ONTARIO MUNICIPAL UTILITIES COMPANY

Recycled Water

Desalter Water

Ground Water

Imported Water

2015 Urban Water Management Plan

July 2016

City of Ontario

DRAFT

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CHAPTER 1
INTRODUCTION AND OVERVIEW

1.1 Urban Water Management Planning Act

All urban water suppliers within the State of California are required to prepare Urban Water Management Plans and update the plans every five years. California Water Code Sections 10610 through 10657 details the information that must be included in these plans as well as who must file them. This plan satisfies the requirements of the Urban Water Management Planning Act (the Act) of 1983 and the subsequent amendments to the Act. According to the Act, an urban water supplier is defined as a supplier, either publicly or privately owned, that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually.

This report constitutes the City of Ontario's (City) 2015 Urban Water Management Plan (UWMP). Urban water suppliers are required to update their UWMPs at least once every five years on or before December 31, in years ending in five and zero. This plan shall be adopted by the City Council and submitted to the California Department of Water Resources (DWR). The UWMP requires greater analyses of management tools and options that will maximize local resources and minimize the need to import water from other regions. An analysis of total projected water use compared to water supply sources over the next 25 years in five-year increments is required. Water quality, as it affects water management strategies and supply reliability, is addressed in this UWMP. Water demand and supply information is compared for single dry year and multiple dry year scenarios.

1.2 Water Management Planning Efforts

In 2012 the City completed a Water Master Plan (WMP), Recycled Water Master Plan (RWMP) and a Sewer Master Plan (SMP) providing an overall water supply and demand framework for the City. The purpose of the WMP, RWMP and SMP is to identify supply deficiencies, anticipate supply issues, and develop plans to address the constantly changing environment in which we live in. The documents analyze water demands for a growing community, analyze the different resources required to meet those demands, project future demand and production needs, identify the infrastructure required to meet those needs and analyze the cost of water now and in the future. These documents, as well as revised land use based demand factors, serve as source document for preparation of this 2015 UWMP.

The City has always actively managed its water resources for the population that it serves to ensure the quality, quantity, and reliability of the water supply in a cost effective manner. This approach follows the City's vision goal of "A sustained, community-wide prosperity which continuously adds value and yields benefits." The WMP, RWMP and SMP meets the City's vision goal by proactively analyzing the present, past and future state of the water supply and will build upon the foundations laid out by "The Ontario Plan."

The Inland Empire Utilities Agency (IEUA), in coordination with the City and its other member agencies, has developed an Integrated Resources Plan (IRP) and a Water Use Efficiency Business Plan (WUE Plan) to identify potential water supply projects and demand management programs that

could be developed. Collectively the WMP, RWMP, SMP, IRP and WUE will act as the City's road map for ensuring reliable, cost-effective, and environmentally responsible water supplies for the next 25 years.

CHAPTER 2
PLAN PREPARATION

2.1 Basis for Preparing a Plan

The City of Ontario's (City) 2015 Urban Water Management Plan (UWMP) has been prepared consistent with the State of California Water Code Sections 10610 through 10656, known as the Urban Water Management Planning Act (Act).

Originally enacted in 1983, the Act requires that every urban water supplier (providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually) prepare and adopt an urban water management plan. The Act requires urban water suppliers to prepare plans that describe and evaluate reasonable and practical efficient water uses, recycling and conservation activities. These plans are to be filed with the California Department of Water Resources (DWR) every five years.

2.2 Public Water Systems

The City meets the reporting threshold of 3,000 or more connections or 3,000 acre-feet (AF) of water supplied. In 2015, the City delivered 36,153 AF of water to 33,720 connections, as found in table 2-1.

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
3610034 SD	City of Ontario	33,720	36,153
	TOTAL	33,720	36,153

NOTES: Numbers include recycled water irrigation and agriculture connections and volume delivered.

2.3 Regional Alliance

In partnership with Inland Empire Utilities Agency (IEUA), the City and the other IEUA member agencies formed a Regional Alliance, for SBX 7-7 compliance purposes, prior to the 2010 Urban Water Management Plan submittal (Table 2-2). This Regional Alliance is still in effect for the 2015 UWMP submittals. Additional information on SBx 7-7 and Regional Compliance can be found in Chapter 5.

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Inland Empire Utilities Agency Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4 Reporting Year and Units of Measure

All of the City's water demand and supply data in this document reports in calendar years and the units of measure are in acre-feet (Table 2-3).

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF

2.5 Coordination with Wholesale Agencies, Other Agencies and the Community

The City is a member of the wholesale agencies listed in Table 2-4. The City is also indirectly a member of Metropolitan Water District (MWD) through its association with the Water Facilities Authority (WFA) and the Inland Empire Utilities Agency (IEUA). Neighboring water retail agencies include the Cities of Chino, Chino Hills, Pomona and Upland, Cucamonga Valley Water District (CVWD), Monte Vista Water District (MVWD), Fontana Water Company (FWC) and Jurupa Community Services District (JCSD). Copies of the 2015 UWMP were sent to all agencies listed in Table 10-1, located in Chapter 10.

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
Water Facilities Authority (WFA)
Metropolitan Water District (MWD)
Chino Basin Desalter Authority (CDA)
San Antonio Water Company (SAWCo)
Inland Empire Utilities Agency (IEUA)

CHAPTER 3
SYSTEM DESCRIPTION

3.1 General Description

The City of Ontario (City) is located 35 miles east of downtown Los Angeles and is bordered by the Cities of Chino and Montclair on the west; the Cities of Upland and Rancho Cucamonga on the north; the City of Fontana and Riverside County on the east; and the City of Chino, City of Eastvale, and Riverside County on the south. The predominant land uses are residential, commercial, industrial and agricultural, in addition to the Ontario International Airport. Figure 3-1 shows the location of the study area.

The City is divided into two distinct areas: Old Model Colony (OMC) and Ontario Ranch (OR). The OMC mostly consists of residential, commercial, and industrial developments, including the Ontario Airport. Annexed in 1999, the presently agricultural OR is planned to be developed into residential, commercial, industrial and public uses. The combined 2015 service population for both OMC and OR is 168,777. The projected population at build out is 368,239. Two small areas in the north central and northeastern sections of the City are served by the Cucamonga Valley Water District (CVWD) and are excluded from this study. Over the last 10 years, the City has produced an average of 23,408 AFY of groundwater, purchased an average of 10,724 AFY from Water Facilities Authority (WFA), purchased an average of 4,733 AFY from Chino Basin Desalter Authority (CDA), and purchased an average of 5,263 AFY of recycled water (not including groundwater recharge credits) from Inland Empire Utilities Agency (IEUA). There are currently 33,720 meters throughout the City.

