APPENDIX H

Water Supply Assessment

ARCADIS Design & Consultancy for natural and built assets

El Toro Water District

FIVE LAGUNAS PROJECT

WATER SUPPLY ASSESSMENT

DECEMBER 2015

FIVE LAGUNAS PROJECT WATER SUPPLY ASSESSMENT

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05991004.0000

Date:

December 2015

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EXECUTIVE SUMMARY

In September 2015, the City of Laguna Hills (Lead Agency) determined that the Five Lagunas project proposed by Merlone Geier Partners (project applicant) qualified as a "project" as defined by the California Water Code § 10912 and requested El Toro Water District (Water Supplier) to prepare a Water Supply Assessment (WSA) to satisfy the requirements of Senate Bill (SB) 610. The WSA must address whether the projected water supply for the next 20 years – based on normal, single dry, and multiple dry years will meet the demand projected for the project plus existing uses.

The Five Lagunas project proposes to develop multi-family residential units and to redevelop Laguna Hills Mall. The project will result in a net increase in water demand from ETWD's residential, commercial, and landscape irrigation customer sectors. The project will add 988 multi-family residential units comprising a mixture of studios, one-, two-, and three-bedroom apartments. These residential units will generate approximately 141,400 gallons per day (gpd) or 158 acre-feet per year (AFY) of potable water demand. Commercial potable water demand is estimated to increase by 72,800 gpd (82 AFY), mainly as a result of adding restaurants and a large fitness center. The Five Lagunas project will result in a net increase of approximately 215,800 sq. ft. of landscape areas to the mall and residential units, with an associated irrigation demand of approximately 14,840 gpd (17 AFY).

This WSA evaluates ETWD's projected future demands with additional water demands associated with the Five Lagunas project and compares to projected supplies available to ETWD through 2035. In accordance with the foregoing and the standards set forth by Water Code § 10910, this WSA concludes that the total projected water supplies available to ETWD during average, single-dry, and multiple-dry water years over the next 20 years are sufficient to meet the projected water demands for the proposed project, in addition to ETWD's existing uses.

1. INTRODUCTION

This section provides background information on the proposed Five Lagunas project under the Urban Village Specific Plan (UVSP) and the requirements of Senate Bill (SB) 610 for developing a Water Supply Assessment (WSA) by the public water supplier. This section also provides a brief overview of the El Toro Water District (ETWD), the public water supplier that will be supplying water to the proposed project.

1.1 Five Lagunas Project

The UVSP was adopted on November 26, 2002 by the City of Laguna Hills' City Council. The vision is to transform the existing 240-acre commercial/business/residential sector of the City of Laguna Hills (City) into a village-like downtown district (Hogle-Ireland, 2002). The name of the proposed development was later changed to Five Lagunas. The Five Lagunas project proposed to redevelop and expand the existing Laguna Hills Mall per the UVSP to create a new mixed-use town center. The redevelopment will include demolition of the southern portion of the mall and replacing it with an upscale movie theater, an outdoor plaza, a fitness center/health club, restaurants, shops, and approximately 988 residential apartment units. The residential construction will consist of three buildings, one of which will be mixed-use retail and residential. The northern portion of the mall will be remodeled to create a pedestrian oriented streetscape that includes new shops and restaurants that will be oriented along Regional Center Drive. The proposed project consists of approximately 834,000 square feet (sq. ft.) of commercial gross floor area and 1,300,000 sq. ft. of residential gross floor area. The project conceptual site plan is shown on Figure 1-1.

