake levels causing water to flow over the emergency spillway structure, an ungated, 1,730 foot long concrete barrier located adjacent to and north of the main flood control spillway structure. Use of the emergency spillway structure resulted in erosion that threatened the stability of the emergency spillway structure. This concern prompted the Butte County Sheriff, on February 12, 2017, to issue an evacuation order for approximately 200,000 people living in Oroville and the surrounding communities.

On November 1, 2018, DWR completed reconstruction of the main spillway to its original design capacity of approximately 270,000 cubic feet per second ("cfs"), a capacity almost twice its highest historical outflow. Work on the emergency spillway was substantially completed in April 2019. Mitigation measures such as slope revegetation are expected to be completed in 2021. Although the full extent of the costs of the response and recovery efforts are unknown at this time, DWR has indicated that the total costs of the recovery and restoration project prior to any federal or other reimbursement are estimated to be approximately $1.1 billion. Cost estimates are based on actual and projected work and may be adjusted further as work continues through completion of the project in 2021. As of March 7, 2019, the Federal Emergency Management Agency ("FEMA") had approved reimbursement to DWR of $128 million for emergency response work and $205 million for spillway reconstruction, with total approved reimbursement

of $333 million. FEMA has excluded $306 million of costs for the upper spillway reconstruction and emergency spillway repair from its approval. DWR is appealing that decision and has indicated that it will advocate for reimbursement of 75 percent of all costs. FEMA funding is generally available to recover costs to restore facilities damaged as a result of natural disasters to their pre-disaster condition. Any costs to be paid for by the State Water Contractors under the State water supply contracts are expected to be financed long-term with DWR bonds. Metropolitan is unable to assess at this time what costs it will ultimately incur as a State Water Contractor associated with the spillway repairs.

Bay-Delta Proceedings Affecting State Water Project

General. In addition to being a source of water for diversion into the State Water Project, the Bay-Delta is the source of water for local agricultural, municipal and industrial needs, and also supports significant resident and anadromous fish and wildlife resources and important recreational uses of water. Both the State Water Project's upstream reservoir operations and its Bay-Delta diversions can at times affect these other uses of Bay-Delta water directly, or indirectly, through impacts on Bay-Delta water quality. A variety of proceedings and other activities are ongoing with the participation of various State and federal agencies, as well as California's environmental, urban and agricultural communities, in an effort to develop long-term, collectively-negotiated solutions to the environmental and water management issues concerning the Bay-Delta, and Metropolitan actively participates in these proceedings. Metropolitan cannot predict the ultimate outcome of any of the litigation or regulatory processes described below, but believes that a materially adverse impact on the operation of State Water Project pumps, Metropolitan's State Water Project deliveries or Metropolitan's water reserves could result.

SWRCB Regulatory Activities and Decisions. The State Water Resources Control Board (the "SWRCB") is the agency responsible for setting water quality standards and administering water rights throughout California. The SWRCB exercises its regulatory authority over the Bay-Delta by means of public proceedings leading to regulations and decisions that can affect the availability of water to Metropolitan and other users of State Water Project water. These include the Water Quality Control Plan ("WQCP") for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, which establishes the water quality objectives and proposed flow regime of the estuary, and water rights decisions, which assign responsibility for implementing the objectives of the WQCP to users throughout the system by adjusting their respective water rights permits.

The WQCP gets reviewed periodically and new standards and allocations of responsibility can be imposed on the State Water Project as a result. The last review was completed in 2006, and the current review has been ongoing since approximately 2010.

Since 2000, SWRCB's Water Rights Decision 1641 ("D-1641") has governed the State Water Project's ability to export water from the Bay-Delta for delivery to Metropolitan and other agencies receiving water from the State Water Project. D-1641 allocated responsibility for meeting flow requirements and salinity and other water quality objectives established earlier by the WQCP. In response to ongoing drought conditions in 2014 and 2015, DWR and the Bureau of Reclamation requested temporary relief from certain WQCP standards and filed petitions requesting changes to D-1641 terms that govern outflows and salinity standards in the Bay-Delta. The SWRCB approved temporary urgency changes in the Bay-Delta for 2014 and 2015, enabling water to be conserved in reservoirs in case of continued drought.

The SWRCB's current review and update of the WQCP is being undertaken through two separate plan amendment processes. In December 2018, the SWRCB completed Phase 1 of the WQCP proceedings, adopting the plan amendments and environmental documents to support new flow standards for San Joaquin River tributaries and revised southern Delta salinity objectives. Various stakeholders have since filed suit against the SWRCB challenging these amendments. A framework document for the second plan amendment process, focused on the Sacramento River and its tributaries, Delta eastside tributaries, Delta outflows, and interior Delta flows, was released in July 2018. The framework describes changes that will likely be

proposed by the SWRCB before the end of 2019 through formal proposed amendments and supporting environmental documents. The proposed changes include certain unimpaired flow requirements for the Sacramento River and its salmon-bearing tributaries. The SWRCB has also encouraged all stakeholders to work together to reach voluntary agreements for consideration by the SWRCB that could implement the proposed amendments to the WQCP through a variety of tools, while seeking to protect water supply reliability. Metropolitan is participating in these Phase 2 proceedings and voluntary agreement negotiations.

Bay-Delta Planning Activities. In 2000, several State and federal agencies released the CALFED Bay Delta Programmatic Record of Decision ("ROD") and Environmental Impact Report/Environmental Impact Statement ("EIR/EIS") that outlined and disclosed the environmental impacts of a 30-year plan to improve the Bay-Delta's ecosystem, water supply reliability, water quality, and levee stability. The CALFED ROD remains in effect and many of the State, federal, and local projects begun under CALFED continue.

Building on CALFED and other Bay-Delta planning activities, in 2006 multiple State and federal resource agencies, water agencies, and other stakeholder groups entered into a planning agreement for the Bay-Delta Conservation Plan ("BDCP"). The BDCP was originally conceived as a comprehensive conservation strategy for the Bay-Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework to be implemented over a 50-year time frame with corresponding long-term permit authorizations from fish and wildlife regulatory agencies. The BDCP includes both alternatives for new water conveyance infrastructure and extensive habitat restoration in the Bay-Delta. The existing State Water Project Delta water conveyance system needs to be improved and modernized to address operational constraints on pumping in the south Delta as well as risks to water supplies and water quality from climate change, earthquakes, and flooding. Operational constraints are largely due to biological opinions and incidental take permits to which the State Water Project is subject that substantially limit the way DWR operates the State Water Project.

In 2015, the State and federal lead agencies proposed an alternative implementation strategy and new alternatives to the BDCP to provide for the protection of water supplies conveyed through the Bay-Delta and the restoration of the ecosystem of the Bay-Delta, termed "California WaterFix" and "California EcoRestore," respectively. In this alternative approach, DWR and the Bureau of Reclamation would implement planned water conveyance improvements (California WaterFix) as a stand-alone project with the required habitat restoration limited to that directly related to construction mitigation. The associated costs of such mitigation would be underwritten by the public water agencies participating in the conveyance project. Ecosystem improvements and habitat restoration more generally (California EcoRestore) would be undertaken under a more phased approach than previously contemplated by the BDCP and would not be linked with the conveyance project or permits. As part of California EcoRestore, which was initiated in 2015, the State intends to pursue more than 30,000 acres of Delta habitat restoration by 2020. Among other things, EcoRestore is expected to implement restoration projects required by the biological opinions issued in 2008 and 2009 to which the State Water Project is subject. EcoRestore is estimated to cost $300 million in the first four years, and includes amounts being paid by the State Water Contractors, including Metropolitan, for the costs of habitat restoration required to mitigate State and federal water project impacts pursuant to the biological opinions. See also "–Endangered Species Act and Other Environmental Considerations – Endangered Species Act Considerations – State Water Project."

In July 2017, DWR certified a final EIR and approved the California WaterFix as an improvement to the State Water Project. As approved by DWR, California WaterFix, if completed, would have provided new conveyance facilities for the transportation of State Water Project and Central Valley Project water from the north Delta, principally from three new intakes through two 30-mile long tunnels running under the Delta, to the existing aqueduct systems in the south Delta. Under the California WaterFix, DWR would have extended the delivery system from new north Delta water intakes on the Sacramento River to a new forebay in the south Delta to provide additional flexibility in operating the State Water Project. As configured, the total maximum north Delta diversion intake capacity would have been 9,000 cfs.

On July 10, 2018, Metropolitan's Board approved Metropolitan's funding in the aggregate of up to 64.6 percent of the overall capital cost of the California WaterFix, including its share as a State Water Contractor and through various forms of additional financial support Metropolitan would contribute to the project.

On February 12, 2019, recently elected Governor Gavin Newsom presented at the State of the State address a conceptual proposal supporting a single-tunnel configuration for California WaterFix. On March 1, 2019, DWR and the Bureau of Reclamation sent a request to the SWRCB to temporarily place their pending petition before the SWRCB for a change in point of diversion (a water right proceeding) for California WaterFix in abeyance and issue a temporary 60 day stay on all proceedings for the California WaterFix change in point of diversion. DWR and the Bureau of Reclamation indicated that the request was being submitted in light of the Governor's State of the State address to allow DWR sufficient time to assess the effects on the California WaterFix and the nature and the extent the effects would have on any new permit and planning work for California WaterFix. The request for a 60-day stay of the proceedings was granted by the SWRCB on March 5, 2019.

On April 29, 2019, Governor Newsom issued an executive order directing identified State agencies to develop a comprehensive statewide strategy to build a climate-resilient water system. The specific actions identified in the Governor's executive order included directing the State agencies to inventory and assess the current planning for modernizing conveyance through the Bay-Delta with a new single tunnel project. Following the Governor's executive order, on May 2, 2019, DWR withdrew the approval of the California WaterFix project, decertified the EIR, and rescinded approvals based on the EIR. DWR and the Bureau of Reclamation also withdrew their change in point of diversion petition before the SWRCB and requested that the United States Fish and Wildlife Service ("USFWS") and the National Marine Fisheries Service ("NMFS") withdraw the California WaterFix biological opinions that had been issued in 2017. DWR additionally requested that the California Department of Fish and Wildlife ("CDFW") withdraw the California WaterFix Incidental Take Permit issued for the project. Concurrently, DWR announced plans to pursue a new planning and environmental review process for a single tunnel project. Following its rescission of project approvals for California WaterFix, on May 7, 2019, DWR rescinded its related revenue bond authorization which was the subject of a validation action initiated by DWR to legally establish its authority to issue revenue bonds to finance California WaterFix.

Metropolitan held a Board workshop on March 26, 2019, during which it reviewed the various single tunnel alternatives that were analyzed by the State during the environmental review process for the California WaterFix project, including a 3,000 cfs diversion capacity one tunnel option, and a 6,000 cfs diversion capacity tunnel option. The expected benefits and estimated costs of each of these alternatives were presented. Based upon the single tunnel alternatives previously analyzed and preliminary estimates, the total capital costs of a 6,000 cfs capacity alternative are estimated to be $11.1 billion in 2017 dollars ($11.8 billion as adjusted to 2019 dollars) and the total capital costs of a 3,000 cfs capacity alternative are estimated to be $9.2 billion in 2017 dollars ($9.7 billion as adjusted to 2019 dollars). A single tunnel project to be proposed under the new planning effort and environmental review process to be undertaken by DWR may be designed and configured differently than these previously analyzed single tunnel alternatives and therefore the capacity and cost estimates of the single tunnel project that is ultimately proposed by DWR may vary significantly from the estimates above.

California WaterFix is currently subject to several lawsuits. The existing lawsuits primarily relate to DWR's powers to finance and construct the project and various environmental approvals and related matters. The lawsuits, administrative proceedings, and other matters described or referred to herein in regard to California WaterFix are likely to be dismissed as a result of the cancellation of the California WaterFix project. However, new lawsuits could be filed in the future with respect to any new Bay-Delta conveyance project and may impact the anticipated timing and costs of a proposed new single tunnel project.

Metropolitan's Board has previously authorized Metropolitan's participation in two joint powers agencies relating to the Bay-Delta conveyance project: the Delta Conveyance Design and Construction Authority (the "Construction JPA"), formed by the participating water agencies to actively participate with DWR in the design and construction of the conveyance project in coordination with DWR and under the control and supervision of DWR; and the Delta Conveyance Finance Authority, formed by the participating water agencies to facilitate financing for the conveyance project prior to completion of DWR's validation action to legally establish its authority to issue revenue bonds to finance California WaterFix. Included in DWR's May 2, 2019 announcements is its expectation that the Construction JPA would provide engineering and design activities to support the DWR's planning and environmental analysis for a potential new Bay-Delta conveyance project.

As authorized by Metropolitan's Board in July 2018, Metropolitan previously committed to provide up to $86 million in advance funding for California WaterFix. As of May 1, 2019, Metropolitan had provided $41.5 million in advance funding for pre-construction costs for California WaterFix pursuant to an advance funding agreement with DWR. New or amended planning and funding agreements between DWR, the Construction JPA and participating State Water Contractors will be required for future funding of the Construction JPA's participation in DWR's project planning efforts. Metropolitan currently expects that proposed funding arrangements will be developed over the next 30 to 60 days. Planning, environmental review and conceptual design work by DWR for a proposed single tunnel project is expected to take approximately 18 to 36 months.

Colorado River Aqueduct

Background

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 and its tributaries is also available to other users in California, as well as users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming (collectively, 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, in which event the water allotted to Mexico would be curtailed. Mexico can also 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.

Construction of the CRA, which is owned and operated by Metropolitan, was undertaken by Metropolitan to provide for the transportation of its Colorado River water entitlement to its service area. The CRA originates at Lake Havasu on the Colorado River and extends approximately 242 miles through a series of pump stations and reservoirs to its terminus at Lake Mathews in Riverside County. Up to 1.25 million acre-feet of water per year may be conveyed through the CRA to Metropolitan's member agencies, subject to availability of Colorado River water for delivery to Metropolitan as described below. Metropolitan first delivered CRA water to its member agencies in 1941.

Colorado River Water Apportionment and Seven-Party Agreement

Pursuant to the federal Boulder Canyon Project Act of 1928, 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 (the "Lower Basin States"). Under an agreement entered into in 1931 among the California entities that expected to receive a portion of California's apportionment of Colorado River water (the "Seven-Party Agreement") and which 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. In addition, Metropolitan holds the fifth priority right to 662,000 acre-feet of water, which is in excess of California's basic apportionment. Until 2003, Metropolitan had been able to take full advantage of its fifth priority right as a result of the availability of surplus water and water apportioned to Arizona and Nevada that was not needed by those states. However, during the 1990s Arizona and Nevada increased their use of water from the Colorado River, and by 2002 no unused apportionment was available for California. As a result, California has limited its annual use to 4.4 million acre-feet since 2003, not including supplies made available under water supply programs such as intentionally-created surplus and certain conservation and storage agreements. In addition, a severe drought in the Colorado River Basin from 2000-2004 reduced storage in system reservoirs, ending the availability of surplus deliveries to Metropolitan. Prior to 2003, Metropolitan could divert over 1.25 million acre-feet in any year, but since that time, Metropolitan's net diversions of Colorado River water have ranged from a low of nearly 633,000 acre-feet in 2006 to a high of approximately 1,179,000 acre-feet in 2015, and totaled over 889,000 acre-feet in 2018. Average annual net deliveries for 2009 through 2018 were nearly 957,000 acre-feet, with annual volumes dependent primarily on programs to augment supplies, including transfers of conserved water from agriculture. See " – Quantification Settlement Agreement" and " – Colorado River Operations: Surplus and Shortage Guidelines – Interim Surplus Guidelines." See also "–Water Transfer, Storage and Exchange Programs – Colorado River Aqueduct Agreements and Programs."

The following table sets forth the existing priorities of the California users of Colorado River water established under the 1931 Seven-Party Agreement.

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PRIORITIES UNDER THE 1931 CALIFORNIA SEVEN-PARTY AGREEMENT[1]

Priority	Description	Acre-Feet Annually
1	Palo Verde Irrigation District gross area of 104,500 acres of land in the Palo Verde Valley	3,850,000
2	Yuma Project in California not exceeding a gross area of 25,000 acres in California	
3(a)	Imperial Irrigation District and other lands in Imperial and Coachella Valleys[2] to be served by All-American Canal	
3(b)	Palo Verde Irrigation District - 16,000 acres of land on the Lower Palo Verde Mesa	
4	Metropolitan Water District of Southern California for use on the coastal plain	550,000
	SUBTOTAL	4,400,000
5(a)	Metropolitan Water District of Southern California for use on the coastal plain	550,000
5(b)	Metropolitan Water District of Southern California for use on the coastal plain[3]	112,000
6(a)	Imperial Irrigation District and other lands in Imperial and Coachella Valleys to be served by the All-American Canal	300,000
6(b)	Palo Verde Irrigation District - 16,000 acres of land on the Lower Palo Verde Mesa	
	TOTAL	5,362,000
7	Agricultural use in the Colorado River Basin in California	Remaining surplus

Source: Metropolitan.

(1) Agreement dated August 18, 1931, among Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan, the City of Los Angeles, the City of San Diego and the County of San Diego. These priorities were memorialized in the agencies' respective water delivery contracts with the Secretary of the Interior.

(2) The Coachella Valley Water District serves Coachella Valley.

(3) In 1946, the City of San Diego, the San Diego County Water Authority, Metropolitan and the Secretary of the Interior entered into a contract that merged and added the City and County of San Diego's rights to storage and delivery of Colorado River water to the rights of Metropolitan.

Quantification Settlement Agreement

The Quantification Settlement Agreement ("QSA"), executed by the Coachella Valley Water District ("CVWD"), Imperial Irrigation District ("IID") and Metropolitan in October 2003, establishes Colorado River water use limits for IID and CVWD, and provides for specific acquisitions of conserved water and water supply arrangements for up to 75 years. The QSA and related agreements provide a framework for Metropolitan to enter into other cooperative Colorado River supply programs and set aside several disputes among California's Colorado River water agencies.

Specific programs under the QSA and related agreements include lining portions of the All-American and Coachella Canals, which were completed in 2009 and conserve over 98,000 acre-feet annually. Metropolitan receives this water and delivers over 77,000 acre-feet of exchange water annually to

the San Diego County Water Authority ("SDCWA"), plus any of the 4,850 acre-feet of mitigation water that is not used in that year, and provides 16,000 acre-feet of water annually by exchange to the United States for use by the La Jolla, Pala, Pauma, Rincon and San Pasqual Bands of Mission Indians, the San Luis Rey River Indian Water Authority, the City of Escondido and the Vista Irrigation District. Water became available for exchange with the United States following a May 17, 2017 notice from the Federal Energy Regulatory Commission ("FERC") satisfying the last requirement of Section 104 of the San Luis Rey Indian Water Rights Settlement Act (Title I of Public Law 100-675, as amended). The QSA and related agreements also authorized the transfer of conserved water annually by IID to SDCWA (up to a maximum expected amount in 2021 of 205,000 acre-feet, then stabilizing to 200,000 acre-feet per year). Metropolitan also receives this water and delivers exchange water annually to SDCWA. See description under the caption "– Metropolitan and San Diego County Water Authority Exchange Agreement" below; see also "METROPOLITAN REVENUES–Principal Customers" in this Appendix A. Also included under the QSA is a delivery and exchange agreement between Metropolitan and CVWD that provides for Metropolitan, when requested, to deliver annually up to 35,000 acre-feet of Metropolitan's State Water Project contractual water to CVWD by exchange with Metropolitan's available Colorado River supplies. With full implementation of the programs identified in the QSA, at times when California is limited to its basic apportionment of 4.4 million acre-feet per year, Metropolitan expects to be able to annually divert to its service area approximately 850,000 acre-feet of Colorado River water plus water from other water augmentation programs it develops, including the Palo Verde Land Management, Crop Rotation and Water Supply Program (described under "–Water Transfer, Storage and Exchange Programs –Colorado River Aqueduct Agreements and Programs" below), which provides up to approximately 133,000 acre-feet of water per year. (Amounts of Colorado River water received by Metropolitan in 2009 through 2018 are discussed under " –Colorado River Water Apportionment and Seven-Party Agreement" above.)

Metropolitan and San Diego County Water Authority Exchange Agreement

No facilities exist to deliver conserved water acquired by SDCWA from IID and water allocated to SDCWA that has been conserved as a result of the lining of the All-American and Coachella Canals. See " – Quantification Settlement Agreement." Accordingly, in 2003, Metropolitan and SDCWA entered into an exchange agreement (the "Exchange Agreement"), pursuant to which SDCWA makes available to Metropolitan at its intake at Lake Havasu on the Colorado River the conserved Colorado River water. Metropolitan delivers an equal volume of water from its own sources of supply through portions of its delivery system to SDCWA. In consideration for the conserved water made available to Metropolitan by SDCWA, a lower price is paid by SDCWA for the exchange water delivered by Metropolitan. The price payable by SDCWA is calculated using the charges set by Metropolitan's Board from time to time to be paid by its member agencies for the conveyance of water through Metropolitan's facilities. See "METROPOLITAN REVENUES–Litigation Challenging Rate Structure" in this Appendix A for a description of Metropolitan's charges for the conveyance of water through Metropolitan's facilities and litigation in which SDCWA is challenging such charges. In 2018, 207,700 acre-feet were delivered to Metropolitan by SDCWA for exchange, consisting of 130,000 acre-feet of IID conservation plus 77,000 acre-feet of conserved water from the Coachella Canal and All-American Canal lining projects.

Colorado River Operations: Surplus and Shortage Guidelines

General. The Secretary of the Interior is vested with the responsibility of managing the mainstream waters of the lower Colorado River pursuant to federal law. Each year, the Secretary of the Interior is required to declare the Colorado River water supply availability conditions for the Lower Basin States in terms of "normal," "surplus" or "shortage" and has adopted operations criteria in the form of guidelines to determine the availability of surplus or potential shortage allocations among the Lower Basin States and reservoir operations for such conditions.

Interim Surplus Guidelines. In January 2001, the Secretary of the Interior adopted guidelines (the "Interim Surplus Guidelines"), initially for use through 2016, in determining if there is surplus Colorado River water available for use in California, Arizona and Nevada. The Interim Surplus Guidelines were

amended in 2007 and now extend through 2026. The purpose of the Interim Surplus Guidelines was to provide mainstream users of Colorado River water, particularly those in California who utilize surplus flows, a greater degree of predictability with respect to the availability and quantity of surplus water. Under the Interim Surplus Guidelines, Metropolitan initially expected to divert up to 1.25 million acre-feet of Colorado River water annually under foreseeable runoff and reservoir storage scenarios from 2004 through 2016. However, an extended drought in the Colorado River Basin reduced these initial expectations, and Metropolitan has not received any surplus water since 2002.

Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead. In May 2005, the Secretary of the Interior directed the Bureau of Reclamation to develop additional strategies for improving coordinated management of the reservoirs of the Colorado River system. In November 2007, the Bureau of Reclamation issued a Final EIS regarding new federal guidelines concerning the operation of the Colorado River system reservoirs, particularly during drought and low reservoir conditions. These guidelines provide water release criteria from Lake Powell and water storage and water release criteria from Lake Mead during shortage and surplus conditions in the Lower Basin, provide a mechanism for the storage and delivery of conserved system and non-system water in Lake Mead and extend the Interim Surplus Guidelines through 2026. The Secretary of the Interior issued the final guidelines through a Record of Decision signed in December 2007. The Record of Decision and accompanying agreement among the Colorado River Basin States protect reservoir levels by reducing deliveries during drought periods, encourage agencies to develop conservation programs and allow the Colorado River Basin States to develop and store new water supplies. The Colorado River Basin Project Act of 1968 insulates California from shortages in all but the most extreme hydrologic conditions. Consistent with these legal protections, under the guidelines, Arizona and Nevada are first subject to the initial annual shortages identified by the Secretary up to 500,000 acre-feet.

The guidelines also created the Intentionally Created Surplus ("ICS") program, which allows the Lower Basin States to store conserved water in Lake Mead. Under this program, ICS water (water that has been conserved through an extraordinary conservation measure, such as land fallowing) is eligible for storage in Lake Mead by Metropolitan. ICS can be created through 2026 and delivered through 2036. See the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below. Under the guidelines, California is able to create and deliver up to 400,000 acre-feet of extraordinary conservation ICS ("EC ICS") annually, and accumulate up to 1.5 million acre-feet of EC ICS in Lake Mead. In December 2007, California contractors for Colorado River water executed the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus (the "California ICS Agreement"), which established terms and conditions for the creation, accumulation, and delivery of EC ICS by California contractors receiving Colorado River water. The California ICS Agreement apportioned the State's EC ICS creation, accumulation, and delivery limits provided to California under the 2007 Interim Surplus Guidelines between IID and Metropolitan. No other California contractors were permitted to create or accumulate ICS. Under the terms of the agreement, IID is allowed to store up to 25,000 acre-feet per year of EC ICS in Lake Mead with a cumulative limit of 50,000 acre-feet. Metropolitan is permitted to use the remaining available EC ICS creation, delivery, and accumulation limits provided to California.

The Secretary of the Interior delivers the stored ICS water to Metropolitan in accordance with the terms of December 13, 2007, January 6, 2010, and November 20, 2012 Delivery Agreements between the United States and Metropolitan. As of January 1, 2019, Metropolitan had an estimated 625,000 acre-feet in its ICS accounts. These surplus accounts are made up of water conserved by fallowing in the Palo Verde Valley, projects implemented with IID in its service area, groundwater desalination, the Warren H. Brock Reservoir Project, and international agreements that converted water conserved by Mexico to the United States, which have not been delivered to the region.

Since the 2007 Lower Basin shortage guidelines were issued for the coordinated operations of Lake Powell and Lake Mead, the Colorado River has continued to experience drought conditions. The seven Colorado River Basin States, the U.S. Department of Interior through the Bureau of Reclamation, and water users in the Colorado River basin, including Metropolitan, have been developing Drought Contingency Plans ("DCPs") to reduce the risk of Lake Powell and Lake Mead declining below critical elevations through 2026.

On December 11, 2018, Metropolitan's Board authorized Metropolitan's entering into seven agreements to implement the Lower Basin DCP on the proposed terms. The Lower Basin Drought Contingency Plan Agreement requires California, Arizona and Nevada to store defined volumes of water in Lake Mead at specified lake levels. California would begin making contributions if Lake Mead's elevation is projected to be at 1,045 feet above sea level or below on January 1. Lake Mead elevation in January 2019 was 1,085 feet. Depending on the lake's elevation, California's contributions would range from 200,000 to 350,000 acre-feet a year ("DCP Contributions"). A set of proposed intrastate implementation agreements would have divided California's obligation to make DCP Contributions among Metropolitan, IID, Palo Verde Irrigation District ("PVID"), and CVWD. Implementation of the Lower Basin DCP enhances Metropolitan's ability to store water in Lake Mead and to ensure that water in storage can be delivered at a later date. The Lower Basin DCP increases the total volume of water that California may store in Lake Mead by 200,000 acre-feet, which Metropolitan will have the right to use. Water stored as ICS will be available for delivery so long as Lake Mead's elevation remains above 1,025 feet. Previously, that water would likely have become inaccessible below a Lake Mead elevation of 1,075 feet. DCP Contributions may be made through conversion of existing forms of ICS. These types of DCP Contributions become DCP ICS. DCP Contributions may also be made by leaving water in Lake Mead that there was a legal right to have delivered. This type of DCP Contribution becomes system water and may not be recovered. Rules are set for delivery of DCP ICS through 2026 and between 2027-2057.

Subsequent to Metropolitan's December 11, 2018 Board action, the Commissioner of the Bureau of Reclamation established a deadline of March 18, 2019 for the participating water agencies to obtain the necessary authorization for the DCP agreements. The approval of the intrastate DCP agreements by IID's board of directors occurred on December 10, 2018; however, IID's board approval was suspended until certain conditions were met, including that the State of California and the United States governments have irrevocably committed to provide sufficient funding for full completion of a 10-year Salton Sea management plan, a condition that could not likely be secured by the federal deadline for the required DCP authorizations.

In order to protect Metropolitan's access to its ICS and advance the implementation of the Lower Basin DCP, on March 12, 2019, Metropolitan's Board authorized Metropolitan to make California's contributions if IID, PVID, and/or CVWD did not participate in the Lower Basin DCP. IID's Board has not authorized its agency to participate in the Lower Basin DCP. Both PVID and CVWD's boards have authorized their respective agencies' participation in the Lower Basin DCP. Metropolitan will be responsible for 93 percent of California's DCP Contributions under the Lower Basin DCP. CVWD will be responsible for 7 percent of California's required DCP Contributions.

Congress passed, and on April 16, 2019, the President signed legislation directing the Secretary of the Interior to sign and implement four DCP agreements related to the Upper and Lower Basin DCPs without delay. The agreements were executed and the Upper and Lower Basin DCPs became effective on May 20, 2019.

On April 22, 2019, Metropolitan was served notice of a CEQA lawsuit filed by IID against Metropolitan. In this lawsuit, IID is seeking to vacate Metropolitan's Board actions taken on December 11, 2018 and March 12, 2019 under CEQA and to block Metropolitan from implementing the Lower Basin DCP and any related agreements. Metropolitan is unable to assess at this time the likelihood of success of this litigation or any future claims, or their potential effect on the timing or likelihood of implementation of the Lower Basin DCP.

The Lower Basin DCP will be effective through 2026. Beginning in 2020, the U.S. Department of Interior through the Bureau of Reclamation, the seven Colorado River Basin States, and water users in the Colorado River basin, including Metropolitan, are expected to begin work on the development of new shortage guidelines for the management and operation of the Colorado River after the term of the 2007 Lower Basin shortage guidelines ends in 2026.

Related Litigation–Navajo Nation Suit. The Navajo Nation filed litigation against the Department of the Interior, specifically the Bureau of Reclamation and the Bureau of Indian Affairs, in 2003, alleging that the Bureau of Reclamation has failed to determine the extent and quantity of the water rights of the Navajo Nation in the Colorado River and that the Bureau of Indian Affairs has failed to otherwise protect the interests of the Navajo Nation. The complaint challenges the adequacy of the environmental review for the Interim Surplus Guidelines (described under " –Colorado River Operations: Surplus and Shortage Guidelines – Interim Surplus Guidelines" above) and seeks to prohibit the Department of the Interior from allocating any "surplus" water until such time as a determination of the rights of the Navajo Nation is completed. Metropolitan and other California water agencies filed motions to intervene in this action. In October 2004 the court granted the motions to intervene and stayed the litigation to allow negotiations among the Navajo Nation, federal defendants, Central Arizona Water Conservation District ("CAWCD"), State of Arizona and Arizona Department of Water Resources. After years of negotiations, a tentative settlement was proposed in 2012 that would provide the Navajo Nation with specified rights to water from the Little Colorado River and groundwater basins under the reservation, along with federal funding for development of water supply systems on the tribe's reservation. The proposed agreement was rejected by tribal councils for both the Navajo and the Hopi, who were seeking to intervene. On May 16, 2013, the stay of proceedings was lifted. On June 3, 2013, the Navajo Nation moved for leave to file a first amended complaint, which the court granted on June 27, 2013. The amended complaint added a legal challenge to the Lower Basin Shortage Guidelines adopted by the Secretary of the Interior in 2007 that allow Metropolitan and other Colorado River water users to store water in Lake Mead (described under "– Colorado River Operations: Surplus and Shortage Guidelines – Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead" above). Metropolitan has used these new guidelines to store over 1,000,000 acre-feet of water in Lake Mead, a portion of which has been delivered, and the remainder of which may be delivered at Metropolitan's request in future years. On July 22, 2014, the district court dismissed the lawsuit in its entirety, ruling that the Navajo Nation lacked standing and that the claim was barred against the federal defendants. The district court denied a motion by the Navajo Nation for leave to amend the complaint further after the dismissal. On September 19, 2014, the Navajo Nation appealed the dismissal of its claims related to the Interim Surplus Guidelines, the Lower Basin Shortage Guidelines, and breach of the federal trust obligation to the tribe. On December 4, 2017, the Ninth Circuit of Appeals held that the Navajo Nation lacked standing for its National Environmental Policy Act claims, but that the breach of trust claim was not barred against the federal defendants. The court remanded the breach of trust claim to the district court to consider on the merits. Metropolitan is unable to assess at this time the likelihood of success of this litigation or any future claims, or their potential effect on Colorado River water supplies.

Endangered Species Act and Other Environmental Considerations

Endangered Species Act Considerations - State Water Project

General. DWR has altered the operations of the State Water Project to accommodate species of fish listed as threatened or endangered under the Federal Endangered Species Act ("ESA") or California ESA. Currently, five species (the winter-run and spring-run Chinook salmon, Delta smelt, North American green sturgeon and Central Valley steelhead) are listed under the ESAs. In addition, the longfin smelt is listed as a threatened species under the California ESA. These changes in project operations have limited the flexibility of the State Water Project and adversely affected State Water Project deliveries to Metropolitan. State Water Project operational requirements may be further modified in the future under new biological opinions for listed species under the Federal ESA or by the issuance by CDFW of incidental take authorizations under the California ESA. Additionally, new litigation, listings of additional species or new regulatory requirements

could further adversely affect State Water Project operations in the future by requiring additional export reductions, releases of additional water from storage or other operational changes impacting the water supply available for export. Such operational constraints are likely to continue until long-term solutions to the problems in the Bay-Delta are identified and implemented. See also "–State Water Project – Bay-Delta Proceedings Affecting State Water Project."

The Federal ESA requires that before any federal agency authorizes funds or carries out an action that may affect a listed species or designated critical habitat, it must consult with the appropriate federal fishery agency to determine whether the action would jeopardize the continued existence of any threatened or endangered species, or adversely modify habitat critical to the species' needs. The result of the consultation is known as a "biological opinion." In the biological opinion the federal fishery agency determines whether the action would cause jeopardy to a threatened or endangered species or adverse modification to critical habitat, and recommends reasonable and prudent alternatives or measures that would allow the action to proceed without causing jeopardy or adverse modification. The biological opinion also includes an "incidental take statement." The incidental take statement allows the action to go forward even though it will result in some level of "take," including harming or killing some members of the species, incidental to the agency action, provided that the agency action does not jeopardize the continued existence of any threatened or endangered species and complies with reasonable mitigation and minimization measures recommended by the federal fishery agency.