3.1.1 Topography and Geology

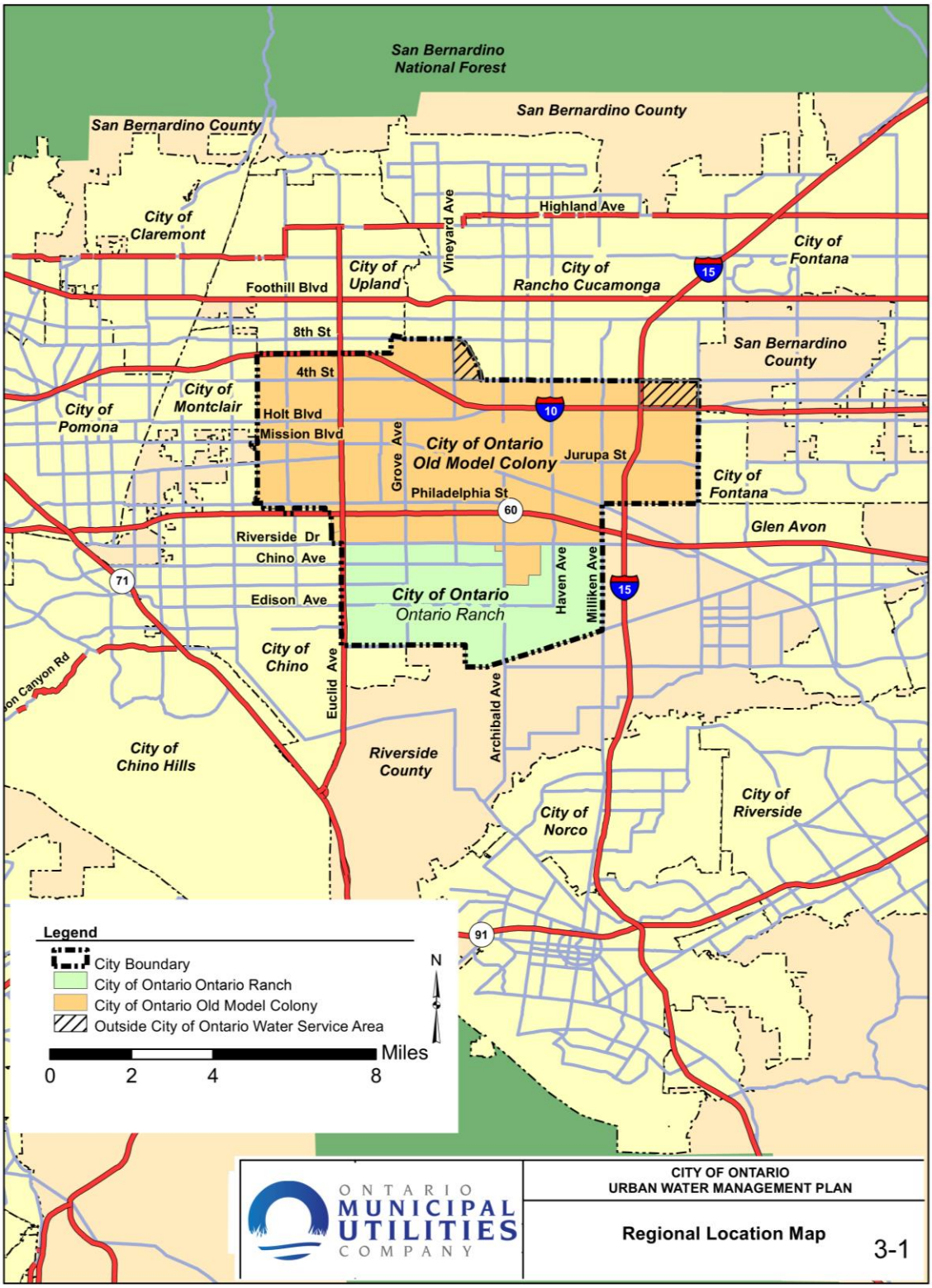
The City is located in the San Bernardino Plain, which is an expanse of sand, gravel and boulders. Dominating the valley are Mt. San Antonio, Cucamonga Peak, and Ontario Peak. Cucamonga Peak is visibly flat on top which represents sections of the original valley floor. Loose dirt and gravel flows swiftly from the slopes of these young mountains with the sometimes torrential rains.

The valley and plain has taken more than 10 million years to form. Geologists place the beginning of the area's geologic history between 12 and 28 million years ago, the same time the San Andreas Fault is believed to have been formed. The San Gabriel Mountains are part of the east-west trending transverse ranges, which run across the north-south grain of California. The San Gabriel Mountains are intersected 25 miles east of Ontario at the Cajon Pass by the San Andreas Fault.

These mountains were partially formed by geologic activity along this fault. Visible to the south of Ontario is a portion of the peninsular range consisting of the Santa Ana Mountains, the base of which is carved by the Santa Ana River. Several blocks of the Peninsular Range are separated by faults generally attributed to the San Andreas Fault system. Small rolling hills make up the north and west portions of the valley (Chino Hills, Diamond Bar, and the Covina Hills).

The Transverse and Peninsular Ranges meet in the San Gorgonio Pass area, 50 miles east of the City. Mount San Gorgonio is the tallest peak in Southern California and is frequently visible from the City.

Figure 3-1 City of Ontario Location Map



3.1.2 Elevations

The topography of the region generally slopes in a southwesterly direction from 1170 to 630 feet above mean sea level (amsl).