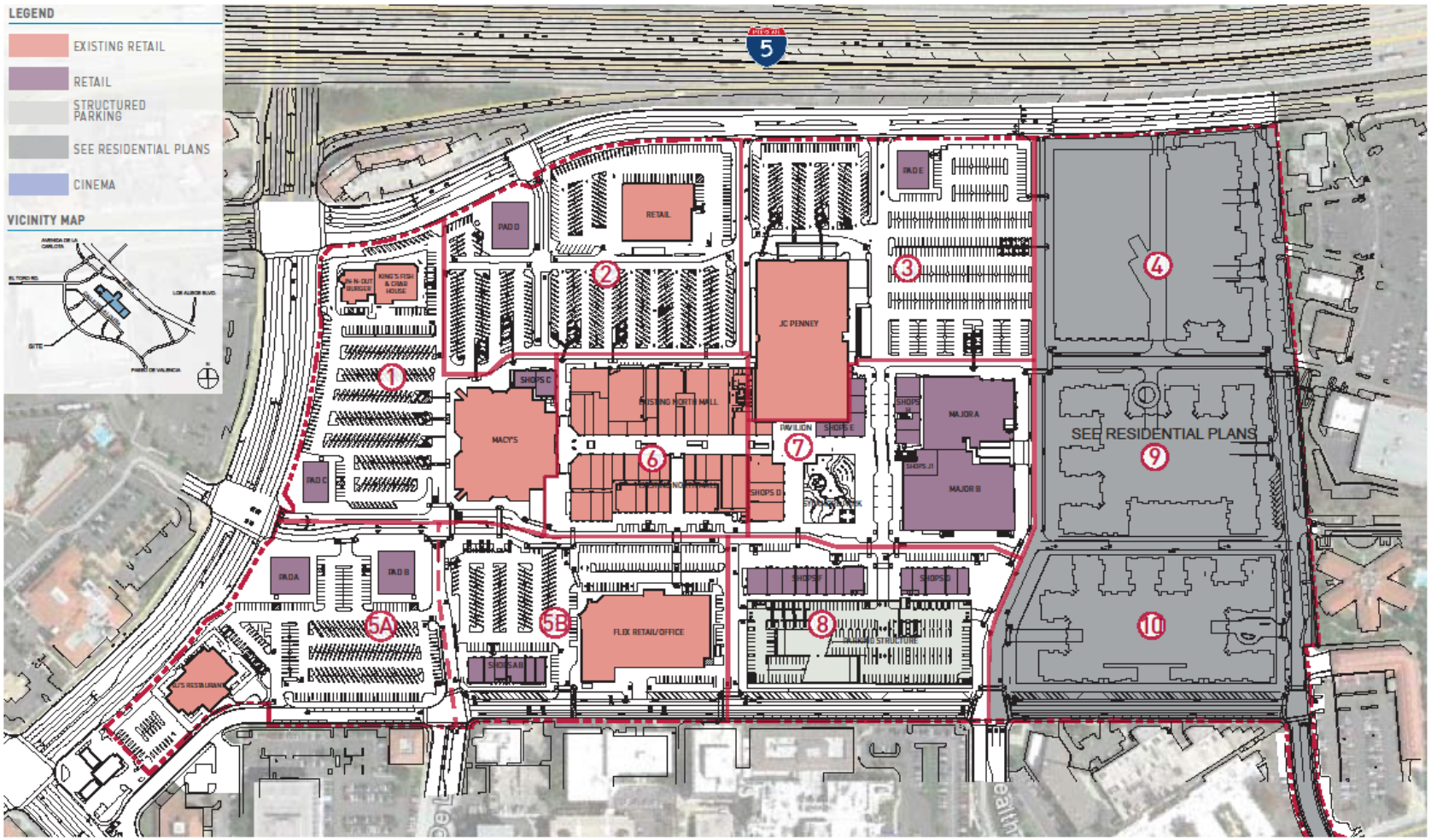

Figure 1-1: Five Lagunas Concept Site Plan

1.2 Water Supply Assessment Requirement

Effective January 1, 2002, SB 610 was signed into law, requiring preparation of a WSA for certain types of development projects subject to CEQA review. Section 10912 of the Water Code defines a "project" for which a WSA must be prepared as 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 space.
6. A mixed-use project that includes one or more of the projects specified above.
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 City of Laguna Hills (Lead Agency) has determined that a WSA is required for this project as it proposes the type of development that constitutes a "project" under Water Code § 10912 (above). The WSA must address whether the projected water supply for the next 20 years – based on normal, single dry, and multiple dry years will meet the demand projected for the project plus existing uses.

Once the City or County (Lead Agency) determines that a proposed development project qualifies as a "project", as defined above, it must identify the public water system that may supply water for the proposed project. ETWD is the water purveyor for the proposed Five Lagunas project. Accordingly, ETWD, through its consultant, is preparing this WSA to satisfy the requirements of SB 610 and Water Code § 10910-10914.

The Water Code requires ETWD to first determine whether the projected water demand associated with the proposed project was included as part of ETWD's most recently adopted Urban Water Management Plan (UWMP). A review of ETWD's most recently adopted UWMP of 2010 revealed that projected demands associated with the Urban Village Specific Plan are not accounted for.

1.3 El Toro Water District

ETWD was formed in 1960 under provisions of the California Water District Law, Division 13 of the Water Code of the State of California, for the purpose of providing water supply to its service area. ETWD is governed by a publicly elected five-member Board of Directors. Situated in the southern portion of Orange County, ETWD provides potable and recycled water service to over 48,000 residents. ETWD's water customers include residential, commercial, institutional, and dedicated landscape customers within all of the City of Laguna Woods and portions of the cities of Lake Forest, Aliso Viejo, Laguna Hills and Mission Viejo. All potable water served by ETWD is imported from the Metropolitan Water District of Southern California (Metropolitan) through its member agency, the Municipal Water District of Orange County (MWDOC). ETWD's recycled water program provides additional treatment to a portion of its secondary treated wastewater, and rather than discharging it to the ocean, it is used for landscape irrigation. ETWD's water supplies and demands are described in more detail in Sections 2 and 3, respectively.

2. WATER SUPPLIES

This section describes existing water supply sources and quantifies supplies available to meet ETWD's water demands. Additionally, this section provides an overview of ETWD's potential future supply sources currently under development and quantifies the water supplies projected to be available to ETWD in the next 20 years.

2.1 Existing Water Supplies

ETWD's potable water supply is imported water from Metropolitan through MWDOC. Treated imported potable water comes from the Robert B. Diemer (Diemer) Filtration Plant located north of Yorba Linda. Through the 2014/15 fiscal year treated, imported water represented about 95 percent of ETWD's total water supply. The other 5 percent is (non-potable) recycled water used for landscape irrigation. The District recently completed a large recycled water project that will increase the recycled water supply to approximately 15% of ETWD's total water supply. Groundwater sources are not available due to underlying geology and a lack of an aquifer. Table 2-1 shows ETWD's historical and current water consumption from 1990 to 2015 in fiscal year (July 1 to June 30).

Table 2-1: Historic and Current Water Supplies

Water Supply Sources	Fiscal Year Ending (AFY)					
	1990	1995	2000	2005	2010	2015
MWDOC (Imported Treated, Full Service)	12,279	10,351	11,868	10,317	8,574	8,650
Recycled Water	336	339	606	605	418	464
Total	**12,615**	**10,690**	**12,474**	**10,922**	**8,992**	**9,114**

2.1.1 Existing Water Rights and Imported Supplies

Table 2-2 provides a summary of existing water rights and rights to import supplies available to ETWD, including a future supply from the Baker Water Treatment Plant (WTP) described in Section 2.2.3. ETWD owns capacity rights to regional pipelines that convey imported water from Metropolitan's facilities to ETWD. However, capacity rights in pipelines do not guarantee supply, which is subject to availability from Metropolitan and MWDOC. Additionally, as a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies and to the local agencies. However, historical deliveries of imported water to ETWD have been as high as 12,279 AFY. In response to potential future water shortages, Metropolitan developed a Water Supply Allocation Plan (WSAP) to allocate wholesale imported water supplies among its member agencies should demand exceed available imported supplies. Subsequently, MWDOC also developed

a WSAP to allocate imported supplies at the retail level in Orange County. Under these Water Supply Allocation Plans, water allocations are based primarily on the need for imported supplies relative to the total need for imported supplies within the Metropolitan and MWDOC service areas.