Delta Smelt and Salmon Federal ESA Biological Opinions. USFWS released a biological opinion on December 15, 2008 on the impacts of the State Water Project and the federal Central Valley Project on Delta smelt. On June 4, 2009, the NMFS released a biological opinion for salmonid species. The water supply restrictions imposed by these biological opinions on Delta smelt and salmonid species have a range of impacts on Metropolitan's deliveries from the State Water Project, depending on hydrologic conditions. The impact on total State Water Project deliveries to State Water Contractors attributable to the Delta smelt and salmonid species biological opinions combined is estimated to be one million acre-feet in an average year, reducing total State Water Project deliveries to State Water Contractors from approximately 3.3 million acre-feet to approximately 2.3 million acre-feet for the year under average hydrology. Reductions are estimated to range from 0.3 million acre-feet during critically dry years to 1.3 million acre-feet in above normal water years. Total State Water Project delivery impacts to Metropolitan for calendar years 2008 through 2017 are estimated to be 2.1 million acre-feet.

Endangered Species Act Considerations - Colorado River

Federal and state environmental laws protecting fish species and other wildlife species have the potential to affect Colorado River operations. A number of species that are on either "endangered" or "threatened" lists under the ESAs are present in the area of the Lower Colorado River, including among others, the bonytail chub, razorback sucker, southwestern willow flycatcher and Yuma clapper rail. To address this issue, a broad-based state/federal/tribal/private regional partnership that includes water, hydroelectric power and wildlife management agencies in Arizona, California and Nevada have developed a multi-species conservation program for the main stem of the Lower Colorado River (the Lower Colorado River Multi-Species Conservation Program or "MSCP"). The MSCP allows Metropolitan to obtain federal and state permits for any incidental take of protected species resulting from current and future water and power operations of its Colorado River facilities and to minimize any uncertainty from additional listings of endangered species. The MSCP also covers operations of federal dams and power plants on the river that deliver water and hydroelectric power for use by Metropolitan and other agencies. The MSCP covers 27 species and habitat in the Lower Colorado River from Lake Mead to the Mexican border for a term of 50 years (commencing in 2005). Over the 50-year term of the program, the total cost to Metropolitan will be about $88.5 million (in 2003 dollars), and annual costs will range between $0.8 million and $4.7 million (in 2003 dollars).

Invasive Species - Mussel Control Programs

Zebra and quagga mussels are established in many regions of the United States. Mussels can reproduce quickly and, if left unmanaged, can reduce flows by clogging intakes and raw water conveyance systems, alter or destroy fish habitats, and affect lakes and beaches. Mussel management activities may require changes in water delivery protocols to reduce risks of spreading mussel populations, and increase operation and maintenance costs.

In January 2007, quagga mussels were discovered in Lake Mead. All pipelines and facilities that transport raw Colorado River water are considered to be infested with quagga mussels. Metropolitan has a quagga mussel control plan, approved by the CDFW to address the presence of mussels in the CRA system and limit further spread of mussels. Year-round routine monitoring for mussel larvae has been conducted at Lake Havasu, selected locations in the CRA system, and non-infested areas of Metropolitan's system and some southern locations in the State Water Project. Recent shutdown inspections have demonstrated that control activities effectively limit mussel infestation in the CRA and prevent the further spread of mussels to other bodies of water and water systems. Metropolitan's costs for controlling quagga mussels in the CRA system over the past 12 years has been approximately $5 million per year.

Established mussel populations are located within ten miles of the State Water Project. A limited number of mussels have also been detected in State Water Project supplies but there is currently no evidence of established mussel populations, nor have they impacted Metropolitan's State Water Project deliveries. To prevent the introduction and further spread of mussels into the State Water Project, the Bay-Delta, and other uninfested bodies of water and water systems, DWR has also developed quagga mussel control plans and has partnered with other State and federal agencies on a number of related activities. Metropolitan coordinates mussel monitoring and control activities with these agencies.

Water Transfer, Storage and Exchange Programs

General

To supplement its State Water Project and Colorado River water supplies, Metropolitan has developed and actively manages a portfolio of water supply programs, including water transfer, storage and exchange agreements, the supplies created by which are conveyed through the California Aqueduct of the State Water Project, utilizing Metropolitan's rights under its State Water Contract to use the portion of the State Water Project conveyance system necessary to deliver water to it, or through available CRA capacity. Consistent with its IRP, Metropolitan will continue to pursue voluntary water transfer and exchange programs with State, federal, public and private water districts and individuals to help mitigate supply/demand imbalances and provide additional dry-year supply sources. A summary description of certain of Metropolitan's supply programs are set forth below. In addition to the arrangements described below, Metropolitan is entitled to storage and access to stored water in connection with various other storage programs and facilities. See "–Colorado River Aqueduct" above, as well as the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below.

State Water Project Agreements and Programs

In addition to the basic State Water Project contract provisions, Metropolitan has other contract rights that accrue to the overall value of the State Water Project. Because each Contractor is paying for physical facilities, they also have the right to use the facilities to move water supplies associated with agreements, water transfers and water exchanges. Metropolitan has entered into agreements and exchanges that provide additional water supplies.

Existing and potential water transfers and exchanges are an important element for improving the water supply reliability within Metropolitan's service area and accomplishing the reliability goal set by Metropolitan's Board. California's agricultural activities consume approximately 34 million acre-feet of

water annually, which is approximately 80 percent of the total water used in the State for agricultural and urban uses and 40 percent of the water used for all consumptive uses, including environmental demands. Voluntary water transfers and exchanges with agricultural users can make a portion of this agricultural water supply available to support the State's urban areas. The portfolio of supplemental supplies that Metropolitan has developed to be conveyed through the California Aqueduct extend from north of the Bay-Delta to Southern California. Certain of these arrangements are also described below.

Castaic Lake and Lake Perris. Metropolitan has contractual rights to withdraw up to 65,000 acre-feet of water in Lake Perris (East Branch terminal reservoir) and 153,940 acre-feet of water in Castaic Lake (West Branch terminal reservoir). This storage provides Metropolitan with additional options for managing State Water Project deliveries to maximize yield from the project. Any water used must be returned to the State Water Project within five years or it is deducted from allocated amounts in the sixth year.

Metropolitan Article 56 Carryover. Metropolitan has the right to store its allocated contract amount for delivery in subsequent years. Metropolitan can store between 100,000 and 200,000 acre-feet, depending on the final water supply allocation percentage.

Yuba River Accord. Metropolitan entered into an agreement with DWR in December 2007 to purchase a portion of the water released by the Yuba County Water Agency ("YCWA"). YCWA was involved in a SWRCB proceeding in which it was required to increase Yuba River fishery flows. Within the framework of agreements known as the Yuba River Accord, DWR entered into an agreement for the long-term purchase of water from YCWA. The agreement permits YCWA to transfer additional supplies at its discretion. Metropolitan, other State Water Contractors, and the San Luis & Delta-Mendota Water Authority entered into separate agreements with DWR for the purchase of portions of the water made available. Metropolitan's agreement allows Metropolitan to purchase, in dry years through 2025, available water supplies which have ranged from approximately 6,555 acre-feet to 67,068 acre-feet per year.

In addition to water made available under the Yuba River Accord, Metropolitan has developed groundwater storage agreements that allow Metropolitan to store available supplies in the Central Valley for return later. See also "METROPOLITAN'S WATER DELIVERY SYSTEM–Water Quality and Treatment" in this Appendix A for information regarding a recently adopted water quality regulation for 1,2,3-Trichloropropane ("TCP") that impacts certain of Metropolitan's groundwater storage programs. Metropolitan has also developed exchanges and transfers with other State Water Contractors.

Arvin-Edison/Metropolitan Water Management Program. In December 1997, Metropolitan entered into an agreement with the Arvin-Edison Water Storage District ("Arvin-Edison"), an irrigation agency located southeast of Bakersfield, California. Under the program, Arvin-Edison stores water on behalf of Metropolitan. In January 2008, Metropolitan and Arvin-Edison amended the agreement to enhance the program's capabilities and to increase the delivery of water to the California Aqueduct. Up to 350,000 acre-feet of Metropolitan's water may be stored and Arvin-Edison is obligated to return up to 75,000 acre-feet of stored water in any year to Metropolitan, upon request. The agreement will terminate in 2035 unless extended. To facilitate the program, new wells, spreading basins and a return conveyance facility connecting Arvin-Edison's existing facilities to the California Aqueduct have been constructed. The agreement also provides Metropolitan priority use of Arvin-Edison's facilities to convey high quality water available on the east side of the San Joaquin Valley to the California Aqueduct. Metropolitan's storage account balance under the Arvin-Edison/Metropolitan Water Management Program as of January 1, 2019 is shown in the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below. As a result of detecting TCP in Arvin-Edison wells, Metropolitan has temporarily suspended operation of the program until the water quality concerns can be further evaluated and managed.

Semitropic/Metropolitan Groundwater Storage and Exchange Program. In 1994, Metropolitan entered into an agreement with the Semitropic Water Storage District ("Semitropic"), located adjacent to the

California Aqueduct north of Bakersfield, to store water in the groundwater basin underlying land within Semitropic. The minimum annual yield available to Metropolitan from the program is 39,700 acre-feet of water and the maximum annual yield is 231,200 acre-feet of water depending on the available unused capacity and the State Water Project allocation. Metropolitan's storage account balance under the Semitropic program as of January 1, 2019 is shown in the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below.

Kern Delta Storage Program. Metropolitan entered into an agreement with Kern Delta Water District ("Kern Delta") in May 2003, for a groundwater banking and exchange transfer program to allow Metropolitan to store up to 250,000 acre-feet of State Water Contract water in wet years and to permit Metropolitan, at Metropolitan's option, a return of up to 50,000 acre-feet of water annually during hydrologic and regulatory droughts. Metropolitan's storage account balance under this program as of January 1, 2019 is shown in the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below.

Mojave Storage Program. Metropolitan entered into a groundwater banking and exchange transfer agreement with Mojave Water Agency ("Mojave") in October 2003. This agreement was amended in 2011 to allow for the cumulative storage of up to 390,000 acre-feet. The agreement allows for Metropolitan to store water in an exchange account for later return. The agreement allows Metropolitan to annually withdraw Mojave State Water Project contractual amounts, after accounting for local needs. Under a 100 percent allocation, the State Water Contract provides Mojave 82,800 acre-feet of water. Metropolitan's storage account balance under this program as of January 1, 2019 is shown in the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below.

Antelope Valley-East Kern Storage and Exchange Program. In 2016, Metropolitan entered into an agreement with the Antelope Valley-East Kern Water Agency ("AVEK"), the third largest State Water Contractor, to both exchange supplies and store water in the Antelope Valley groundwater basin. Under this agreement, AVEK would provide Metropolitan up to 30,000 acre-feet of storage and the ability to exchange supplies. AVEK would provide at least 30,000 acre-feet over ten years of its unused Table A State Water Project water to Metropolitan. For every two acre-feet provided to Metropolitan as part of the exchange, AVEK would receive back one acre-foot in the future. For the one acre-foot that is retained by Metropolitan, Metropolitan would pay AVEK under a set price schedule based on the State Water Project allocation at the time. The payment would range from $587/acre-foot under a five percent State Water Project allocation to $38/acre-foot under an 86 percent State Water Project allocation. DWR has approved the storage program element but has yet to approve the exchange element of the program.

Antelope Valley-East Kern High Desert Water Bank Program. In April 2019, Metropolitan's Board authorized the General Manager to enter into an agreement with AVEK for a groundwater banking program referred to as the High Desert Water Bank Program. Under this agreement, Metropolitan would pay AVEK for the capital costs of construction of groundwater recharge and recovery facilities to be located in AVEK's service area near the split of the West and East Branches of the California Aqueduct. Metropolitan currently expects that construction will commence in fiscal year 2019-20. The estimated costs of construction of the facilities is $131 million. Following completion of construction, which is expected to take approximately five years, Metropolitan would have the right to store up to 70,000 acre-feet per year of its unused Table A State Water Project water or other supplies in the Antelope Valley groundwater basin for later return. The maximum storage capacity for Metropolitan supplies would be 280,000 acre-feet. At Metropolitan's direction, up to 70,000 acre-feet of stored water annually would be available for return by direct pump back into the East Branch of the California Aqueduct. Metropolitan would pay for the actual operation, maintenance and power costs for the water bank facilities when used for Metropolitan's benefit. In addition, Metropolitan would pay a set recovery usage fee on all recovered water. In total, the estimated cost to Metropolitan would be $320/per acre-foot. Upon completion, this program would provide additional flexibility to store and recover water for emergency or water supply needs through 2057.

San Gabriel Valley Municipal Water District and Other Exchange Programs. In 2013, Metropolitan entered into an agreement with the San Gabriel Valley Municipal Water District ("SGVMWD"). Under this agreement, Metropolitan delivers treated water to a SGVMWD subagency in exchange for twice as much untreated water in the groundwater basin. Metropolitan's member agencies can then use the groundwater supplies to meet their needs. Metropolitan can exchange and purchase at least 5,000 acre-feet per year. This program has the potential to increase Metropolitan's reliability by providing 115,000 acre-feet through 2035.

Metropolitan has been negotiating, and will continue to pursue, water purchase, storage and exchange programs with other agencies in the Sacramento and San Joaquin Valleys. These programs involve the storage of both State Water Project supplies and water purchased from other sources to enhance Metropolitan's dry-year supplies and the exchange of normal year supplies to enhance Metropolitan's water reliability and water quality, in view of dry conditions and potential impacts from the ESA cases discussed above under the heading "–Endangered Species Act and Other Environmental Considerations – Endangered Species Act Considerations - State Water Project."

Metropolitan/CVWD/Desert Water Agency Exchange and Advance Delivery Agreement. Metropolitan has agreements with CVWD and the Desert Water Agency ("DWA") in which Metropolitan exchanges its Colorado River water for those agencies' State Water Project contractual water and other State Water Project water acquisitions on an annual basis. Because CVWD and DWA do not have a physical connection to the State Water Project, Metropolitan takes delivery of CVWD's and DWA's State Water Project supplies and delivers a like amount of Colorado River water to the agencies. In accordance with an advance delivery agreement executed by Metropolitan, CVWD and DWA, Metropolitan may deliver Colorado River water in advance of receiving State Water Project supplies to these agencies for storage in the Upper Coachella Valley groundwater basin. In years when it is necessary to augment available supplies to meet local demands, Metropolitan may meet the exchange delivery obligation through drawdowns of the advance delivery account, rather than deliver Colorado River water in that year. Metropolitan's storage account under the CVWD/DWA program as of January 1, 2019 is shown in the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "–Storage Capacity and Water in Storage" below. In addition to the storage benefits of the program, Metropolitan receives water quality benefits with increased deliveries of lower salinity water from the State Water Project in lieu of delivering higher saline Colorado River water.

Colorado River Aqueduct Agreements and Programs

Metropolitan has taken steps to augment its share of Colorado River water through agreements with other agencies that have rights to use such water, including through cooperative programs with other water agencies to conserve and develop supplies and through programs to exchange water with other agencies. These supplies are conveyed through the CRA. Metropolitan determines the delivery schedule of these supplies throughout the year based on changes in the availability of State Water Project and Colorado River water. Under certain of these programs, water may be delivered to Metropolitan's service area in the year made available or in a subsequent year as ICS water from Lake Mead storage. See "–Colorado River Aqueduct –Colorado River Operations: Surplus and Shortage Guidelines – Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead."

IID/Metropolitan Conservation Agreement. Under a 1988 water conservation agreement, as amended in 2003 and 2007 (the "1988 Conservation Agreement") between Metropolitan and IID, Metropolitan provided funding for IID to construct and operate a number of conservation projects that have conserved up to 109,460 acre-feet of water per year that has been provided to Metropolitan. As amended, the agreement's initial term has been extended to at least 2041 or 270 days after the termination of the QSA. In 2018, 105,000 acre-feet of conserved water was made available by IID to Metropolitan. Under the QSA and related agreements, Metropolitan, at the request of CVWD, forgoes up to 20,000 acre-feet of this water each year for diversion by CVWD. In each of 2017 and 2018, CVWD's requests were for 0 acre-feet, leaving

105,000 acre-feet in 2017 and 2018 for Metropolitan. See "–Colorado River Aqueduct –Quantification Settlement Agreement."

Palo Verde Land Management, Crop Rotation and Water Supply Program. In August 2004, Metropolitan and PVID signed the program agreement for a Land Management, Crop Rotation and Water Supply Program. Under this program, participating landowners in the PVID service area are compensated for reducing water use by not irrigating a portion of their land. This program provides up to 133,000 acre-feet of water to be available to Metropolitan in certain years. The term of the program is 35 years. Fallowing began on January 1, 2005. The following table shows annual volumes of water saved and made available to Metropolitan under the Land Management, Crop Rotation and Water Supply Program with PVID:

WATER AVAILABLE FROM PVID LAND MANAGEMENT,
CROP ROTATION AND WATER SUPPLY PROGRAM

Calendar Year	Volume (acre-feet)
2006	105,000
2007	72,300
2008	94,300
2009[(1)]	144,300
2010[(1)]	148,600
2011	122,200
2012	73,700
2013	32,800
2014	43,000
2015	94,500
2016	125,400
2017	111,800
2018[(2)]	93,300

Source: Metropolitan.

(1) Includes water from a supplemental fallowing program entered into with PVID in March 2009 that provided for fallowing of additional acreage in 2009 and 2010 and resulted in an additional 24,100 acre-feet and 32,300 acre-feet of water in 2009 and 2010, respectively, made available under the program.

(2) Estimate.

Lake Mead Storage Program. As described under "–Colorado River Aqueduct –Colorado River Operations: Surplus and Shortage Guidelines – Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead," in December 2007, Metropolitan entered into agreements to set forth the guidelines under which ICS water is developed, and stored in and delivered from Lake Mead. The amount of water stored in Lake Mead must be created through extraordinary conservation, system efficiency, tributary, imported, or binational conservation methods. Metropolitan has participated in projects to create ICS as described below:

Drop 2 (Warren H. Brock) Reservoir. In May 2008, Metropolitan provided $28.7 million to join the CAWCD and the Southern Nevada Water Authority ("SNWA") in funding the Bureau of Reclamation's construction of an 8,000 acre-foot off-stream regulating reservoir near Drop 2 of the All-American Canal in Imperial County (officially named the Warren H. Brock Reservoir). Construction was completed in October 2010 and the Bureau of Reclamation refunded approximately $3.71 million in unused contingency funds to Metropolitan. The Warren H. Brock Reservoir conserves about 70,000 acre-feet of water per year by capturing and storing water that would otherwise be lost from the system. In return for its funding, Metropolitan received 100,000 acre-feet of water that was stored in Lake Mead for its future use, and has the ability to receive up to 25,000 acre-feet of water in any single year. Besides the additional water supply, the addition of the Warren H. Brock reservoir adds to the flexibility of Colorado River operations by storing

underutilized Colorado River water orders caused by unexpected canal outages, changes in weather conditions, and high tributary runoff into the Colorado River. As of January 1, 2019, Metropolitan had taken delivery of 35,000 acre-feet of this water, and had 65,000 acre-feet remaining in storage.

Yuma Desalting Plant. In September 2009, Metropolitan authorized participation with SNWA, the Colorado River Commission of Nevada, the CAWCD and the Bureau of Reclamation in the pilot operation of the Yuma Desalting Plant. The Bureau of Reclamation concluded the pilot operation of the Yuma Desalting Plant in March 2011. Metropolitan's contribution for the funding agreement was approximately $8.4 million, of which approximately $1.1 million was refunded to Metropolitan. Metropolitan's yield from the pilot run of the project was 24,397 acre-feet. As of January 1, 2019, that water was stored in Lake Mead for Metropolitan's future use.

Mexico Pilot Project. In November 2012, Metropolitan executed agreements in support of a program to augment Metropolitan's Colorado River supply between 2013 through 2017 through an international pilot project in Mexico. Metropolitan's total share of costs was $5 million for 47,500 acre-feet of project supplies. In December 2013, Metropolitan and IID executed an agreement under which IID has paid half of Metropolitan's program costs, or $2.5 million, in return for half of the project supplies, or 23,750 acre-feet. As such, 23,750 acre-feet of Intentionally Created Mexican Allocation was converted to Binational ICS and credited to Metropolitan's binational ICS water account in 2017. See "–Colorado River Aqueduct –Colorado River Operations: Surplus and Shortage Guidelines – Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead." As of January 1, 2019, that water was stored in Lake Mead for Metropolitan's future use.

Storage and Interstate Release Agreement with Nevada. In May 2002, SNWA and Metropolitan entered into an Agreement Relating to Implementation of Interim Colorado River Surplus Guidelines, in which SNWA and Metropolitan agreed to the allocation of unused apportionment as provided in the Interim Surplus Guidelines and on the priority of SNWA for interstate banking of water in Arizona. SNWA and Metropolitan entered into a storage and interstate release agreement on October 21, 2004. Under this agreement, SNWA can request that Metropolitan store unused Nevada apportionment in California. The amount of water stored through 2014 under this agreement was approximately 205,000 acre-feet. In October 2015, SNWA and Metropolitan executed an additional amendment to the agreement under which Metropolitan paid SNWA approximately $44.4 million and SNWA stored an additional 150,000 acre-feet with Metropolitan during 2015. Of that amount, 125,000 acre-feet has been added to SNWA's storage account with Metropolitan, increasing the total amount of water stored to approximately 330,000 acre-feet. In subsequent years, SNWA may request recovery of the stored water. When SNWA requests the return of any of the stored 125,000 acre-feet, SNWA will reimburse Metropolitan for an equivalent proportion of the $44.4 million plus inflation based on the amount of water returned. However, it is expected that SNWA will not request return of any of the water stored with Metropolitan before 2022.

California ICS Agreement Intrastate Storage Provisions. In addition to establishing terms and conditions for the creation, accumulation, and delivery of ICS by California contractors, the California ICS Agreement allows IID to store up to 25,000 acre-feet per year of conserved water within Metropolitan's system with a cumulative limit of 50,000 acre-feet. Under a 2015 amendment, IID was permitted to store up to 100,000 acre-feet per year of conserved water within Metropolitan's system with a cumulative limit of 200,000 acre-feet, for a three-year term (2015-2018). When requested by IID, Metropolitan has agreed to return to IID the lesser of either 50,000 acre-feet per year, or in a year in which Metropolitan's member agencies are under a shortage allocation, 50 percent of the cumulative amount of water IID has stored with Metropolitan under the 2015 amendment. IID currently has 162,000 acre-feet of water stored with Metropolitan pursuant to the terms of the California ICS Agreement.

Storage Capacity and Water in Storage

Metropolitan's storage capacity, which includes reservoirs, conjunctive use and other groundwater storage programs within Metropolitan's service area and groundwater and surface storage accounts delivered through the State Water Project or CRA, is approximately 6.04 million acre-feet. In 2018, approximately 626,000 acre-feet of stored water was emergency storage that was reserved for use in the event of supply interruptions from earthquakes or similar emergencies (see "METROPOLITAN'S WATER DELIVERY SYSTEM–Seismic Considerations and Emergency Response Measures" in this Appendix A), as well as extended drought. Metropolitan's emergency storage requirement is established periodically to provide a six-month water supply at 75 percent of member agencies' retail demand under normal hydrologic conditions. Metropolitan's ability to replenish water storage, both in the local groundwater basins and in surface storage and banking programs, has been limited by Bay-Delta pumping restrictions under the biological opinions issued for listed species. See "–Endangered Species Act and Other Environmental Considerations – Endangered Species Act Considerations – State Water Project – Delta Smelt and Salmon Federal ESAs Biological Opinions." Metropolitan replenishes its storage accounts when available imported supplies exceed demands. Effective storage management is dependent on having sufficient years of excess supplies to store water so that it can be used during times of shortage. Metropolitan forecasts that, with anticipated supply reductions from the State Water Project due to pumping restrictions, it will need to draw down on storage in about seven of ten years and will be able to replenish storage in about three years out of ten. This reduction in available supplies extends the time required for storage to recover from drawdowns and could require Metropolitan to implement its Water Supply Allocation Plan during extended dry periods. See "CONSERVATION AND WATER SHORTAGE MEASURES–Water Supply Allocation Plan" in this Appendix A. As a result of increased State Water Project supplies and reduced demands from 2010 to 2012, Metropolitan rebuilt its storage after several years of withdrawals to approximately 3.375 million acre-feet, including emergency storage. This was the highest end-of-year total water reserves in Metropolitan's history. Following withdrawals in 2014 and 2015, in 2016, approximately 350,000 acre-feet were added to storage reserves, providing for nearly 1.9 million acre-feet in reserves as of January 1, 2017. More than 1.1 million acre-feet were returned to storage reserves in 2017, providing over 3.1 million acre-feet in reserves as of January 1, 2018. Metropolitan added slightly to storage reserves in 2018, maintaining approximately 3.1 million acre-feet in reserves as of January 1, 2019. In early 2019, however, hydrologic conditions allowed DWR to fill San Luis Reservoir. Consistent with the State Water Contract, approximately 163,000 acre-feet of Metropolitan's State Water Project carryover supplies converted to State Water Project supplies that are shared by all State Water Contractors. Metropolitan reflected this conversion as a reduction in the January 1, 2019 storage balance. The following table shows three years of Metropolitan's water in storage as of January 1, including emergency storage.

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METROPOLITAN'S WATER STORAGE CAPACITY AND WATER IN STORAGE[1]
(in Acre-Feet)

Water Storage Resource	Storage Capacity	Water in Storage January 1, 2019	Water in Storage January 1, 2018	Water in Storage January 1, 2017
Colorado River Aqueduct				
Desert / CVWD Advance Delivery Account	800,000	235,000	228,000	38,000
Lake Mead ICS	1,563,000	625,000	479,000	157,000
Subtotal	2,363,000	860,000	707,000	195,000
State Water Project				
Arvin-Edison Storage Program	350,000	154,000	149,000	108,000
Semitropic Storage Program	350,000	187,000	187,000	125,000
Kern Delta Storage Program	250,000	138,000	138,000	99,000
Mojave Storage Program	330,000[4]	19,000[4]	27,000	27,000
AVEK Storage Program	30,000	9,000	9,000	-0-
Castaic Lake and Lake Perris[2]	219,000	219,000	219,000	154,000
State Water Project Carryover[3]	350,000[5]	93,000	325,000	210,000
Emergency Storage	328,000	328,000	328,000	328,000
Subtotal	2,207,000	1,147,000	1,382,000	1,051,000
Within Metropolitan's Service Area				
Diamond Valley Lake	810,000	702,000	747,000	566,000
Lake Mathews	182,000	141,000	139,000	135,000
Lake Skinner	44,000	37,000	38,000	7,000
Subtotal[6]	1,036,000	880,000	924,000	708,000
Member Agency Storage Programs				
Cyclic Storage and Conjunctive Use	500,000	97,000	88,000	1,000
Total	6,106,000	2,984,000	3,101,000	1,955,000

Source: Metropolitan

(1) Water storage capacity and water in storage are measured based on engineering estimates and are subject to change.
(2) Flexible storage allocated to Metropolitan under its State Water Contract. Withdrawals must be returned within 5 years.
(3) Includes Article 56 Carryover of Metropolitan, Coachella Valley Water District, and Desert Water Agency, prior-year carryover, non-project carryover, and carryover of curtailed deliveries pursuant to Article 14(b) of Metropolitan's State Water Contract.
(4) The Mojave Storage agreement was amended in 2011 to allow for cumulative storage of up to 390,000 acre-feet. Since January 1, 2011, Metropolitan has stored 60,000 acre-feet, resulting in a remaining balance of storage capacity of 330,000 acre-feet. 41,000 acre-feet of the 60,000 acre-feet stored has been returned, leaving a remaining balance in storage of 19,000 acre-feet.
(5) A capacity of 350,000 acre-feet is estimated to be the practical operational limit for carryover storage considering Metropolitan's capacity to take delivery of carryover supplies before San Luis Reservoir fills.
(6) Includes 298,000 acre-feet of emergency storage in Metropolitan's reservoirs in 2017, 2018, and 2019.

CONSERVATION AND WATER SHORTAGE MEASURES

General

The central objective of Metropolitan's water conservation program is to help ensure adequate, reliable and affordable water supplies for Southern California by actively promoting efficient water use. The importance of conservation to the region has increased in recent years because of drought conditions in the State Water Project watershed and court-ordered restrictions on Bay-Delta pumping, as described under "METROPOLITAN'S WATER SUPPLY–State Water Project –Bay-Delta Proceedings Affecting State Water Project" and "–Endangered Species Act and Other Environmental Considerations –Endangered Species Act Considerations-State Water Project – Delta Smelt and Salmon Federal ESAs Biological

Opinions" in this Appendix A. Conservation reduces the need to import water to deliver to member agencies through Metropolitan's system. Water conservation is an integral component of Metropolitan's IRP, WSDM Plan and Water Supply Allocation Plan.

Metropolitan's conservation program has largely been developed to assist its member agencies in meeting the conservation goals of the most recent IRP Update. See "METROPOLITAN'S WATER SUPPLY–Integrated Water Resources Plan" in this Appendix A. Under the terms of Metropolitan's Conservation Credits Program, Metropolitan administers regional conservation programs and also co-funds member agency conservation programs designed to achieve greater water use efficiency in residential, commercial, industrial, institutional and landscape uses. Conservation incentives and other water management programs are funded by Metropolitan's Water Stewardship Rate and available grant funds. The Water Stewardship Rate is charged on every acre-foot of water conveyed by Metropolitan, except on water delivered to SDCWA pursuant to the Exchange Agreement (see "METROPOLITAN REVENUES–Water Rates" and "–Litigation Challenging Rate Structure" in this Appendix A) in calendar years 2018, 2019, and 2020, pending Metropolitan's completion of a cost allocation study of its demand management costs. See "METROPOLITAN REVENUES–Rate Structure –Water Stewardship Rate" in this Appendix A. All users of Metropolitan's system benefit from the reduced infrastructure costs and system capacity made available by investments in demand management programs like the Conservation Credits Program. Direct spending by Metropolitan on active conservation incentives, including rebates for water-saving plumbing fixtures, appliances and equipment totaled about $12.6 million in fiscal year 2017-18. The 2015 IRP Update estimates that 1,197,000 acre-feet of water will be conserved annually in Southern California by 2025. See also "METROPOLITAN'S WATER SUPPLY–Integrated Water Resources Plan" in this Appendix A and "–Increased Drought Resiliency" below.

In addition to ongoing conservation, Metropolitan has developed a WSDM Plan, which splits resource actions into two major categories: Surplus Actions and Shortage Actions. See "–Water Surplus and Drought Management Plan." Conservation and water efficiency programs are part of Metropolitan's resource management strategy which makes up these Surplus and Shortage actions.

Metropolitan's Water Supply Allocation Plan allocates Metropolitan's water supplies among its member agencies, based on the principles contained in the WSDM Plan, to reduce water use and drawdowns from water storage reserves. See "–Water Supply Allocation Plan." Metropolitan's member agencies and retail water suppliers in Metropolitan's service area also have the ability to implement water conservation and allocation programs, and some of the retail suppliers in Metropolitan's service area have initiated conservation measures. The success of conservation measures in conjunction with the Water Supply Allocation Plan is evidenced as a contributing factor in the lower than budgeted water transactions during fiscal years 2009-10, 2010-11, 2011-12 and 2015-16.

Legislation approved in November 2009 sets a statewide conservation target for urban per capita potable water use of 20 percent reductions (from a baseline per capita use determined utilizing one of four State-approved methodologies) by 2020 (with credits for existing conservation) at the retail level, providing an additional catalyst for conservation by member agencies and retail suppliers. Metropolitan's water transactions projections incorporate an estimate of conservation savings that will reduce retail demands. Current projections include an estimate of additional water use efficiency savings that would result from Metropolitan's IRP goals that include the reduction of overall regional per capita water use by 20 percent by 2020 from a baseline of average per capita water use from 1996-2005 in Metropolitan's service area.

Water Surplus and Drought Management Plan

In addition to the long-term planning guidelines and strategy provided by its IRP, Metropolitan has developed its WSDM Plan for the on-going management of its resources and water supplies in response to hydrologic conditions. The WSDM Plan, which was adopted by Metropolitan's Board in April 1999, evolved from Metropolitan's experiences during the droughts of 1976-77 and 1987-92. The WSDM Plan is a

planning document that Metropolitan uses to guide inter-year and intra-year storage operations, and splits resource actions into two major categories: surplus actions and shortage actions. The surplus actions emphasize storage of surplus water inside the region, followed by storage of surplus water outside the region. The shortage actions emphasize critical storage programs and facilities and conservation programs that make up part of Metropolitan's response to shortages. Implementation of the plan is directed by a WSDM team, made up of Metropolitan staff, that meets regularly throughout the year and more frequently between November and April as hydrologic conditions develop. The WSDM team develops and recommends storage actions to senior management on a regular basis and provides updates to the Board on hydrological conditions, storage levels and planned storage actions through detailed reports.

Water Supply Allocation Plan

In times of prolonged or severe water shortages, Metropolitan manages its water supplies through the implementation of its Water Supply Allocation Plan. The Water Supply Allocation Plan was originally approved by Metropolitan's Board in February 2008, and has been implemented three times since its adoption, including most recently in April 2015. The Water Supply Allocation Plan provides a formula for equitable distribution of available water supplies in case of extreme water shortages within Metropolitan's service area and if needed is typically approved in the month of April with implementation beginning in the month of July. In December 2014, the Board approved certain adjustments to the formula for calculating member agency supply allocations during subsequent periods of implementation of the Water Supply Allocation Plan. Although the Act gives each of Metropolitan's member agencies a preferential entitlement to purchase a portion of the water served by Metropolitan (see "METROPOLITAN REVENUES–Preferential Rights" in this Appendix A), historically, these rights have not been used in allocating Metropolitan's water. Metropolitan's member agencies and retail water suppliers in Metropolitan's service area also may implement water conservation and allocation programs within their respective service territories in times of shortage. See also "–Increased Drought Resiliency." Based upon current hydrologic conditions and current DWR State Water Project allocation estimates, implementation of the Water Supply Allocation Plan for fiscal year 2018-19 is not expected.