3.1.3 Soils

Native soils, shown on Figure 3-2, consist of the following

Class I Soils

- Chino Silt Loam
- Grangeville Fine Sandy Loam
- Hanford Sandy Loam

Class II Soils

- Delhi Fine Sand
- Hanford Coarse Sandy Loam
- Hilmar Loamy Fine Sand

Class III Soils

- Tujunga Loamy Sand

Class IV Soils

- Soboda Stony Loamy Sand
- Tujunga Gravelly Loamy Sand

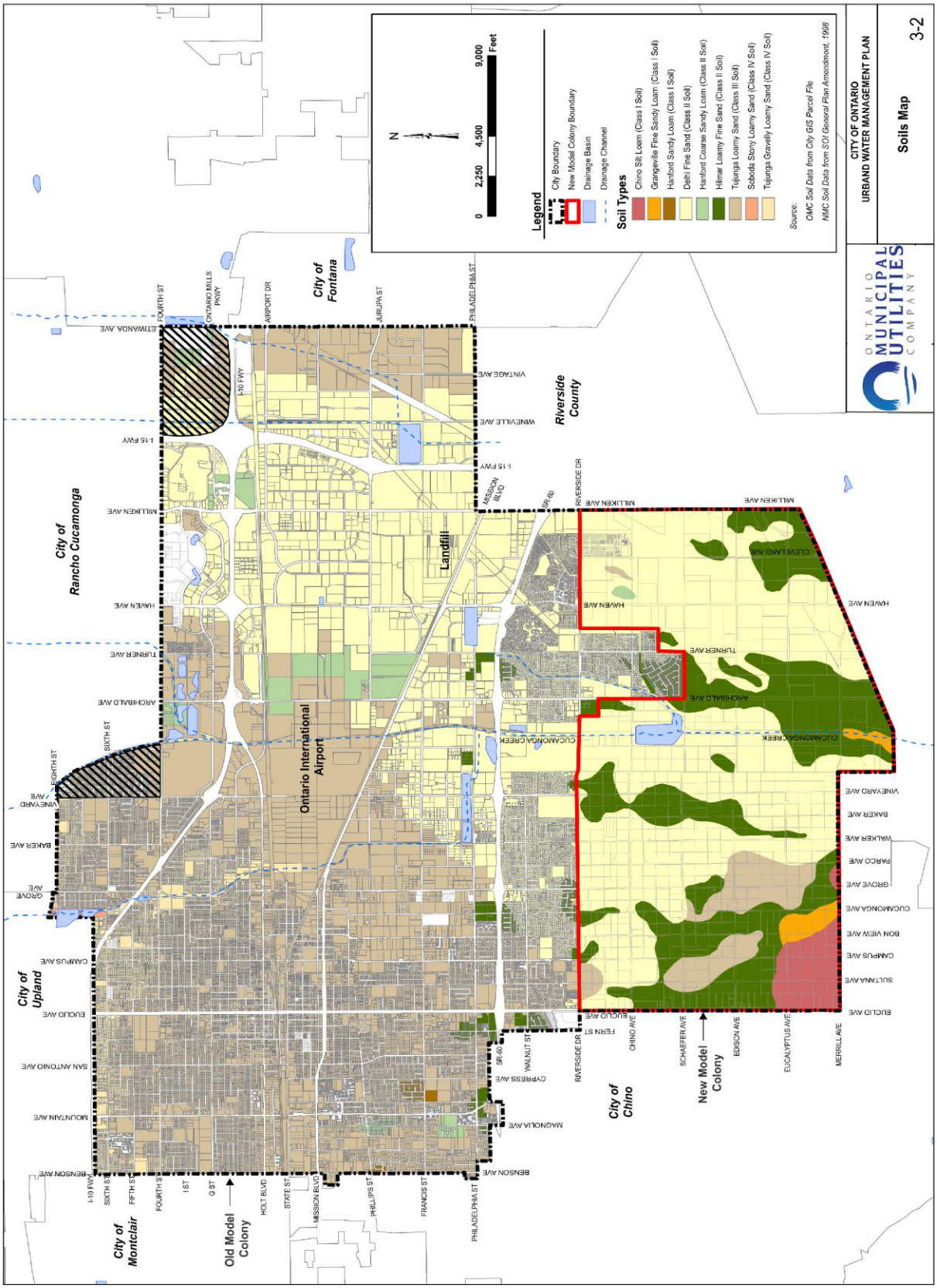
Due to the presence of predominantly dairy industries over a long period of time, prime agricultural soils, high in salts and nitrates, cover approximately 2,999 acres or 36 percent of the total area in the OR (SOI General Plan Amendment, 1998). Organic materials (manure and feed) are reportedly present in thickness of up to six feet.

The OR is located within the Chino Groundwater Basin, which has been found to maintain a relatively shallow water table. The SOI General Plan Amendment reported findings of groundwater elevations ranging from 530 to 590 feet in 1991. Water depths observed in 1991 were approximately 100 – 200 feet (SOI General Plan Amendment).