Table 2-2: Existing Water Rights and Supply Sources

Existing Supply	Amount (AFY)	Availability	Right	Contract	Ever Used
MWDOC [1]	12,279	X		X	Yes
Recycled Water [2]	4,145	X	X		Yes
Future Supply	**Amount (AFY)**	**Availability**	**Right**	**Contract**	**Ever Used**
Baker WTP [3]	3,250	X		X	No

[1] Based on historic deliveries.

[2] ETWD has a maximum of 3.7 MGD (4,145 AFY) of tertiary treatment capacity from existing Water Recycling Plant (WRP) as of late 2014. This maximum capacity is intended to meet the demand requirements of a maximum day demand condition and does not represent annual average recycled water deliveries.

[3] ETWD has capacity rights of 5 cfs (3,600 AFY) when Baker Water Treatment Plant comes online in 2016. Expected actual delivery at 90% production time is 3,258 AFY. Baker WTP is not a "new" day-to-day water supply, it merely offsets and reduces amount of purchased Metropolitan treated water from Diemer Filtration Plant. However, the potential exists for the project participants to receive and treat local surface water from Irvine Lake as a yet to be quantified new supply of source when available.

2.1.2 Imported Water

In FY 2014-15, ETWD received approximately 8,650 AFY of imported water from Metropolitan. Due to continuing drought conditions ETWD budgeted for 7,650 AFY of imported water for FY 2015-16. Metropolitan's principal water sources originate from the Colorado River via the Colorado River Aqueduct and from Northern California through the State Water Project (SWP). These raw water sources are treated at the Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through Metropolitan's Lower Feeder and SWP water through the Yorba Linda Feeder.

ETWD has service connection agreements with Metropolitan's member agency, MWDOC. These agreements entitle ETWD to receive water from available Metropolitan sources via the regional transmission system located in Orange County. MWDOC delivers water from Metropolitan in the amount requested by ETWD, subject to capacity limitations of the service connections and the capacity limits of ETWD in the Feeder. ETWD has three service connections to the Allen-McColloch Pipeline (AMP) and one service connection to the Joint Regional Water Supply System (JRWSS) which is directly supplied from the East Orange County Feeder No.2 (EOCF #2) operated by Metropolitan.

Although pipeline capacity rights do not guarantee the availability of water, per se, pipeline capacity does guarantee the ability to convey water when it is available from Metropolitan sources to the ETWD system and,

therefore, demonstrates not only water supply reliability, but also physical delivery system reliability. All imported water supplies assumed in this document are available to ETWD from existing infrastructure.

Allen-McColloch Pipeline – The AMP is the primary source of domestic water in which ETWD owns specific capacity rights. Metropolitan owns and operates the AMP. ETWD's AMP capacity ownership, expressed as rate of flow, is 26.3 cubic feet per second (cfs) or 19,040 acre-feet per year. The Agreement for Sale and Purchase of Allen-McColloch Pipeline (Metropolitan Agreement No. 4623) among Metropolitan, MWDOC, MWDOC Water Facilities Corporation and certain other identified participants, including ETWD, dated July 1, 1994 (the AMP Sale Agreement) requires Metropolitan, among other things, to meet ETWD's requests for water deliveries (subject to the availability of water from Metropolitan). The AMP Sale Agreement further requires Metropolitan to augment/increase capacity necessary to meet ETWD projected ultimate service area water demands and other undeveloped lands within ETWD.

East Orange County Feeder No. 2 – The EOCF #2 is a pipeline jointly owned by several local agencies and Metropolitan, which operates it. ETWD has 2 cfs, or 1,450 acre-feet per year of capacity rights in the JRWSS which is directly supplied from the EOCF #2 operated by Metropolitan.

2.1.3 Recycled Water

Almost all of the wastewater generated within the ETWD service area is conveyed to their Water Recycling Plant (WRP) where it is treated and either used for irrigation or disposed of through the South Orange County Wastewater Authority's (SOCWA) Effluent Transmission Main and Aliso Creek Ocean Outfall. The WRP is located in the western portion of ETWD's service area, adjacent to the Laguna Woods Village Golf Course. ETWD's WRP is one of the oldest water recycling plants in Orange County, and was designed and permitted to provide secondary-treated recycled water for restricted irrigation at the nearby golf course. A small portion of flow in the southeast portion of ETWD is conveyed directly to the Moulton Niguel Water District (MNWD) collection system.

ETWD began the expansion of its recycled water treatment facilities and recycled water distribution system in early 2013. The WRP upgrade and expansion was completed in late 2014. Distribution system expansion and dedicated irrigation meter retrofits are expected to be completed by early 2016. Prior to the WRP upgrade, ETWD supplied approximately 500 AFY of disinfected secondary-treated recycled water for irrigation use at the Laguna Woods Village Golf Course and for in plant irrigation and process water. The remaining secondary effluent is discharged to the Pacific Ocean via SOCWA's Effluent Transmission Main and Aliso Creek Ocean Outfall. Section 2.2.2 describes the Recycled Water Tertiary Treatment Plant and system expansion project.

2.2 Projected Future Supplies

While imported water from Metropolitan will continue to meet the majority of ETWD's demands over the next 20 years, ETWD's supply portfolio is changing resulting in reduced reliance on imported supplies and an increased reliance on local recycled supplies as a result of the Recycled Water Expansion Project. In addition, the Baker WTP, a partnership among several local retail water agencies, will further reduce ETWD's dependence on treated imported water from the Metropolitan Diemer Filtration Plant and provides the project participants the potential to receive and treat local surface water from Irvine Lake[1] water as a yet to be quantified new supply of source when available. ETWD will have an expected delivery of 3,258 AFY from the Baker WTP. Construction of the Baker WTP began in February 2014 and the plant is anticipated to be on line late 2016.