Increased Drought Resiliency

Metropolitan has worked proactively with its member agencies to conserve water supplies in its service area, and significantly expanded its water conservation and outreach programs and increased funding for conservation incentive programs. In May 2017, the Alliance for Water Efficiency presented a peer review report of Metropolitan's conservation programs. Program modifications were adopted in April 2018 to reflect the peer review recommendations as well as feedback from member agencies. See "CONSERVATION AND WATER SHORTAGE MEASURES–General." Metropolitan has also taken other actions to improve drought resiliency that include increasing water recycling by providing incentives for on-site recycled water hook-ups, improving return capability of storage programs, and modifying Metropolitan's distribution system to enhance Colorado River water delivery to mitigate limitations in State Water Project supply.

REGIONAL WATER RESOURCES

The water supply for Metropolitan's service area is provided in part by Metropolitan and in part by non-Metropolitan sources available to members. Approximately 60 percent of the water supply for Metropolitan's service area is imported water received by Metropolitan from the CRA and the State Water Project and by the City of Los Angeles (the "City") from the Los Angeles Aqueduct. While the City is one of the largest water customers of Metropolitan, it receives a substantial portion of its water from the Los Angeles Aqueduct and local groundwater supply. The balance of water within the region is produced locally, primarily from groundwater supplies and runoff.

Metropolitan's member agencies are not required to purchase or use any of the water available from Metropolitan. Some agencies depend on Metropolitan to supply nearly all of their water needs, regardless of

the weather. Other agencies, with local surface reservoirs or aqueducts that capture rain or snowfall, rely on Metropolitan more in dry years than in years with heavy rainfall, while others, with ample groundwater supplies, purchase Metropolitan water only to supplement local supplies and to recharge groundwater basins. The demand for supplemental supplies provided by Metropolitan is dependent on water use at the retail consumer level and the amount of locally supplied and conserved water. See "CONSERVATION AND WATER SHORTAGE MEASURES" in this Appendix A and "–Local Water Supplies" below. Consumer demand and locally supplied water vary from year to year, resulting in variability in the volume of Metropolitan's water transactions. Future reliance on Metropolitan supplies will depend on, among other things, local projects and the amount of water, if any, that may be derived from sources other than Metropolitan. In recent years, supplies and demands have been affected by drought, water use restrictions, economic conditions, weather conditions and environmental laws, regulations and judicial decisions, as described in this Appendix A under "METROPOLITAN'S WATER SUPPLY." For information on Metropolitan's water revenues, see "METROPOLITAN REVENUES" and "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

The following graph shows a summary of the regional sources of water supply for the years 1976 to 2017. Local supplies available within Metropolitan's service area are augmented by water imported by the City of Los Angeles through the Los Angeles Aqueduct and Metropolitan supplies provided through the CRA and State Water Project.

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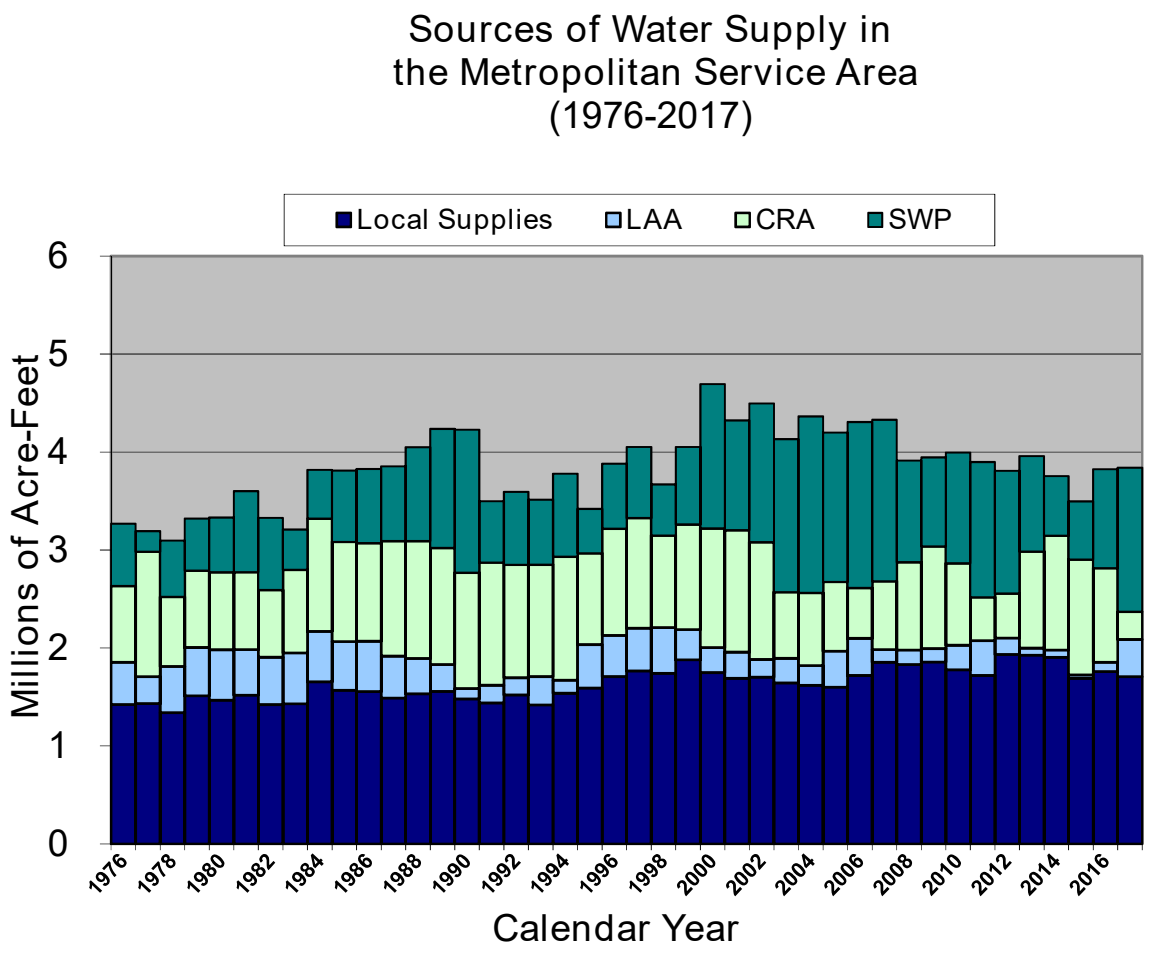

Source: Metropolitan.

The major sources of water available to some or all of Metropolitan's member agencies in addition to supplies provided by Metropolitan are described below.

Los Angeles Aqueduct

The City of Los Angeles, through its Department of Water and Power ("LADWP"), operates its Los Angeles Aqueduct system to import water from the Owens Valley and the Mono Basin on the eastern slopes of the Sierra Nevada in eastern California. Prior to the 1990-1991 drought, the City had imported an average of 440,000 acre-feet of water annually from the combined Owens Valley/Mono Basin system, of which about 90,000 acre-feet came from the Mono Basin. Under the Mono Lake Basin Water Right Decision (Decision 1631) issued in September 1994, which revised LADWP's water rights licenses in the Mono Basin, the City is prohibited from exporting water when Mono Lake elevation is below 6,377 feet above mean sea level, and is limited to export 4,500 acre-feet annually when Mono Lake elevation is between 6,377 to 6,380 feet above mean sea level, and 16,000 acre-feet annually when the elevation is between 6,380 to 6,391 feet above mean sea level, on April 1 of the runoff year. If Mono Lake is above elevation 6,391 feet, the City may export all available water from the Basin that is not dedicated to instream fishery protection flows. Due to the near record snowpack in the Eastern Sierra during the winter of 2016-17, the April 1, 2018 Mono Lake water level reached 6,382 feet, surpassing the 6,380 feet threshold which permits the increase of exports to 16,000 acre-feet pursuant to Decision 1631. As of April 1, 2019 Mono Lake water levels reached 6,382.4 feet.

Pursuant to the City's turnout agreement with DWR, AVEK and Metropolitan, LADWP commenced construction in 2010 of the turnout facilities along the California Aqueduct within AVEK's service area. The turnout was completed in December 2018 and enables delivery of water from the California Aqueduct to the Los Angeles Aqueduct. Conditions precedent to such delivery of water include obtaining agreements for the transfer of non-State Water Project water, available capacity in the California Aqueduct and compliance with State Water Project water quality requirements.

Prior to 1991, the Los Angeles Aqueduct and local groundwater supplies had been nearly sufficient to meet the City's water demands during normal water supply years. As a result, only about 13 percent of the City's water needs (approximately 82,000 acre-feet) was supplied by Metropolitan. From fiscal year 2000-01 to fiscal year 2017-18, approximately 31 to 75 percent of the City's total water requirements were met by Metropolitan. For the five fiscal years ended June 30, 2018, the City's water deliveries from Metropolitan averaged approximately 308,725 acre-feet per year, which constituted approximately 59 percent of the City's total water supply. Deliveries from Metropolitan to the City during this period varied between approximately 182,700 acre-feet per year and approximately 442,000 acre-feet per year. See "METROPOLITAN REVENUES–Principal Customers" in this Appendix A. According to LADWP's 2015 Urban Water Management Plan, the City is planning to increase locally-developed supplies including recycled water, new conservation, stormwater capture and local groundwater from the average for the five-year period ending June 30, 2015 of 14 percent to 47 percent of its normal year supplies by fiscal year 2039-40. Accordingly, the City expects to decrease reliance on Metropolitan from the five year average ending June 30, 2015 of 57 percent to 11 percent of its normal year supplies by fiscal year 2039-40. However, the City may still purchase up to 311,000 acre-feet per year or 44 percent of its dry year supplies from Metropolitan until 2040. This corresponds to an increase from normal to dry years of approximately 236,000 acre-feet in potential demand for supplies from Metropolitan.

LADWP analyzed the additional impacts to the Los Angeles Aqueduct's water supply deliveries for various environmental projects aimed at improving air quality and fish and riparian habitat in the Owens Valley. In November 2014, LADWP reached an agreement over implementation of dust control measures on Owens Lake which saved approximately 8,700 acre-feet of water from the water use baseline established in 2013 and is expected to expand water savings in the future. LADWP reports that in calendar year 2018, 93,500 acre-feet of water was devoted to dust and environmental mitigation projects in the Owens Valley and Eastern Sierra, resulting in the need to purchase an equivalent amount of Metropolitan supply.

Local Water Supplies

Local water supplies are made up of groundwater, groundwater recovery, surface runoff, recycled water, and seawater desalination. Metropolitan supports local resources development through its Local Resources Program, which provides financial incentives up to $340 per acre-foot of water production from local water recycling, groundwater recovery and seawater desalination projects. Metropolitan utilizes conjunctive use of groundwater to encourage storage in groundwater basins. Member agencies and other local agencies have also independently funded and developed additional local supplies, including groundwater clean-up, recycled water and desalination of brackish or high salt content water.

Metropolitan's water transaction projections are based in part on projections of locally-supplied water. Projections of future local supplies are based on estimated yields from sources and projects that are currently producing water or are under construction at the time a water transaction projection is made. Additional reductions in Metropolitan's water transaction projections are made to account for future local supply augmentation projects, based on the IRP Update goals. See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES–Water Transactions Projections" and "METROPOLITAN'S WATER SUPPLY–Integrated Water Resources Plan" in this Appendix A.

Groundwater. Demands for about 1.1 million acre-feet per year, about one-third of the annual water demands for approximately 19 million residents of Metropolitan's service area, are met from groundwater

production. Local groundwater supplies are supported by recycled water, which is blended with imported water and recharged into groundwater basins, and also used for creating seawater barriers that protect coastal aquifers from seawater intrusion.

Member Agency Storage Programs. Metropolitan has developed a number of local programs to work with its member agencies to increase storage in groundwater basins. Metropolitan has encouraged storage through its cyclic and conjunctive use storage programs. These programs allow Metropolitan to deliver water into a groundwater basin in advance of agency demands. Metropolitan has drawn on dry-year supply from cyclic storage accounts and nine contractual conjunctive use storage programs to address shortages from the State Water Project and the CRA.

Cyclic storage agreements allow pre-delivery of imported water for recharge into groundwater basins in excess of an agency's planned and budgeted deliveries making best use of available capacity in conveyance pipelines, use of storm channels for delivery to spreading basins, and spreading basins. This water is then purchased at a later time when the agency has a need for groundwater replenishment deliveries.

Conjunctive use agreements provide for storage of imported water that can be called for use by Metropolitan during dry, drought, or emergency conditions. During a dry period, Metropolitan has the option to call water stored in the groundwater basins pursuant to its contractual conjunctive use agreements. At the time of the call, the member agency pays Metropolitan the prevailing rate for that water. Nine conjunctive use projects provide about 210,000 acre-feet of groundwater storage and have a combined extraction capacity of about 70,000 acre-feet per year. See the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "METROPOLITAN'S WATER SUPPLY–Storage Capacity and Water in Storage" in this Appendix A.

Recovered Groundwater. Contamination of groundwater supplies is a growing threat to local groundwater production. Metropolitan has been supporting increased groundwater production and improved regional supply reliability by offering financial incentives to agencies for production and treatment of degraded groundwater since 1991. Metropolitan has executed agreements with local agencies to provide financial incentives to 25 projects that recover contaminated groundwater with total contract yields of about 117,000 acre-feet per year. During fiscal year 2017-18, Metropolitan provided incentives for approximately 50,000 acre-feet of recovered water under these agreements. Total groundwater recovery use under executed agreements is expected to grow to 67,000 acre-feet in 2020.

Surface Runoff. Local surface water resources consist of runoff captured in storage reservoirs and diversions from streams. Since 1980, agencies have used an average of 110,000 acre-feet per calendar year of local surface water. Local surface water supplies are heavily influenced by year to year local weather conditions, varying from a high of 188,000 acre-feet in calendar year 1998 to a low of 37,000 acre-feet in calendar years 2015 and 2016.

Recycled Water-Local Agency Projects. Metropolitan has supported recycled water use to offset water demands and improve regional supply reliability by offering financial incentives to agencies for production and sales of recycled water since 1982. Metropolitan has executed agreements with local agencies to provide financial incentives to 82 recycled water projects with total expected contract yields of about 312,000 acre-feet per year. During fiscal year 2017-18, Metropolitan provided incentives for approximately 165,000 acre-feet of recycled water under these agreements. Total recycled water use under executed agreements currently in place is expected to be approximately 185,000 acre-feet by 2020.

Recycled Water-Metropolitan Regional Program Demonstration Project. Since 2010, Metropolitan has been evaluating the potential and feasibility of implementing a regional recycled water program. Chronic drought conditions over the past 10 years have resulted in significant reductions in local surface supplies and groundwater production, and have increased the need for recharge supplies to groundwater and surface water

reservoirs to improve their sustainable yields and operating integrity. In 2015, Metropolitan executed an agreement with the Sanitation Districts of Los Angeles County ("LACSD") to implement a demonstration project and to establish a framework of terms and conditions of such a regional recycled water program (the "RRWP"). The objectives of this framework are to enable the potential reuse of up to 150 million gallons per day ("mgd") of treated effluent from LACSD's treatment facility. Purified water from a new advanced treatment facility could be delivered through pipelines to the region's groundwater basins, industrial facilities, and two of Metropolitan's treatment plants. The demonstration project will provide critical information needed to move forward with the potential RRWP, and will assist with regulatory approval of the proposed advance treatment process. Construction of the 0.5 mgd advanced water treatment demonstration plant was approved in 2017 and is nearly complete. Testing and operation of the plant will confirm treatment costs and provide the basis for future technical recommendations concerning design, operation, and optimization of the full-scale RRWP.

Seawater Desalination. Metropolitan's IRP includes seawater desalination as a part of the region's local supply that could help increase supply reliability in Metropolitan's service area. The IRP also supports foundational actions to lay the groundwork for accelerating seawater desalination development as needed in the future. To encourage local development, Metropolitan has signed Seawater Desalination Program ("SDP") incentive agreements with three of its member agencies: City of Long Beach, Municipal Water District of Orange County ("MWDOC") and West Basin Municipal Water District ("West Basin MWD"). The SDP agreements provide incentives to the member agencies of up to $250 per acre-foot when the desalinated supplies are produced. Agreement terms are for the earlier of 25 years or through 2040 and are designed to phase out if Metropolitan's water rates surpass the unit cost of producing desalinated seawater. SDP agreements are subject to final approval by Metropolitan's Board after review of the complete project description and environmental documentation. While City of Long Beach is no longer pursuing a seawater desalination project, both MWDOC's and West Basin MWD's projects are currently in the environmental review phase. If completed, the two would produce up to 25,000 acre-feet initially and potentially up to 75,000 acre-feet if expanded in the future. The SDP agreements automatically terminate in 2020 if the projects are not operational by that time. In October 2014, seawater desalination projects became eligible for funding under Metropolitan's Local Resources Program.

In late 2015, Poseidon Resources LLC ("Poseidon") began operating the 56,000 acre-foot capacity Carlsbad Desalination Project ("Carlsbad Project") and associated pipeline. The SDCWA has a purchase agreement with Poseidon for a minimum of 48,000 acre-feet per year with an option to purchase an additional 8,000 acre-feet per year. Other seawater desalination projects that could provide supplies to Metropolitan's service area are under development or consideration. In partnership with the Orange County Water District, Poseidon is also developing a 56,000 acre-feet per year plant in Huntington Beach which is currently in the permitting phase.

Another project with the potential to augment regional supplies is a seawater desalination project in Rosarito Beach, Mexico. A consortium of private companies led by Consolidated Water Co., Ltd. and its Mexican subsidiary, N.S.C. Agua S.A. de C.V., is developing the project. The 56,000 to 112,000 acre-feet per year project is in the pre-construction phase, and could supply Metropolitan's service area either through direct delivery or exchange agreements. Additional approvals from a number of U.S. and Mexican federal agencies, along with State and local approvals, would be needed for the cross-border project to proceed.

METROPOLITAN'S WATER DELIVERY SYSTEM

Primary Facilities and Method of Delivery

Metropolitan's water delivery system is made up of three basic components: the CRA, the California Aqueduct of the State Water Project and Metropolitan's internal water distribution system. Metropolitan's delivery system is integrated and designed to meet the differing needs of its member agencies. Metropolitan seeks redundancy in its delivery system to assure reliability in the event of an outage. Improvements are

designed to increase the flexibility of the system. Since local sources of water are generally used to their maximum each year, growth in the demand for water is partially met by Metropolitan. The operation of Metropolitan's water system is being made more reliable through the rehabilitation of key facilities as needed, improved preventive maintenance programs and the upgrading of Metropolitan's operational control systems. See "CAPITAL INVESTMENT PLAN" in this Appendix A.

Colorado River Aqueduct. Work on the CRA commenced in 1933 and water deliveries started in 1941. Additional facilities were completed by 1961 to meet additional requirements of Metropolitan's member agencies. The CRA is 242 miles long, starting at the Lake Havasu intake and ending at the Lake Mathews terminal reservoir. Metropolitan owns all of the components of the CRA, which include five pumping plants, 64 miles of canal, 92 miles of tunnels, 55 miles of concrete conduits and 144 underground siphons totaling 29 miles in length. The pumping plants lift the water approximately 1,617 feet over several mountain ranges to Metropolitan's service area. See "METROPOLITAN'S WATER SUPPLY–Colorado River Aqueduct" in this Appendix A.

State Water Project. The initial portions of the State Water Project serving Metropolitan were completed in 1973. The State Water Project, managed and operated by DWR, is one of the largest water supply projects undertaken in the history of water development. The State Water Project facilities dedicated to water delivery consist of a complex system of dams, reservoirs, power plants, pumping plants, canals and aqueducts to deliver water. Water from rainfall and snowmelt runoff is captured and stored in State Water Project conservation facilities and then delivered through State Water Project transportation facilities to water agencies and districts located throughout the Upper Feather River, Bay Area, Central Valley, Central Coast, and Southern California. Metropolitan receives water from the State Water Project through the main stem of the aqueduct system, the California Aqueduct, which is 444 miles long and includes 381 miles of canals and siphons, 49 miles of pipelines or tunnels and 13 miles of channels and reservoirs.

As described herein, Metropolitan is the largest (in terms of number of people it serves, share of State Water Project water it has contracted to receive, and percentage of total annual payments made to DWR therefor) of twenty-nine agencies and districts that have entered into contracts with DWR to receive water from the State Water Project. Contractors pay all costs of the facilities in exchange for participation rights in the system. Thus, Contractors also have the right to use the portion of the State Water Project conveyance system necessary to deliver water to them at no additional cost as long as capacity exists. See "METROPOLITAN'S WATER SUPPLY–State Water Project" in this Appendix A.

Internal Distribution System. Metropolitan's internal water distribution system includes components that were built beginning in the 1930s and through the present. Metropolitan owns all of these components, including 14 dams and reservoirs, five regional treatment plants, over 800 miles of transmission pipelines, feeders and canals, and 16 hydroelectric plants with an aggregate capacity of 131 megawatts.

Diamond Valley Lake. Diamond Valley Lake, a man-made reservoir, built, owned and operated by Metropolitan, is located southwest of the city of Hemet, California. It covers approximately 4,410 acres and has capacity to hold approximately 810,000 acre-feet or 265 billion gallons of water. Diamond Valley Lake was constructed to serve approximately 90 percent of Metropolitan's service area by gravity flow. Imported water is delivered to Diamond Valley Lake during surplus periods. The reservoir provides more reliable delivery of imported water from the State Water Project during summer months, droughts and emergencies. In addition, Diamond Valley Lake is capable of providing more than one-third of Southern California's water needs from storage for approximately six months after a major emergency (assuming that there has been no impairment of Metropolitan's internal distribution network). See the table entitled "Metropolitan's Water Storage Capacity and Water in Storage" under "METROPOLITAN'S WATER SUPPLY–Storage Capacity and Water in Storage" in this Appendix A for the amount of water in storage at Diamond Valley Lake. Excavation at the project site began in May 1995. Diamond Valley Lake was completed in March 2000, at a total cost of $2 billion, and was in full operation in December 2001.

Inland Feeder. Metropolitan's Inland Feeder is a 44-mile-long conveyance system that connects the State Water Project to Diamond Valley Lake and the CRA. The Inland Feeder provides greater flexibility in managing Metropolitan's major water supplies and allows greater amounts of State Water Project water to be accepted during wet seasons for storage in Diamond Valley Lake. In addition, the Inland Feeder increases the conveyance capacity from the East Branch of the State Water Project by 1,000 cfs, allowing the East Branch to operate up to its full capacity. Construction of the Inland Feeder was completed in September 2009 at a total cost of $1.14 billion.

Operations Control Center. Metropolitan's water conveyance and distribution system operations are coordinated from the Operations Control Center ("OCC") centrally located in Los Angeles County. The OCC plans, balances and schedules daily water and power operations to meet member agencies' demands, taking into consideration the operational limits of the entire system.

Water Quality and Treatment

Metropolitan filters and disinfects water at five water treatment plants: the F.E. Weymouth Treatment Plant, the Joseph Jensen Treatment Plant, the Henry J. Mills Treatment Plant, the Robert B. Diemer Treatment Plant, and the Robert A. Skinner Treatment Plant. In recent years, the plants typically treat between 0.8 billion and 1.0 billion gallons of water per day, and have a maximum capacity of approximately 2.4 billion gallons per day. Approximately 50 percent of Metropolitan's water deliveries are treated water.

Federal and state regulatory agencies continually monitor and establish new water quality standards. New water quality standards could affect availability of water and impose significant compliance costs on Metropolitan. The federal Safe Drinking Water Act ("SDWA") establishes drinking water quality standards, monitoring, and public notification and enforcement requirements for public water systems. To achieve these objectives, the U.S. Environmental Protection Agency, as the lead regulatory authority, promulgates national drinking water regulations and develops the mechanism for individual states to assume primary enforcement responsibilities. The SWRCB Division of Drinking Water ("DDW"), formerly the Drinking Water Program under the California Department of Public Health, has primary responsibility for the regulation of public water supply systems in the State. Drinking water delivered to customers must comply with statutory and regulatory water quality standards designed to protect public health and safety that are now administered by DDW. Metropolitan operates its five water treatment plants under a domestic water supply permit issued by DDW which is amended, as necessary, such as when significant facility modifications occur. Metropolitan operates and maintains water storage, treatment and conveyance facilities, implements watershed management and protection activities, performs inspections, monitors drinking water quality, and submits monthly and annual compliance reports. In addition, public water system discharges to state and federal waters are regulated under general National Pollutant Discharge Elimination System ("NPDES") permits. The SWRCB issued these NPDES permits to Metropolitan which contain numerical effluent limitations, monitoring, reporting, and notification requirements for water discharges from the facilities and pipelines of Metropolitan's water supply and distribution system.

As described herein, Metropolitan has established five groundwater storage programs with other water agencies that allow Metropolitan to store available supplies in the Central Valley for return later. These programs help manage supplies by putting into storage surplus water in years when it is available and converting that to dry year supplies to be returned when needed. These programs can also provide emergency supplies. See "METROPOLITAN'S WATER SUPPLY–Water Transfer, Storage and Exchange Programs – State Water Project Agreements and Programs" and "–Storage Capacity and Water in Storage" in this Appendix A. Generally, water returned to Metropolitan under these groundwater storage programs ("return water") may be made available in one of two ways: by direct pump back from a groundwater well to the California Aqueduct or, when available, by an exchange with a supply already in the aqueduct. Water quality issues can arise in water returned by direct pumping as a result of the presence of a water quality contaminant in the groundwater storage basin and due to the imposition of stricter water quality standards by federal or State regulation.

In 2017, the SWRCB adopted a regulation setting a Maximum Contaminant Level ("MCL") for TCP of five parts per trillion or 5 ppt based upon a running annual average. TCP is a manufactured chemical used as a cleaning and degreasing solvent and has been found at industrial or hazardous waste sites. It is also associated with pesticide products used in agricultural practices. In January 2018, the new regulation went into effect. Under the new regulation, drinking water agencies are required to perform quarterly monitoring of TCP levels. There have been no detections of this chemical in Metropolitan's system. However, TCP has been detected above the new MCL in groundwater wells of three of Metropolitan's groundwater storage program partners through monitoring performed by these agencies. Levels detected in groundwater wells of the Arvin-Edison Water Storage District are the highest and will impact the ability of Metropolitan to take return water under that program. As noted under "METROPOLITAN'S WATER SUPPLY–Water Transfer, Storage and Exchange Programs" in this Appendix A, Metropolitan has temporarily suspended operation of this program until the water quality concerns can be further evaluated and managed. The levels of TCP detected at Metropolitan's other groundwater storage programs are much lower and impact fewer groundwater wells. Metropolitan is evaluating how the return capability could be reduced from those programs.

Possible remediation measures include, for example, return water with other surface water supplies, removal of wells from service, return water by exchange, or treatment. Additional capital and/or operation and maintenance costs could be incurred by Metropolitan in connection with remediation options, but the magnitude of such costs is not known at this time. To the extent return water under one or more groundwater storage programs could not be utilized due to groundwater quality, the available supply of stored water during extended drought or emergency periods would be reduced.

Metropolitan continually monitors new water quality laws and regulations and frequently comments on new legislative proposals and regulatory rules. Metropolitan is currently operating in compliance with all state and federal drinking water regulations and permit requirements.

Seismic Considerations and Emergency Response Measures

General. Although the magnitude of damages resulting from a significant seismic event are impossible to predict, Metropolitan's water conveyance and distribution facilities are designed either to withstand a maximum probable seismic event or to minimize the potential repair time in the event of damage. The five pumping plants on the CRA have been buttressed to better withstand seismic events. Other components of the CRA are monitored for any necessary rehabilitation and repair. Metropolitan personnel and independent consultants periodically reevaluate the internal water distribution system's vulnerability to earthquakes. As facilities are evaluated and identified for seismic retrofitting, they are prioritized, with those facilities necessary for delivering or treating water scheduled for upgrade before non-critical facilities. However, major portions of the California Aqueduct and the CRA are located near major earthquake faults, including the San Andreas Fault. A significant earthquake could damage structures and interrupt the supply of water, adversely affecting Metropolitan's revenues and its ability to pay its obligations. Therefore, emergency supplies are stored for use throughout Metropolitan's service area, and a six-month reserve supply of water normally held in local storage (including emergency storage in Diamond Valley Lake) provides reasonable assurance of continuing water supplies during and after such events (assuming there has been no impairment of Metropolitan's internal distribution network).

Metropolitan has an ongoing surveillance program that monitors the safety and structural performance of its 20 permitted dams and reservoirs. Operating personnel perform regular inspections that include monitoring and analyzing seepage flows and pressures. Engineers responsible for dam safety review the inspection data and monitor the horizontal and vertical movements for each dam. Major on-site inspections are performed at least twice each year. Instruments that transmit seismic acceleration time histories for analysis any time a dam is subjected to strong motion during an earthquake are located at a number of selected sites.

In addition, Metropolitan has developed an emergency plan that calls for specific levels of response appropriate to an earthquake's magnitude and location. Included in this plan are various communication tools, as well as a structured plan of management that varies with the severity of the event. Pre-designated personnel follow detailed steps for field facility inspection and distribution system patrol. Approximately 40 employees are designated to respond immediately under certain identifiable seismic events. An emergency operations center is maintained at the OCC. The OCC, which is specifically designed to be earthquake resistant, contains communication equipment, including a radio transmitter, microwave capability and a response line linking Metropolitan with its member agencies, DWR, other utilities and the State's Office of Emergency Services.

Metropolitan, in conjunction with DWR and LADWP, has formed the Seismic Resilience Water Supply Task Force for the purpose of collaborating on studies and mitigation measures aimed at improving the reliability of imported water supplies to Southern California. Specific task force goals included revisiting historical assumptions regarding potential aqueduct outages after a seismic event; establishing a common understanding about individual agency aqueduct vulnerability assessments, projected damage scenarios, and planning assumptions; and discussing ideas for improving the resiliency of Southern California's imported water supplies through multi-agency cooperation. The task force has established multi-year goals and will continue to meet on these issues and develop firm plans for mitigating seismic vulnerabilities.

Metropolitan's resiliency efforts include manufacturing, fabrication and coating capabilities in La Verne, California. Over $47 million has been invested to enhance and expand Metropolitan's capacity to provide fabrication, manufacturing, and coating services for rehabilitation work, maintenance activities, and capital projects. Upon request, Metropolitan is also able to provide manufacturing, coating and fabrication services through reimbursable agreements to member agencies, and DWR. These agreements have enhanced timely and cost-effective emergency response capabilities. Materials to fabricate pipe and other appurtenant fittings are kept on site. In the event of earthquake damage, Metropolitan has taken measures to provide the design and fabrication capacity to fabricate pipe and manufacture fittings. Metropolitan is also staffed to perform emergency repairs and has pre-qualified contractors for emergency repair needs at various locations throughout Metropolitan's service area.

State Water Project Facilities-California Aqueduct. The California Aqueduct crosses all major faults either by canal at ground level or by pipeline at very shallow depths to ease repair in case of damage from movement along a fault. State Water Project facilities are designed to withstand major earthquakes along a local fault or the San Andreas Fault without major damage. Dams, for example, are designed to accommodate movement along their foundations and to resist earthquake forces on their embankments. Earthquake loads have been taken into consideration in the design of project structures such as pumping and power plants. The location of check structures on the canal allows for hydraulic isolation of the fault-crossing repair. While the dams, canals, pump stations and other constructed State Water Project facilities have been designed to withstand earthquake forces, the critical supply of water from Northern California must traverse the Bay-Delta through hundreds of miles of varying levels of engineered levees that are susceptible to major failures due to flood and seismic risk. In the event of a failure of the Bay-Delta levees, the quality of the Bay-Delta's water could be severely compromised as salt water comes in from the San Francisco Bay. Metropolitan's supply of State Water Project water would be adversely impacted if pumps that move Bay-Delta water southward to the Central Valley and Southern California are shut down to contain the salt water intrusion. Metropolitan estimates that stored water supplies, CRA supplies and local water resources that would be available in case of a levee breach or other interruption in State Water Project supplies would meet demands in Metropolitan's service area for approximately twelve months. See "METROPOLITAN'S WATER SUPPLY–Storage Capacity and Water in Storage" in this Appendix A.

Metropolitan, in cooperation with the other State Water Contractors, developed recommendations to DWR for emergency preparedness measures to maintain continuity in export water supplies and water quality during emergency events. These measures include improvements to emergency construction

materials stockpiles in the Bay-Delta, improved emergency contracting capabilities, strategic levee improvements and other structural measures of importance to Bay-Delta water export interests, including development of an emergency freshwater pathway to export facilities in a severe earthquake. DWR utilized $12 million in fiscal year 2007-08 for initial stockpiling of rock for emergency levee repairs and development of Bay-Delta land and marine loading facilities and has identified future funding for expanded stockpiles.