3.1.4 Existing Land Use

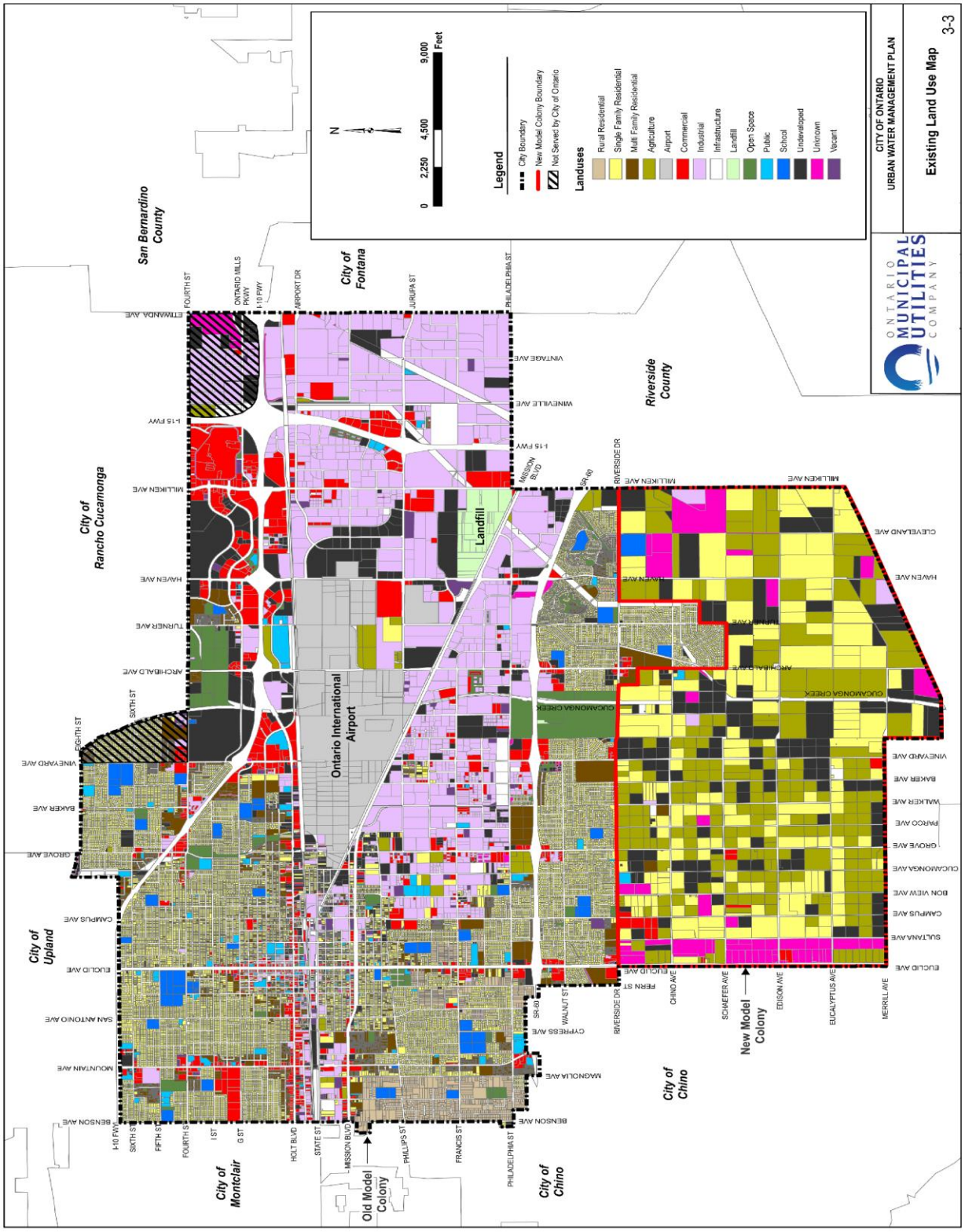
The City is a well planned urban community with a balance of residential, commercial, and industrial land uses. Within the service area, the primary land use in the City is residential (8,762 Ac or 28%). Industrial use also makes up a significant portion of the total existing land use (4,671 Ac or 15%).

Figure 3-2 Soils Map



Approximately 3,290 acres or 11 percent of the total is currently undeveloped. Figure 3-3 shows the existing land uses within the City.

Figure 3-3 Existing Land Uses



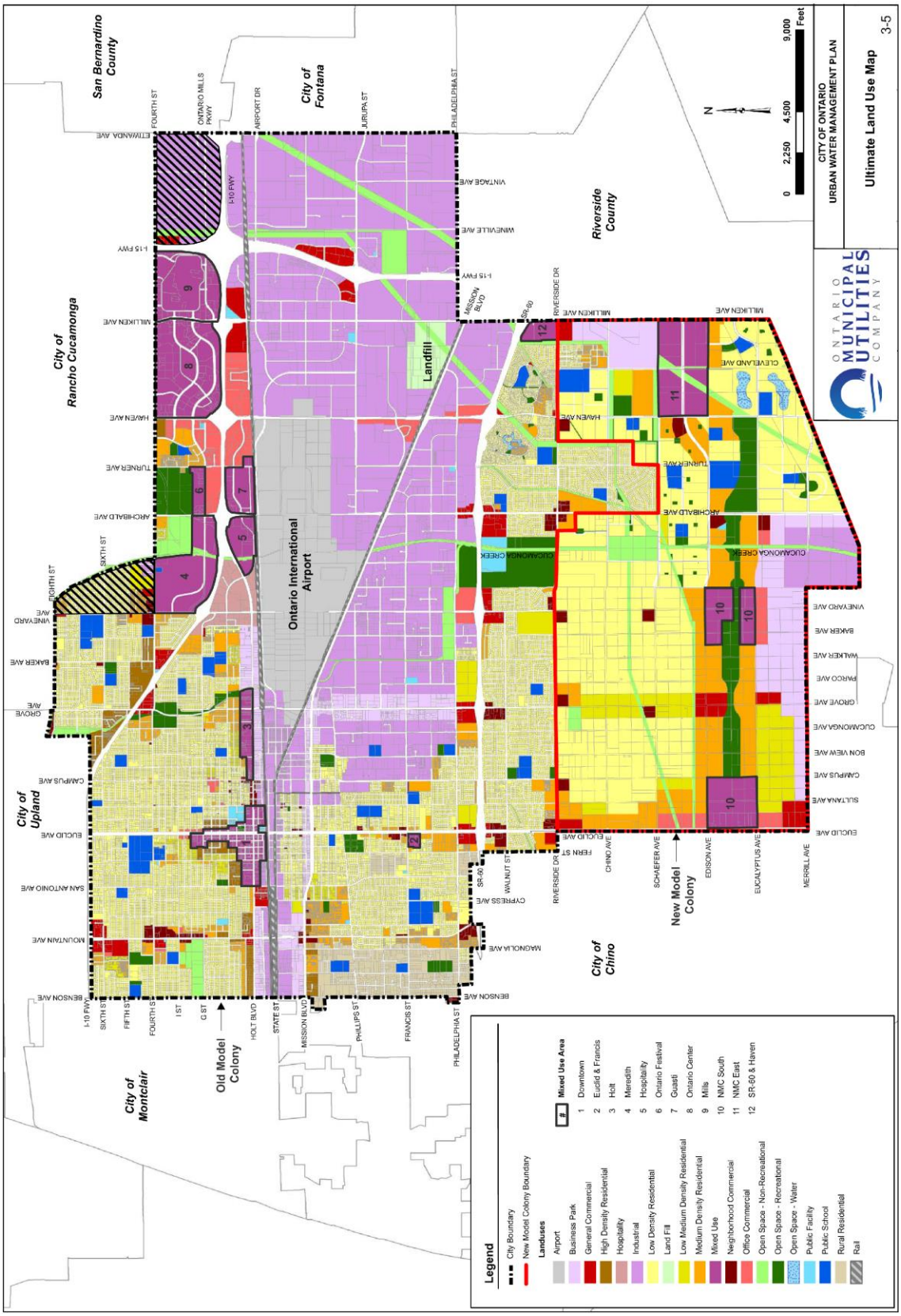
3.1.5 Ultimate Land Use

The ultimate land uses are based upon the City's latest general plan document entitled The Ontario Plan (2010). Figure 3-4 provides a comparison of the existing and ultimate land uses. The residential area increases to 10,915 acres (34% of total). The employment area, including business parks and industrial uses, is expected to cover about 8,103 acres (25% of total). Figure 3-5 shows the locations of these land uses. Additional details and descriptions of all land use categories can be found in (Appendix B - Technical Memorandum – Ultimate Citywide Water Demand Estimate).