ETWD's projected water supplies from 2015 to 2035 are summarized in Table 2-3.

Table 2-3: Projected Water Supply Sources

Water Supply Sources	Fiscal Year Ending (AFY)				
	2015 [5]	2020	2025	2030	2035
MWDOC (Imported Treated, Full Service) [1]	8,650	9,021	9,021	9,021	9,021
Baker WTP (Imported Untreated, Full Service) [2], [3]	-	3,258	3,258	3,258	3,258
Recycled Water Available [4]	464	1,710	1,710	1,710	1,710
Total	**9,114**	**13,989**	**13,989**	**13,989**	**13,989**

[1] 2020 to 2035 projections reflect availability of imported water based on highest historical deliveries less Baker WTP supply.

[2] Baker WTP supply will offset and reduce purchased Metropolitan treated water from Diemer Filtration Plant.

[3] Expected actual delivery at 90% of the 3,600 AFY capacity rights.

[4] 1,440 AFY (Phase 1 expansion) and 270 AFY (Phase 2)

[5] Actual data for FY 2014-15

2.2.1 Imported Water

Metropolitan's most recent (2010) Regional Urban Water Management Plan (RUWMP) reports on its water reliability and identifies projected supplies to meet the long-term demand within its service area. It presents Metropolitan's supply capacities from 2015 through 2035 under the three hydrologic conditions specified in the UWMP Act: average year, single dry-year, and multiple dry-years.

[1] Irvine Lake is supplied with untreated water from Metropolitan and local surface runoff.

Colorado River Aqueduct (CRA) supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements to transfer water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 million acre-feet (MAF) on an as-needed basis.

Metropolitan's SWP supplies have been impacted in recent years by restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008 and June 4, 2009, respectively. The Drought Operations Plan prepared on April 8, 2014 lays out the proposed operations and conditions of the SWP during multiple dry years to maximize regulatory flexibility while remaining within the boundaries of existing law and regulations (U.S. Bureau of Reclamation, April 2014). In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP water storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed with available storage and pumping capacity to maintain deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

Because a large portion of Metropolitan's water supply comes from the SWP via the Sacramento and San Joaquin River Delta (Delta), in June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to create a sustainable Delta and reduce water use conflicts between water supply needs and environmental needs. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented.

State and federal resource agencies and various environmental and water user entities are currently engaged in developing the Bay Delta Conservation Plan (BDCP), aimed at addressing Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 (now delayed) that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed by Biological Opinions of the resource agencies.

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its WSAP, is dependent on its storage resources. In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands.

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multi-year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply).

For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992[2]. Metropolitan's analyses are illustrated in Tables 2-4, 2-5, and 2-6 which correspond to Metropolitan's 2010 RUWMP's Tables 2-11, 2-9 and 2-10, respectively. These tables show that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry-year hydrologies for the 20-year horizon.

[2] This analysis is based on Metropolitan's most recent (2010) RUWMP. The 2010-2015 drought is more severe and will be addressed in Metropolitan's 2015 RUWMP currently in preparation.

Table 2-4: Metropolitan Average Year Projected Supply Capability and Demands for 2015 to 2035

(Metropolitan, November 2010)

AverageYear

Supply Capability[1] and Projected Demands

Average of 1922-2004 Hydrologies

(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,507,000	1,529,000	1,472,000	1,432,000	1,429,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,485,000**	**3,810,000**	**4,089,000**	**3,947,000**	**3,814,000**
Demands					
Firm Demands of Metropolitan	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,006,000**	**1,933,000**	**1,985,000**	**2,049,000**	**2,106,000**
Surplus	**1,479,000**	**1,877,000**	**2,104,000**	**1,898,000**	**1,708,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	382,000	383,000	715,000	715,000	715,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**588,000**	**689,000**	**1,051,000**	**1,051,000**	**1,051,000**
Potential Surplus	**2,067,000**	**2,566,000**	**3,155,000**	**2,949,000**	**2,759,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-5: Metropolitan Single Dry Year Projected Supply Capability and Demands for 2015 to 2035

(Metropolitan, November 2010)

Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	522,000	601,000	651,000	609,000	610,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,416,000	1,824,000	1,669,000	1,419,000	1,419,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,457,000**	**2,782,000**	**2,977,000**	**2,823,000**	**2,690,000**
Demands					
Firm Demands of Metropolitan	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,171,000**	**2,162,000**	**2,201,000**	**2,254,000**	**2,319,000**
Surplus	**286,000**	**620,000**	**776,000**	**569,000**	**371,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	556,000	556,000	700,000	700,000	700,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**762,000**	**862,000**	**1,036,000**	**1,036,000**	**1,036,000**
Potential Surplus	**1,048,000**	**1,482,000**	**1,812,000**	**1,605,000**	**1,407,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-6: Metropolitan Multiple Dry Year Projected Supply Capability and Demands for 2015 to 2035

(Metropolitan, November 2010)

Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	246,000	373,000	435,000	398,000	353,000
California Aqueduct[2]	752,000	794,000	835,000	811,000	812,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,318,000	1,600,000	1,417,000	1,416,000	1,416,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,248,000**	**2,417,000**	**2,520,000**	**2,459,000**	**2,415,000**
Demands					
Firm Demands of Metropolitan	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
IID-SDCWA Transfers and Canal Linings	180,000	241,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,236,000**	**2,188,000**	**2,283,000**	**2,339,000**	**2,399,000**
Surplus	**12,000**	**229,000**	**237,000**	**120,000**	**16,000**
Programs Under Development					
In-Region Storage and Programs	162,000	280,000	314,000	336,000	336,000
California Aqueduct	242,000	273,000	419,000	419,000	419,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**404,000**	**553,000**	**733,000**	**755,000**	**755,000**
Potential Surplus	**416,000**	**782,000**	**970,000**	**875,000**	**771,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

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2.2.2 Recycled Water

ETWD completed the construction of a tertiary treatment facility at the existing Water Recycling Plant (WRP) in late 2014. The uses of tertiary-treated water are less restrictive than secondary-treated water, thus allowing recycled water to be used more extensively for commercial and public applications. The Tertiary Treatment Plant (TTP) is located within ETWD's WRP site at the northeast corner of the Laguna Woods Village Golf Course. Local access to the project site is via Moulton Parkway and Ridge Route Drive (Dudek, March 2012).