State Water Project-Perris Dam. Perris Dam forms Lake Perris, the southernmost terminal reservoir for the State Water Project in Riverside County, with maximum capacity of approximately 130,000 acre-feet of water. Metropolitan uses water from Lake Perris for delivery to customers in Riverside and San Diego counties. Deliveries from the lake are used as a redundant source for the Mills Water Treatment Plant, drought supply from a flexible storage account, and for consumptive use by Metropolitan's customers. DWR reported in July 2005 that seismic studies indicate that DWR's Perris Dam facility could experience damage from moderate earthquakes along the San Jacinto or San Andreas faults due to potential weaknesses in the dam's foundation. In late 2005, DWR lowered the water level in the reservoir by about 25 feet and reduced the amount of water stored in the reservoir to about 75,000 acre-feet as DWR evaluated alternatives for repair of the dam. In December 2006, DWR completed a study identifying various repair options, began additional geologic exploration along the base of Perris Dam and started preliminary design. DWR's preferred alternative is to repair the dam to restore the reservoir to its historical level. On November 11, 2011, DWR certified the final EIR and filed a Notice of Determination stating its intent to proceed with the preferred alternative. Repair work was completed in April 2018. DWR's current estimate for repair costs, inclusive of environment and right-of-way work is $125.6 million. DWR has begun to refill Lake Perris to allow the dam to be tested and certified to again store 130,000 acre-feet of water. Under the original allocation of joint costs for this facility, the State would have paid approximately six percent of the repair costs. However, because of the recreational benefit this facility provides to the public, the Legislature has approved a recommendation from DWR that the State assume 32.2 percent of these repair costs. The remaining 67.8 percent of repairs costs are being paid for by the three agencies that use the water stored in Lake Perris: Metropolitan (42.9 percent), DWA (3.0 percent) and CVWD (21.9 percent). DWR recovers the cost of repairs through its annual statement of charges sent to each agency. See "METROPOLITAN EXPENSES–State Water Contract Obligations" in this Appendix A.

The dam remediation is one of three major projects to improve seismic stability and enhance public safety in the Perris Dam Remediation Program. The other two projects include the Outlet Tower Improvements and the Emergency Release Facility ("ERF") Project. The Outlet Tower Improvement project is in preliminary design, while the ERF is in design. The EIR for the ERF was published in February 2018. The ERF project provides improvements downstream of the reservoir that would direct the flow of water in an emergency requiring the dewatering of the reservoir. Flows would be directed through a series of berms and lined and unlined channels that would ultimately terminate at the Riverside County Flood Control and Water Conservation District's Perris Valley Channel. The Outlet Tower and Emergency Release Facility projects enhance the safety of the dam for other risks in addition to that posed by earthquakes. It is anticipated that costs will be shared in the same manner as for the Lake Perris dam remediation project:. DWR's current estimate for repair costs (including the share of costs to be assumed by the State) is $49.8 million for the Outlet Tower Improvements and $62.3 million for the Emergency Release Facility (of which Metropolitan's anticipated share would be 42.9 percent).

Security Measures

Metropolitan conducts ground and air patrols of the CRA and monitoring and testing at all treatment plants and along the CRA. Similarly, DWR has in place security measures reasonably designed to protect critical facilities of the State Water Project, including both ground and air patrols of the State Water Project.

Although Metropolitan has constructed redundant systems and other safeguards to ensure its ability to continually deliver water to its customers, and DWR has made similar efforts, a terrorist attack or other

security breach against water facilities could materially impair Metropolitan's ability to deliver water to its customers, its operations, and revenues and its ability to pay its obligations.

CAPITAL INVESTMENT PLAN

General Description

Metropolitan's current Capital Investment Plan (the "Capital Investment Plan" or "CIP") involves infrastructure and system reliability projects, either as upgrades to existing capital assets or replacements and refurbishments of existing facilities, to ensure reliability as well as enhance operational efficiency and flexibility, and comply with water quality regulations. Metropolitan's CIP is regularly reviewed and updated. Metropolitan's biennial budget process includes a review of the projected long-term capital needs and the development of a capital expenditure forecast for the ten-year financial forecast, as well as the identification of the capital priorities of Metropolitan over the biennial budget term. Implementation and construction of specific elements of the program are subject to Board approval, and the amount and timing of borrowings will depend upon, among other factors, status of construction activity and water demands within Metropolitan's service area. From time to time, projects that have been undertaken are delayed, redesigned or deferred by Metropolitan for various reasons, and no assurance can be given that a project in the CIP will be completed in accordance with its original schedule or that any project will be completed as currently planned. In addition, from time to time, when circumstances warrant, Metropolitan's Board may approve capital expenditures other than or in addition to those contemplated by the CIP at the time of the then current biennial budget.

Projection of Capital Investment Plan Expenditures

The table below sets forth the projected CIP expenditures as reflected in the adopted biennial budget for fiscal years 2018-19 and 2019-20, by project type for the fiscal years ending June 30, 2019 through 2023. This estimate is updated every two years as a result of the periodic review and adoption of the capital budget by Metropolitan's Board of Directors. See "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

CAPITAL INVESTMENT PLAN
PROJECTION OF EXPENDITURES[1]
(Fiscal Years Ended June 30 - Dollars in Thousands)

	2019	2020	2021	2022	2023	Total[2]
Infrastructure R&R	$ 89,885	$ 98,396	$133,941	$120,049	$150,480	$ 592,752
Infrastructure Upgrade	85,724	87,372	97,425	102,371	99,080	471,972
Regulatory Compliance	2,768	3,441	5,616	4,752	349	16,926
Stewardship	10,270	2,671	1,353	838	--	15,132
Supply Reliability	6,158	2,753	3,920	1,405	--	14,236
System Flexibility	1,498	--	2,403	20,476	91	24,467
Water Quality	3,697	5,367	5,342	108	--	14,514
Total[2]	$200,000[3]	$200,000	$250,000	$250,000	$250,000	$1,150,000

Source: Metropolitan.

(1) Fiscal years 2018-19 and 2019-20 are based on the adopted biennial budget for fiscal years 2018-19 and 2019-20. Fiscal years 2020-21 through 2022-23 are based on the ten-year financial forecast provided in the adopted biennial budget.
(2) Totals may not foot due to rounding.
(3) Fiscal year 2018-19 capital expenditures are currently estimated to be approximately $214 million.

In developing the CIP, projects are reviewed, scored and prioritized towards the objectives of ensuring the sustainable delivery of reliable, high quality water, while meeting all regulatory requirements

and maintaining affordability. Additional capital costs may arise in the future as a result of, among other things, federal and State water quality regulations, project changes and mitigation measures necessary to satisfy environmental and regulatory requirements, and additional facilities needs. See "METROPOLITAN'S WATER DELIVERY SYSTEM–Water Quality and Treatment" in this Appendix A.

The CIP planned spending as developed by Metropolitan's Engineering Services and presented in the Capital Expenditures (Capital Investment Plan) section of the fiscal years 2018-19 and 2019-20 budget is estimated to be $514.5 million over the biennium. Over the last several years, actual expenditures have been about 20 percent below planned spending. In keeping with that trend, the current budget for the two years is about 80 percent of planned engineering spending or $200 million in each fiscal year.

Construction projects included in the CIP are subject to ordinary construction risks and delays, including but not limited to: inclement weather or natural hazards affecting work and timeliness of completion; contractor claims or nonperformance; work stoppages or slowdowns; unanticipated project site conditions encountered during construction; errors or omissions in contract documents requiring change orders; and/or higher than anticipated construction bids or costs, any of which could affect the costs and availability of, or delivery schedule for, equipment, components, materials, labor or subcontractors, and result in increased CIP costs. In addition, on June 1, 2018, the federal government imposed tariffs on steel and aluminum imports. Contracts awarded both before and after June 1, 2018 are affected. Market data indicates material prices for steel have seen up to a 10 percent increase since March 2018. Metropolitan's direct contracts currently in progress have a total value of $344 million and face a tariff exposure of approximately $2.9 million, or less than one percent. Since implementation of the tariffs, Metropolitan has taken steps to account for the impacts of the tariffs in its bid and contract documents.

Capital Investment Plan Financing

The CIP requires funding from debt financing (see "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A) as well as from pay-as-you-go funding. The Board has adopted an internal funding objective to fund 60 percent of capital program expenditures from current revenues. The remainder of capital program expenditures are expected to be funded through the issuance from time to time of water revenue bonds, which are payable from Net Operating Revenues. However, as in prior years, pay-as-you-go funding may be reduced or increased by the Board during the fiscal year.

The issuance of approximately $80 million of additional water revenue bonds to fund or to reimburse prior capital expenditures is in Metropolitan's budget assumptions for the adopted biennial budget for fiscal year 2019-20, and current projections for each of the fiscal years 2020-21 through 2022-23 assume the issuance of approximately $100 million of additional water revenue bonds. These revenue bonds may be issued either as Senior Revenue Bonds under the Senior Debt Resolutions or as Subordinate Revenue Bonds under the Subordinate Debt Resolutions (each as defined under "METROPOLITAN EXPENSES–Limitations on Additional Revenue Bonds" in this Appendix A). The cost of these projected bond issues are reflected in the financial projections under, "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

Major Projects of Metropolitan's Capital Investment Plan

Colorado River Aqueduct Facilities. As previously noted, deliveries through the CRA began in 1941. Through annual inspections and maintenance activities, the performance and reliability of the various components of the CRA are regularly evaluated. Projects under the CRA facilities program are designed to replace or refurbish facilities and components on the CRA system in order to reliably convey water from the Colorado River to Southern California. A variety of projects have been completed over the past 10 years, including, among other things, replacement of high voltage circuit breakers and transformers at the five pumping plant switchyards, refurbishment of operators and power centers on the head gates downstream of the pumping plants, replacement of several miles of deteriorated concrete canal liner, new wastewater

systems at the Hinds and Eagle Mountain Pumping Plants, replacement of the sand trap facilities upstream of the Hinds, Eagle, and Iron Mountain pumping plants, and replacement of the outlet gates and appurtenant electrical, mechanical, and control systems at the Copper Basin Reservoir. Refurbishment or replacement of many of the electrical system components, including the transformers, circuit breakers and motor control centers, is currently under way. Additionally, many of the mechanical and electrical components at all five pumping plants will be evaluated and replaced or refurbished over the next several years. The current projected cost estimate for all prior and planned refurbishment or replacement projects under the CRA facilities program is $854.4 million. Costs through February 2019 were $264.6 million. Budgeted aggregate capital expenditures for improvements on the CRA for fiscal years 2018-19 and 2019-20 are $110.0 million.

Distribution System – Prestressed Concrete Cylinder Pipe. Metropolitan's distribution system is comprised of approximately 830 miles of pipelines ranging in diameter from 30 inches to over 200 inches. (See "METROPOLITAN'S WATER DELIVERY SYSTEM" in this Appendix A.) 163 miles of the distribution system is made up of prestressed concrete cylinder pipe ("PCCP"). In response to PCCP failures experienced by several water agencies, Metropolitan initiated the PCCP Assessment Program in December 1996 to evaluate the condition of Metropolitan's PCCP lines and investigate inspection and refurbishment methods. As a result, Metropolitan has identified and made improvements to several sections of PCCP. The costs for these improvements through February 2019 were $96.7 million. Rather than continue to make spot repairs to pipe segments, Metropolitan has initiated a long-term capital program to rehabilitate approximately 100 miles of PCCP in five pipelines by relining with a welded steel liner. The first major contract to reline approximately 4.5 miles of PCCP on the Second Lower Feeder was completed in August 2018. The second major contract to reline approximately 1.9 miles of PCCP on the Second Lower Feeder was awarded in November 2018. Subsequent contracts are planned to be awarded annually depending on shutdown scheduling. Costs through February 2019 for all PCCP work (including the $96.7 million of repairs costs noted above) were $159.7 million. The estimated cost to reline all 100 miles of PCCP is approximately $2.2 billion and is expected to be undertaken over a period of approximately 20 years. Budgeted aggregate capital expenditures for PCCP rehabilitation for fiscal years 2018-19 and 2019-20 are $92.4 million.

Distribution System – Refurbishments and Improvements. In addition to the long-term program to rehabilitate Metropolitan's PCCP lines, several other components of the distribution system are being refurbished and/or improved. Major projects completed to date include the $70 million replacement of the outlet facilities at Lake Mathews, the first two phases of the Orange County Feeder and Etiwanda Pipeline relining projects for a total of $34 million, and various other facility refurbishment and replacement projects ranging in cost from approximately $500,000 to over $10 million. Ongoing projects to ensure the reliability of the distribution system, primarily due to age, include multiple replacements or refurbishments of isolation and control valves and gates, lining replacement of remaining portions of the Etiwanda Pipeline and Orange County Feeder, refurbishment to pressure control and hydroelectric power facilities, system improvements to provide drought relief, and various other upgrades totaling approximately $363.6 million through February 2019. The current projected cost estimate for the prior and planned refurbishment or replacement projects, other than the PCCP relining, is $1.1 billion. For fiscal years 2018-19 and 2019-20, budgeted aggregate capital expenditures for improvements on the distribution system, other than PCCP rehabilitation, are $108.9 million.

System Reliability. System Reliability projects are implemented at facilities throughout Metropolitan's system to utilize new processes or technologies, to improve safety, or to increase overall reliability. Planned projects in this category include seismic strengthening of Metropolitan's headquarters building, construction of operations support facilities such as the La Verne machine and fabrication shops, security system enhancements, and information technology infrastructure projects. The total estimated cost for all prior and projected system reliability improvements under this program is approximately $482.4 million, with $168.4 million spent through February 2019. Budgeted aggregate capital expenditures for improvements on system reliability projects for fiscal years 2018-19 and 2019-20 are $90.7 million.

F.E. Weymouth Treatment Plant Improvements. The Weymouth Treatment Plant, built in 1938, is Metropolitan's oldest water treatment facility. It has been subsequently expanded several times since its original construction. Metropolitan has completed several upgrades and refurbishment/replacement projects to maintain the plant's reliability and improve its efficiency. These include power systems upgrades, a residual solids dewatering facility, refurbishment/replacement of the mechanical equipment in two of the eight flocculation and settling basins, a new plant maintenance facility, new chemical feed systems and storage tanks, replacement of the plant domestic/fire water system, seismic upgrades to the plant inlet structure and filter buildings, upgrades to the plants filters, and a new chlorine handling and containment facility. Planned projects over the next several years include refurbishment of the plant's settling basins, seismic retrofits to the administration building, and replacement of the valves used to control filter operation. The cost estimate for all prior and projected improvements at the Weymouth plant, not including the ozone facilities, is approximately $452.4 million, with $276.5 million spent through February 2019. Budgeted aggregate capital expenditures for improvements at the Weymouth plant for fiscal years 2018-19 and 2019-20 are $26.7 million.

Robert B. Diemer Treatment Plant Improvements. The Diemer Treatment Plant, built in 1963 and subsequently expanded in 1968, is Metropolitan's second oldest water treatment facility. Several upgrades and refurbishment/replacement projects have been completed at the Diemer plant, including power system upgrades, a new residual solids dewatering facility, new vehicle and plant maintenance facilities, new chemical feed systems and storage tanks, a new chlorine handling and containment facility, construction of a roller-compacted concrete slope stabilization system, a new secondary access road, and upgrades to half of the plant's settling basins and filter valves. Planned projects over the next several years include the completion of refurbishment of the plant's settling basins and replacement of the valves used to control filter operation, and seismic retrofits to the filter buildings and administration building. The current cost estimate for all prior and projected improvements at the Diemer plant, not including the ozone facilities, is approximately $399.2 million, with $276.5 million spent through February 2019. Budgeted aggregate capital expenditures for improvements at the Diemer plant for fiscal years 2018-19 and 2019-20 are $17.6 million.

METROPOLITAN REVENUES

General

Until water deliveries began in 1941, Metropolitan's activities were, by necessity, supported entirely through the collection of ad valorem property taxes. Since the mid-1980s, water revenues, which includes revenues from water sales, wheeling and exchanges, have provided approximately 80 percent of total revenues annually. In that time period, ad valorem property taxes have accounted for about 10 percent of total revenues, declining to eight percent of total revenues in fiscal year 2017-18. See "–Revenue Allocation Policy and Tax Revenues." The remaining revenues have been derived principally from the sale of hydroelectric power, interest on investments and additional revenue sources (water standby charges and availability of service charges) beginning in 1992. Ad valorem taxes do not constitute a part of Operating Revenues and are not available to make payments with respect to the water revenue bonds issued by Metropolitan.

The basic rate for untreated water service for domestic and municipal uses is $731 per acre-foot at the Tier 1 level, which became effective January 1, 2019. See "–Rate Structure" and "–Water Rates." The ad valorem tax rate for Metropolitan purposes has gradually been reduced from a peak equivalent rate of 0.1250 percent of full assessed valuation in fiscal year 1945-46 to 0.0035 percent of full assessed valuation for fiscal year 2018-19. The rates charged by Metropolitan represent the cost of Metropolitan's wholesale water service to its member agencies, and not the cost of water to the ultimate consumer. Metropolitan does not exercise control over the rates charged by its member agencies or their subagencies to their customers.

Summary of Revenues by Source

The following table sets forth Metropolitan's sources of revenues for the five fiscal years ended June 30, 2018, on a modified accrual basis. All information is unaudited. Audited financial statements for the fiscal years ended June 30, 2018 and June 30, 2017 are provided in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

SUMMARY OF REVENUES BY SOURCE[1]
Fiscal Years Ended June 30
(Dollars in Millions)

	2014	2015	2016	2017	2018
Water Revenues[2]	$1,485	$1,383	$1,166	$1,151	$1,285
Net Tax Collections[3]	95	104	108	116	131
Additional Revenue Sources[4]	182	199	200	184	172
Interest on Investments	19	16	17	4	8
Hydroelectric Power Sales	15	8	7	21	24
Other Revenues[5]	19	163	246	51	28
Total Revenues	$1,815	$1,873	$1,744	$1,527	$1,648

Source: Metropolitan.

(1) Does not include any proceeds from the sale of bonded indebtedness.
(2) Water revenues include revenues from water sales, exchanges, and wheeling.
(3) Ad valorem taxes levied by Metropolitan are applied solely to the payment of outstanding general obligation bonds of Metropolitan and to State Water Contract obligations.
(4) Includes revenues derived from water standby charges, readiness-to-serve, and capacity charges.
(5) Includes miscellaneous revenues and Build America Bonds (BABs) subsidy payment of $12.3 million, $12.3 million, $12.3 million, $9.8 million, and $15.0 million, in fiscal years 2013-14 through 2017-18, respectively. Fiscal years 2014-15, 2015-16, 2016-17, and 2017-18, include $142 million, $222 million, $33 million, and $1 million, respectively, of water conservation and water purchase expenditures, funded from a like amount of funds transferred from the Water Management Fund.

Revenue Allocation Policy and Tax Revenues

The Board determines the water revenue requirement for each fiscal year after first projecting the ad valorem tax levy for that year. The tax levy for any year is subject to limits imposed by the State Constitution, the Act and Board policy and to the requirement under the State Water Contract that in the event that Metropolitan fails or is unable to raise sufficient funds by other means, Metropolitan must levy upon all property within its boundaries not exempt from taxation a tax or assessment sufficient to provide for all payments under the State Water Contract. See "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A. Beginning with fiscal year 1990-91, the Act limits Metropolitan's tax levy to the amount needed to pay debt service on Metropolitan's general obligation bonds and to satisfy a portion of Metropolitan's State Water Contract obligation. However, Metropolitan has authority to impose a greater tax levy if, following a public hearing, the Board finds that such revenue is essential to Metropolitan's fiscal integrity. For each fiscal year since 2013-14, the Board has exercised that authority and voted to suspend the tax limit clause in the Act, maintaining the fiscal year 2012-13 ad valorem tax rate to pay for a greater portion of Metropolitan's State Water Contract obligations. Any deficiency between tax levy receipts and Metropolitan's State Water Contract obligations is expected to be paid from Operating Revenues, as defined in the Senior Debt Resolutions (defined in this Appendix A under "METROPOLITAN EXPENSES–Limitations on Additional Revenue Bonds").

Water Revenues

General; Authority. Water rates are established by the Board and are not subject to regulation or approval by the Public Utilities Commission of California or by any other local, State or federal agency. In accordance with the Act, water rates must be uniform for like classes of service. Metropolitan, a wholesaler, provides two types of services: full service water service (treated or untreated) and wheeling service. See "–Classes of Water Service."

No member agency of Metropolitan is obligated to purchase water from Metropolitan. However, 21 of Metropolitan's 26 member agencies have entered into 10-year voluntary water supply purchase orders ("Purchase Orders") effective through December 31, 2024. See "–Member Agency Purchase Orders." Consumer demand and locally supplied water vary from year to year, resulting in variability in water revenues. Metropolitan uses its financial reserves and budgetary tools to manage the financial impact of the variability in revenues due to fluctuations in annual water transactions. See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

Payment Procedure. Water is delivered to the member agencies on demand and is metered at the point of delivery. Member agencies are billed monthly and a late charge of one percent of the delinquent payment is assessed for a payment that is delinquent for no more than five business days. A late charge of two percent of the amount of the delinquent payment is charged for a payment that is delinquent for more than five business days for each month or portion of a month that the payment remains delinquent. Metropolitan has the authority to suspend service to any member agency delinquent for more than 30 days. Delinquencies have been rare; in such instances late charges have been collected. No service has been suspended because of delinquencies.

Water Revenues. The following table sets forth water transactions (which includes water sales, exchanges, and wheeling) in acre-feet and water revenues (which includes revenues from water sales, exchanges, and wheeling) for the five fiscal years ended June 30, 2018, on a modified accrual basis. As reflected in the table below, water revenues for the fiscal year ended June 30, 2018 aggregated $1,285.2 million, of which $1,189.0 million was generated from water sales and $96.1 million was generated from exchanges and wheeling. Water revenues of Metropolitan for the fiscal years ended June 30, 2018 and June 30, 2017, on an accrual basis, are shown in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

SUMMARY OF WATER TRANSACTIONS AND REVENUES
Fiscal Years Ended June 30

Year	Water Transactions in Acre-Feet[1]	Water Revenues[2] (in millions)	Dollars Per Acre-Foot	Average Dollars Per 1,000 Gallons
2014	2,043,720	$1,484.6	$726	$2.23
2015	1,905,502	1,383.1	726	2.23
2016	1,623,052	1,166.0	718	2.20
2017	1,540,915	1,150.5	747	2.29
2018	1,610,969	1,285.2	798	2.45

Source: Metropolitan.

(1) Water Transactions include water sales, exchanges, and wheeling.
(2) Water Revenues include revenues from water sales, exchanges, and wheeling.

Principal Customers

Total water transactions accrued for the fiscal year ended June 30, 2018, were 1.61 million acre-feet, generating $1.29 billion in water revenues for such period. Metropolitan's ten largest water customers for the year ended June 30, 2018 are shown in the following table, on an accrual basis. The SDCWA has filed litigation challenging Metropolitan's rates. See "–Litigation Challenging Rate Structure."

TEN LARGEST WATER CUSTOMERS
Year Ended June 30, 2018
Accrual Basis

Agency	Water Revenues[1] (in Millions)	Percent of Total	Water Transactions in Acre-Feet[2]	Percent of Total
MWD of Orange County	$ 232.3	18.1%	266,545	16.5%
San Diego CWA	222.9	17.3	365,215	22.7
City of Los Angeles	151.3	11.8	183,527	11.4
West Basin MWD	113.9	8.9	114,422	7.1
Calleguas MWD	95.3	7.4	95,772	5.9
Eastern MWD	88.0	6.8	101,620	6.3
Western MWD	63.8	5.0	73,688	4.6
Three Valleys MWD	56.6	4.4	65,779	4.1
Inland Empire Utilities Agency	46.0	3.6	67,977	4.2
City of Long Beach	24.8	1.9	24,988	1.6
Total	$ 1,094.9	85.2%	1,359,531	84.4%
Total Water Revenues[1]	$1,285.2	Total Acre-Feet	1,610,969	

Source: Metropolitan.

(1) Water Revenues include revenues from water sales, exchanges, and wheeling.
(2) Water Transactions include water sales, exchanges, and wheeling.

Rate Structure

The following rates and charges are elements of Metropolitan's unbundled rate structure:

Tier 1 and Tier 2 Water Supply Rates. The rate structure recovers supply costs through a two-tiered price structure. The Tier 1 Supply Rate supports a regional approach through the uniform, postage stamp rate. The Tier 1 Supply Rate is calculated as the amount of the total supply revenue requirement that is not covered by the Tier 2 Supply Rate divided by the estimated amount of Tier 1 water sales. The Tier 2 Supply Rate is a volumetric rate that reflects Metropolitan's cost of purchasing water transfers north of the Delta. The Tier 2 Supply Rate encourages the member agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation. Member agencies are charged the Tier 1 or Tier 2 Water Supply Rate for water purchases, as described under "–Member Agency Purchase Orders" below.

System Access Rate. The System Access Rate recovers the cost of the Conveyance and Distribution System that is used on an average annual basis through a uniform, volumetric rate. The System Access Rate is charged for each acre-foot of water transported by Metropolitan, regardless of the ownership of the water being transported. All users (including member agencies and third-party wheelers) using the Metropolitan system to transport water pay the same System Access Rate for the use of the system conveyance and distribution capacity to meet average annual demands.

Water Stewardship Rate. The Water Stewardship Rate provides a dedicated source of funding for conservation and local resources development through a uniform, volumetric rate. The Water Stewardship Rate is charged on each acre-foot of water delivered by Metropolitan, except SDCWA Exchange Agreement deliveries as explained below, and is allocated to Metropolitan's transportation rates. All users (including member agencies and third-party wheelers) benefit from avoided system infrastructure costs through conservation and local resources development, and from the system capacity made available by investments in demand management programs like Metropolitan's Conservation Credits Program and Local Resources Program. Therefore, all users pay the Water Stewardship Rate, except on water delivered to SDCWA pursuant to the Exchange Agreement (see "METROPOLITAN REVENUES–Water Rates" and "–Litigation Challenging Rate Structure" in this Appendix A) in calendar years 2018, 2019, and 2020, pending Metropolitan's completion of a cost allocation study of its demand management costs.

In San Diego County Water Authority v. Metropolitan Water District of Southern California, et al. (see "–Litigation Challenging Rate Structure" below), the Court of Appeal held that the administrative record before it for the rates in calendar years 2011 through 2014 did not support Metropolitan's Water Stewardship Rate allocation to transportation rates, but the court did not address the allocation in subsequent years based on a different record. On April 10, 2018, the Board suspended the billing and collection of the Water Stewardship Rate on Exchange Agreement deliveries to SDCWA in calendar years 2018, 2019, and 2020, pending Metropolitan's completion of a cost allocation study of its demand management costs recovered through the Water Stewardship Rate. The process may take up to two years and staff expects to propose that the results be incorporated in the next biennial budget and rate setting cycle. For calendar year 2018, the suspension was retroactive to January 1, 2018. The total effect of the proposed suspension, taking into consideration the lower revenues over the three calendar years, is estimated to be up to approximately $46 million.

System Power Rate. The System Power Rate recovers the cost of energy required to pump water to Southern California through the State Water Project and CRA. The cost of power is recovered through a uniform, volumetric rate. The System Power Rate is applied to all deliveries of Metropolitan water to member agencies. Wheeling parties pay for actual cost (not system average) of power needed to move the water. Member agencies engaging in wheeling transactions of up to one year pay the wheeling rate (consisting of the actual cost of power, the System Access Rate, the Water Stewardship Rate, and an administrative fee). Other wheeling transactions are pursuant to individual contracts. For example, a party wheeling water through the California Aqueduct would pay the variable power cost associated with using the State Water Project transportation facilities.

Treatment Surcharge. The Treatment Surcharge recovers all of the costs of providing treatment capacity and operations through a uniform, volumetric rate per acre-foot of treated water transactions. The Treatment Surcharge is charged to all treated water transactions.

The amount of each of these rates since January 1, 2014, is shown in the table entitled "SUMMARY OF WATER RATES" under "–Water Rates" below.

Member Agency Purchase Orders

The current rate structure allows member agencies to choose to purchase water from Metropolitan by means of a Purchase Order. Purchase Orders are voluntary agreements that determine the amount of water that a member agency can purchase at the Tier 1 Supply Rate. They allow member agencies to purchase a greater amount of water at the lower Tier 1 Supply Rate than would otherwise be authorized by the Administrative Code. In exchange for the higher Tier 1 Maximum, the member agency commits to purchase a specific amount of water (based on past purchase levels) over the term of the agreement. Such agreements allow member agencies to manage costs and provide Metropolitan with a measure of secure revenue.

In November 2014, the Metropolitan Board approved new Purchase Orders effective January 1, 2015 through December 31, 2024 (the "Purchase Order Term"). Twenty-one of the twenty-six member agencies have Purchase Orders, which commit the member agencies to purchase a minimum amount of supply from Metropolitan (the "Purchase Order Commitment").

The key terms of the Purchase Orders include:

- A ten-year term, effective January 1, 2015 through December 31, 2024;
- A higher Tier 1 limit based on the Base Period Demand, determined by the member agency's choice between (1) the Revised Base Firm Demand, which is the highest fiscal year purchases during the 13-year period of fiscal year 1989-90 through fiscal year 2001-02, or (2) the highest year purchases in the most recent 12-year period of fiscal year 2002-03 through 2013-14. The demand base is unique for each member agency, reflecting the use of Metropolitan's system water over time;
- An overall purchase commitment by the member agency based on the Demand Base period chosen, times ten to reflect the ten-year Purchase Order term. Those agencies choosing the more recent 12-year period may have a higher Tier 1 Maximum and commitment. The commitment is also unique for each member agency;
- The opportunity to reset the Base Period Demand using a five-year rolling average;
- Any obligation to pay the Tier 2 Supply Rate will be calculated over the ten-year period, consistent with the calculation of any Purchase Order commitment obligation; and
- An appeals process for agencies with unmet purchase commitments that will allow each acre-foot of unmet commitment to be reduced by the amount of production from a local resource project that commences operation on or after January 1, 2014.

Member agencies that do not have Purchase Orders in effect are subject to Tier 2 Supply Rates for amounts exceeding 60 percent of their base amount (equal to the member agency's highest fiscal year demand between 1989-90 and 2001-02) annually.

Other Charges

The following paragraphs describe the additional charges for the use of Metropolitan's distribution system:

Readiness-to-Serve Charge. The Readiness-to-Serve Charge ("RTS") recovers the cost of the portion of the system that is available to provide emergency service and available capacity during outages and hydrologic variability. The RTS is a fixed charge that is allocated among the member agencies based on a ten-fiscal year rolling average of firm demands. Water transfers and exchanges, except SDCWA Exchange Agreement transactions, are included for purposes of calculating the ten-fiscal year rolling average. The Standby Charge, described below, will continue to be collected at the request of a member agency and applied as a direct offset to the member agency's RTS obligation. The RTS generated $155.5 million in 2015-16, $144 million in 2016-17, and $137.5 million in 2017-18. Based on the adopted rates and charges, the RTS is projected to generate $136.5 million in fiscal year 2018-19, and $134.5 million in fiscal year 2019-20.

Water Standby Charges. The Standby Charge is authorized by the State Legislature and has been levied by Metropolitan since fiscal year 1992-93. Metropolitan will continue to levy the Standby Charge only within the service areas of the member agencies that request that the Standby Charge be utilized to help fund a member agency's RTS obligation. See "– Readiness-to-Serve Charge" above. The Standby Charge for each

acre or parcel of less than an acre will vary from member agency to member agency, reflecting current rates, which have remained the same since fiscal year 1993-94, and range from $6.94 to $15 for each acre or parcel less than an acre within Metropolitan's service area, subject to specified exempt categories. Standby charges are assessments under the terms of Proposition 218, a State constitutional ballot initiative approved by the voters on November 5, 1996, but Metropolitan's current standby charges are exempt from Proposition 218's procedural requirements. See "–California Ballot Initiatives."

Twenty-two member agencies collect their RTS charges through standby charges. RTS charges collected by means of such standby charges were $41.7 million in each of fiscal years 2015-16 and 2016-17, and $41.6 million in fiscal year 2017-18.

Capacity Charge. The Capacity Charge recovers costs incurred to provide peak capacity within Metropolitan's distribution system. The Capacity Charge provides a price signal to encourage agencies to reduce peak demands on the distribution system and to shift demands that occur during the May 1 through September 30 period into the October 1 through April 30 period. This results in more efficient utilization of Metropolitan's existing infrastructure and deferring capacity expansion costs. Each member agency will pay the Capacity Charge per cfs based on a three-year trailing peak (maximum) day demand, measured in cfs. Each member agency's peak day is likely to occur on different days; therefore this measure approximates peak week demands on Metropolitan. The Capacity Charge was $8,700 per cfs effective as of January 1, 2018, and was $8,600 per cfs effective as of January 1, 2019. The Capacity Charge will be $8,800 per cfs effective as of January 1, 2020. The Capacity Charge is projected to generate $33.1 million in fiscal year 2018-19 and $30.5 million in fiscal year 2019-20.

Classes of Water Service

Metropolitan, a wholesaler, provides two types of services: full service water service (treated or untreated) and wheeling service. Metropolitan has one class of customers: its member agencies. The level of rate unbundling in Metropolitan's rate structure provides transparency to show that rates and charges recover only those functions involved in the applicable service, and that no cross-subsidy of costs exists. Metropolitan's cost of service process and resulting unbundled rate structure ensures that its wholesale customers pay for only those services they elect to receive.

The applicable rate components and fixed charges for each class of water service are shown in the chart below.

Current Services and Rate Components

	Rates & Charges That Apply						
Service	System Access	Water Stewardship	System Power	Tier 1/ Tier 2	Readiness to Serve	Capacity Charge	Treatment Surcharge
Full Service Untreated	Yes	Yes	Yes	Yes	Yes	Yes	No
Full Service Treated	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wheeling Service[1]	Yes	Yes	No[2]	No	Yes	Yes	Yes[3]

[1] Metropolitan's rate for wheeling service applies to wheeling to member agencies in transactions of up to one year.
[2] Under Metropolitan's rate for wheeling service, wheeling parties must pay for their own cost for power (if such power can be scheduled by Metropolitan) or pay Metropolitan for the actual cost (not system average) of power service utilized for delivery of the wheeled water. In addition, wheeling parties shall be assessed an administration fee of not less than $5,000 per transaction.
[3] If applicable.

Metropolitan offers three programs that encourage the member agencies to increase groundwater and emergency storage and for which certain Metropolitan charges are inapplicable.

(1) Conjunctive Use Program. The Conjunctive Use Program is operated through individual agreements with member and retail agencies for groundwater storage within Metropolitan's service area. Wet-year imported supplies are stored to enhance reliability during dry, drought, and emergency conditions. Metropolitan has the option to call water stored in the groundwater basins for the participating member agency pursuant to its contractual conjunctive use agreement. At the time of the call, the member agency pays the prevailing rate for that water, but the deliveries are excluded from the calculation of the Capacity Charge because Conjunctive Use Program deliveries are made at Metropolitan's discretion. Conjunctive use programs may also contain cost-sharing terms related to operational costs. See "REGIONAL WATER RESOURCES–Local Water Supplies" in this Appendix A.