Figure 3-4 Existing and Ultimate Land Uses

Type	Existing Land Use	Acres	Ultimate Land Use	Acres
		Residential		
RR	Rural Residential	566	Rural Residential (RR)	453
SFR	Single Family Residential	7,074	Single Family Residential	7,466
MFR	Multi Family Residential	1,122	Multi Family Residential	2,996
	Sub-Total Residential	***8,762***	***Sub-Total Residential***	***10,915***
		Other		
COM	Commercial	1,821	Commercial	3,321
IND	Insudtrial	4,671	Insudtrial	8,103
OPEN	Open Space	734	Open Space	2,293
PUBLIC	Public	341	Public	99
SCHL	Schools	457	Schools	627
ARPT	Airport	1,500	Airport	1,422
LF	Landfill	209	Landfill	137
AGR	Agriculture	2,939	Agriculture	
INF	Infrastructure	954	Infrastructure	
ROW	Right-of-Ways	4,734	Right-of-Ways	4,794
UND	Undeveloped	3,290	Undeveloped	
UNK	Unknown	735	Unknown	
VAC	Vacant Buildings	198	Vacant Buildings	
	Sub-Total Other	***22,583***	***Sub-Total Other***	***20,796***
	TOTAL	**31,345**	**TOTAL**	**31,711**

Figure 3-5 Ultimate Land Uses



3.2 Service Area Climate

The climate in the area is typical of Southern California with generally mild temperatures, virtually no days below freezing, and approximately 312 days of sunshine per year. The average median temperature is approximately 83°F. The historical average annual rainfall in the City is about 11.3 inches, as recorded by the San Bernardino County Rain Gauge Stations 2835 and 1335. The maximum rainfall recorded at the two stations is 27.82 inches (average of the two stations) in 1997-1998, and the minimum is 2.58 inches in 2001-2002. Most of the rainfall occurs between October and April.

3.3 Service Area Population and Demographics

Since its incorporation in 1890, the City has grown from a population of 683 to approximately 168,777 in 2015 (Ref: California Department of Finance). The City's total population in 2010 was 163,924 according to State Department of Finance estimates. The projected ultimate population stems from The Ontario Plan and anticipated development patterns and is estimated at 368,239, which will occur through infill, densification in OMC, and development of OR (Appendix B - Technical Memorandum – Ultimate Citywide Water Demand Estimate). Population projections are shown in Table 3-1.

Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	168,777	180,591	202,262	236,647	288,709	368,239

NOTES: Projection includes 5,328 people located within the City of Ontario but receive water service from Cucamonga Valley Water District. 2040 is considered buildout

The large increase in population in the outer years can be attributed to the expansion of OR. It is currently comprised of mostly agricultural land that is currently being developed and will include residential, commercial, industrial, and public uses.

In 2010, the City had approximately 47,795 housing units and a 3.7 vacancy rate, resulting in 3.8 persons per household. In comparison, the total number of housing units stands at approximately 47,871 with a 5.3 vacancy rate in 2015. Consequently, the population per household can be estimated to be 3.7 (Ref: California Department of Finance). The City aims to have a full range of housing types and community services that meet the special housing needs for all its residents, regardless of income level, age or other status.

3.3.1 Customer Base

The City is planned to have the following characteristics:

- A highly diverse economic base that capitalize on early regional centers, strategic corridor locations and international markets as the impetus for the extensive financial and technical centers that now exist

- Extensively revitalized sectors of the OMC and mature mixed use centers in key opportunity areas
- Sustained economic viability and leadership in the region that reflects a highly trained and diverse workforce and that confirms Ontario as an investment destination of choice
- A world-class airport that is a focal point and magnet for dynamic, multi-faceted metropolitan commercial, cultural and tourist centers serving the economic interests of Ontario and the Southern California region: in effect, a world-renowned "aerotropolis"
- Prudent public ownership and timely disposition of strategic properties where public ownership can be demonstrated to reinforce market forces in achieving the City's economic development and revitalization goals.
- Mature and highly productive industrial areas that set the standards in the region for efficient land use, environmental management and workforce employment opportunities
- Development quality that is broadly recognized as distinctive and not exclusively tied to the general suburban character typical of much of Southern California
- A system of vibrant retail centers responsive to market demands
- A reputation for being good for business to work with while still satisfying broader community interests
- A demonstrated ability to attract housing in pursuit of City's acknowledged responsibility to balance housing with the job growth that drives quality of life in Ontario
- One of the most comprehensive and diverse housing stocks in the region that offers broad choices for its diverse workforce and their families, ranging from entry level housing to executive level development; from semi-rural to highly urban
- Distinctive and well maintained neighborhoods that offer exceptional variety in lifestyles, with convenient access to schools, recreation and cultural facilities, places of worship, places of employment and shopping
- A contemporary arrangement of villages that facilitates identification with the total Ontario community (OR) – a key to enabling Ontario to achieve the unity it desires
- Diverse and highly successful villages that benefit from preservation, enhancement and selective intensification (OMC)

3.3.2 Housing and Disadvantaged Communities

Many families in the City have special housing needs. They are the severely low income earners, single-parent families, large families, seniors, people with disabilities, and homeless persons.

Extremely low income earners account for 4,255 households in the City. Most of them are renters since homeownership is essentially infeasible. Out of the 2,592 planned very low income units for 2013 to 2021, 1,296 units are designated for extremely low income families. Significant financial subsidies are necessary to assist extremely low income earners in acquiring affordable housing. The City's efforts in providing this assistance are concentrated on rental housing vouchers.