The TTP is designed to produce 3.7 MGD of recycled water, based on projected maximum day non-potable demand with the ability to expand to 4.0 MGD with the addition of more cloth media disc filters. Simultaneous to the TTP construction, recycled water distribution system pipelines were constructed to deliver tertiary treated recycled water to irrigation users in the ETWD service area. The recycled water distribution system expansion is complete. It consists of approximately 19.5 miles of pipeline (4-20 inch diameter) within existing public rights-of-way and private roads in residential neighborhoods within the Cities of Laguna Woods and Laguna Hills.

The distribution system expansion consists of two main portions, one on the east side of Moulton Parkway and one on the west side of Moulton Parkway. The eastern portion is adjacent to the east side of the Laguna Woods Village Golf Course and extends east towards Interstate 5. The western portion extends from Lake Forest Drive in the north to El Toro Road in the south and west to the western limits of the Cities of Laguna Hills and Laguna Woods. (Dudek, March 2012). Approximately 215 dedicated irrigation meters will be converted to recycled water in the cities of Laguna Woods and Laguna Hills. Meter retrofitting is expected to be completed by early 2016. The conversion will replace 940 AFY previously served by potable water, bringing the recycled water supply to approximately 1,440 AFY after the completion of the Phase 1 meter retrofits. A planned Phase 2 expansion will provide another 270 AFY of tertiary treated recycled water to ETWD's customers. ETWD is also evaluating other recycled water projects that could expand its treatment and distribution system capability.

2.2.3 Baker Water Treatment Plant

The Baker WTP will be a new 28.1 MGD plant at the existing Irvine Ranch Water District's (IRWD) Baker Filtration Plant site in the City of Lake Forest. The Baker WTP will treat raw imported water from Metropolitan and potentially Irvine Lake water. Given that the project primarily relies on imported raw water from Metropolitan, it does not create a day-to-day new supply but would provide increased water reliability to southern Orange County by providing locally treated water to customers of IRWD, ETWD, MNWD, Santa Margarita Water District (SMWD) and Trabuco Canyon Water District (TCWD). It will minimize water supply impacts in the event of emergency conditions or scheduled maintenance on the Metropolitan delivery system such as the Diemer Filtration Plant, Lower Feeder Pipeline or AMP. Additionally, the potential exists for the project participants to receive and treat Irvine Lake water as a yet to be quantified new supply source when available. Irvine Lake is supplied by untreated water from Metropolitan and local surface runoff. The Baker WTP

construction is expected to be completed in late 2016. ETWD has a capacity right of approximately 3.2 MGD (3,600 AFY) from the Baker WTP.

2.2.4 Huntington Beach Desalination Project

Poseidon Water (Poseidon) is proposing to construct a Huntington Beach Desalination Project (HBDP), a potential source of water for ETWD, which would be co-located adjacent to the existing Huntington Beach Generating Station (HBGS). The HBDP is a proposed 50 MGD facility that will require a total intake flow of approximately 127 MGD. Approximately 100 MGD will enter the process, which will produce 50 MGD of potable water and 50 MGD of concentrated seawater. The remaining 27 MGD will be used as a dilution flow and combined with the seawater reverse osmosis (SWRO) concentrate. The proposed desalination project would be located approximately 0.5 miles from the Pacific Ocean within the boundaries of a 13-acre site owned by the HBGS (PSOMAS, May 2007). Poseidon is currently in discussions with the California Coastal Commission (CCC) to secure the Coastal Development Permit, the last discretionary permit necessary to authorize the construction of the project (Poseidon, 2015).

3. WATER DEMANDS

This section provides an overview of ETWD's current and projected population and climate conditions which are the main drivers affecting water demand. This section also presents the water demand projected for the Five Lagunas project and its impact on the SBx7-7 gallons per capita per day (GPCD) targets, defined in Section 3.3.3.

3.1 ETWD Service Area

ETWD provides water to a population of over 48,000 customers throughout its 5,350 acre service area. ETWD service area is almost entirely developed encompassing all of the City of Laguna Woods and portions of four other cities: Lake Forest, Aliso Viejo, Laguna Hills and Mission Viejo.

The ETWD service area ranges in elevation between 230 feet above sea level at its lowest point to 904 feet at its highest. In general, elevations increase from west to east. Interstate 5 bisects ETWD's service area from north to south, with the higher elevations located on the east side. ETWD is bordered by IRWD to the north, the Laguna Beach County Water District (LBCWD) to the west, MNWD to the west and south, and SMWD to the south and east. ETWD also shares a small border with TCWD in the northern part of its service area.

3.1.1 Population

Based on the 2010 census, the Center for Demographic Research (CDR) at California State University Fullerton estimated a population of 48,890 in 2005 and 48,797 in 2015 within ETWD's service area. This represents a 0.2% decrease in population in the last decade. Therefore, ETWD's service area population has been relatively stable. Table 3-1 shows historic population in five-year increments.

Table 3-1: Historical Service Area Population

	1990	1995	2000	2005	2010
Population	43,602	46,262	49,796	48,890	47,861

Source: Center for Demographic Research (CDR) at California State University, Fullerton, September 2015

The 2015 to 2035 projections shown in Table 3-2 are based on the 2010 census. It is expected that the growth within ETWD service area will be approximately 10 percent from 2015 to 2020, and tapering off to minimal change through 2035.