(2) Cyclic Storage Program. The Cyclic Storage Program is operated through individual agreements with member agencies for groundwater or surface water storage within Metropolitan's service area. Wet-year imported supplies are stored to enhance reliability during dry, drought, and emergency conditions. Deliveries to the cyclic storage accounts are at Metropolitan's discretion while member agencies have discretion on whether they want to accept the water. At the time the water is delivered from the cyclic storage account, the prevailing full service rate applies, but deliveries are excluded from the calculation of the Capacity Charge because Cyclic Storage Program deliveries are made at Metropolitan's discretion. See "REGIONAL WATER RESOURCES–Local Water Supplies" in this Appendix A.

(3) Emergency Storage Program. The Emergency Storage Program is used for delivering water for emergency storage in surface water reservoirs and storage tanks. Emergency Storage Program purposes include initially filling a newly constructed reservoir or storage tank and replacing water used during an emergency. Because Metropolitan could interrupt delivery of this water, Emergency Storage Program Deliveries are excluded from the calculation of the RTS Charge, the Capacity Charge, and the Tier 1 maximum.

The applicable rate components and fixed charges applicable for each such program are shown in the following chart.

Current Programs and Rate Components

	Rates & Charges That Apply					
Full Service Program	System Access	Water Stewardship	System Power	Tier 1 Maximum	Readiness to Serve	Capacity Charge
Conjunctive Use Program	Yes	Yes	Yes	Yes	Yes	No
Cyclic Storage Program	Yes	Yes	Yes	Yes	Yes	No
Emergency Storage Program	Yes	Yes	Yes	No*	No	No

* Emergency Storage Program pays the Tier 1 Supply Rate; purchases under Emergency Storage program do not count towards a member agency's Tier 1 Maximum.

Water Rates

The following table sets forth Metropolitan's water rates by category beginning January 1, 2014. See also "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES–Water Revenues" in this Appendix A. In addition to the base rates for untreated water sold in the different classes of service, the columns labeled "Treated" include the surcharge that Metropolitan charges for water treated at its water treatment plants. See "–Rate Structure" and "–Classes of Water Service" for descriptions of current rates. See also "–Litigation Challenging Rate Structure" for a description of litigation challenging Metropolitan's water rates.

SUMMARY OF WATER RATES
(Dollars per Acre-Foot)

	SUPPLY RATE		SYSTEM ACCESS RATE	WATER STEWARDSHIP RATE	SYSTEM POWER RATE	TREATMENT SURCHARGE
	Tier 1	Tier 2				
January 1, 2014	$148	$290	$243	$41	$161	$297
January 1, 2015	$158	$290	$257	$41	$126	$341
January 1, 2016	$156	$290	$259	$41	$138	$348
January 1, 2017	$201	$295	$289	$52	$124	$313
January 1, 2018	$209	$295	$299	$55	$132	$320
January 1, 2019*	$209	$295	$326	$69	$127	$319
January 1, 2020*	$208	$295	$346	$65	$136	$323

	FULL SERVICE TREATED[1]		FULL SERVICE UNTREATED[2]	
	Tier 1	Tier 2	Tier 1	Tier 2
January 1, 2014	$890	$1,032	$593	$735
January 1, 2015	$923	$1,055	$582	$714
January 1, 2016	$942	$1,076	$594	$728
January 1, 2017	$979	$1,073	$666	$760
January 1, 2018	$1,015	$1,101	$695	$781
January 1, 2019*	$1,050	$1,136	$731	$817
January 1, 2020*	$1,078	$1,165	$755	$842

Source: Metropolitan.

* Rates effective January 1, 2019 and January 1, 2020 were adopted by Metropolitan's Board on April 10, 2018.

(1) Full service treated water rates are the sum of the applicable Supply Rate, System Access Rate, Water Stewardship Rate, System Power Rate and Treatment Surcharge.

(2) Full service untreated water rates are the sum of the applicable Supply Rate, System Access Rate, Water Stewardship Rate and System Power Rate.

Financial Reserve Policy

Metropolitan's reserve policy provides for a minimum reserve requirement and target amount of unrestricted reserves at June 30 of each year. The minimum reserve requirement at June 30 of each year is equal to the portion of fixed costs estimated to be recovered by water revenues for the 18 months beginning with the immediately succeeding July. Funds representing the minimum reserve requirement are held in the Revenue Remainder Fund. Any funds in excess of the minimum reserve requirement are held in the Water Rate Stabilization Fund. The target amount of unrestricted reserves is equal to the portion of the fixed costs estimated to be recovered by water revenues during the two years immediately following the 18-month period used to calculate the minimum reserve requirement. Funds in excess of the target amount are to be utilized for capital expenditures in lieu of the issuance of additional debt, or for the redemption, defeasance or purchase of outstanding bonds or commercial paper as determined by the Board. Provided that the fixed charge coverage ratio is at or above 1.2, amounts in the Water Rate Stabilization Fund may be expended for any lawful purpose of Metropolitan, as determined by the Board. See "CAPITAL INVESTMENT PLAN–Capital Investment Plan Financing" in this Appendix A.

At June 30, 2018, unrestricted reserves, which consist of the Water Rate Stabilization Fund and the Revenue Remainder Fund, totaled $474 million on a modified accrual basis. As of June 30, 2018, the minimum reserve requirement was $257.3 million and the target reserve level was $626.9 million.

Due to SDCWA's litigation challenging Metropolitan's rates and pursuant to the Exchange Agreement between Metropolitan and SDCWA, Metropolitan is required to set aside funds based on the quantities of exchange water that Metropolitan provides to SDCWA and the amount of charges disputed by SDCWA. In April 2016, Metropolitan transferred these funds from unrestricted financial reserves to a new designated fund, the Exchange Agreement Set-Aside Fund. As of March 31, 2019, Metropolitan held $55.8 million in the Exchange Agreement Set-Aside Fund. This amount contains the disputed Water Stewardship Rate payments and interest earned thereon based on the rate earned by Metropolitan's investment portfolio. The amounts held do not include the statutory prejudgment interest, post-judgment interest, attorneys' fees, or costs awards, none of which the Exchange Agreement requires to be held. Amounts held pursuant to the Exchange Agreement will continue to accumulate based on the quantities of exchange water that Metropolitan provides to SDCWA and the payments disputed by SDCWA, until the litigation, including all appeals, is concluded. See "METROPOLITAN'S WATER SUPPLY–Colorado River Aqueduct – Metropolitan and San Diego County Water Authority Exchange Agreement" in this Appendix A. See also "– Litigation Challenging Rate Structure" below.

Metropolitan projects that its unrestricted reserves as of June 30, 2019 will be approximately $425 million. This amount does not include funds held in the Exchange Agreement Set-Aside Fund. This projection is based on the assumptions set forth in the table entitled "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" under "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A. In addition, this projection is based on the assumption that Metropolitan's Board will not authorize the use of any additional amounts in the unrestricted reserves.

California Ballot Initiatives

Proposition 218, a State ballot initiative known as the "Right to Vote on Taxes Act," was approved by the voters on November 5, 1996 adding Articles XIIIC and XIIID to the California Constitution. Article XIIID provides substantive and procedural requirements on the imposition, extension or increase of any "fee" or "charge" levied by a local government upon a parcel of real property or upon a person as an incident of property ownership. As a wholesaler, Metropolitan serves water to its member agencies, not to persons or properties as an incident of property ownership. Thus, water rates charged by Metropolitan to its member agencies are not property related fees and charges and therefore are exempt from the requirements of Article XIIID. Fees for retail water service by Metropolitan's member agencies or their agencies are subject to the requirements of Article XIIID.

Article XIIID also imposes certain procedures with respect to assessments. Under Article XIIID, "standby charges" are considered "assessments" and must follow the procedures required for "assessments," unless they were in existence on the effective date of Article XIIID. Metropolitan has imposed its water standby charges since 1992 and therefore its current standby charges are exempt from the Article XIIID procedures. Changes to Metropolitan's current standby charges could require notice to property owners and approval by a majority of such owners returning mail-in ballots approving or rejecting any imposition or increase of such standby charge. Twenty-two member agencies have elected to collect all or a portion of their readiness-to-serve charges through standby charges. See "–Other Charges – Readiness-to-Serve Charge" and "– Water Standby Charges" above. Even if Article XIIID is construed to limit the ability of Metropolitan and its member agencies to impose or collect standby charges, the member agencies will continue to be obligated to pay the readiness-to-serve charges.

Article XIIIC makes all taxes either general or special taxes and imposes voting requirements for each kind of tax. It also extends the people's initiative power to reduce or repeal previously authorized local taxes, assessments, fees and charges. This extension of the initiative power is not limited by the terms of

Article XIIIC to fees imposed after November 6, 1996 or to property-related fees and charges and absent other authority could result in retroactive reduction in existing taxes, assessments or fees and charges.

Proposition 26, a State ballot initiative aimed at restricting regulatory fees and charges, was approved by the California voters on November 2, 2010. Proposition 26 broadens the definition of "tax" in Article XIIIC of the California Constitution to include: levies, charges and exactions imposed by local governments, except for charges imposed for benefits or privileges or for services or products granted to the payor (and not provided to those not charged) that do not exceed their reasonable cost; regulatory fees that do not exceed the cost of regulation and are allocated in a fair or reasonable manner; fees for the use of local governmental property; fines and penalties imposed for violations of law; real property development fees; and assessments and property-related fees imposed under Article XIIID of the California Constitution. Special taxes imposed by local governments including special districts are subject to approval by two-thirds of the electorate. Proposition 26 applies to charges imposed or increased by local governments after the date of its approval. Metropolitan believes its water rates and charges are not taxes under Proposition 26. SDCWA's lawsuit challenging the rates adopted by Metropolitan in April 2012 (part of which became effective January 1, 2013 and part of which became effective January 1, 2014) alleged that such rates violate Proposition 26. On June 21, 2017, the California Court of Appeal ruled that whether or not Proposition 26 applies to Metropolitan's rates, the System Access Rate and System Power Rate challenged by SDCWA in such lawsuit comply with Proposition 26. See "–Litigation Challenging Rate Structure."

Propositions 218 and 26 were adopted as measures that qualified for the ballot pursuant to the State's initiative process. Other initiative measures have been proposed from time to time, including presently, or could be proposed in the future, which if qualified for the ballot, could be adopted, or legislative measures could be approved by the Legislature, which may place limitations on the ability of Metropolitan or its member agencies to increase revenues or to increase appropriations. Such measures may further affect Metropolitan's ability to collect taxes, assessments or fees and charges, which could have an effect on Metropolitan's revenues.

Preferential Rights

Section 135 of the Act gives each of Metropolitan's member agencies a preferential right to purchase for domestic and municipal uses within the agency a portion of the water served by Metropolitan, based upon a ratio of all payments on tax assessments and otherwise, except purchases of water, made to Metropolitan by the member agency compared to total payments made by all member agencies on tax assessments and otherwise since Metropolitan was formed, except purchases of water. Historically, these rights have not been used in allocating Metropolitan's water. In 2004, the California Court of Appeal upheld Metropolitan's methodology for calculation of the respective member agencies' preferential rights under Section 135 of the Act. SDCWA's litigation challenging Metropolitan's rate structure also challenged Metropolitan's exclusion of payments for Exchange Agreement deliveries from the calculation of SDCWA's preferential right. On June 21, 2017, the California Court of Appeal held that SDCWA's payments under the Exchange Agreement must be included in the preferential rights calculation. See "–Litigation Challenging Rate Structure."

Litigation Challenging Rate Structure

SDCWA filed San Diego County Water Authority v. Metropolitan Water District of Southern California, et al. on June 11, 2010. The complaint alleges that the rates adopted by the Board on April 13, 2010, which became effective January 1, 2011 and January 1, 2012, misallocate certain State Water Contract costs to the System Access Rate and the System Power Rate, and thus affect charges for transportation of water, resulting in an overcharge to SDCWA by at least $24.5 million per year. The complaint alleges that all State Water Project costs should be allocated instead to Metropolitan's Supply Rate, even though under the State Water Contract Metropolitan is billed separately for transportation, power and supply costs. It states additionally that Metropolitan will overcharge SDCWA by another $5.4 million per year by including the Water Stewardship Rate in transportation charges.

The complaint requested a court order invalidating the rates adopted April 13, 2010, and that Metropolitan be mandated to allocate costs associated with the State Water Contract and the Water Stewardship Rate to water supply rates and not to transportation rates. Rates in effect in prior years are not challenged in this lawsuit.

SDCWA filed its First Amended Petition for Writ of Mandate and Complaint on October 27, 2011, adding five new claims to this litigation, two of which were eliminated from the case on January 4, 2012. The three remaining new claims were for breach of the water Exchange Agreement between Metropolitan and SDCWA (described herein under "METROPOLITAN'S WATER SUPPLY–Colorado River Aqueduct – Metropolitan and San Diego County Water Authority Exchange Agreement") due to a price based on allegedly illegal rates; improper exclusion of SDCWA's payments under this Exchange Agreement from calculation of SDCWA's preferential rights to purchase Metropolitan supplies (see "–Preferential Rights" above); and illegality of the rate structure integrity provision in conservation and local resources incentive agreements between Metropolitan and SDCWA. The rate structure integrity provision permitted the Board to terminate incentives payable under conservation and local resources incentive agreements between Metropolitan and a member agency due to certain actions by the member agency to challenge the rates that are the source of incentive payments. In June 2011, Metropolitan's Board authorized termination of two incentive agreements with SDCWA under the rate structure integrity provision in such agreements after SDCWA filed its initial complaint challenging Metropolitan's rates. SDCWA filed a Second Amended Petition for Writ of Mandate and Complaint on April 17, 2012, which contained additional allegations but no new causes of action.

On June 8, 2012, SDCWA filed a new lawsuit challenging the rates adopted by Metropolitan on April 10, 2012 and effective on January 1, 2013 and January 1, 2014. The complaint contained allegations similar to those in the Second Amended Petition for Writ of Mandate and Complaint and new allegations asserting that Metropolitan's rates, adopted in April 2012, violate Proposition 26. See "–California Ballot Initiatives" for a description of Proposition 26.

SDCWA filed a Third Amended Petition for Writ of Mandate and Complaint on January 23, 2013, to add new allegations that Metropolitan's rates adopted in April 2010 did not meet the requirements of Proposition 26. The court granted Metropolitan's motion to strike allegations relating to Proposition 26 on March 29, 2013, expressly ruling that SDCWA may not allege a violation of Proposition 26 in its challenge to the rates adopted in April 2010. This ruling did not affect SDCWA's separate challenge to Metropolitan's rates adopted in April 2012, which also includes Proposition 26 allegations.

Following trial of both lawsuits in two phases, concluding on January 23, 2014 and April 30, 2015, respectively, the Superior Court of the State of California, County of San Francisco (the "Superior Court"), issued its Final Judgment and a Peremptory Writ of Mandate in the 2010 and 2012 SDCWA v. Metropolitan cases. Metropolitan appealed the trial court's decision in each case, and SDCWA filed a cross-appeal of the court's ruling on the rate structure integrity claim and an attorneys' fees order.

On June 21, 2017, the California Court of Appeal released its decision in the appeals and cross-appeal filed by Metropolitan and SDCWA, respectively. The Court of Appeal ruled that Metropolitan may lawfully include its State Water Project transportation costs in the System Access Rate and System Power Rate that are part of the Exchange Agreement's price term, and that Metropolitan may also lawfully include the System Access Rate in its wheeling rate, reversing the trial court decision on this issue. The Court held Metropolitan's allocation of the State Water Project transportation costs as its own transportation costs is proper and does not violate the wheeling statutes (Water Code, § 1810, et seq.), Proposition 26 (Cal. Const., Article XIIIC, §1, subd.(e)), California Government Code section 54999.7, the common law, or the terms of the parties' Exchange Agreement.

The Court of Appeal also ruled that the administrative record before it for the rates in calendar years 2011 through 2014 did not support Metropolitan's inclusion of its Water Stewardship Rate as a transportation cost in the Exchange Agreement price or the wheeling rate, under the common law and wheeling statutes. Having made that determination, the Court of Appeal stated it need not evaluate the issue under any other law. The court did not address the allocation of the Water Stewardship Rate in subsequent years based on a different record. The court noted, and in a subsequent modification confirmed, that its holding does not preclude Metropolitan from including the Water Stewardship Rate in Metropolitan's full service rate.

The Court of Appeal held that because the Water Stewardship Rate was included in the Exchange Agreement price, there was a breach by Metropolitan of the Exchange Agreement in 2011 through 2014. The court remanded the case to the trial court for a redetermination of damages in light of its ruling concerning the Water Stewardship Rate. The Court of Appeal agreed with the trial court that statutory prejudgment interest applies with respect to any damages award, not a lesser contractual interest. The Court of Appeal reversed the trial court by finding that the Exchange Agreement may entitle SDCWA to attorneys' fees for the second phase of the case concerning breach of contract; but directed the trial court on remand to make a new determination of the prevailing party, if any. The cases were therefore remanded to the trial court for a review of both damages and attorneys' fees.

With respect to other issues considered on appeal, the Court of Appeal upheld the trial court's ruling that Metropolitan improperly excludes SDCWA's payments under the Exchange Agreement in Metropolitan's calculation of SDCWA's preferential rights. The court also ruled that SDCWA had the constitutional right to challenge the rate structure integrity provision in Metropolitan's conservation and local resources incentive agreements, and found that the rate structure integrity provision was invalid and unenforceable as an unconstitutional condition on the provision of a public benefit.

On September 27, 2017, the California Supreme Court denied SDCWA's petition for review, declining to consider the Court of Appeal's decision. The Court of Appeal's decision is therefore final.

On July 25, 2018, the Superior Court issued an order regarding the scope of the matters to be reconsidered by the Superior Court on remand pursuant to the Court of Appeal decision. With respect to the Superior Court's re-determination of damages in light of the Court of Appeal's ruling that the administrative record for calendar years 2011 through 2014 did not support Metropolitan's inclusion of its demand management costs in the Exchange Agreement price, the Superior Court ruled that it will award SDCWA $28,678,190.90 in contract damages for breach of the Exchange Agreement, plus prejudgment interest at 10 percent per annum. The Superior Court determined that Metropolitan is not entitled in the remand proceedings to show what it could have lawfully charged SDCWA for demand management costs and to deduct that from SDCWA's damages.

The Superior Court further ruled that SDCWA is not entitled in the remand proceedings to litigate the issue of "offsetting benefits" under the wheeling statutes for the parties' Exchange Agreement. The Superior Court found that such claim is both outside the scope of remand and waived.

The Superior Court also ruled that SDCWA is entitled to judgment on its declaratory relief cause of action declaring the rate structure integrity provision in Metropolitan's conservation and local resources incentive agreements invalid and unenforceable, SDCWA is entitled to further proceedings to litigate the issue of an entitlement to monetary restitution for 2011 through 2014, and the parties shall also litigate in further proceedings the issue of what prospective relief SDCWA may be entitled to in connection with this cause of action. The Superior Court scheduled a case management conference for May 9, 2019, which has been continued to July 15, 2019, at which time it may address the scope of any appropriate discovery relating to the rate structure integrity provision monetary restitution and non-monetary equitable relief sought by SDCWA and may set a date for legal briefing and further proceedings to determine the issue of SDCWA's entitlement to the requested relief.

Finally, the Superior Court confirmed, as the parties agreed, that it will conduct further proceedings for a redetermination of the prevailing party and attorneys' fees in this matter.

On September 14, 2018, Metropolitan filed a Petition for Writ of Mandate with the California Court of Appeal, requesting the court to require the Superior Court to recalculate contract damages for breach of the Exchange Agreement from years 2011 through 2014, to include a set-off for the additional sums SDCWA would have paid had Metropolitan collected the Water Stewardship Rate through its full service sales as SDCWA argued was correct. On November 1, 2018, the Court of Appeal determined that it would not review the issue at this stage of the cases. Metropolitan may raise this issue again on any later appeal from the cases' final judgment.

Due to SDCWA's litigation challenging Metropolitan's rates, and pursuant to the Exchange Agreement between Metropolitan and SDCWA, as of March 31, 2019, Metropolitan held $55.8 million in a designated fund, the Exchange Agreement Set-Aside Fund. See "–Financial Reserve Policy." This amount includes the disputed Water Stewardship Rate payments for calendar years 2011 through the present, and interest earned by Metropolitan thereon. The amount held does not include statutory prejudgment interest or any post-judgment interest, attorneys' fees, or costs the Court may award. The Set-Aside Fund also does not include any amounts applicable to the rate structure integrity provision declaratory relief cause of action, because that claim does not involve disputed payments under the Exchange Agreement.

On February 14, 2019, Metropolitan tendered to SDCWA payment of $44.4 million for the San Francisco Superior Court's contract damages award for Water Stewardship Rate payments from 2011 through 2014, plus statutory interest through February 15, 2019, with a reservation of appeal rights, in the San Diego County Water Authority v. Metropolitan Water District of Southern California, et al., 2010 and 2012 actions. This tender was made under compulsion to cease accrual of statutory interest in excess of market rates, but did not affect Metropolitan's rights to appeal, including its right to challenge the amount of the damages award. The tendered payment included $31.6 million of amounts withdrawn from the Exchange Agreement Set-Aside Fund, and $12.8 million withdrawn from reserves (representing statutory interest). On March 7, 2019, SDCWA rejected the tendered payment and returned the uncashed check for the tendered payment. The returned funds were credited back to the Exchange Agreement Set-Aside Fund and Metropolitan reserves in the amounts drawn. The balance in the Exchange Agreement Set-Aside Fund set forth above includes the returned funds.

In May 2014, SDCWA filed a new lawsuit asserting essentially the same rate claims and breach of contract claim in connection with the Board's April 2014 rate adoption. Metropolitan filed its answer on June 30, 2014. On February 9, 2015, pursuant to stipulation by the parties, the San Francisco Superior Court ordered that the case be stayed. Metropolitan is unable to assess at this time the likelihood of success of this case, any possible appeal or any future claims.

On April 13, 2016, SDCWA filed a new lawsuit that alleges all rates and charges for 2017 and 2018 adopted by Metropolitan's Board on April 12, 2016 violate the California Constitution, statutes, and common law. The Petition for Writ of Mandate and Complaint asserts misallocation of costs as alleged in the previous cases listed above and additional claims of over-collection and misallocation of costs and procedural violations. Following a stipulated order issued by the court on November 10, 2016, SDCWA filed a First Amended Petition for Writ of Mandate and Complaint and the court ordered the case stayed pending final resolution of the 2010 and 2012 SDCWA v. Metropolitan cases' appeals. The amended petition/complaint adds allegations of the same Exchange Agreement breach as in the previous cases listed above and breach of a provision that requires Metropolitan to set aside disputed amounts, relating to the manner in which Metropolitan has set aside the amounts; requests a judicial declaration that, if a judgment is owed to SDCWA under the Exchange Agreement, SDCWA will not be required to pay any portion of that judgment; and requests a refund to SDCWA of any amount Metropolitan has collected in excess of the reasonable costs of

the services provided or, alternatively, a reduction in SDCWA's future fees. Metropolitan is unable to assess at this time the likelihood of success of this case, any possible appeal or any future claims.

On June 9, 2017, SDCWA filed a new Petition for Writ of Mandate and Complaint challenging the Readiness-to-Serve Charge and Capacity Charge for 2018 adopted by Metropolitan's Board on April 11, 2017. These two charges are set annually, and SDCWA's 2016 lawsuit included a challenge to these two charges for 2017. The new lawsuit similarly alleges the 2018 Readiness-to-Serve Charge and Capacity Charge violate the California Constitution, statutes, and common law. The petition/complaint asserts misallocation of costs. Metropolitan was served with the petition/complaint on June 20, 2017. On July 18, 2017, SDCWA filed a first amended petition/complaint to add Metropolitan's Board action of July 11, 2017 to make minor corrections to the Readiness-to-Serve Charge. On July 31, 2018, pursuant to stipulation by the parties, the San Francisco Superior Court ordered that the case be stayed. Metropolitan is unable to assess at this time the likelihood of success of this case, any possible appeal or any future claims.

On June 8, 2018, SDCWA filed a new lawsuit that alleges all rates and charges for 2019 and 2020 adopted by Metropolitan's Board on April 10, 2018 violate the California Constitution, statutes, and common law. The Petition for Writ of Mandate and Complaint asserts the Water Stewardship Rate is unlawful per se and its collection in transportation charges is also unlawful; failure to provide wheelers a reasonable credit for "offsetting benefits" pursuant to Water Code Section 1810, et seq., which SDCWA contends (and Metropolitan disputes) applies to the parties' Exchange Agreement; over-collection and misallocation of costs, including misallocation of Metropolitan's California WaterFix costs as its transportation costs; and specified procedural violations. SDCWA states in the Petition and Complaint that it intends to amend its complaint to allege additional claims against Metropolitan, including but not limited to a claim for breach of contract. Following a stipulated order issued by the San Francisco Superior Court on January 10, 2019, SDCWA filed a First Amended Petition for Writ of Mandate and Complaint and the court ordered the case stayed pending final resolution of the 2010 and 2012 SDCWA v. Metropolitan cases. The amended petition/complaint adds a cause of action for breach of the Exchange Agreement for charging an unlawful price that includes the Water Stewardship Rate (despite suspension of this charge), failing to provide credit for offsetting benefits, charging transportation rates that are not based on costs of service, including California WaterFix costs, and not following procedural requirements; and requests a refund to SDCWA of any amount Metropolitan has collected in excess of the reasonable costs of the services provided or, alternatively, a reduction in SDCWA's future fees. Metropolitan is unable to assess at this time the likelihood of success of this case, any possible appeal or any future claims.

Other Revenue Sources

Hydroelectric Power Recovery Revenues. Metropolitan has constructed 16 small hydroelectric plants on its distribution system. The combined generating capacity of these plants is approximately 131 megawatts. The total capital cost of the 16 facilities is approximately $176.1 million. Since 2000, annual energy generation sales revenues have ranged between $7.5 million and nearly $29.6 million. Energy generation sales revenues were $20.8 million in fiscal year 2016-17 and $23.7 million in fiscal year 2017-18.

Metropolitan has a power sales contract with Pacific Gas and Electric Company ("PG&E") for the sale to PG&E of the output of Metropolitan's 24 megawatt Etiwanda hydroelectric plant through 2034. On January 29, 2019, PG&E and its parent company, PG&E Corporation, filed for bankruptcy protection under Chapter 11 of the Bankruptcy Code. As a result of the PG&E bankruptcy filing, a $10,136 payment due in January 2019 under the power sales contract was not received. PG&E has taken no action to reject the power sales contract in the bankruptcy proceedings and Metropolitan continues to perform under the contract. The next scheduled payment will be due from PG&E in June 2019. Metropolitan will hold a claim against the bankruptcy estate for any unpaid amounts from PG&E during the pendency of the bankruptcy proceedings.

Investment Income. In fiscal years 2015-16, 2016-17, and 2017-18 Metropolitan's earnings on investments, including adjustments for gains and losses and premiums and discounts, including construction

account and trust fund earnings, excluding gains and losses on swap terminations, on an accrual basis (audited) were $19.4 million, $6.2 million, and $10.6 million, respectively.

Investment of Moneys in Funds and Accounts

The Board has delegated to the Treasurer the authority to invest funds. All moneys in any of the funds and accounts established pursuant to Metropolitan's water revenue or general obligation bond resolutions are managed by the Treasurer in accordance with Metropolitan's Statement of Investment Policy. All Metropolitan funds available for investment are currently invested in United States Treasury and agency securities, commercial paper, negotiable certificates of deposit, banker's acceptances, corporate notes, municipal bonds, government-sponsored enterprise and the California Local Agency Investment Fund ("LAIF"). The LAIF is a voluntary program created by statute as an investment alternative for California's local governments and special districts. LAIF permits such local agencies to participate in an investment portfolio, which invests billions of dollars, managed by the State Treasurer's Office.

The Statement of Investment Policy provides that in managing Metropolitan's investments, the primary objective shall be to safeguard the principal of the invested funds. The secondary objective shall be to meet all liquidity requirements and the third objective shall be to achieve a return on the invested funds. Although the Statement of Investment Policy permits investments in some government-sponsored enterprise, the portfolio does not include any of the special investment vehicles related to sub-prime mortgages. The Statement of Investment Policy allows Metropolitan to exceed the portfolio and single issuer limits for purchases of California local agency securities when purchasing Metropolitan tendered bonds in conjunction with its self-liquidity program. See "METROPOLITAN EXPENSES–Outstanding Senior Revenue Bonds and Senior Parity Obligations –Variable Rate and Swap Obligations – Self-Liquidity Bonds" in this Appendix A. Metropolitan's current investments comply with the Statement of Investment Policy.

As of March 31, 2019, the total market value (cash-basis) of all Metropolitan invested funds was $1,147.8 million, including bond reserves of $13.0 million. The market value of Metropolitan's investment portfolio is subject to market fluctuation and volatility and general economic conditions. Over the three years ended March 31, 2019 the market value of the month-end balance of Metropolitan's investment portfolio (excluding bond reserve funds) averaged approximately $1.10 billion. The minimum month-end balance of Metropolitan's investment portfolio (excluding bond reserve funds) during such period was approximately $890.1 million on January 31, 2018. See Footnote 3 to Metropolitan's audited financial statements in Appendix B for additional information on the investment portfolio.

Metropolitan's administrative code requires that (1) the Treasurer provide an annual Statement of Investment Policy for approval by Metropolitan's Board, (2) the Treasurer provide a monthly investment report to the Board and the General Manager showing by fund the description, maturity date, yield, par, cost and current market value of each security, and (3) the General Counsel review as to eligibility the securities invested in by the Treasurer for that month and report his or her determinations to the Board. The Board approved the Statement of Investment Policy for fiscal year 2018-19 on June 13, 2018.

Subject to the provisions of Metropolitan's water revenue or general obligation bond resolutions, obligations purchased by the investment of bond proceeds in the various funds and accounts established pursuant to a bond resolution are deemed at all times to be a part of such funds and accounts and any income realized from investment of amounts on deposit in any fund or account therein will be credited to such fund or account. The Treasurer is required to sell or present for redemption any investments whenever it may be necessary to do so in order to provide moneys to meet required payments or transfers from such funds and accounts. For the purpose of determining at any given time the balance in any such funds, any such investments constituting a part of such funds and accounts will be valued at the then estimated or appraised market value of such investments.

All investments, including those authorized by law from time to time for investments by public agencies, contain certain risks. Such risks include, but are not limited to, a lower rate of return than expected and loss or delayed receipt of principal. The occurrence of these events with respect to amounts held under Metropolitan's water revenue or general obligation revenue bond resolutions, or other amounts held by Metropolitan, could have a material adverse effect on Metropolitan's finances. These risks may be mitigated, but are not eliminated, by limitations imposed on the portfolio management process by Metropolitan's Statement of Investment Policy.

The Statement of Investment Policy requires that investments have a minimum credit rating of "A-1/P-1/F1" for short-term securities and "A" for longer-term securities at the time of purchase. If immediate liquidation of a security downgraded below these levels is not in the best interests of Metropolitan, the Treasurer or investment manager, in consultation with an ad hoc committee made up of the Chairman of the Board, the Chairman of the Finance and Insurance Committee and the General Manager, and with the concurrence of the General Counsel, may dispose of the security in an orderly and prudent manner considering the circumstances, under terms and conditions approved by a majority of the members of such ad hoc committee. The Treasurer is required to include a description of any securities that have been downgraded below investment grade and the status of their disposition in the Treasurer's monthly report.

The Statement of Investment Policy also limits the amount of securities that can be purchased by category, as well as by issuer, and prohibits investments that can result in zero interest income. Metropolitan's securities are settled on a delivery versus payment basis and are held by an independent third-party custodian. See APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)" for a description of Metropolitan's investments at June 30, 2018.

Since May 2002, Metropolitan has retained two outside investment firms to manage the portion of Metropolitan's portfolio not needed to provide liquidity for expenditures over the next six months. As of March 31, 2019 such managers were managing approximately $357.5 million in investments on behalf of Metropolitan. Since December 2018, Metropolitan has retained an outside investment firm to manage the liquidity portfolio. As of March 31, 2019, this firm managed approximately $773.5 million. The outside managers are required to adhere to Metropolitan's Statement of Investment Policy.

Metropolitan's Statement of Investment Policy may be changed at any time by the Board (subject to State law provisions relating to authorized investments). There can be no assurance that the State law and/or the Statement of Investment Policy will not be amended in the future to allow for investments that are currently not permitted under State law or the Statement of Investment Policy, or that the objectives of Metropolitan with respect to investments or its investment holdings at any point in time will not change.

METROPOLITAN EXPENSES

General

The following table sets forth a summary of Metropolitan's expenses, by major function, for the five years ended June 30, 2018, on a modified accrual basis. All information is unaudited. Expenses of Metropolitan for the fiscal years ended June 30, 2018 and June 30, 2017, on an accrual basis, are shown in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

SUMMARY OF EXPENSES
Fiscal Years Ended June 30
(Dollars in Millions)

	2014	2015	2016	2017	2018
Operation and Maintenance Costs[1]	$ 512	$ 697	$ 799	$ 559	$ 568
Total State Water Project[2]	465	436	512	506	527
Total Debt Service	384	303	332	330	360
Construction Expenses from Revenues[3]	117	210	273	132	98
Other[4]	6	7	6	4	5
Total Expenses (net of reimbursements)	$1,484	$1,653	$1,922	$1,531	$1,558

Source: Metropolitan.

(1) Includes operation and maintenance, debt administration, conservation and local resource programs, CRA power, and water supply expenses. Fiscal years 2014-15, 2015-16, 2016-17, and 2017-18 include $142 million, $222 million, $33 million, and $1 million, respectively, of conservation projects funded from transfers from the Water Management Fund.