Large families, defined as households with five or more members, account for 9,105 of all households in the City. Approximately 7,075 of them are homeowners, and 2,030 are renters. In addition, the City is home to about 6,102 single-parent families. Large families are typically more prone to overpayment since they require bigger houses. Those who live in cheaper, smaller apartments experience overcrowding and substandard living conditions. To solve the housing problem among large families and single-parent households, the City offers low cost units at mobile home parks, deed restricted apartments, and units in publicly assisted multi-family housing projects. Additional units, part of the Ontario Town Square project, are also planned to be built.

Seniors fall into the special housing needs category due to their low income, higher health care costs, and disabilities. The 2010 Census determined that 12% of Ontario residents were 65 years and older. This percentage is expected to increase up to 50% in the coming years due the aging baby boomers. It is estimated that 48% of the senior homeowners and 82% of the senior renters are low income. Senior Housing (i.e. reserved housing projects and mobile home parks for those 55 and older), assisted living facilities, convalescent homes (i.e. nursing homes), and care facilities in select residential neighborhoods are readily available as housing options for the City's aging population. There are currently 782 senior apartments, 450 units at senior mobile home parks, and 374 residential care facilities.

Many people with disabilities who reside in the City require specialized housing in order to live independent or semi-independent lives. This type of housing needs to be affordable, accessible, have adequate resources for more specialized care, and offer supportive services that allow for a full life. Currently, there are 739 housing units for persons with disabilities.

Lastly, there are some 136 homeless persons living in Ontario, as identified by the 2013 San Bernardino County Homeless Census. Programs that are currently in place to aid the homeless include emergency shelters, transitional housing, and permanent supportive housing.

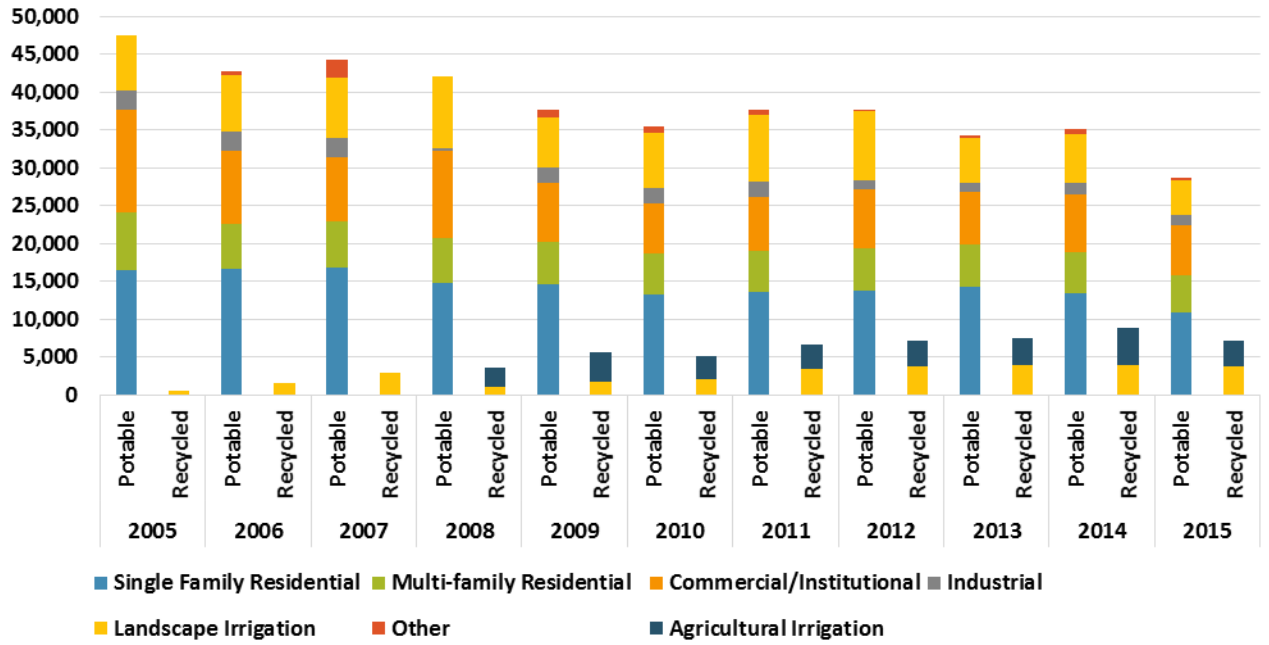
The Housing Element of the 2010 The Ontario Plan addresses the need for adequate housing for the aforementioned groups.

CHAPTER 4
SYSTEM WATER USE

4.1 Historical Potable and Recycled Water Demands

Total potable and recycled water demands within the City of Ontario (City) service area averaged 43,663 AFY between 2005 and 2015. Potable water demands averaged 38,470 AFY and recycled water demands averaged 5,193 AFY (including Agricultural demands), between 2005 and 2015 (Figure 4-1). Despite growth within the City between 2005 and 2015, potable demands have steadily decreased in the last 10 years primarily due to increasing recycled water use and conservation efforts.

Figure 4-1: Historical Potable and Recycled Water Demands (AFY)



4.2 Current Potable and Recycled Water Demands

In 2015, the City's total demand was 36,153 AFY. Potable water demands was 28,945 AFY and recycled water demands was 7,208 AFY (including Agricultural demands). The total demand estimate for 2015 in the 2010 Urban Water Management Plan was 41,906 AFY; which is 14% higher than actual demands. This is primarily due to the State Water Resources Control Board (SWRCB) Emergency Conservation Regulations that were put in place to respond to the existing drought conditions.

Table 4-1 shows the 2015 potable demands by customer class. The City as an agreement with a neighboring agency that provides the option to deliver up to 2,000 AFY of potable water through 2027.

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type (Add additional rows as needed)	2015 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume
Single Family		Drinking Water	10,941
Multi-Family		Drinking Water	4,839
Commercial		Drinking Water	6,584
Industrial		Drinking Water	1,471
Landscape		Drinking Water	4,564
Other		Drinking Water	340
Sales/Transfers/Exchanges to other agencies		Drinking Water	206
		TOTAL	28,945

4.3 Projected Potable and Recycled Water Demands

Tables 4-2 and 4-3 show the projected total demands in the year 2040 (considered buildout for the purposes of this document) at 73,640 AFY. Potable water demands are projected to be 57,093 AFY and recycled water demands are projected to be 16,547 AFY (including Agricultural demands).

Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type (Add additional rows as needed)	Additional Description (as needed)	Projected Water Use Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2020	2025	2030	2035	2040-opt
Single Family		11,488	12,063	13,271	14,864	16,557
Multi-Family		6,050	7,563	9,832	13,273	17,699
Commercial		7,271	7,635	8,398	9,406	10,277
Industrial		1,839	2,298	2,988	3,884	5,138
Landscape		4,792	5,032	5,535	6,365	7,422
	TOTAL	31,440	34,591	40,024	47,792	57,093

The projected potable and recycled water demands were determined based upon the existing demands, the land use planning adopted by the City (The Ontario Plan), and the unit demand factors developed for future development. Appendix B (Technical Memorandum – Ultimate Citywide Water Demand Estimate) includes detailed descriptions, for both NMC and OR, on how each land use category unit demand factors and projections were developed (including water losses).

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	28,945	31,440	34,591	40,024	47,792	57,093
Recycled Water Demand* *From Table 6-4*	7,208	7,929	9,118	10,942	13,677	16,547
TOTAL WATER DEMAND	36,153	39,369	43,709	50,966	61,469	73,640

4.4 Distribution System Losses

The City uses a conservative approach when estimating its "unaccounted for water." The demand projections in this document use a conservative 7% unaccounted for water loss rate. This water loss rate was developed using the average annual difference between the metered production and consumption from 2008 to 2014, and is included in the City's 2016 Potable and Recycled Water Master Plans. Some of the distribution system losses are due to inaccuracies of the nearly 29,000 smaller customer meters compared to the few larger supply and production meters which are maintained and calibrated more frequently than the smaller customer meters; water main flushing and other maintenance purposes; and system leaks.

The City has also quantified its distribution system losses using the American Water Works Association Method. The full water loss calculation will be submitted to the Department of Water Resources (DWR) using their online submittal tool.

4.5 Estimating Future Water Savings

As described in Section 4.2, all water losses (including lower income residential demands) are included in the total projected demands (Table 4-5). A complete description of how water loss projections were developed is included in Appendix B (Technical Memorandum – Ultimate Citywide Water Demand Estimate).

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	Chapter 4, Page 2
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

4.6 Water Use for Lower Income Households

The Housing Element of The Ontario Plan identifies 17,185 (36% of all households) households that are considered low income, of which 8,850 are renters and 8,335 are homeowners. This includes disadvantaged communities, such as large and single-parent families, seniors, and people with disabilities. For estimation purposes, renters are assumed to be living in multi-family residential units, such as apartments and mobile homes, and homeowners in single family homes. At build out (considered the year 2040 for purposes of this document), an estimated 15,143 AFY of demands will come from lower income households.

4.7 Climate Change

Climate change impacts have already started to create critical challenges for water resources management in Southern California. More intense storm events and the changing frequency and duration of drought years are becoming evident throughout the State and the West. This makes future water supplies available to the region more uncertain, particularly imported water resources that are uniquely vulnerable to changes in the state's snowpack.

The *Regional Integrated Resources Plan: Water Supply and Climate Change Impacts 2015 – 2040*, developed in partnership with Inland Empire Utilities Agency (IEUA) and its member agencies, recognizes and incorporates an assessment of a range of impacts that climate change could have on water supplies for the whole region, including impacts on the City's water supplies. The Plan can be found at www.ieua.org.

CHAPTER 5
BASELINES AND TARGETS

5.1 Updating Calculations from 2010 UMWP

As presented in the City of Ontario's (City) 2010 Urban Water Management Plan (UWMP), the City will continue to determine its 2020 Water Use Target utilizing Method 1. As shown in SB X7-7 Table 3 (submitted electronically), the City has recalculated its baselines and targets with revised California Department of Finance data, based on the 2010 U.S. Census data.

5.2 Baseline Periods

As presented in the City's 2010 UWMP, the City's 2008 recycled water use amounted to 6.3% of its total water deliveries for that year. The City will continue to calculate its baseline daily per capita water use, urban water use target, interim urban water use target and compliance daily per capita water use, using a 10-year base period. As shown in SB X7-7 Table 1, the selected 10 year base period years are from 1995 to 2004. The 5-year base period years, from 2003 to 2007, are also shown.

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	42,072	Acre Feet
	2008 total volume of delivered recycled water	2,637	Acre Feet
	2008 recycled water as a percent of total deliveries	6.27%	Percent
	Number of years in baseline period[1]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[2]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[3]	2007	

5.3 Baseline Daily Per Capita Water Use

Using the annual gross water use and revised population data, utilizing Method 1 with a 10-year base period of 1995 to 2004, the City's new baseline is 245 gallons per capita per day (GPCD); a slight decrease from the 2010 UWMP baseline of 248 GPCD (SB X7-7 Table 5).

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	144,087	36,076	224
Year 2	1996	145,459	40,765	250
Year 3	1997	147,322	40,115	243
Year 4	1998	150,021	40,066	238
Year 5	1999	152,413	45,144	264
Year 6	2000	158,007	46,100	260
Year 7	2001	158,428	43,951	248
Year 8	2002	161,051	44,709	248
Year 9	2003	162,828	43,447	238
Year 10	2004	163,956	42,967	234
10-15 Year Average Baseline GPCD				**245**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	162,828	43,447	238
Year 2	2004	163,956	42,967	234
Year 3	2005	164,504	42,205	229
Year 4	2006	163,757	43,901	239
Year 5	2007	164,175	44,806	244
5 Year Average Baseline GPCD				**237**
2015 Compliance Year GPCD				
2015		168,777	26,594	141

5.4 2015 Compliance and 2020 Target

As shown in Table 5-1, using the revised baseline from SB X7-7 Table 5, the 2015 Interim Target for the City is 235 GPCD and the 2020 Target is 196 GPCD.

Table 5-1 Baselines and Targets Summary *Retail Agency or Regional Alliance Only*					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*1995*	*2004*	*245*	*235*	*196*
5 Year	*2003*	*2007*	*237*		
*All values are in Gallons per Capita per Day (GPCD)					

Table 5-2 shows that the City has more than achieved its 2015 Interim Target of 235 GPCD, with an actual 2015 GPCD of 141. Even though this low 2015 GPCD is likely partially a result of the current State Water Resources Control Board (SWRCB) Emergency Conservation Regulations, the City's projected increase in recycled water use and conservation measures will still put the City well on track to meet its 2020 target of 196 GPCD, even if the reduced demands from the Emergency Conservation Regulations completely return.