Table 3-2: Current[1] and Projected[2] Service Area Population

	2015	2020	2025	2030	2035
Population	48,797	53,743	52,750	53,225	53,245

[1] Center for Demographic Research (CDR) at California State University, Fullerton, September 2015

[2] Center for Demographic Research (CDR) at California State University, Fullerton, March 2015

3.1.2 Climate Conditions

The ETWD service area encompasses portions of south Orange County located in an area known as the South Coast Air Basin (SCAB). The SCAB climate is characterized by a "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. Table 3-3 below shows climate data for ETWD service area. The service area's average temperature ranges from 58.3°F in January to 74.3°F in August. The average annual rainfall is 13.57 inches, and the average evapotranspiration (ET_0) is 49.69 inches, which is over three times the annual average rainfall. This translates to a high demand for landscape irrigation for homes, commercial properties, parks, and golf courses. Moreover, a region with low rainfall like Southern California is also more prone to drought conditions.

Table 3-3: Average Climate Conditions

Month	Standard Monthly Average ET_0 (inches) [1]	Annual Rainfall (inches) [2]	Temperature (˚F) [3]	
			Max	Min
Jan	2.37	2.73	68.1	43.1
Feb	2.55	3.05	68.9	44.9
Mar	3.62	2.21	70.7	46.7
Apr	4.77	1.05	73.1	50.0
May	5.18	0.25	75.2	54.0
Jun	5.58	0.06	78.6	57.4
Jul	6.36	0.02	83.5	60.9
Aug	6.17	0.06	84.7	61.6
Sep	4.76	0.22	83.9	59.3
Oct	3.59	0.49	79.4	54.5
Nov	2.61	1.28	74.2	47.5
Dec	2.12	2.28	68.8	43.6
Annual	**49.68**	**13.69**	**75.8**	**52.0**

[1] CIMIS Station #75, Irvine, California from October 1987 to present.

[2] WRCC, Santa Ana Fire Station, California 4/1/1906 to 1/20/2015, Average total precipitation.

[3] WRCC, Santa Ana Fire Station, California 4/1/1906 to 1/20/2015, Average max and min temperature.

3.2 Existing Water Demands

ETWD has maintained approximately 10,000 customer connections to its potable water distribution system since 2005. All connections in the service area are metered. Slightly less than 60 percent of ETWD's water demand is residential. Commercial/industrial and dedicated landscape sectors represent approximately 40 percent of ETWD's water demand. A small portion of ETWD's demand is from government/institutional establishments such as municipal buildings and hospitals (approximately 1 percent of total demand).

Table 3-4 summarizes ETWD's existing water demand for FY 2014-2015.

Table 3-4: Current Water Demand

Water Supply Sources	Fiscal Year Ending (AFY)
MWDOC (Imported Treated, Full Service)	8,650
Recycled Water	464
Total	**9,114**

3.3 Projected Water Demands

As noted previously, ETWD's most recently adopted 2010 UWMP did not include projected demands associated with the Five Lagunas project. Since the adoption of the 2010 UWMP, ETWD has more recently developed new water demand projections for its service area excluding water demand from the Five Lagunas Project. The Five Lagunas Project will result in a net increase of water demand as detailed below.

3.3.1 Projected Water Demands without Five Lagunas Project

Table 3-5 presents the 20-year projected water demand without demands from the Five Lagunas Project.

Table 3-5: Projected Water Demands without Five Lagunas Project Demand

Water Supply Sources	Fiscal Year Ending (AFY)				
	2015 [2]	2020	2025	2030	2035
MWDOC (Imported Treated, Full Service)	8,650	5,063	5,796	5,825	5,717
Baker WTP (Imported Untreated, Full Service) [1]	-	3,258	3,258	3,258	3,258
Recycled Water	464	1,710	1,710	1,710	1,710
Total	**9,114**	**10,031**	**10,764**	**10,793**	**10,685**

[1] Baker WTP supply will offset and reduce purchased Metropolitan treated water from Diemer Filtration Plant.

[2] Actual demand for FY2014-15

3.3.2 Projected Water Demands from Five Lagunas Project

The Five Lagunas project proposes new residential units and the redevelopment of Laguna Hills Mall accompanied by a net increase in water demand for ETWD's residential, commercial, and landscape irrigation customer sectors. The project will add 988 multi-family residential units comprising a mixture of studios, one-, two-, and three-bedroom apartments. These residential units will generate approximately 141,400 gallons per day (gpd) or 158 AFY of potable (indoor) water demands (Table 3-6). Commercial potable (indoor) water demand is estimated to increase by 72,800 gpd (82 AFY), mainly as a result of the addition of restaurants and a large fitness center (Table 3-7). The Five Lagunas Project will result in a net increase of approximately 215,800 sq. ft. in landscaped areas to the mall and residential areas, with an associated irrigation demand of approximately 14,840 gpd (17 AFY) (Table 3-8).

Table 3-6: Five Lagunas Project's Residential Water Demands Projection

Use Category	Dwelling Units (DU)	Sewer Generation Factor (gpd/DU)	Sewer Demand [1] (gpd)	Water Demand [2] (gpd)
Studio	63	80	5,040	5,305
One bedroom	493	120	59,160	62,274
Two bedroom	407	160	65,120	68,547
Three bedroom	25	200	5,000	5,263
Total Residential	**988**		**134,320**	**141,389**

[1] Sewer demand per City of Los Angeles/Los Angeles County Sanitation Districts' Characteristics Sewage Generation Factors.

[2] Assume sewer demand is 95% of water demand.