(2) Includes both operating and capital expense portions.

(3) At the discretion of the Board, in any given year, Metropolitan may increase or decrease funding available for construction disbursements to be paid from revenues. Includes $160 million for acquiring properties in Riverside and Imperial Counties, funded by $160 million from the Replacement and Refurbishment Fund Reserves. Does not include expenditures of bond proceeds.

(4) Includes operating equipment.

Revenue Bond Indebtedness and Other Obligations

As of May 1, 2019, Metropolitan had total outstanding indebtedness secured by a lien on Net Operating Revenues of $4.11 billion. This indebtedness was comprised of $3.04 billion of water revenue bonds issued under the Senior Debt Resolutions (defined below), which includes $2.24 billion of fixed rate senior lien revenue bonds, and $797.3 million of variable rate senior lien revenue bonds; $1.03 billion of subordinate water revenue bonds issued under the Subordinate Debt Resolutions (defined below), which includes $579.7 million of fixed rate subordinate revenue bonds, and $446.3 million of variable rate subordinate revenue bonds; and $46.8 million Short-Term Certificates, which bear a variable rate, and are on parity with the subordinate water revenue bonds. In addition, Metropolitan has $493.6 million of fixed-payor interest rate swaps which provides a fixed interest rate hedge to an equivalent amount of variable rate debt. Metropolitan's revenue bonds and other revenue obligations are more fully described below.

REVENUE BOND INDEBTEDNESS AND OTHER OBLIGATIONS

	Variable Rate	Fixed Rate	Total
Senior Lien Revenue Bonds	$ 797,320,000	$2,244,765,000	$3,042,085,000
Subordinate Lien Revenue Bonds	446,255,000	579,655,000	1,025,910,000
Subordinate Lien Short-Term Certificates	46,800,000	0	46,800,000
Total	$1,290,375,000	$2,824,420,000	$4,114,795,000
Fixed-Payor Interest Rate Swaps	(493,630,000)	493,630,000	0
Net Amount (after giving effect to Swaps)	$ 796,745,000	$3,318,050,000	$4,114,795,000

Limitations on Additional Revenue Bonds

Resolution 8329, adopted by Metropolitan's Board on July 9, 1991, as amended and supplemented (the "Master Senior Resolution," and collectively with all such supplemental resolutions, the "Senior Debt Resolutions"), provides for the issuance of Metropolitan's senior lien water revenue bonds. The Senior Debt Resolutions establish limitations on the issuance of additional obligations payable from Net Operating Revenues. Under the Senior Debt Resolutions, no additional bonds, notes or other evidences of indebtedness payable out of Operating Revenues may be issued having any priority in payment of principal, redemption premium, if any, or interest over any water revenue bonds authorized by the Senior Debt Resolutions

("Senior Revenue Bonds") or other obligations of Metropolitan having a lien and charge upon, or being payable from, the Net Operating Revenues on parity with such Senior Revenue Bonds ("Senior Parity Obligations"). No additional Senior Revenue Bonds or Senior Parity Obligations may be issued or incurred unless the conditions of the Senior Debt Resolutions have been satisfied.

Resolution 9199, adopted by Metropolitan's Board on March 8, 2016, as amended and supplemented (the "Master Subordinate Resolution," and collectively with all such supplemental resolutions, the "Subordinate Debt Resolutions," and together with the Senior Debt Resolutions, the "Revenue Bond Resolutions"), provides for the issuance of Metropolitan's subordinate water revenue bonds and other obligations secured by a pledge of Net Operating Revenues that is subordinate to the pledge securing Senior Revenue Bonds and Senior Parity Obligations. The Subordinate Debt Resolutions establish limitations on the issuance of additional obligations payable from Net Operating Revenues. Under the Subordinate Debt Resolutions, with the exception of Senior Revenue Bonds and Senior Parity Obligations, no additional bonds, notes or other evidences of indebtedness payable out of Operating Revenues may be issued having any priority in payment of principal, redemption premium, if any, or interest over any subordinate water revenue bonds authorized by the Subordinate Debt Resolutions ("Subordinate Revenue Bonds" and, together with Senior Revenue Bonds, "Revenue Bonds") or other obligations of Metropolitan having a lien and charge upon, or being payable from, the Net Operating Revenues on parity with the Subordinate Revenue Bonds ("Subordinate Parity Obligations"). No additional Subordinate Revenue Bonds or Subordinate Parity Obligations may be issued or incurred unless the conditions of the Subordinate Debt Resolutions have been satisfied.

The laws governing Metropolitan's ability to issue water revenue bonds currently provide two additional limitations on indebtedness that may be incurred by Metropolitan. The Act provides for a limit on general obligation bonds, water revenue bonds and other evidences of indebtedness of 15 percent of the assessed value of all taxable property within Metropolitan's service area. As of May 1, 2019, outstanding general obligation bonds, water revenue bonds and other evidences of indebtedness in the amount of $4.16 billion represented approximately 0.14 percent of the fiscal year 2018-19 taxable assessed valuation of $2,916.6 billion. The second limitation under the Act specifies that no revenue bonds may be issued, except for the purpose of refunding, unless the amount of net assets of Metropolitan as shown on its balance sheet as of the end of the last fiscal year prior to the issuance of such bonds, equals at least 100 percent of the aggregate amount of revenue bonds outstanding following the issuance of such bonds. The net assets of Metropolitan at June 30, 2018 were $6.69 billion. The aggregate amount of revenue bonds outstanding as of May 1, 2019 was $4.07 billion. The limitation does not apply to other forms of financing available to Metropolitan. Audited financial statements including the net assets of Metropolitan as of June 30, 2018 and June 30, 2017, respectively, are shown in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

Metropolitan provides no assurance that the Act's limitations on indebtedness will not be revised or removed by future legislation. Limitations under the Revenue Bond Resolutions respecting the issuance of additional obligations payable from Net Operating Revenues on parity with the Senior Revenue Bonds and Subordinate Revenue Bonds of Metropolitan will remain in effect so long as any Senior Revenue Bonds and Subordinate Revenue Bonds authorized pursuant to the applicable Revenue Bond Resolutions are outstanding, provided however, that the Revenue Bond Resolutions are subject to amendment and supplement in accordance with their terms.

Variable Rate Exposure Policy

As of May 1, 2019, Metropolitan had outstanding $797.3 million of variable rate obligations issued under the Senior Debt Resolutions, including variable rate Senior Revenue Bonds (described under "–

Outstanding Senior Revenue Bonds and Senior Parity Obligations –Variable Rate and Swap Obligations" below). In addition, as of May 1, 2019, $446.3 million of Metropolitan's $1.03 billion of outstanding Subordinate Revenue Bonds issued under the Subordinate Debt Resolutions were variable rate obligations (described under "–Outstanding Subordinate Revenue Bonds and Subordinate Parity Obligations" below).

As of May 1, 2019, of Metropolitan's $1.29 billion of variable rate obligations, $493.6 million of such variable rate demand obligations are treated by Metropolitan as fixed rate debt, by virtue of interest rate swap agreements (described under "–Outstanding Senior Revenue Bonds and Senior Parity Obligations – Variable Rate and Swap Obligations – Interest Rate Swap Transactions" below), for the purpose of calculating debt service requirements. The remaining $796.7 million of variable rate obligations represent approximately 19.4 percent of total outstanding water revenue secured indebtedness (including Senior Revenue Bonds and Senior Parity Obligations and Subordinate Revenue Bonds and Subordinate Parity Obligations), as of May 1, 2019.

Metropolitan's variable rate exposure policy requires that variable rate debt be managed to limit net interest cost increases within a fiscal year as a result of interest rate changes to no more than $5 million. In addition, the maximum amount of variable interest rate exposure (excluding variable rate bonds associated with interest rate swap agreements) is limited to 40 percent of total outstanding water revenue bond debt. Variable rate debt capacity will be reevaluated as interest rates change and managed within these parameters.

The periodic payments due to Metropolitan from counterparties under its outstanding interest rate swap agreements and the interest payments to be payable by Metropolitan under certain of its outstanding variable rate obligations are calculated by reference to the London interbank offering rate ("LIBOR"). On July 27, 2017, the Financial Conduct Authority (the "FCA"), the U.K. regulatory body currently responsible for the regulation and supervision of LIBOR, announced that it will no longer persuade or compel banks to submit rates for the calculation of the LIBOR rates after 2021 (the "FCA Announcement"). It is not possible to predict the effects of the FCA Announcement or how any prospective phasing out of LIBOR as a reference rate and transition to an alternate benchmark rate will be implemented, but increased volatility in the reported LIBOR rates may occur and the level of such LIBOR-based swap and interest payments may be affected.

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Outstanding Senior Revenue Bonds and Senior Parity Obligations

Senior Revenue Bonds

The water revenue bonds issued under the Senior Debt Resolutions outstanding as of May 1, 2019, are set forth below:

Name of Issue	Principal Outstanding
Water Revenue Refunding Bonds, 1993 Series A	$ 21,840,000
Water Revenue Bonds, 2000 Authorization, Series B-3[1]	88,800,000
Water Revenue Refunding Bonds, 2009 Series B[3]	106,690,000
Water Revenue Refunding Bonds, 2009 Series C[3]	91,165,000
Water Revenue Bonds, 2008 Authorization, Series B[3]	5,365,000
Water Revenue Bonds, 2008 Authorization, Series C[2] [3] [4]	78,385,000
Water Revenue Bonds, 2008 Authorization, Series D[2] [3] [4]	250,000,000
Water Revenue Refunding Bonds, 2009 Series D[3]	31,030,000
Water Revenue Refunding Bonds, 2009 Series E[3]	6,625,000
Water Revenue Bonds, 2010 Authorization, Series A[2]	250,000,000
Water Revenue Refunding Bonds, 2010 Series B	63,800,000
Water Revenue Refunding Bonds, 2011 Series B	2,640,000
Water Revenue Refunding Bonds, 2011 Series C	128,750,000
Water Revenue Refunding Bonds, 2012 Series A	181,180,000
Water Revenue Refunding Bonds, 2012 Series C	54,795,000
Water Revenue Refunding Bonds, 2012 Series F	59,335,000
Water Revenue Refunding Bonds, 2012 Series G	111,890,000
Special Variable Rate Water Revenue Refunding Bonds, 2013 Series D[1]	87,445,000
Water Revenue Refunding Bonds, 2014 Series A	83,865,000
Water Revenue Refunding Bonds, 2014 Series C-1[3]	13,505,000
Water Revenue Refunding Bonds, 2014 Series C-2	14,020,000
Water Revenue Refunding Bonds, 2014 Series C-3	2,810,000
Special Variable Rate Water Revenue Refunding Bonds, 2014 Series D[1]	38,465,000
Water Revenue Refunding Bonds, 2014 Series E	86,060,000
Water Revenue Refunding Bonds, 2014 Series G-4[4]	11,605,000
Water Revenue Refunding Bonds, 2014 Series G-5	6,205,000
Special Variable Rate Water Revenue Refunding Bonds, 2015 Series A-1 and A-2[1]	188,900,000
Water Revenue Bonds, 2015 Authorization, Series A	206,265,000
Water Revenue Refunding Bonds, 2016 Series A	239,455,000
Special Variable Rate Water Revenue Refunding Bonds, 2016 Series B-1 and B-2[1]	103,670,000
Water Revenue Bonds, 2017, Authorization, Series A[1]	80,000,000
Special Variable Water Revenue Refunding Bonds, 2018 Series A-1 and A-2[1]	210,040,000
Water Revenue Refunding Bonds, 2018 Series B	137,485,000
Total	$3,042,085,000

Source: Metropolitan.

(1) Outstanding variable rate obligation.
(2) Designated as "Build America Bonds" pursuant to the American Recovery and Reinvestment Act of 2009.
(3) To be refunded (or a portion of which to be refunded) by Metropolitan's Water Revenue Refunding Bonds, 2019 Series A.
(4) Expected to be refunded (or a portion of which expected to be refunded) by Metropolitan's Subordinate Water Revenue Refunding Bonds, 2019 Series A.

Variable Rate and Swap Obligations

As of May 1, 2019, Metropolitan had outstanding $797.3 million of senior lien variable rate obligations, including variable rate Senior Revenue Bonds issued under the Senior Debt Resolutions (described under this caption "–Variable Rate and Swap Obligations") and Senior Parity Obligations incurred pursuant to a Short-Term Revolving Credit Facility (described under "–Senior Parity Obligations – Short-Term Revolving Credit Facility" below).

The outstanding variable rate Senior Revenue Bonds include special variable rate bonds initially designated as self-liquidity bonds (the "Self-Liquidity Bonds") and variable rate demand obligations supported by standby bond purchase agreements between Metropolitan and various liquidity providers.

Self-Liquidity Bonds. As of May 1, 2019, Metropolitan had $314.8 million of outstanding Self-Liquidity Bonds issued under the Senior Debt Resolutions. Each Series of the outstanding Self-Liquidity Bonds may bear interest in any one of several interest rate modes at the election of Metropolitan. The interest rates for each Series of the outstanding Self-Liquidity Bonds are currently reset on a weekly basis. The Self-Liquidity Bonds are subject to optional tender upon seven days' notice by the owners thereof and mandatory tender upon specified events. Metropolitan is irrevocably committed to purchase all Self-Liquidity Bonds tendered pursuant to any optional or mandatory tender to the extent that remarketing proceeds are insufficient therefor and no standby bond purchase agreement or other liquidity facility is in effect. Metropolitan's obligation to pay the purchase price of any tendered Self-Liquidity Bonds is an unsecured, special limited obligation of Metropolitan payable from Net Operating Revenues. Purchase price payments of Self-Liquidity Bonds are subordinate to both the Senior Revenue Bonds and Senior Parity Obligations and to the Subordinate Revenue Bonds and Subordinate Parity Obligations. In addition, Metropolitan's investment policy permits it to purchase tendered Self-Liquidity Bonds as an investment for its investment portfolio (other than from amounts in its investment portfolio consisting of bond reserve funds). Thus, while Metropolitan is only obligated to purchase tendered Self-Liquidity Bonds from Net Operating Revenues, it may use the cash and investments in its investment portfolio (other than amounts in its investment portfolio consisting of bond reserve funds and amounts posted as collateral with interest rate swap counterparties as described below) to purchase tendered Self-Liquidity Bonds. Metropolitan has not secured any liquidity facility or letter of credit to pay the purchase price of any tendered Self-Liquidity Bonds; however, Metropolitan has entered into a Revolving Credit Agreement (as described below) pursuant to which it may make borrowings for the purpose of paying the purchase price of Self-Liquidity Bonds. See "–Outstanding Subordinate Revenue Bonds and Subordinate Parity Obligations –Self-Liquidity Revolving Credit Agreement" below. Failure to pay the purchase price of Self-Liquidity Bonds upon optional or mandatory tender is not a default under the related paying agent agreement or a default under the Senior Debt Resolutions.

The following table lists the outstanding Self-Liquidity Bonds as of May 1, 2019.

Self-Liquidity Bonds

Name of Issue	Principal Outstanding
Special Variable Rate Water Revenue Refunding Bonds, 2013 Series D	$ 87,445,000
Special Variable Rate Water Revenue Refunding Bonds, 2014 Series D	38,465,000
Special Variable Rate Water Revenue Refunding Bonds, 2015 Series A-1 and A-2	188,900,000
Total	$314,810,000

Source: Metropolitan.

Liquidity Supported Bonds. The interest rates for Metropolitan's other variable rate demand obligations issued under the Senior Debt Resolutions, totaling $482.5 million as of May 1, 2019, are currently reset on a daily basis. While bearing interest at a daily rate, such variable rate demand obligations are subject to optional tender on any business day with same day notice by the owners thereof and mandatory tender upon specified events. Such variable rate demand obligations are supported by standby bond purchase agreements between Metropolitan and liquidity providers that provide for purchase of variable rate bonds by the applicable liquidity provider upon tender of such variable rate bonds and a failed remarketing. Metropolitan has secured its obligation to repay principal and interest advanced under the standby bond purchase agreements as Senior Parity Obligations. A decline in the creditworthiness of a liquidity provider will likely result in an increase in the interest rate of the applicable variable rate bonds, as well as an increase in the risk of a failed remarketing of such tendered variable rate bonds. Variable rate bonds purchased by a liquidity provider ("bank bonds") would initially bear interest at a per annum interest rate equal to, depending on the liquidity facility, either: (a) one month LIBOR plus 7.50 percent; or (b) the highest of the

(i) the Prime Rate plus one percent, (ii) Federal Funds Rate plus two percent, and (iii) seven percent (with the spread or rate increasing in the case of each of (i), (ii) and (iii) of this clause (b) after 90 days). To the extent such bank bonds have not been remarketed or otherwise retired as of the earlier of the 90th day following the date such bonds were purchased by the liquidity provider or the stated expiration date of the related liquidity facility, Metropolitan's obligation to reimburse the liquidity provider may convert the term of the variable rate bonds purchased by the liquidity provider into a term loan payable under the terms of the current liquidity facilities in semi-annual installments over a period of approximately one, three, or five years, depending on the applicable liquidity facility. In addition, upon an event of default under any such liquidity facility, including a failure by Metropolitan to perform or observe its covenants under the applicable standby bond purchase agreement, a default in other specified indebtedness of Metropolitan, or other specified events of default (including a reduction in the credit rating assigned to Senior Revenue Bonds issued under the Senior Debt Resolutions by any of Fitch, S&P or Moody's below "A–" or "A3"), the liquidity provider could require all bank bonds to be subject to immediate mandatory redemption by Metropolitan.

The following table lists the liquidity providers, the expiration date of each facility and the principal amount of outstanding variable rate demand obligations covered under each facility as of May 1, 2019.

Liquidity Facilities and Expiration Dates

Liquidity Provider	Bond Issue	Principal Outstanding	Facility Expiration
Bank of America, N.A.	2016 Series B-1 and Series B-2	$103,670,000	July 2021
Citibank, N.A.	2000 Authorization Series B-3	$ 88,800,000	March 2020
Citibank, N.A.	2017 Authorization Series A	$ 80,000,000	March 2020
The Toronto-Dominion Bank, New York Branch	2018 Series A-1 and Series A-2	$210,040,000	June 2021
Total		$482,510,000	

Source: Metropolitan.

Interest Rate Swap Transactions. By resolution adopted on September 11, 2001, Metropolitan's Board authorized the execution of interest rate swap transactions and related agreements in accordance with a master swap policy, which was subsequently amended by resolutions adopted on July 14, 2009 and May 11, 2010. Metropolitan may execute interest rate swaps if the transaction can be expected to reduce exposure to changes in interest rates on a particular financial transaction or in the management of interest rate risk derived from Metropolitan's overall asset/liability balance, result in a lower net cost of borrowing or achieve a higher net rate of return on investments made in connection with or incidental to the issuance, incurring or carrying of Metropolitan's obligations or investments, or manage variable interest rate exposure consistent with prudent debt practices and Board-approved guidelines. The Chief Financial Officer reports to the Finance and Insurance Committee of Metropolitan's Board each quarter on outstanding swap transactions, including notional amounts outstanding, counterparty exposures and termination values based on then-existing market conditions.

Metropolitan currently has one type of interest rate swap, referred to in the table below as "Fixed Payor Swaps." Under this type of swap, Metropolitan receives payments that are calculated by reference to a floating interest rate and makes payments that are calculated by reference to a fixed interest rate.

Metropolitan's obligations to make regularly scheduled net payments under the terms of the interest rate swap agreements are payable on a parity with the Senior Parity Obligations. Termination payments under the 2002A and 2002B interest rate swap agreements would be payable on a parity with the Senior

Parity Obligations. Termination payments under all other interest rate swap agreements would be on parity with the Subordinate Parity Obligations.

The following swap transactions were outstanding as of May 1, 2019:

FIXED PAYOR SWAPS:

Designation	Notional Amount Outstanding	Swap Counterparty	Fixed Payor Rate	MWD Receives	Maturity Date
2002 A	$ 75,838,400	Morgan Stanley Capital Services, Inc.	3.300%	57.74% of one-month LIBOR	7/1/2025
2002 B	28,371,600	JPMorgan Chase Bank	3.300	57.74% of one-month LIBOR	7/1/2025
2003	158,597,500	Wells Fargo Bank	3.257	61.20% of one-month LIBOR	7/1/2030
2003	158,597,500	JPMorgan Chase Bank	3.257	61.20% of one-month LIBOR	7/1/2030
2004 C	7,760,500	Morgan Stanley Capital Services, Inc.	2.980	61.55% of one-month LIBOR	10/1/2029
2004 C	6,349,500	Citigroup Financial Products, Inc.	2.980	61.55% of one-month LIBOR	10/1/2029
2005	29,057,500	JPMorgan Chase Bank	3.360	70% of 3-month LIBOR	7/1/2030
2005	29,057,500	Citigroup Financial Products, Inc.	3.360	70% of 3-month LIBOR	7/1/2030
Total	$493,630,000				

Source: Metropolitan.

These interest rate swap agreements entail risk to Metropolitan. The counterparty may fail or be unable to perform, interest rates may vary from assumptions, Metropolitan may be required to post collateral in favor of its counterparties and Metropolitan may be required to make significant payments in the event of an early termination of an interest rate swap. Metropolitan believes that if such an event were to occur, it would not have a material adverse impact on its financial position. Metropolitan seeks to manage counterparty risk by diversifying its swap counterparties, limiting exposure to any one counterparty, requiring collateralization or other credit enhancement to secure swap payment obligations, and by requiring minimum credit rating levels. Initially, swap counterparties must be rated at least "Aa3" or "AA-", or equivalent by any two of the nationally recognized credit rating agencies; or use a "AAA" subsidiary as rated by at least one nationally recognized credit rating agency. Should the credit rating of an existing swap counterparty drop below the required levels, Metropolitan may enter into additional swaps if those swaps are "offsetting" and risk-reducing swaps. Each counterparty is initially required to have minimum capitalization of at least $150 million. See Note 5(f) in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

Early termination of an interest rate swap agreement could occur due to a default by either party or the occurrence of a termination event (including defaults under other specified swaps and indebtedness, certain acts of insolvency, if a party may not legally perform its swap obligations, or, with respect to Metropolitan, if its credit rating is reduced below "BBB–" by Moody's or "Baa3" by S&P (under most of the interest rate swap agreements) or below "BBB" by Moody's or "Baa2" by S&P (under one of the interest

rate swap agreements)). As of March 31, 2019, Metropolitan would have been required to pay to some of its counterparties termination payments if its swaps were terminated on that date. Metropolitan's net exposure to its counterparties for all such termination payments on that date was approximately $52.0 million. Metropolitan does not presently anticipate early termination of any of its interest rate swap agreements due to default by either party or the occurrence of a termination event. However, Metropolitan has previously exercised, and may in the future exercise, from time to time, optional early termination provisions to terminate all or a portion of certain interest rate swap agreements.

Metropolitan is required to post collateral in favor of a counterparty to the extent that Metropolitan's total exposure for termination payments to that counterparty exceeds the threshold specified in the applicable swap agreement. Conversely, the counterparties are required to release collateral to Metropolitan or post collateral for the benefit of Metropolitan as market conditions become favorable to Metropolitan. As of March 31, 2019, Metropolitan had no collateral posted with any counterparty. The highest, month-end, amount of collateral posted was $36.8 million, on June 30, 2012, which was based on an outstanding swap notional amount of $1.4 billion at that time. The amount of required collateral varies from time to time due primarily to interest rate movements and can change significantly over a short period of time. See "METROPOLITAN REVENUES–Financial Reserve Policy" in this Appendix A. In the future, Metropolitan may be required to post additional collateral, or may be entitled to a reduction or return of the required collateral amount. Collateral deposited by Metropolitan is held by the counterparties; a bankruptcy of any counterparty holding collateral posted by Metropolitan could adversely affect the return of the collateral to Metropolitan. Moreover, posting collateral limits Metropolitan's liquidity. If collateral requirements increase significantly, Metropolitan's liquidity may be materially adversely affected. See "METROPOLITAN REVENUES–Financial Reserve Policy" in this Appendix A.

Term Mode Bonds

As of May 1, 2019, Metropolitan had outstanding $48.1 million of Senior Revenue Bonds bearing interest in a term mode, comprised of $30.3 million of 2014 Series C Bonds in three series, and $17.8 million of 2014 Series G Bonds in two series (collectively, the "Term Mode Bonds"). The Term Mode Bonds initially bear interest at a fixed rate for a specified period from their date of issuance, after which there shall be determined a new interest mode for each series (which may be another term mode, a daily mode, a weekly mode, a short-term mode or an index mode) or the Term Mode Bonds may be converted to bear fixed interest rates through the maturity date thereof. The owners of the Term Mode Bonds of a series must tender for purchase, and Metropolitan must purchase, all of the Term Mode Bonds of such series on the specified scheduled mandatory tender date of each term period for such series. The Term Mode Bonds outstanding as of May 1, 2019, are summarized in the following table:

Term Mode Bonds

Series	Original Principal Amount Issued	Next Scheduled Mandatory Tender Date
2014 C-1	$13,505,000	October 1, 2019[1]
2014 C-2	14,020,000	October 1, 2020
2014 C-3	2,810,000	October 1, 2021
2014 G-4	11,605,000	October 1, 2019[2]
2014 G-5	6,205,000	October 1, 2020
Total	$48,145,000	

Source: Metropolitan.

(1) To be refunded by Metropolitan's Water Revenue Refunding Bonds, 2019 Series A.

(2) Expected to be refunded by Metropolitan's Subordinate Water Revenue Refunding Bonds, 2019 Series A.

Metropolitan will pay the principal of, and interest on, the Term Mode Bonds on parity with its other Senior Revenue Bonds. Metropolitan anticipates that it will pay the purchase price of tendered Term Mode Bonds from the proceeds of remarketing such Term Mode Bonds or from other available funds. Metropolitan's obligation to pay the purchase price of any tendered Term Mode Bonds is an unsecured, special limited obligation of Metropolitan payable from Net Operating Revenues. Purchase price payments of Term Mode Bonds are subordinate to both the Senior Revenue Bonds and Senior Parity Obligations and to the Subordinate Revenue Bonds and Subordinate Parity Obligations. Metropolitan has not secured any liquidity facility or letter of credit to support the payment of the purchase price of Term Mode Bonds in connection with any scheduled mandatory tender. If the purchase price of the Term Mode Bonds of any series is not paid from the proceeds of remarketing or other funds following a scheduled mandatory tender, such Term Mode Bonds will then bear interest at a default rate of up to 12 percent per annum until purchased by Metropolitan or redeemed. Failure to pay the purchase price of a series of Term Mode Bonds on a scheduled mandatory tender date is a default under the related paying agent agreement, upon the occurrence and continuance of which a majority in aggregate principal amount of the owners of such series of Term Mode Bonds may elect a bondholders' committee to exercise rights and powers of such owners under such paying agent agreement. Failure to pay the purchase price of a series of Term Mode Bonds on a scheduled mandatory tender date is not a default under the Senior Debt Resolutions. If the purchase price of the Term Mode Bonds of any series is not paid on a scheduled mandatory tender date, such Term Mode Bonds will also be subject to special mandatory redemption, in part, 18, 36 and 54 months following the purchase default. Any such special mandatory redemption payment will constitute an obligation payable on parity with the Senior Revenue Bonds and Senior Parity Obligations.

Build America Bonds

Metropolitan previously issued and designated three series of Senior Revenue Bonds in the aggregate principal amount of $578.385 million as "Build America Bonds" under the provisions of the American Recovery and Reinvestment Act of 2009 (the "Build America Bonds"). Metropolitan currently expects to receive cash subsidies from the United States Treasury (the "Interest Subsidy Payments") equal to 35 percent of the interest payable on all such outstanding Build America Bonds less any federal budget sequestration offsets as described in the following paragraph. The Interest Subsidy Payments in connection with the Build America Bonds do not constitute Operating Revenues under the Senior Debt Resolutions or the Subordinate Debt Resolutions. Such Interest Subsidy Payments will constitute Additional Revenues, which Metropolitan may take into consideration when establishing its rates and charges and will be available to Metropolitan to pay principal of and interest on Metropolitan's Bonds.

The Budget Control Act of 2011 (the "Budget Control Act") provided for increases in the federal debt limit and established procedures designed to reduce the federal budget deficit. The Budget Control Act provided that a failure to reduce the deficit would result in sequestrations, which are automatic, generally across-the-board, spending reductions. These reductions began on March 1, 2013 pursuant to an executive order that reduced budgetary authority for expenditures subject to sequestration, including subsidies for Build America Bonds. Pursuant to this executive order, the approximately $6.64 million semi-annual Interest Subsidy Payment that Metropolitan was to receive on or about July 1, 2013 was reduced by 8.7 percent, or $578,000, to $6.06 million. The percentage reduction is re-determined for each federal fiscal year. Interest Subsidy Payments processed in the subsequent federal fiscal years ended September 30, 2014 through 2018 were also reduced by the applicable sequestration rate for each such federal fiscal year, which sequestration rate ranged from 6.6 percent to 7.3 percent for such federal fiscal years. Interest Subsidy Payments processed on or after October 1, 2018 and on or before September 30, 2019 are to be reduced by the federal fiscal year 2018 sequestration rate of 6.2 percent. At present, pursuant to federal legislation, sequestration will continue to September 30, 2027. Metropolitan can offer no assurances as to future subsidy payments and expects that once it receives less than any full 35 percent subsidy payment, the United States Treasury will not thereafter reimburse Metropolitan for payments not made. Metropolitan expects to refund $78,385,000 Water Revenue Bonds, 2008 Authorization Series C (Build America Bonds) and $250,000,000 Water Revenue Bonds, 2008

Authorization Series D (Build America Bonds) with its Water Revenue Refunding Bonds, 2019 Series A and Subordinate Water Revenue Refunding Bonds, 2019 Series A.

Senior Parity Obligations

Short-Term Revolving Credit Facility. In April 2016, Metropolitan entered into a noteholder's agreement (such agreement as subsequently amended, the "RBC Short-Term Revolving Credit Facility") with RBC Municipal Products, LLC ("RBC") and a related note purchase agreement with RBC Capital Products, LLC, as the underwriter, for the issuance and sale by Metropolitan and the purchase by RBC of Metropolitan's Index Notes, Series 2016. Pursuant to the RBC Short-Term Revolving Credit Facility, Metropolitan may borrow, pay down and re-borrow amounts, through the issuance and sale from time to time of up to $200 million of notes (including, subject to certain terms and conditions, notes to refund maturing notes) to be purchased by RBC during the term of RBC's commitment thereunder (which commitment currently extends to April 5, 2022). As of May 1, 2019, Metropolitan has outstanding $0 of short-term notes under the RBC Short-Term Revolving Credit Facility. Any unpaid principal remaining outstanding at the April 5, 2022 commitment end date of the RBC Short-Term Revolving Credit Facility is required to be paid by Metropolitan in quarterly installments over a period of approximately one year.

Notes under the RBC Short-Term Revolving Credit Facility bear interest at a variable rate of interest: for taxable borrowings, at a spread of 0.54 percent (so long as the current credit rating on Metropolitan's Senior Revenue Bonds issued under the Senior Debt Resolutions is maintained) to the one-month LIBOR; and for tax-exempt borrowings, at a spread of 0.38 percent (so long as the current credit rating on Metropolitan's Senior Revenue Bonds issued under the Senior Debt Resolutions is maintained) to the SIFMA Municipal Swap Index. Under the RBC Short-Term Revolving Credit Facility, upon a failure by Metropolitan to pay principal or interest of any note thereunder, a failure by Metropolitan to perform or observe its covenants, a default in other specified indebtedness of Metropolitan, certain acts of insolvency, or other specified events of default (including a reduction in the credit rating assigned to Senior Revenue Bonds issued under the Senior Debt Resolutions by Fitch, S&P or Moody's below "A–" or "A3"), the bank has the right to terminate its commitments and may accelerate (depending on the event, seven days after the occurrence, or for certain events, only after 180 days' notice) Metropolitan's obligation to repay its borrowings. Metropolitan has secured its obligation to pay principal and interest on notes evidencing borrowings under the RBC Short-Term Credit Facility as Senior Parity Obligations.

In connection with the execution of the RBC Short-Term Revolving Credit Facility, Metropolitan designated the principal and interest payable on the notes thereunder as Excluded Principal Payments under the Senior Debt Resolutions and thus, for purposes of calculating Maximum Annual Debt Service, included the amount of principal and interest due and payable under the RBC Short-Term Revolving Credit Facility on a schedule of Assumed Debt Service. This schedule of Assumed Debt Service assumes that Metropolitan will pay the principal under the RBC Short-Term Revolving Credit Facility over a period of 30 years at a fixed interest rate of approximately 3.3 percent.

Metropolitan has previously, and may in the future, enter into one or more other or alternative short-term revolving credit facilities, the repayment obligations of Metropolitan under which may be secured as either Senior Parity Obligations or Subordinate Parity Obligations.

Outstanding Subordinate Revenue Bonds and Subordinate Parity Obligations

The water revenue bonds issued under the Subordinate Debt Resolutions outstanding as of May 1, 2019, are set forth below:

Name of Issue	Principal Outstanding
Subordinate Water Revenue Bonds, 2016 Authorization Series A[(1)]	$175,000,000
Subordinate Water Revenue Refunding Bonds, 2017 Series A	238,015,000
Subordinate Water Revenue Refunding Bonds, 2017 Series B	178,220,000
Subordinate Water Revenue Bonds, 2017 Series C[(1)]	80,000,000
Subordinate Water Revenue Refunding Bonds, 2017 Series D[(1)]	95,630,000
Subordinate Water Revenue Refunding Bonds, 2017 Series E[(1)]	95,625,000
Subordinate Water Revenue Refunding Bonds, 2018 Series A	99,075,000
Subordinate Water Revenue Bonds, 2018 Series B	64,345,000
Total	$1,025,910,000

Source: Metropolitan.

(1) Outstanding variable rate obligation.

As of May 1, 2019, of the $1.03 billion outstanding Subordinate Revenue Bonds, $446.3 million were variable rate obligations. The outstanding variable rate Subordinate Revenue Bonds are all bonds bearing interest in a LIBOR Index Mode or a SIFMA Index Mode.

In December 2016, Metropolitan entered into a Continuing Covenant Agreement with Bank of America, N.A. ("BANA," and the "2016 BANA Agreement"), for the purchase by BANA and sale by Metropolitan of $175 million Subordinate Water Revenue Bonds, 2016 Authorization Series A (the "Subordinate 2016 Series A Bonds"), which was the first series of bonds issued under the Subordinate Debt Resolutions. Proceeds were used to reimburse Metropolitan for the purchase of the Delta Islands in the San Francisco Bay\Sacramento-San Joaquin River Delta that was funded from Metropolitan's reserves in July 2016.

The Subordinate 2016 Series A Bonds bear interest at a variable rate of interest, at a spread of 0.32 percent (so long as the current credit rating on Metropolitan's Senior Revenue Bonds issued under the Senior Debt Resolutions is maintained) to one-month LIBOR. Under the 2016 BANA Agreement, upon a failure by Metropolitan to pay principal or interest of any Subordinate 2016 Series A Bonds, a failure by Metropolitan to perform or observe its covenants, a default in other specified indebtedness of Metropolitan, certain acts of insolvency, or other specified events of default (including if S&P shall have assigned a credit rating below "BBB–," or if any of Fitch, S&P or Moody's shall have assigned a credit rating below "BBB" or "Baa2," to Senior Revenue Bonds issued under the Senior Debt Resolutions), BANA has the right to terminate its commitments and may accelerate (depending on the event, seven days after the occurrence, or for certain events, only after 180 days' notice) Metropolitan's obligation to repay the Subordinate 2016 Series A Bonds. Metropolitan has secured its obligation to pay principal and interest under the 2016 BANA Agreement as a Subordinate Parity Obligation. The Subordinate 2016 Series A Bonds are Index Tender Bonds and are subject to mandatory tender for purchase on the scheduled mandatory tender date of December 21, 2020, or, if directed by BANA upon the occurrence and continuance of an event of default under the 2016 BANA Agreement, five business days after receipt of such direction. On or before the scheduled mandatory tender date, Metropolitan may request an extension of the 2016 BANA Agreement for another tender period or may request BANA to purchase the Subordinate 2016 Series A Bonds in another interest rate mode, or Metropolitan may seek to remarket the Subordinate 2016 Series A Bonds to another bank or in the public debt markets. In the event the 2016 BANA Agreement is not extended, Metropolitan is obligated under the 2016 BANA Agreement to cause unremarketed Subordinate 2016 Series A Bonds to be redeemed five business days after the scheduled mandatory tender date in the event the purchase price of the Subordinate 2016 Series A Bonds is not paid from the proceeds of a remarketing or other funds on the scheduled mandatory tender date. A failure to pay the purchase price of the Subordinate 2016 Series A Bonds upon a mandatory tender would constitute a default under the Subordinate Debt Resolutions if not remedied within five business days.

Metropolitan's Subordinate Water Revenue Bonds, 2017 Series C, Subordinate Water Revenue Refunding Bonds, 2017 Series D and Subordinate Water Revenue Refunding Bonds, 2017 Series E (collectively, the "Subordinate 2017 Series C, D and E Bonds") bear interest at a rate that fluctuates weekly based on the SIFMA Municipal Swap Index plus a spread. The Subordinate 2017 Series C, D and E Bonds are Index Tender Bonds and are subject to mandatory tender under certain circumstances, including on certain scheduled mandatory tender dates (unless earlier remarketed or otherwise retired). Metropolitan anticipates that it will pay the purchase price of tendered Subordinate 2017 Series C, D and E Bonds from the proceeds of remarketing such Index Tender Bonds or from other available funds. Metropolitan's obligation to pay the purchase price of any such tendered Subordinate 2017 Series C, D and E Bonds is a special limited obligation of Metropolitan payable solely from Net Operating Revenues subordinate to the Senior Revenue Bonds and Senior Parity Obligations and on parity with the other outstanding Subordinate Revenue Bonds and Subordinate Parity Obligations. Metropolitan has not secured any liquidity facility or letter of credit to support the payment of the purchase price of Subordinate 2017 Series C, D and E Bonds in connection with a scheduled mandatory tender. Failure to pay the purchase price of any Subordinate 2017 Series C, D and E Bonds on a scheduled mandatory tender date for such Index Tender Bonds for a period of five business days following written notice by any Owner of such Subordinate 2017 Series C, D and E Bonds will constitute an event of default under the Subordinate Debt Resolutions, upon the occurrence and continuance of which the owners of 25 percent in aggregate principal amount of the Subordinate Revenue Bonds then outstanding may elect a bondholders' committee to exercise rights and powers of such owners under the Subordinate Debt Resolutions, including the right to declare the entire unpaid principal of the Subordinate Revenue Bonds then outstanding to be immediately due and payable.

The mandatory tender dates and related tender periods for the Index Tender Bonds outstanding as of May 1, 2019, are summarized in the following table:

Index Tender Bonds

Series	Date of Issuance	Original Principal Amount Issued	Next Scheduled Mandatory Tender Date	Maturity Date
Subordinate 2016 Authorization Series A	December 21, 2016	$175,000,000	December 21, 2020	July 1, 2045
Subordinate 2017 Series C	July 3, 2017	80,000,000	July 25, 2019	July 1, 2047
Subordinate 2017 Refunding Series D	July 3, 2017	95,630,000	July 25, 2019	July 1, 2037
Subordinate 2017 Refunding Series E	July 3, 2017	95,625,000	July 25, 2019	July 1, 2037
Total		$446,255,000		

Source: Metropolitan.

Subordinate Short-Term Certificates. On August 1, 2018, Metropolitan entered into a note purchase and continuing covenant agreement with BANA (the "BANA Short-Term Note Purchase Agreement") for the purchase by BANA and sale by Metropolitan of Metropolitan's Short-Term Revenue Certificates, Series 2018 A. Pursuant to the terms of the BANA Short-Term Note Purchase Agreement, Metropolitan may borrow, through the issuance and sale from time to time of short-term notes, an aggregate principal amount not to exceed $86 million (including, subject to certain terms and conditions, notes to refund maturing notes) to be purchased by BANA during the term of BANA's commitment thereunder (the stated termination date of which is currently July 31, 2020). As of May 1, 2019, Metropolitan has sold $46.8 million of short-term notes under the BANA Short-Term Note Purchase Agreement for the purpose of providing advance funding to support the California WaterFix as authorized by the Board on July 10, 2018. On May 2, 2019, DWR withdrew its approval of California WaterFix and announced plans to pursue a new planning and environmental review process for a single tunnel Bay-Delta conveyance project. See "METROPOLITAN'S WATER SUPPLY–State Water Project –Bay-Delta Proceedings Affecting State Water Project – Bay-Delta Planning Activities" in this Appendix A.

Notes under the BANA Short-Term Note Purchase Agreement bear interest at a fluctuating per annum interest rate, equal to one-month LIBOR plus a spread of 0.32 percent (so long as the current credit rating on Metropolitan's Senior Revenue Bonds issued under the Senior Debt Resolutions is maintained). Under the BANA Short-Term Note Purchase Agreement, upon a failure by Metropolitan to pay principal or interest of any note thereunder, upon a failure by Metropolitan to perform or observe its covenants, a default in other specified indebtedness of Metropolitan, certain acts of insolvency, or other specified events of default (including if S&P shall have assigned a credit rating below "BBB–," or if any of Fitch, S&P or Moody's shall have assigned a credit rating below "BBB" or "Baa2," to Senior Revenue Bonds issued under the Senior Debt Resolutions), BANA has the right to terminate its commitments and may accelerate (depending on the event, seven days after the occurrence, or for certain events, only after 180 days' notice) Metropolitan's obligation to repay its borrowings. Metropolitan has secured its obligations to pay principal and interest under the BANA Short-Term Note Purchase Agreement as Subordinate Parity Obligations, payable from Net Operating Revenues on a basis junior and subordinate to the Senior Revenue Bonds and Senior Parity Obligations.

Self-Liquidity Revolving Credit Agreement. In June 2018, Metropolitan entered into a revolving credit agreement (the "ICBC Self-Liquidity Revolving Credit Agreement") with the Industrial and Commercial Bank of China Limited, New York Branch ("ICBC"), under the terms of which Metropolitan may borrow up to $200 million for the purpose of paying the purchase price of tendered Self-Liquidity Bonds, including any Senior Revenue Bonds and/or Subordinate Revenue Bonds of Metropolitan that are part of Metropolitan's self-liquidity program. The stated expiration date of the ICBC Self-Liquidity Revolving Credit Agreement is June 23, 2023.

Borrowings made by Metropolitan under the ICBC Revolving Credit Agreement initially bear interest at a fluctuating per annum interest rate equal to, at Metropolitan's discretion, either: (a) one month LIBOR plus 1.50 percent; or (b) the higher of (i) the Federal Funds Rate plus 0.50 percent, and (ii) the Prime Rate, (increasing in any case periodically, beginning after 90 days). Metropolitan is required to pay principal remaining unpaid as of the earlier of the 180th day following the date of the related borrowing or the stated expiration date of the ICBC Self-Liquidity Revolving Credit Agreement in semi-annual installments over a period of approximately five years. Under the ICBC Self-Liquidity Revolving Credit Agreement, upon a failure by Metropolitan to perform or observe its covenants, a default in other specified indebtedness of Metropolitan, or other specified events of default (including a reduction in the credit rating assigned to Subordinate Revenue Bonds issued under the Subordinate Debt Resolutions or any Subordinate Parity Obligation by any of Fitch, S&P or Moody's below "BBB" or "Baa2"), ICBC has the right to terminate its commitments and may accelerate Metropolitan's obligation to repay its borrowings. Metropolitan has secured its obligations to pay principal and interest under the ICBC Self-Liquidity Revolving Credit Agreement as Subordinate Parity Obligations, payable from Net Operating Revenues on a basis junior and subordinate to the Senior Revenue Bonds and Senior Parity Obligations. In addition, Metropolitan has secured its obligations under the ICBC Self-Liquidity Revolving Credit Agreement with a pledge of any principal and interest it receives from Self-Liquidity Bonds it purchases from borrowings under the ICBC Self-Liquidity Revolving Credit Agreement.

Metropolitan has previously, and may in the future, enter into one or more other or alternative self-liquidity revolving credit agreements (a "Self-Liquidity Revolving Credit Agreement"). Metropolitan may secure its obligation to pay principal and interest under any new Self-Liquidity Revolving Credit Agreement as either Senior Parity Obligations or Subordinate Parity Obligations. Metropolitan has no obligation to make borrowings under, maintain, or renew any Self-Liquidity Revolving Credit Agreement, including the ICBC Self-Liquidity Revolving Credit Agreement. See also "–Limitations on Additional Revenue Bonds."

Pursuant to the Master Subordinate Resolution, for purposes of calculating the amount of Debt Service thereunder, Metropolitan has included the amount of principal and interest due and payable under the ICBC Self-Liquidity Revolving Credit Agreement on a schedule of Revolving Credit Agreement Debt

Service (as defined in the Master Subordinate Resolution). This schedule of Revolving Credit Agreement Debt Service initially assumes that Metropolitan will pay the principal under the ICBC Self-Liquidity Revolving Credit Agreement over a period of 30 years at a fixed interest rate of 2.97 percent. Pursuant to the terms of the Revenue Bond Resolutions, while a Self-Liquidity Revolving Credit Agreement is in force and effect, when Metropolitan calculates its covenant relating to the creation or incurrence of additional indebtedness, it will add an amount to its Net Operating Revenues relating to an assumed annual debt service payment that Metropolitan would receive if it were to use the proceeds of the Self-Liquidity Revolving Credit Agreement to purchase Self-Liquidity Bonds.

Other Junior Obligations

Metropolitan currently is authorized to issue up to $400,000,000 of Commercial Paper Notes payable from Net Operating Revenues on a basis subordinate to both the Senior Revenue Bonds and Senior Parity Obligations and to the Subordinate Revenue Bonds and Subordinate Parity Obligations. Although no Commercial Paper Notes are currently outstanding, the authorization remains in full force and effect and Metropolitan may issue Commercial Paper Notes from time to time.

General Obligation Bonds

As of May 1, 2019, $48,050,000 aggregate principal amount of general obligation bonds payable from ad valorem property taxes were outstanding. See "METROPOLITAN REVENUES–General" and "–Revenue Allocation Policy and Tax Revenues" in this Appendix A. Metropolitan's revenue bonds are not payable from the levy of ad valorem property taxes.

General Obligation Bonds	Amount Issued[1]	Principal Outstanding
Waterworks General Obligation Refunding Bonds, 2010 Series A	39,485,000	18,735,000
Waterworks General Obligation Refunding Bonds, 2014 Series A	49,645,000	12,560,000
Waterworks General Obligation Refunding Bonds, 2019 Series A	16,755,000	16,755,000
Total	$105,885,000	$48,050,000

Source: Metropolitan.

(1) Voters authorized Metropolitan to issue $850,000,000 of Waterworks General Obligation Bonds, Election 1966, in multiple series, in a special election held on June 7, 1966. This authorization has been fully utilized. This table lists bonds that refunded such Waterworks General Obligation Bonds, Election 1966.

State Water Contract Obligations

General. As described herein, in 1960, Metropolitan entered into its State Water Contract with DWR to receive water from the State Water Project. All expenditures for capital and operations, maintenance, power and replacement costs associated with the State Water Project facilities used for water delivery are paid for by the 29 Contractors that have executed State water supply contracts with DWR, including Metropolitan. Contractors are obligated to pay allocable portions of the cost of construction of the system and ongoing operating and maintenance costs through at least 2035, regardless of quantities of water available from the project. Other payments are based on deliveries requested and actual deliveries received, costs of power required for actual deliveries of water, and offsets for credits received. In exchange, Contractors have the right to participate in the system, with an entitlement to water service from the State Water Project and the right to use the portion of the State Water Project conveyance system necessary to deliver water to them at no additional cost as long as capacity exists. Metropolitan's State Water Contract accounts for nearly one-half of the total entitlement for State Water Project water contracted for by all Contractors.

DWR and other State Water Contractors, including Metropolitan, have reached an Agreement in Principle to extend their State water supply contracts to 2085 and to make certain changes related to the

financial management of the State Water Project in the future. See "METROPOLITAN'S WATER SUPPLY–State Water Project" in this Appendix A.

Metropolitan's payment obligation for the State Water Project for the fiscal year ended June 30, 2018 was $527.3 million, which amount reflects prior year's credits of $43.8 million. For the fiscal year ended June 30, 2018, Metropolitan's payment obligations under the State Water Contract were approximately 34 percent of Metropolitan's total annual expenses. A portion of Metropolitan's annual property tax levy is for payment of State Water Contract obligations, as described above under "METROPOLITAN REVENUES–Revenue Allocation Policy and Tax Revenues" in this Appendix A. Any deficiency between tax levy receipts and Metropolitan's State Water Contract obligations is expected to be paid from Operating Revenues, as defined in the Senior Debt Resolutions. See Note 9(a) to Metropolitan's audited financial statements in Appendix B for an estimate of Metropolitan's payment obligations under the State Water Contract. See also "–Power Sources and Costs; Related Long-Term Commitments" for a description of current and future costs for electric power required to operate State Water Project pumping systems and a description of litigation involving the federal relicensing of the Hyatt-Thermalito hydroelectric generating facilities at Lake Oroville.

Metropolitan capitalizes its share of the State Water Project capital costs as participation rights in State Water Project facilities as such costs are billed by DWR. Unamortized participation rights essentially represent a prepayment for future water deliveries through the State Water Project system. Metropolitan's share of system operating and maintenance costs are annually expensed.

DWR and various subsets of the State Water Contractors have entered into amendments to the State water supply contracts related to the financing of certain State Water Project facilities. The amendments establish procedures to provide for the payment of construction costs financed by DWR bonds by establishing separate subcategories of charges to produce the revenues required to pay all of the annual financing costs (including coverage on the allocable bonds) relating to the financed project. If any affected Contractor defaults on payment under certain of such amendments, the shortfall may be collected from the non-defaulting affected Contractors, subject to certain limitations.

These amendments represent additional long-term obligations of Metropolitan, as described below.

Devil Canyon-Castaic Contract. On June 23, 1972, Metropolitan and five other Southern California public agencies entered into a contract (the "Devil Canyon-Castaic Contract") with DWR for the financing and construction of the Devil Canyon and Castaic power recovery facilities, located on the aqueduct system of the State Water Project. Under this contract, DWR agreed to build the Devil Canyon and Castaic facilities, using the proceeds of revenue bonds issued by DWR under the State Central Valley Project Act. DWR also agreed to use and apply the power made available by the construction and operation of such facilities to deliver water to Metropolitan and the other contracting agencies. Metropolitan, in turn, agreed to pay to DWR 88 percent of the debt service on the revenue bonds issued by DWR. For calendar year 2018, this represented a payment of $7.8 million. In addition, Metropolitan agreed to pay 78.5 percent of the operation and maintenance expenses of the Devil Canyon facilities and 96 percent of the operation and maintenance expenses of the Castaic facilities. Metropolitan's obligations under the Devil Canyon-Castaic Contract continue until the bonds are fully retired in 2022 even if DWR is unable to operate the facilities or deliver power from these facilities.

Off-Aqueduct Power Facilities. In addition to system "on-aqueduct" power facilities costs, DWR has, either on its own or by joint venture, financed certain off-aqueduct power facilities. The power generated is utilized by the system for water transportation and other State Water Project purposes. Power generated in excess of system needs is marketed to various utilities and the California Independent System Operator ("CAISO"). Metropolitan is entitled to a proportionate share of the revenues resulting from sales of excess power. By virtue of a 1982 amendment to the State Water Contract and the other water supply contracts,

Metropolitan and the other water Contractors are responsible for paying the capital and operating costs of the off-aqueduct power facilities regardless of the amount of power generated.

East Branch Enlargement Amendment. In 1986, Metropolitan's State Water Contract and the water supply contracts of certain other State Water Contractors were amended for the purpose, among others, of financing the enlargement of the East Branch of the California Aqueduct. Under the amendment, enlargement of the East Branch can be initiated either at Metropolitan's request or by DWR finding that enlargement is needed to meet demands. Metropolitan, the other State Water Contractors on the East Branch, and DWR are currently in discussions on the timetable and plan for future East Branch enlargement actions.

The amendment establishes a separate subcategory of the Transportation Charge under the State Water Contract for the East Branch Enlargement and provides for the payment of costs associated with financing and operating the East Branch Enlargement. Under the amendment, the annual financing costs for such facilities financed by bonds issued by DWR are allocated among the participating Contractors based upon the delivery capacity increase allocable to each participating Contractor. Such costs include, but are not limited to, debt service, including coverage requirements, deposits to reserves, and certain operation and maintenance expenses, less any credits, interest earnings or other moneys received by DWR in connection with this facility.

If any participating Contractor defaults on payment of its allocable charges under the amendment, among other things, the non-defaulting participating Contractors may assume responsibility for such charges and receive delivery capability that would otherwise be available to the defaulting participating Contractor in proportion to the non-defaulting Contractor's participation in the East Branch Enlargement. If participating Contractors fail to cure the default, Metropolitan will, in exchange for the delivery capability that would otherwise be available to the defaulting participating Contractor, assume responsibility for the capital charges of the defaulting participating Contractor.

Water System Revenue Bond Amendment. In 1987, the State Water Contract and other water supply contracts were amended for the purpose of financing State Water Project facilities through revenue bonds. This amendment establishes a separate subcategory of the Delta Water Charge and the Transportation Charge under the State water supply contracts for projects financed with DWR water system revenue bonds. This subcategory of charge provides the revenues required to pay the annual financing costs of the bonds and consists of two elements. The first element is an annual charge for repayment of capital costs of certain revenue bond financed water system facilities under the existing water supply contract procedures. The second element is a water system revenue bond surcharge to pay the difference between the total annual charges under the first element and the annual financing costs, including coverage and reserves, of DWR's water system revenue bonds.

If any Contractor defaults on payment of its allocable charges under this amendment, DWR is required to allocate a portion of the default to each of the nondefaulting Contractors, subject to certain limitations, including a provision that no nondefaulting Contractor may be charged more than 125 percent of the amount of its annual payment in the absence of any such default. Under certain circumstances, the nondefaulting Contractors would be entitled to receive an allocation of the water supply of the defaulting Contractor.

The following table sets forth Metropolitan's projected costs of State Water Project water based upon DWR's Appendix B to Bulletin 132-17 (an annual report produced by DWR setting forth data and computations used by the State in determining State Water Contractors' Statements of Charges), California WaterFix costs forecasted based on a 64.6 percent share of the California WaterFix as authorized by the Board on July 10, 2018, and power costs forecasted by Metropolitan. The projections are included in Metropolitan's adopted biennial budget for fiscal years 2018-19 and 2019-20 and the ten-year financial forecast included in the adopted budget. See also "HISTORICAL AND PROJECTED REVENUES AND

EXPENSES" in this Appendix A. The projections reflect certain assumptions concerning future events and circumstances which may not occur or materialize. Actual costs may vary from these projections if such events and circumstances do not occur as expected or materialize, and such variances may be material.

As noted herein, on May 2, 2019, DWR withdrew its approval of the two tunnel California WaterFix project and announced plans to pursue a new planning and environmental review process for a single tunnel Bay-Delta conveyance project. As DWR has only recently announced its intent to undertake planning and environmental review of a proposed single tunnel project, no cost estimates for such activities or proposed project have yet been developed. Therefore, Metropolitan's costs associated with any such future activities or proposed project, if any, will inevitably vary from the amounts projected in the table below. Metropolitan expects to prepare an updated financial forecast as part of its normal budgeting process after the relevant determinations with respect to a proposed single tunnel project's scope and estimated costs and any commitment by Metropolitan therefor have been made. See "METROPOLITAN'S WATER SUPPLY–State Water Project –Bay-Delta Proceedings Affecting State Water Project – Bay-Delta Planning Activities" in this Appendix A.

PROJECTED COSTS OF METROPOLITAN
FOR STATE WATER CONTRACT AND CALIFORNIA WATERFIX
(Dollars in Millions)

Year Ending June 30	Capital Costs[1]	Minimum OMP&R[1]	Power Costs[2]	Refunds & Credits[1]	California WaterFix[3]	Total[4]
2020	$168.0	$291.6	$170.9	$(41.0)	$13.0	$602.5
2021	163.0	297.4	180.9	(43.2)	50.9	649.0
2022	163.3	316.1	189.8	(37.0)	82.3	714.5
2023	161.8	335.8	197.1	(37.1)	128.4	786.0
2024	160.2	351.9	202.2	(35.9)	185.9	864.3

Source: Metropolitan.

(1) Capital Costs, Minimum Operations, Maintenance, Power and Replacement ("OMP&R") and Refunds and Credits projections are based on Appendix B to Bulletin 132-17.

(2) Power costs are forecasted by Metropolitan based on a 50 percent State Water Project allocation. Availability of State Water Project supplies vary and deliveries may include transfers and storage. All deliveries are based upon availability, as determined by hydrology, water quality and wildlife conditions. See "METROPOLITAN'S WATER SUPPLY–State Water Project" and "–Endangered Species Act and Other Environmental Considerations" in this Appendix A.

(3) Based on Metropolitan's forecast of costs for a 64.6 percent share of the California WaterFix as authorized by the Board on July 10, 2018.

(4) Totals may not add due to rounding.

Power Sources and Costs; Related Long-Term Commitments

Current and future costs for electric power required for operating the pumping systems of the CRA and the State Water Project are a substantial part of Metropolitan's overall expenses. Metropolitan's power costs include various ongoing fixed annual obligations under its contracts with the U.S. Department of Energy Western Area Power Administration and the U.S. Department of Interior Bureau of Reclamation for power from the Hoover and Parker Power Plants respectively. Expenses for electric power for the CRA for the fiscal years 2016-17 and 2017-18 were approximately $26.2 million (net of CRA power revenues) and $29.1 million (gross CRA power expenses), respectively. Expenses for electric power and transmission service for the State Water Project for fiscal years 2016-17 and 2017-18 were approximately $161.0 million and $156.5 million, respectively. Electricity markets are subject to volatility and Metropolitan is unable to give any assurance with respect to the magnitude of future power costs.

Colorado River Aqueduct. Approximately 50 percent of the annual power requirements for pumping at full capacity (1.25 million acre-feet of Colorado River water) in Metropolitan's CRA are secured through long-term contracts for energy generated from federal facilities located on the Colorado River (Hoover Power Plant and Parker Power Plant). Payments made under the Hoover Power Plant and Parker Power Plant contracts are operation and maintenance expenses. These contracts provide Metropolitan with reliable and economical power resources to pump Colorado River water to Metropolitan's service area.

As provided for under the Hoover Power Allocation Act of 2011 (H.R. 470), Metropolitan has executed a 50-year agreement with the Western Area Power Administration for the continued purchase of electric energy generated at the Hoover Power Plant through September 2067, succeeding Metropolitan's prior Hoover contract that expired on September 30, 2017.

Depending on pumping conditions, Metropolitan can require additional energy in excess of the base resources available to Metropolitan from the Hoover and Parker Power Plants. The remaining up to approximately 50 percent of annual pumping power requirements for full capacity pumping on the CRA is obtained through energy purchases from municipal and investor-owned utilities, third party suppliers, or the CAISO markets. Metropolitan is a member of the Western Systems Power Pool ("WSPP"), and utilizes its industry standard form contract to make wholesale power purchases at market cost.

Gross diversions of water from Lake Havasu for fiscal years 2016-17 and 2017-18 were approximately 766,000 acre-feet and 786,000 acre-feet, respectively, including Metropolitan's basic apportionment of Colorado River water and supplies from water transfer and storage programs. In fiscal years 2016-17 and 2017-18, Metropolitan purchased approximately 32,000 and 95,000 megawatt-hours, respectively, of additional energy.

Prior to its expiration on September 30, 2017, Metropolitan was party to a 30-year Service and Interchange Agreement with Southern California Edison ("Edison"), which included provisions for the sharing between Metropolitan and Edison of the benefits realized by the integrated operation of Edison's and Metropolitan's electric systems. Under this agreement Edison also provided Metropolitan with varying amounts of additional energy (benefit energy) for CRA pumping. Metropolitan anticipates market power purchases will replace benefit energy and has reflected the additional costs in the CRA power cost projections for fiscal year 2018-19 and the ten-year financial forecast.

To replace the services previously provided by Edison under the Service and Interchange Agreement, Metropolitan has negotiated new agreements with several parties. In particular, Metropolitan has agreements with the Arizona Electric Power Cooperative ("AEPCO") to provide transmission and energy purchasing services to support CRA power operations. The term of these agreements extends to December 31, 2035.

State Water Project. The State Water Project's power requirements are met from a diverse mix of resources, including State-owned hydroelectric generating facilities. DWR has long-term contracts with Metropolitan (hydropower), and mid-term contracts with Metropolitan (hydropower), Kern River Conservation District (hydropower), Northern California Power Agency (natural gas generation), Wells Fargo Company (Solar), Dominion Solar Holdings (Solar), and S-Power Corporation (Solar). The remainder of the State Water Project power needs is met by short-term purchases.

DWR is seeking renewal of the license issued by FERC for the State Water Project's Hyatt-Thermalito hydroelectric generating facilities at Lake Oroville. A Settlement Agreement containing recommended conditions for the new license was submitted to FERC in March 2006. That agreement was signed by over 50 stakeholders, including Metropolitan and other State Water Contractors. With only a few minor modifications, FERC staff recommended that the Settlement Agreement be adopted as the condition for the new license. DWR issued a final EIR for the relicensing project on July 22, 2008. On August 21,

2008, Butte County and Plumas County filed separate lawsuits against DWR challenging the adequacy of the final EIR. This lawsuit also named all of the signatories to the Settlement Agreement, including Metropolitan, as "real parties in interest," since they could be adversely affected by this litigation. On May 16, 2012, the trial court found that the EIR prepared in conjunction with the relicensing was adequate and dismissed the lawsuit against DWR. On August 7, 2012, Butte and Plumas Counties filed a notice of appeal. Briefing on the appeal was completed in May 2013. Supplemental briefing was completed in the fall of 2016. Oral argument was held on September 24, 2018. Regulatory permits and authorizations are also required before the new license can take effect. In December 2016, the National Marine Fisheries Service issued a biological opinion setting forth the terms and conditions under which the relicensing project must operate in order to avoid adverse impacts to threatened and endangered species. This was the last major regulatory requirement prior to FERC issuing a new license. Following the 2017 Oroville Dam spillway incident, Butte County, the City of Oroville, and others requested that FERC not issue a new license until an Independent Forensic Team ("IFT") delivered their final report to FERC and FERC has had adequate time to review the report. The Final IFT report was delivered on January 5, 2018. DWR submitted a plan to address the findings of the report to FERC on March 12, 2018. See "METROPOLITAN'S WATER SUPPLY–State Water Project –2017 Oroville Dam Spillway Incident." Metropolitan anticipates that FERC will issue the new license; however, the timeframe for FERC approval is not currently known. However, FERC has issued one-year renewals of the existing license since its initial expiration date on January 31, 2007, and is expected to issue successive one-year renewals until a new license is obtained.

DWR receives transmission service from the CAISO. The transmission service providers participating in the CAISO may seek increased transmission rates, subject to the approval of FERC. DWR has the right to contest any such proposed increase. DWR may also be subject to increases in the cost of transmission service as new electric grid facilities are constructed.

On September 10, 2018, Governor Brown signed SB 100 into law, to take effect on January 1, 2019. SB 100 establishes a goal of providing 100 percent carbon-free electricity by 2045 and increases the 2030 Renewables Portfolio Standard ("RPS") requirement for retail electric utilities from 50 percent to 60 percent. Simultaneously, the Governor announced Executive Order B-55-18 directing state agencies to develop a framework to achieve and maintain carbon neutrality by 2045. Metropolitan and DWR are not subject to the RPS requirements. However, as a state agency, DWR is subject to the Executive Order. DWR has an existing climate action plan in order to achieve carbon neutrality by 2045.

Defined Benefit Pension Plan and Other Post-Employment Benefits

Metropolitan is a member of the California Public Employees' Retirement System ("PERS"), a multiple-employer pension system that provides a contributory defined-benefit pension for substantially all Metropolitan employees. PERS provides retirement and disability benefits, annual cost-of-living adjustments and death benefits to plan members and beneficiaries. PERS acts as a common investment and administrative agent for participating public entities within the State. PERS is a contributory plan deriving funds from employee contributions as well as from employer contributions and earnings from investments. A menu of benefit provisions is established by State statutes within the Public Employees' Retirement Law. Metropolitan selects optional benefit provisions from the benefit menu by contract with PERS.

Metropolitan makes contributions to PERS based on actuarially determined employer contribution rates. The actuarial methods and assumptions used are those adopted by the PERS Board of Administration. Employees hired prior to January 1, 2013 are required to contribute 7.00 percent of their earnings (excluding overtime pay) to PERS. Pursuant to the current memoranda of understanding, Metropolitan contributes the requisite 7.00 percent contribution for all employees represented by the Management and Professional Employees Association, the Association of Confidential Employees, Supervisors and Professional Personnel Association and AFSCME Local 1902 and who were hired prior to January 1, 2012. Employees in all four bargaining units who were hired on or after January 1, 2012 but before January 1, 2013, pay the full 7.00 percent contribution to PERS for the first five years of employment. After the employee completes five

years of employment, Metropolitan contributes the requisite 7.00 percent contribution. Metropolitan also contributes the entire 7.00 percent on behalf of unrepresented employees. Employees hired on or after January 1, 2013 and who are "new" PERS members as defined by Public Employees' Pension Reform Act of 2013 pay a member contribution of 6.75 percent in fiscal year 2016-17, and 6.00 percent in fiscal years 2017-18 through 2019-20. In addition, Metropolitan is required to contribute the actuarially determined remaining amounts necessary to fund the benefits for its members.

The contribution requirements of the plan members are established by State statute and the employer contribution rate is established and may be amended by PERS. The fiscal year 2017-18 contribution was based on the June 30, 2015 valuation report, the fiscal year 2018-19 contribution is based on the June 30, 2016 valuation report, and the fiscal year 2019-20 contribution is based on the June 30, 2017 valuation report. The PERS' projected investment return (the discount rate) is 7.50 percent for fiscal year 2017-18, 7.375 percent for fiscal year 2018-19, and 7.25 percent for fiscal year 2019-20.

For fiscal year 2017-18, Metropolitan contributed 22.89 percent of annual covered payroll. The fiscal year 2017-18 annual pension cost was $61.3 million, of which $12.5 million was for Metropolitan's pick-up of the employees' 7.00 percent share. For fiscal years 2018-19 and 2019-20, Metropolitan is required to contribute 25.97 percent and 29.97 percent, respectively, of annual covered payroll, in addition to member contributions paid by Metropolitan.

Metropolitan's required contributions to PERS fluctuate each year and include a normal cost component and a component equal to an amortized amount of the unfunded liability. Many assumptions are used to estimate the ultimate liability of pensions and the contributions that will be required to meet those obligations. The PERS Board of Administration has adjusted and may in the future further adjust certain assumptions used in the PERS actuarial valuations, which adjustments may increase Metropolitan's required contributions to PERS in future years. Accordingly, Metropolitan cannot provide any assurances that its required contributions to PERS in future years will not significantly increase (or otherwise vary) from any past or current projected levels of contributions.

As part of the June 30, 2014 actuarial valuation, the PERS Board of Administration adopted changes in demographic assumptions. The most significant of these was the improvement in post-retirement mortality acknowledging greater life expectancies and expected continued improvements. On December 21, 2016 the PERS Board of Administration approved lowering the discount rate to 7.00 percent over a three year period. As a result, the discount rate for fiscal year 2018-19 will be 7.375 percent, for fiscal year 2019-20 it will be 7.25 percent, and for fiscal year 2020-21 it will be 7.00 percent. PERS has estimated that with a reduction in the rate of return to 7.00 percent, most employers could expect a 1.00 percent to 3.00 percent increase in the normal cost for miscellaneous plans. As a result, required contributions of employers, including Metropolitan, toward unfunded accrued liabilities, and as a percentage of payroll for normal costs, are expected to increase.