Table 3-7: Five Lagunas Project's Commercial Water Demands Projection

Use Category	Sewer Generation Factor (gpd/ksf) [1]	Existing Gross Floor Area (sq. ft)	Existing Sewer Demand (gpd)	Total Future Gross Floor Area (sq. ft.)	Total Future Sewer Demand (gpd)	Change in Sewer Demand [2] (gpd)	Change in Water Demand [3] (gpd)
Restaurant	1,000	78,795	78,795	115,354	115,354	36,559	38,483
Restaurant patio	1,000	4,603	4,603	17,858	17,858	13,255	13,953
Retail	80	873,551	69,884	616,013	49,281	-20,603	-21,687
Retail Patio	80	1,512	121	1,512	121	0	0
Fitness	800	0	0	40,102	32,082	32,082	33,770
Cinema	4	1,020	4,080	2,068	8,272	4,192	4,413
Flex Retail/Med Office	80	0	0	45,890	3,671	3,671	3,864
Total Commercial		**959,481**	**157,483**	**838,797**	**226,639**	**69,156**	**72,796**

[1] Sewer generation factor for cinema is in gpd/seat, existing and proposed number of seats are 1,020 and 2,068, respectively.

[2] Sewer demand per City of Los Angeles/Los Angeles County Sanitation Districts' Characteristics Sewage Generation Factors.

[3] Assume sewer demand is 95% of water demand.

Table 3-8: Five Lagunas Project's Landscape Water Demands Projection

Landscape Category	Existing Area (sq. ft.)	Water Use Factor (gpm/ac)	Existing Water Demand (gpd)	Total Future Area (sq. ft.)	Water Use Factor (gpm/ac)	Total Future Water Demand (gpd)	Change in Water Demand (gpd)
Retail	120,550	2.08	8,289	279,468	2.08	19,216	10,927
Residential	53,140	2.08	3,654	110,000	2.08	7,564	3,910
Total Landscape	**173,690**		**11,943**	**389,468**		**26,780**	**14,837**

[1] There is no existing residential, this area is the existing Laguna Hills Mall landscape that will become part of the residential landscape.

Table 3-9 summarizes the 20-year estimated water demands from the Five Lagunas development. The project will be a single-phase construction with a planned completion in 2018 and residential units are expected to be fully occupied before 2020.

Table 3-9: Five Lagunas Project's Total Water Demands Projection

Demand by Sector	Fiscal Year Ending (AFY)				
	2015	2020	2025	2030	2035
Residential (indoor)	-	158	158	158	158
Commercial (indoor)	-	82	82	82	82
Dedicated Landscape	-	17	17	17	17
Total Five Lagunas Project	-	**257**	**257**	**257**	**257**

3.3.3 Projected Water Demands with Five Lagunas Project

Table 3-10 summarizes the 20-year estimated water demands for ETWD service area, including demand from the Five Lagunas development.

Table 3-10: Projected Water Demands with Five Lagunas Project Demands

Water Supply Sources	Fiscal Year Ending (AFY)				
	2015 [4]	2020	2025	2030	2035
MWDOC (Imported Treated, Full Service) [1]	8,650	5,320	6,053	6,082	5,974
Baker WTP (Imported Untreated, Full Service) [2]	-	3,258	3,258	3,258	3,258
Recycled Water [3]	464	1,710	1,710	1,710	1,710
Total	**9,114**	**10,288**	**11,021**	**11,050**	**10,942**

[1] Includes 240 AFY projected potable demand associated with Five Lagunas Project.

[2] Baker WTP supply will offset and reduce purchased Metropolitan treated water from Diemer Filtration Plant.

[3] Actual demand for FY2014-15 prior to Five Lagunas development

3.3.4 Projected Water Demands Based on SBx7-7 Targets

In February 2010, SBx7-7 established the goals of achieving a statewide 10 percent reduction in per capita urban water demand by the year 2015, and a 20 percent reduction by 2020. To reach these goals, SBx7-7 requires retail urban water suppliers to develop various technical information regarding water demands, such as baseline per capita water use, water use targets, and other compliance data, and to report that information in their UWMPs. Retail water suppliers may choose to meet the targets on their own or several retail suppliers may form an alliance to meet the targets as a region. A total of 29 retail water suppliers in Orange County, including ETWD, chose to comply as a region and came together to form the Orange County 20x2020 Regional Alliance.

The methodologies used to develop the water use targets were established by the California Department of Water Resources (DWR) and are described in ETWD's 2010 UWMP and MWDOC's 2010 RUWMP. The regional target water use to be complied by the Regional Alliance is the weighted average (by population) of the individual retail suppliers' targets. ETWD's individual water use targets were determined from a 10-year baseline daily per capita water use (July 1, 1995 to June 30, 2005), excluding recycled water demands.

ETWD's projected water demand (excluding recycled water) for 2015 and 2020 shown in Tables 3-4, 3-5, and 3-10 have been converted to GPCD for the purpose of comparison (Table 3-11). The 158 GPCD is the actual water use in 2015. It is important to note that the projected water demands (including Five Lagunas development) are lower than the water use targets. In other words, ETWD is already projecting to meet the 20x2020 targets. Based on this finding, the demands including the Five Lagunas development will be used for the supply-demand comparative analyses in Section 4. The projected additional demand from the Five Lagunas

development increases the GPCD slightly (3 percent) and the projected demands are still below the 20x2020 targets.

Regardless of individual SBx7-7 targets, ETWD elected to comply as a member of the Orange County 20x2020 Regional Alliance and the new demand associated with the Five Lagunas project will represent a small increase to the regional GPCD targets.

Table 3-11: ETWD SBx7-7 Baseline and Water Use Targets

	Baseline	2015 [3]	2020
Original GPCD Targets [1]	201	181	161
Revised GPCD Targets [2]	**204**	**183**	**163**
Projected GPCD without Five Lagunas Demands	-	158	138
Projected GPCD with Five Lagunas Demands	**-**	**NA**	**142**

[1] Calculated based on historical population from 2007 SCAG.

[2] Recalculated based on revised population from 2010 Census.

[3] Actual 2015 GPCD prior to Five Lagunas development

4 SUPPLY AND DEMAND COMPARISON

This section compares water supply and demand projections to determine whether sufficient supply will be available for the proposed project. The assessment is done for the years 2020 to 2040 in five-year increments. The supply-demand analyses include the assessment of average-year, single dry-year, and multiple dry-year hydrologic scenarios.

4.1 Average Year

The average year represents average hydrologic conditions. The total demand presented in Table 4-1 represents the sum of ETWD's demand projections without Five Lagunas demands and the demand projections for the Five Lagunas project which imposes a 257 AFY net increase in potable water, 17 AFY of which are dedicated irrigation demand.

ETWD has written contracts to receive imported water from Metropolitan via the regional distribution system. All imported water supplies assumed in this section are available to ETWD from existing water transmission facilities. Table 4-1 shows supply and demand under normal year conditions. Additional water supplies are projected to be available from Metropolitan, but are not included here since projected supplies meet or exceed projected demands.

Table 4-1: Projected Average Year Supply and Demand

	Fiscal Year Ending (AFY)				
	2015 [2]	2020	2025	2030	2035
Total Demand [1]	**9,114**	**10,288**	**11,021**	**11,050**	**10,942**
Potable	8,650	8,578	9,311	9,340	9,232
Recycled Water	464	1,710	1,710	1,710	1,710
Total Supply	**9,114**	**10,288**	**11,021**	**11,050**	**10,942**
Potable	8,650	8,578	9,311	9,340	9,232
Recycled Water	464	1,710	1,710	1,710	1,710

[1] Includes projected demands associated with Five Lagunas project for FY after 2015.
[2] Actual demand/supply for FY2014-15

4.2 Single Dry Year

The impacts of single dry-year conditions on water demands in this WSA were determined by the same methodology provided by MWDOC employed in ETWD's 2010 UWMP. The single dry-year condition increases the demand from the average condition. The increase can be expressed as a percent "bump" up from the

normal level. The methodology focused on per-capita usage because it removes the influence of growth from the analysis. To determine the "bump factor", ETWD's per-capita usage from FY 1992-93 thru FY 2008-09 were used. Usage data are not readily available prior to FY 1991-92. FY 1991-92 and 2009-10 are years of extraordinary conservation and are therefore excluded from the analysis. The single dry bump factor was derived using the highest per-capita usage in the analysis period, divided by average per-capita usage for that period. ETWD's single dry bump factor is 7.5 percent using FY 2002-03 as the single dry-year.

Table 4-2 compiles supply and demand projections for a single dry water year. The available imported supply is greater than shown; however, it is not included because all demands are met.

Table 4-2: Projected Single Dry-Year Supply and Demand

	Fiscal Year Ending (AFY)				
	2015 [2]	2020	2025	2030	2035
Total Demand [1]	**9,114**	**11,059**	**11,847**	**11,878**	**11,762**
Imported	8,650	9,349	10,137	10,168	10,052
Recycled Water	464	1,710	1,710	1,710	1,710
Total Supply	**9,114**	**11,059**	**11,847**	**11,878**	**11,762**
Imported	8,650	9,349	10,137	10,168	10,052
Recycled Water	464	1,710	1,710	1,710	1,710

[1] Includes projected demands associated with Five Lagunas project for FY after 2015.

[2] Actual demand/supply for FY2014-15

4.3 Multiple Dry Years

MWDOC selected a multiple dry year bump factor equal to the single dry year bump factor. This means having three highest-demand years in a row. ETWD, in its 2010 UWMP projects that it will be capable of providing its customers all their demands with significant reserves in multiple dry years from 2015 through 2035 with a demand increase of 7.5 percent from normal in each of the three years. This is true even if the demand projections were to be increased by a larger margin.

Table 4-3 shows supply and demand projections under multiple dry year conditions.

Table 4-3: Projected Multiple Dry-Years Supply and Demand

		Fiscal Year Ending (AFY)				
		2015 [2]	2020	2025	2030	2035
First Year Supply	**Total Demand [1]**	**9,114**	**11,059**	**11,847**	**11,878**	**11,762**
	Imported	8,650	9,349	10,137	10,168	10,052
	Recycled Water	464	1,710	1,710	1,710	1,710
	Total Supply	9,114	11,059	11,847	11,878	11,762
Second Year Supply	**Total Demand**	**9,114**	**11,059**	**11,847**	**11,878**	**11,762**
	Imported [1]	8,650	9,349	10,137	10,168	10,052
	Recycled Water [2]	464	1,710	1,710	1,710	1,710
	Total Supply	9,114	11,059	11,847	11,878	11,762
Third Year Supply	**Total Demand**	**9,114**	**11,059**	**11,847**	**11,878**	**11,762**
	Imported [1]	8,650	9,349	10,137	10,168	10,052
	Recycled Water [2]	464	1,710	1,710	1,710	1,710
	Total Supply	9,114	11,059	11,847	11,878	11,762

[1] Includes projected demands associated with Five Lagunas project for FY after 2015.

[2] Actual demand/supply for FY2014-15

4.4 Conclusions

This WSA has evaluated ETWD's projected future demands and the potential additional water demands associated with the Five Lagunas project and compared those demands to projected supplies available to ETWD through 2040. In accordance with the foregoing and the standards set forth by Water Code § 10910, this WSA concludes that the total projected water supplies available to ETWD during average, single-dry, and multiple-dry water years over the next 20 years are sufficient to meet the projected water demands for the proposed project, in addition to ETWD's existing uses.

Based on Metropolitan's 2010 RUWMP supply projections, MWDOC concludes in its 2010 RUWMP that it will be able to meet full service demands of its retail agencies under average, single-dry, and multiple-dry year conditions with 100% reliability.

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