Beginning with fiscal year 2017-18 PERS began collecting employer contributions towards the plan's unfunded liability as dollar amounts instead of the prior method of contribution rate. This change addresses potential funding issues that could arise from a declining payroll or reduction in the number of active members in the plan.

On December 19, 2017, the PERS Board of Administration adopted new actuarial assumptions based on the recommendations in the December 2017 CalPERS Experience Study and Review of Actuarial Assumptions. This study reviewed the retirement rates, termination rates, mortality rates, rates of salary increases and inflation assumption for public agencies. These new assumptions were incorporated in the June 30, 2017 actuarial valuation and will impact the required contribution for fiscal year 2019-20. In addition, the Board adopted a new asset portfolio as part of its Asset Liability Management. The new asset mix supports a 7.00 percent discount rate. The reduction of the inflation assumption will be implemented in two steps in

conjunction with the decreases in the discount rate. For the June 30, 2017 valuation an inflation rate of 2.625 percent was used and a rate of 2.50 percent will be used in the subsequent valuation.

The PERS Board of Administration has adopted a new amortization policy effective with the June 30, 2019 actuarial valuation. The new policy shortens the period over which actuarial gains and losses are amortized from 30 years to 20 years with the payments computed using a level dollar amount. In addition, the new policy removes the five-year ramp-up and ramp-down on unfunded accrued liability bases attributable to assumption changes and non-investment gains/losses. The new policy removes the five-year ramp-down on investment gains/losses. These changes will apply only to new unfunded accrued liability bases established on or after June 30, 2019.

The following table shows the funding progress of Metropolitan's pension plan.

Valuation Date	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability	Funded Ratio
6/30/17	$2.269	$1.651	$(0.619)	72.7%
6/30/16	$2.166	$1.524	$(0.642)	70.3%
6/30/15	$2.060	$1.556	$(0.504)	75.5%
6/30/14	$1.983	$1.560	$(0.423)	78.7%
6/30/13	$1.805	$1.356	($0.449)	75.1%

Source: California Public Employees' Retirement System.

Effective July 1, 2014, Metropolitan implemented Governmental Accounting Standards Board Statement No. 68, Accounting and Financial Reporting for Pensions – an amendment of GASB Statement No. 27 (GASB 68), affecting the reporting of pension liabilities for accounting purposes. Under GASB 68, Metropolitan is required to report the Net Pension Liability (i.e., the difference between the Total Pension Liability and the Pension Plan's Net Position or market value of assets) in its financial statements.

For Metropolitan's fiscal year ended June 30, 2018 financial statements, the Net Pension Liability reported for the Miscellaneous Plan was $660.9 million (an increase of $73.3 million over the prior year), representing a Total Pension Liability as of such date of $2,315.2 million (an increase of $200.2 million over the prior year) less the Plan Fiduciary Net Position as of such date of $1,654.3 million (an increase of $126.9 million over the prior year). For fiscal year 2018, the Miscellaneous Plan Net Pension Liability as a percentage of covered-employee payroll was 331.81 percent and the Plan Net Position as a percentage of the Total Pension Liability was 71.45 percent. The Net Pension Liability for Metropolitan's Miscellaneous Plan for the year ended June 30, 2018 was measured as of June 30, 2017, and the Total Pension Liability used to calculate the Net Pension Liability was determined by an annual actuarial valuation as of June 30, 2016.

For Metropolitan's fiscal year ended June 30, 2017 financial statements, the Net Pension Liability reported for the Miscellaneous Plan was $587.7 million (an increase of $108.1 million over the prior year), representing a Total Pension Liability as of such date of $2,115.1 million (an increase of $76.5 million over the prior year) less the Plan Fiduciary Net Position as of such date of $1,527.4 million (a decrease of $31.6 million over the prior year). For fiscal year 2017, the Miscellaneous Plan Net Pension Liability as a percentage of covered-employee payroll was 300.01 percent and the Plan Net Position as a percentage of the Total Pension Liability was 72.22 percent. The Net Pension Liability for Metropolitan's Miscellaneous Plan

for the year ended June 30, 2017 was measured as of June 30, 2016, and the Total Pension Liability used to calculate the Net Pension Liability was determined by an annual actuarial valuation as of June 30, 2015.

For more information on the plan, see APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

Metropolitan currently provides post-employment medical insurance to retirees and pays the post-employment medical insurance premiums to PERS. On January 1, 2012, Metropolitan implemented a longer vesting schedule for retiree medical benefits, which applies to all new employees hired on or after January 1, 2012. Payments for this benefit were $30.1 million in fiscal year 2017-18. Under Governmental Accounting Standards Board Statement No. 75, Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions, Metropolitan is required to account for and report the outstanding obligations and commitments related to such benefits, commonly referred to as other post-employment benefits ("OPEB"), on an accrual basis.

The actuarial valuations dated June 30, 2015 and June 30, 2017, were released in June of 2016 and March of 2018, respectively. The June 30, 2015 valuation indicates that the Actuarially Determined Contribution ("ADC" formerly referred to as the Annual Required Contribution) in fiscal year 2017-18 is $30.1 million and the June 30, 2017 valuation indicates that the ADC will be $27.3 million and $28.1 million in fiscal years 2018-19 and 2019-20, respectively. In both valuations, the ADC was based on the entry-age normal actuarial cost method with contributions determined as a level percent of pay. The actuarial assumptions included the following:

	June 30, 2015 Valuation	June 30, 2017 Valuation
Investment Rate of Return	7.25%	6.75%
Inflation	3.00%	2.75%
Salary Increases	3.00%	3.00%
Health Care Cost Trends	Medicare – starting at 7.2%, grading down to 5.0% over five years. Non-Medicare – starting at 7.0%, grading down to 5.0% over five years.	Medicare – starting at 6.5%, grading down to 4.0% over fifty seven years. Non-Medicare – starting at 7.5%, grading down to 4.0% over fifty seven years.
Mortality, Termination, Disability	CalPERS 1997-2011 Experience Study Post-retirement mortality projected fully generational with Scale MP-2014, modified to converge to ultimate improvement rates in 2022	CalPERS 1997-2011 Experience Study Mortality projected fully generational with Scale MP-2017
Affordable Care Act (ACA) Excise Tax	2% load on retiree medical premium subsidy	2% load on retiree medical premium subsidy

As of June 30, 2017, the date of the most recent OPEB actuarial report, the unfunded actuarial accrued liability was estimated to be $235.5 million. The amortization period for the unfunded actuarial accrued liability is 23 years closed with 19 years remaining as of fiscal year end 2018 and the amortization

period of actuarial gains and losses is 15 years closed. Adjustments to the ADC include amortization of the unfunded actuarial accrued liability and actuarial gains and losses.

In September 2013, Metropolitan's Board established an irrevocable OPEB trust fund with the California Employers' Retiree Benefit Trust Fund. The market value of assets in the trust as of June 30, 2018 was $240.0 million. As part of its biennial budget process, the Board approved the full funding of the ADC for fiscal years 2018-19 and 2019-20.

Governmental Accounting Standards Board Statement No. 75, Accounting and Financial Reporting for Postemployment Benefits Other than Pensions, was issued in June 2015, relating to accounting and financial reporting by state and local governments for OPEB. This statement establishes standards for measuring and recognizing liabilities, deferred outflows and deferred inflows of resources, and expenses. For defined benefit OPEB, this statement identifies the methods and assumptions that should be used to project benefit payments, discount projected benefit payments to their actuarial present value, and attribute that present value to periods of employee service. Note disclosure and required supplementary information requirements about OPEB also are addressed. Metropolitan implemented this statement in its June 30, 2018 financial statements. Major changes as a result of this statements were (i) the inclusion of net OPEB liabilities on Metropolitan's Statement of Net Position (previously they were included as notes to Metropolitan's financial statements); (ii) recognition of deferred inflows and outflows of resources related to OPEB; (iii) more variable OPEB expense as it is now based on the net OPEB liability change between reporting dates, with some sources of change recognized immediately and others spread over years, instead of being based on actual contributions; and (iv) restatement of beginning net position for 2018 in the amount of $138.9 million to record the beginning deferred OPEB contributions and net OPEB liability.

HISTORICAL AND PROJECTED REVENUES AND EXPENSES

The "Historical and Projected Revenues and Expenses" table below provides a summary of revenues and expenses of Metropolitan prepared on a modified accrual basis. This is consistent with the adopted biennial budget for fiscal years 2018-19 and 2019-20. The table does not reflect the accrual basis of accounting, which is used to prepare Metropolitan's annual audited financial statements. The modified accrual basis of accounting varies from the accrual basis of accounting in the following respects: depreciation and amortization are not recorded and payments for debt service and pay-as-you-go construction are recorded when paid. Under the modified accrual basis of accounting, revenues are recognized in the fiscal year in which they are earned and expenses are recognized when incurred. Thus water revenues are recognized in the month the water transaction occurs and expenses are recognized when goods have been received and services have been rendered. The change to modified accrual accounting is for budgeting purposes and Metropolitan will continue to calculate compliance with its rate covenant, limitations on additional bonds and other financial covenants in the Revenue Bond Resolutions in accordance with their terms.

The projections are based on assumptions concerning future events and circumstances that may impact revenues and expenses and represent management's best estimates of results at this time. See the footnotes to the table below entitled "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" and "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" for relevant assumptions, including projected water transactions and the average annual increase in the effective water rate, and "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" for a discussion of potential impacts. Some assumptions inevitably will not materialize and unanticipated events and circumstances may occur. Therefore, the actual results achieved during the projection period will vary from the projections and the variations may be material.

As noted below, the financial projections for fiscal years 2020-21 through 2023-24 reflect the ten-year financial forecast provided in Metropolitan's adopted budget for fiscal years 2018-19 and 2019-20. The financial projections include Metropolitan's forecasted costs associated with a 64.4 percent share of the two tunnel California WaterFix project as authorized by the Board on July 10, 2018. On May 2, 2019, DWR withdrew its approval of the California WaterFix project and announced plans to pursue a new planning and environmental review process for a single tunnel Bay-Delta conveyance project. As DWR has only recently announced its intent to undertake planning and environmental review of a proposed single tunnel project, no cost estimates for such activities or proposed project have yet been developed. Therefore, Metropolitan's costs associated with any such future activities or proposed project, if any, will inevitably vary from the amounts projected in the table below. Metropolitan expects to prepare an updated financial forecast as part of its normal budgeting process after the relevant determinations with respect to a proposed single tunnel project's scope and estimated costs and any commitment by Metropolitan therefor have been made. See "METROPOLITAN'S WATER SUPPLY–State Water Project –Bay-Delta Proceedings Affecting State Water Project – Bay-Delta Planning Activities" in this Appendix A.

Metropolitan's resource planning projections are developed using a comprehensive analytical process that incorporates demographic growth projections from recognized regional planning entities, historical and projected data acquired through coordination with local agencies, and the use of generally accepted empirical and analytical methodologies. See "METROPOLITAN'S WATER SUPPLY–Integrated Water Resources Plan" in this Appendix A. Metropolitan has conservatively set the water transactions projections in the following table. Due to the variability of supplemental wholesale water transactions and unpredictability of future hydrologic conditions, projections of the volume of annual water transactions are based on long-term average forecasts consistent with Metropolitan's latest Board adopted Integrated Resources Plan, the 2015 IRP Update.

Nevertheless, Metropolitan's assumptions have been questioned by directors representing SDCWA on Metropolitan's Board. Metropolitan has reviewed SDCWA's concerns and, while recognizing that assumptions may vary, believes that the estimates and assumptions that support Metropolitan's projections are reasonable based upon history, experience and other factors as described herein.

Metropolitan's projections of the level of water transactions are the result of a comprehensive retail demand, conservation, and local supply estimation process, including supply projections from member agencies and other water providers within Metropolitan's service area. Retail demands for water are estimated with a model driven by projections of relevant demographics provided by SCAG and SANDAG. Retail demands are adjusted downward for conservation savings and local supplies, with the remainder being the estimated demand for Metropolitan supplies. Conservation savings estimates include all conservation programs in place to date as well as estimates of future conservation program goals outlined in the 2015 IRP Update. See "CONSERVATION AND WATER SHORTAGE MEASURES" in this Appendix A. Local supplies include water produced by local agencies from various sources including but not limited to groundwater, surface water, locally-owned imported supplies, recycled water, and seawater desalination (see "REGIONAL WATER RESOURCES" in this Appendix A). For example, water transactions projections for fiscal year 2018-19 assumed that local projects such as groundwater recovery and desalination projects (see "REGIONAL WATER RESOURCES–Local Water Supplies" in this Appendix A) would become operational and produce local supplies in 2018. For additional description of Metropolitan's water transactions projections, see "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

The water transactions projections used to determine water rates and charges assume an average year hydrology. Actual water transactions are likely to vary from projections. As shown in the chart entitled "Historical Water Transactions" below, transactions can vary significantly from average and demonstrates the degree to which Metropolitan's commitments to meet supplemental demands can impact transactions. In years when actual transactions exceed projections, the revenues from water transactions during the fiscal year

will exceed budget, potentially resulting in an increase in financial reserves. In years when actual transactions are less than projections, Metropolitan uses various tools to manage reductions in revenues, such as reducing expenses below budgeted levels, reducing funding of capital from revenues, and drawing on reserves. See "METROPOLITAN REVENUES–Financial Reserve Policy" in this Appendix A. Metropolitan considers actual transactions, revenues and expenses, and financial reserve balances in setting rates for future fiscal years.

Projections in the following table reflect, for fiscal year 2018-19 actual financial results through March 31, 2019 and revised projections for the balance of that fiscal year, and revised projections for fiscal year 2019-20. Financial projections for fiscal years 2020-21 through 2023-24 reflect the ten-year financial forecast provided in the adopted budget for fiscal years 2018-19 and 2019-20. This includes the issuance of $560 million of bonds for fiscal years 2018-19 through 2023-24 to finance the CIP (of which bonds with net proceeds of $80 million were issued for fiscal year 2018-19). See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" and "CAPITAL INVESTMENT PLAN–Capital Investment Plan Financing" in this Appendix A.

Water transactions were 1.61 million acre-feet in fiscal year 2017-18. Water transactions are projected to be 1.46 million acre-feet for fiscal year 2018-19, 1.75 million acre-feet for fiscal year 2019-20, and 1.8 million acre-feet for fiscal years 2020-21 through 2023-24. Rates and charges increased by 4.0 percent on January 1, 2017 and January 1, 2018 and 3.0 percent on January 1, 2019. On April 10, 2018 the Board adopted average increases in rate and charges of 3.0 percent, which will become effective on January 1, 2020. Rates and charges are projected to increase an average of 4.1 percent annually thereafter. Actual rates and charges to be effective in 2021 and thereafter are subject to adoption by Metropolitan's Board.

The projections were prepared by Metropolitan and have not been reviewed by independent certified public accountants or any entity other than Metropolitan. Dollar amounts are rounded.

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HISTORICAL AND PROJECTED REVENUES AND EXPENSES[a]
Fiscal Years Ended June 30
(Dollars in Millions)

	Actual			Projected					
	2016	2017	2018	2019	2020	2021	2022	2023	2024
Water Revenues[b]	$1,166	$1,151	$1,285	$1,189	$1,528	$1,616	$1,668	$1,728	$1,787
Additional Revenue Sources[c]	200	184	172	170	166	179	198	216	238
Total Operating Revenues	1,366	1,335	1,457	1,359	1,694	1,795	1,866	1,944	2,025
O&M, CRA Power and Water Transfer Costs[d]	(799)	(559)	(568)	(600)	(689)	(723)	(743)	(767)	(788)
Total SWC OMP&R and Power Costs[e]	(402)	(368)	(395)	(346)	(463)	(478)	(506)	(533)	(554)
Total Operation and Maintenance	(1,201)	(927)	(963)	(946)	(1,152)	(1,201)	(1,249)	(1,300)	(1,342)
Net Operating Revenues	$ 165	$ 408	$ 494	$ 413	$ 542	$ 594	$ 617	$ 644	$ 683
Miscellaneous Revenue[f]	24	18	27	22	24	24	24	24	24
Transfer from Reserve Funds[g]	222	33	1	--	--	--	--	--	--
Sales of Hydroelectric Power[h]	7	21	24	18	19	19	20	20	20
Interest on Investments[i]	17	4	8	27	18	20	21	23	24
Adjusted Net Operating Revenues[j]	435	484	554	480	603	657	682	711	751
Senior and Subordinate Obligations[k]	(310)	(308)	(340)	(330)	(294)	(314)	(319)	(318)	(324)
Funds Available from Operations	$ 125	$ 176	$ 214	$ 150	$ 309	$ 343	$ 363	$ 393	427
Debt Service Coverage on all Senior and Subordinate Bonds[l]	1.40	1.57	1.63	1.45	2.05	2.09	2.14	2.24	2.32
Funds Available from Operations	$ 125	$ 176	$ 214	$ 150	$ 309	$ 343	$ 363	$ 393	427
Other Revenues (Expenses)	(6)	(4)	(5)	(9)	(7)	(7)	(7)	(7)	(8)
Pay-As-You Go Construction[m]	(273)	(132)	(98)	(134)	(120)	(150)	(150)	(150)	(154)
Pay-As-You Go Funded from Replacement & Refurbishment Fund Reserves[m]	160	1	1	--	--	--	--	--	--
Total SWC Capital and WaterFix Costs Paid from Current Year Operations[n]	(24)	(45)	(21)	(22)	(36)	(60)	(96)	(133)	(189)
Remaining Funds Available from Operations	(18)	(4)	91	(15)	146	126	110	103	73
Fixed Charge Coverage[o]	1.30	1.37	1.53	1.36	1.83	1.76	1.64	1.58	1.46
Property Taxes	108	116	131	129	118	119	121	122	124
General Obligation Bonds Debt Service	(22)	(22)	(20)	(14)	(14)	(8)	(9)	(2)	(2)
SWC Capital Costs Paid from Taxes	(86)	(94)	(111)	(115)	(104)	(111)	(112)	(120)	(122)
Net Funds Available from Current Year[m]	$ (18)	$ (4)	$ 91	$ (15)	$ 146	$ 126	$ 110	$ 103	$ 76

Source: Metropolitan.

(Footnotes on next page)

(Footnotes to table on prior page)

(a) Unaudited. Prepared on a modified accrual basis. Projected revenues and expenses in fiscal year 2018-19 are based on preliminary financial results through March 31, 2019, and revised projections for the balance of fiscal year 2019-20. Projections for fiscal year 2020-21 through fiscal year 2023-24 are based on assumptions and estimates used in the adopted biennial budget for fiscal years 2018-19 and 2019-20 and reflect the projected issuance of additional bonds. See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

(b) Water Revenues include revenues from water sales, exchanges, and wheeling. During the fiscal years ended June 30, 2016 through June 30, 2018, annual water transactions (in acre-feet) were 1.62 million, 1.54 million, and 1.61 million, respectively. See the table entitled "Summary of Water Transactions and Revenues" under "METROPOLITAN REVENUES–Water Revenues" in this Appendix A. The water transactions projections (in acre-feet) are 1.46 million acre-feet for fiscal year 2018-19, 1.75 million acre-feet for fiscal year 2019-20 and 1.80 million acre-feet for fiscal years 2020-21 through 2023-24. Projections reflect adopted rate and charge increases of 3.0 percent, effective on January 1, 2019 and January 1, 2020. Rates and charges are projected to increase an average of 4.1 percent per fiscal year thereafter, subject to adoption by Metropolitan's Board. See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

(c) Includes revenues from water standby, readiness-to-serve, and capacity charges. The term Operating Revenues excludes ad valorem taxes. See "METROPOLITAN REVENUES–Other Charges" in this Appendix A.

(d) Water Transfer Costs are included in operation and maintenance expenses for purposes of calculating the debt service coverage on all Obligations.

(e) Includes on- and off-aqueduct power and operation, maintenance, power and replacement costs payable under the State Water Contract. See "METROPOLITAN EXPENSES–State Water Contract Obligations" in this Appendix A.

(f) May include lease and rental net proceeds, net proceeds from sale of surplus property, reimbursements, and federal interest subsidy payments for Build America Bonds.

(g) Reflects transfers from the Water Management Fund, the Water Stewardship Fund, and the Water Rate Stabilization Fund, of $222 million in fiscal year 2015-16, $33 million in fiscal year 2016-17, and $1 million in fiscal year 2017-18 to fund a like amount of costs for conservation and supply programs. See "MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

(h) Includes CRA power sales.

(i) Does not include interest applicable to Bond Construction Funds, the Excess Earnings Funds, other trust funds and the Deferred Compensation Trust Fund.

(j) Adjusted Net Operating Revenues is the sum of all available revenues that the revenue bond resolutions specify may be considered by Metropolitan in setting rates and issuing additional Senior Revenue Bonds and Senior Parity Obligations and Subordinate Revenue Bonds and Subordinate Parity Obligations.

(k) Includes debt service on outstanding Senior Revenue Bonds, Senior Parity Obligations, Subordinate Revenue Bonds, Subordinate Parity Obligations, and additional Revenue Bonds (projected). Includes issuance of $80 million (net proceeds) in additional Revenue Bonds for fiscal year 2018-19 and assumes issuance of an additional $80 million for fiscal year 2019-20 as provided in budget assumptions for the adopted biennial budget for fiscal years 2018-19 and 2019-20 and $100 million annually as projected for fiscal years 2020-21 through 2023-24. Fiscal year 2015-16 debt service increased $7.0 million for debt service paid on June 30, 2016, rather than July 1, 2017 and fiscal year 2016-17 debt service was therefore reduced by $7.0 million. Fiscal year 2017-18 debt service increased by $15.3 million for debt service prepaid through bond refunding transactions in June 2018, rather than on July 1, 2018 and fiscal year 2018-19 debt service is therefore reduced by $15.3 million. Fiscal year 2018-19 debt service increased by $28.5 million for debt service prepaid through bond refunding transactions in June 2019, rather than on July 1, 2019 and fiscal year 2019-20 debt service is therefore reduced by $28.5 million. See "CAPITAL INVESTMENT PLAN–Capital Investment Plan Financing" in this Appendix A.

(l) Adjusted Net Operating Revenues, divided by the sum of debt service on outstanding Senior Revenue Bonds, Senior Parity Obligations, Subordinate Revenue Bonds and Subordinate Parity Obligations, including the subordinate lien California Safe Drinking Water Revolving Fund Loan (prior to its discharge in 2017) and projected Revenue Bonds. See "METROPOLITAN EXPENSES–Outstanding Senior Revenue Bonds and Senior Parity Obligations" and "–Outstanding Subordinate Revenue Bonds and Subordinate Parity Obligations" in this Appendix A.

(m) For fiscal year 2015-16, Metropolitan used $264 million for acquiring properties in Riverside and Imperial Counties, funded by $160 million from the Replacement and Refurbishment Fund Reserves and the balance from unrestricted reserves. This land purchase is reflected as a pay-as-you-go expenditure for fiscal year 2015-16.

(n) As discussed herein, on May 2, 2019, DWR withdrew its approval of the two tunnel California WaterFix project and announced plans to pursue a new planning and environmental review process for a single tunnel Bay-Delta conveyance project. See "METROPOLITAN EXPENSES–State Water Contract Obligations." See also "METROPOLITAN'S WATER SUPPLY–State Water Project –Bay-Delta Proceedings Affecting State Water Project – Bay-Delta Planning Activities" in this Appendix A.

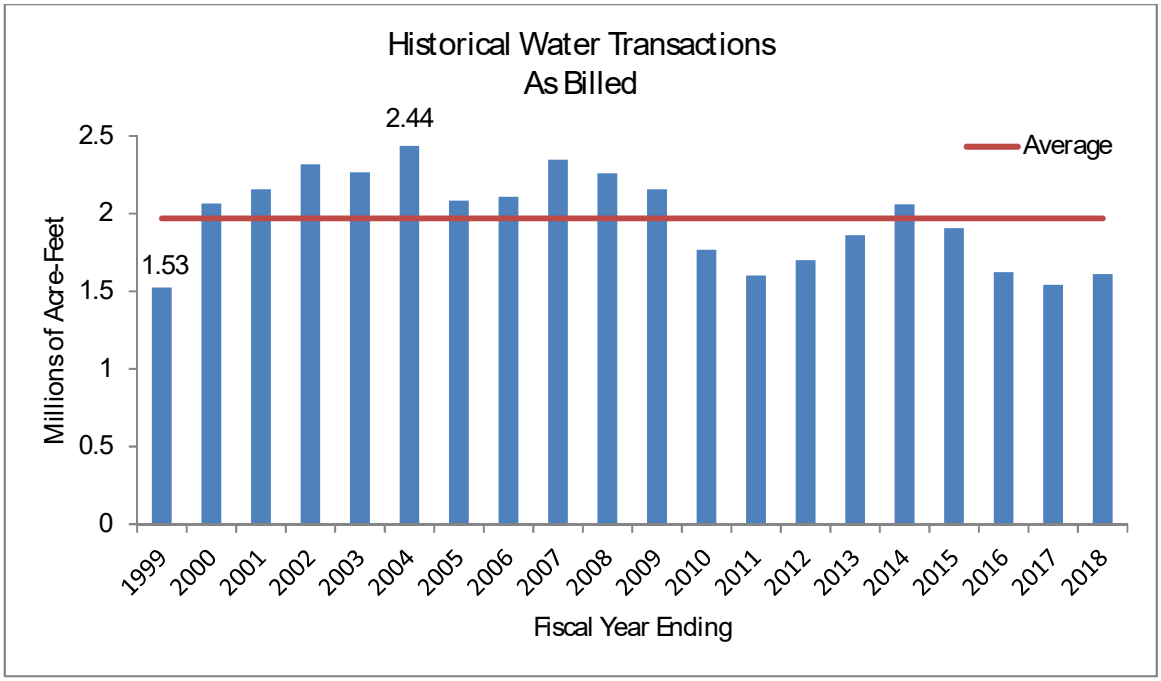
(o) Adjusted Net Operating Revenues, divided by the sum of State Water Contract capital and WaterFix costs paid from current year operations and debt service on outstanding Senior Revenue Bonds, Senior Parity Obligations, Subordinate Revenue Bonds and Subordinate Parity Obligations, including the subordinate lien California Safe Drinking Water Revolving Fund Loan (prior to its discharge in 2017) and additional Revenue Bonds (projected).

MANAGEMENT'S DISCUSSION OF HISTORICAL AND PROJECTED REVENUES AND EXPENSES

Water Transactions Projections

The water transactions forecast in the table above for fiscal year 2018-19 is 1.46 million acre-feet. The water transactions forecast is 1.75 million acre-feet for fiscal years 2019-20 and 1.80 million acre-feet for fiscal years 2020-21 through 2023-24, consistent with the biennial budget and ten-year financial forecast. For purposes of comparison, Metropolitan's highest level of water transactions during the past 20 fiscal years

was approximately 2.44 million acre-feet in fiscal year 2003-04 and the lowest was 1.53 million acre-feet in fiscal year 1998-99. The chart below shows the volume of water transactions over the last 20 fiscal years.



Water Revenues

Metropolitan relies on revenues from water transactions for about 80 percent of its total revenues. In adopting the budget and rates and charges for each fiscal year, Metropolitan's board reviews the anticipated revenue requirements and projected water transactions to determine the rates necessary to produce the required revenues to be derived from water transactions during the fiscal year. Metropolitan sets rates and charges estimated to provide operating revenues sufficient, with other sources of funds, to provide for payment of its expenses. See "HISTORICAL AND PROJECTED REVENUES AND EXPENSES" in this Appendix A.

Metropolitan's Board has adopted annual increases in water rates each year beginning with the rates effective January 1, 2004. See "METROPOLITAN REVENUES–Rate Structure" and "–Classes of Water Service" in this Appendix A. On April 10, 2018, the Board adopted average increases in rate and charges of 3.0 percent, which will become effective on January 1, 2019 and January 1, 2020. Rates and charges are projected to increase an average of 4.1 percent annually thereafter. Actual rates and charges to be effective in 2021 and thereafter are subject to adoption by Metropolitan's Board.

Projected Fiscal Year 2018-19 Results

Projections for fiscal year 2018-19, in the table above, are based on preliminary financial results through March 31, 2019, and revised projections for the balance of fiscal year and revised projections for fiscal year 2019-20. Financial projections for fiscal years 2020-21 through 2023-24 are reflected in the ten-year financial forecast provided in the biennial budget adopted by the Board on April 10, 2018. The fiscal year 2018-19 and 2019-20 biennial budget and rates set the stage for predictable and reasonable rate increases over the ten-year planning period, with Board adopted rate increases of 3.0 percent annually in both fiscal years 2018-19 and 2019-20, and projected average increases of 4.1 percent per year thereafter. Actual rates and charges to be effective in fiscal year 2020-21 and thereafter are subject to adoption by Metropolitan's Board as part of the biennial budget process, at which point the ten-year forecast will be updated as well. Increases in rates and charges reflect the impact of reduced water transactions projections,

increasing operations and maintenance costs, and increasing State Water Project costs, when compared to prior fiscal years.

Operation and maintenance expenses in fiscal year 2018-19 are projected to be $946 million, which represents approximately 60.7 percent of total costs. These expenses include the costs of labor, electrical power, materials and supplies of both Metropolitan and its contractual share of the State Water Project. Metropolitan's operation and maintenance expenses are projected to be $156 million under budget in fiscal year 2018-19. Comparatively, operations and maintenance expenses in fiscal year 2017-18 were $963 million, which represents approximately 62.4 percent of total costs. Overall, projected expenditures for the twelve months ending June 30, 2019 are $1.6 billion. This is $134 million, or 7.9 percent, less than budgeted expenditures.

Fiscal year 2018-19 revenue bond debt service coverage is projected to be 1.45x and fixed charge coverage to be 1.36x. Fiscal year 2018-19 capital expenditures, currently estimated at $214 million, will be primarily funded by pay-as-you-go funding and the remainder from proceeds of Metropolitan's bonds issued in June 2018 for such purpose. Metropolitan's unrestricted reserves are projected to be approximately $425 million at June 30, 2019. See "METROPOLITAN REVENUES–Financial Reserve Policy" in this Appendix A. This amount does not include funds held in the Exchange Agreement Set-Aside Fund.

See also the "Management's Discussion and Analysis" contained in APPENDIX B–"THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INDEPENDENT AUDITORS' REPORT AND BASIC FINANCIAL STATEMENTS FOR FISCAL YEARS ENDED JUNE 30, 2018 AND JUNE 30, 2017 AND BASIC FINANCIAL STATEMENTS FOR THE SIX MONTHS ENDED DECEMBER 31, 2018 AND 2017 (UNAUDITED)."

Appendix G

Water Supply Assessment Checklist

Water Supply Assessment Checklist

Water Code Section	Water Supply Assessment Content	Page # in WSA
10910(c)(2)	Incorporate data from UWMP.	1-35
10910(d)(1)	Identification of existing water supply entitlements, water rights, or water service contracts relevant to identified water supply for proposed project, and description of quantity of water received in prior years.	19-35
10910(d)(2)(A)	Written contracts or other proof of entitlement to an identified water supply.	19-35
10910(d)(2)(B)	Capital outlay program for financing the delivery of a water supply that has been adopted.	35
10910(d)(2)(C)	Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.	13-34
10910(d)(2)(D)	Any necessary regulatory approval to deliver/convey the water supply.	13-34
10910(f)(1)	Review of any information contained in the UWMP relevant to the identified water supply for the proposed project.	1-35
10910(f)(2)	Description of any groundwater basin(s) from which proposed project will be supplied. For basins with adjudicated groundwater pumping rights, include a copy of the order/decree adopted by the court or the board and a description of quantity of groundwater public water system has the legal right to pump under the order/decree.	19-21, 24-27 Appendix D
10910(f)(3)	Description and analysis of amount and location of groundwater pumped for the past 5 years from any groundwater basin from which the proposed project will be supplied.	24-27
10910(f)(4)	Description and analysis of amount and location of groundwater that is projected to be pumped from any basin to provided water to the proposed project.	19-21, 24-27
10910(f)(5)	Analysis of sufficiency of groundwater from the basins from which the proposed project will be supplied to meet projected water demand of the proposed project.	19-21, 24-27

EXHIBIT 3

Related Projects - Estimated Wastewater Generation Table			
Land Use	Units	Generation Rate[2] (gpd/unit)	Total Generation (gpd)
Hotel	7,790	120/RM	934,800
Restaurant	436,439	300/1000 SF	130,932
Retail	921,280	50/1000 SF	46,064
Apartment	31,337	150/DU[1]	4,700,550
Bar	35,878	720/1000 SF	25,832
Manufacturing	320,497	50/1000 SF	16,025
Office	3,211,925	120/1000 SF	385,431
Condo	10,003	150/DU[1]	1,500,450
Grocery	104,622	50/1000 SF	5,231
Senior Housing	55	70/BED	3,850
Pharmacy	56,572	50/1000 SF	2,829
Event Space	296,586	350/1000 SF	103,805
Commercial	12,000	50/1000 SF	600
Gas Station	8	430/Station	3,440
Medical Office	126,450	225/1000 SF	28,451
School	2,440	11/Student	26,840
Stadium	76,250	3/Seat	228,750
Bowling Alley	40,800	50/1000 SF	2,040
Child Care	15,139	30/1000 SF	454
Bus Maintenance	87,120	50/1000 SF	4,356
Gym	38,383	650/1000 SF	24,949
Museum	17,600	30/1000 SF	528
Theatre	2,917	3/Seat	8,751
		TOTAL	8,184,958

SF= SQUARE FEET, GPD = GALLONS PER DAY, DU= DWELLING UNIT

[1] For calculation purposes all units assumed as 2-Bedroom

[2] Generation rates based on 100% of Bureau of Sanitation Sewer Generation Factors for Residential and Commercial Categories. https://engpermitmanual.lacity.org/sewer-s-permits/technical-procedures/sewage-generation-factors-chart