Table 5-2: 2015 Compliance
Retail Agency or Regional Alliance Only

Actual 2015 GPCD*	2015 Interim Target GPCD*	**Optional Adjustments to 2015 GPCD** Enter "0" for adjustments not used *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
141	235	0	0	0	0	141	141	Yes

**All values are in Gallons per Capita per Day (GPCD)*

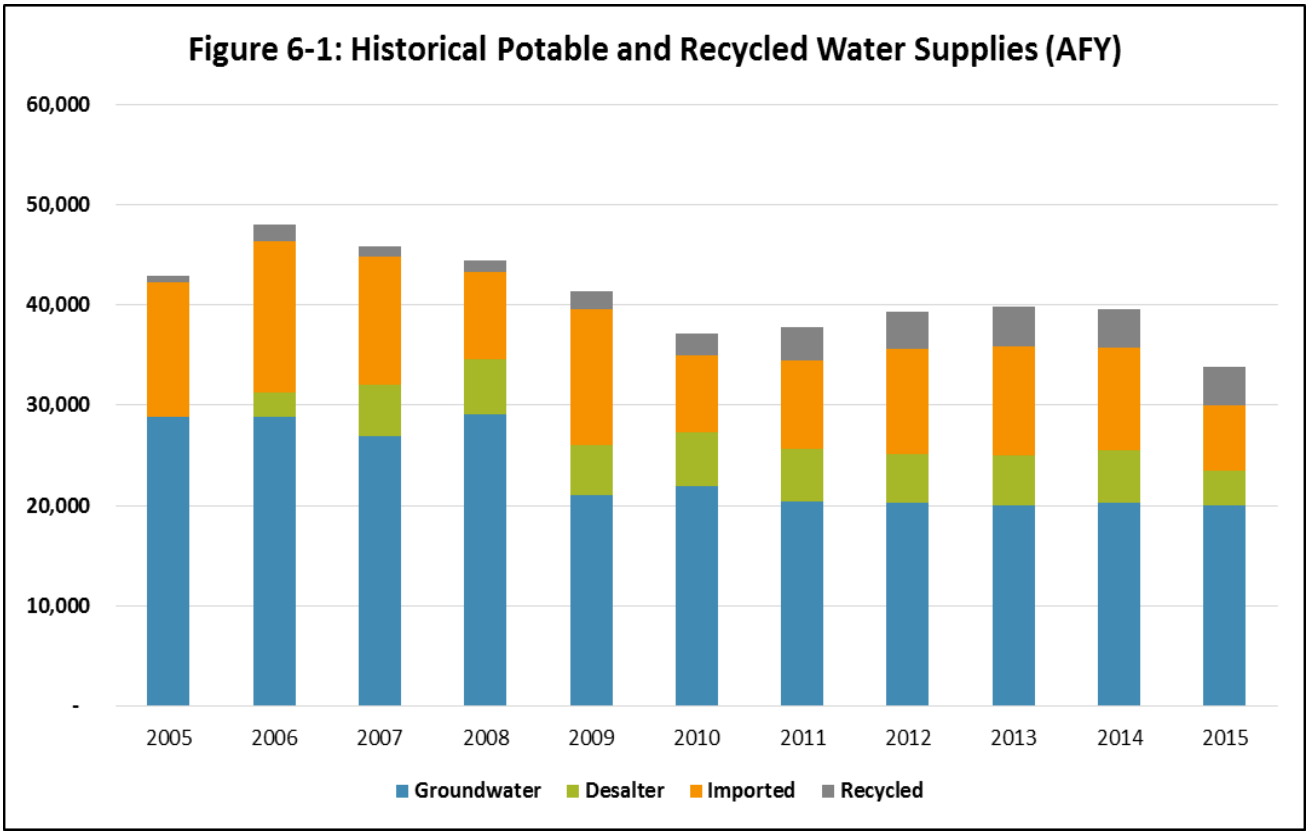
CHAPTER 6

SYSTEM SUPPLIES

This chapter describes the existing and future water sources available to the City of Ontario (City), their limitations, water quality, and exchange opportunities. It is based upon the water supply plan included in the 2012 Potable and Recycled Water Master Plans. The City's goal is to maximize the use of local sources in order to provide a reliable supply for the existing and planned development within its service area.

Water sources available to the City are groundwater from Chino Groundwater Basin (Chino Basin), treated groundwater from the Chino Basin Desalter Authority (CDA), recycled water from Inland Empire Utilities Agency (IEUA), and imported water from the Water Facilities Authority (WFA).

In the past ten years, the City has produced and purchased an average of 40,671 AFY of both potable and recycled water supplies (not including recycled water use by Agricultural customers). An average of 23,408 AFY was produced from the Chino Basin. An average of 10,724 AFY of imported water was purchased from the WFA. An average of 2,458 AFY of recycled water was purchased from IEUA. An average of 4,733 AFY was purchased from the CDA. There was a peak of 47,951 AF produced and purchased in 2006 and a low of 33,802 AF in 2015.



6.1 Groundwater

The Chino Basin is the City's only source of groundwater. Chino Basin encompasses about 235 square miles of the upper Santa Ana River watershed and lies within portions of San Bernardino, Riverside, and Los Angeles counties. The location of the groundwater basin is illustrated on Figure 6-2. The Chino Basin has approximately 5 to 7 million acre feet of water in storage, and an estimated 1 million acre-feet of additional unused storage capacity.

The water rights in the Chino Basin were adjudicated in 1978. The safe yield of the Chino Basin has been approximately 140,000 AFY. However, the Chino Basin Watermaster has preliminarily indicated the safe yield may be slightly lower in the near term but increasing back up to 140,000 AFY in the future. Even if it is determined that the safe yield has declined in the near term, the Judgment does not limit a party's groundwater production to its share of the safe yield; as Watermaster is required to replenish the groundwater basin for any production above the safe yield.

Groundwater quality in Chino Basin is generally good with better quality in the northern portion of the basin where recharge occurs. Salinity (TDS) and nitrate-nitrogen concentrations are higher in the southern portion of the basin. Areas of high nitrate concentrations are shown on Figure 6-3.

Figure 6-2 Groundwater Basin

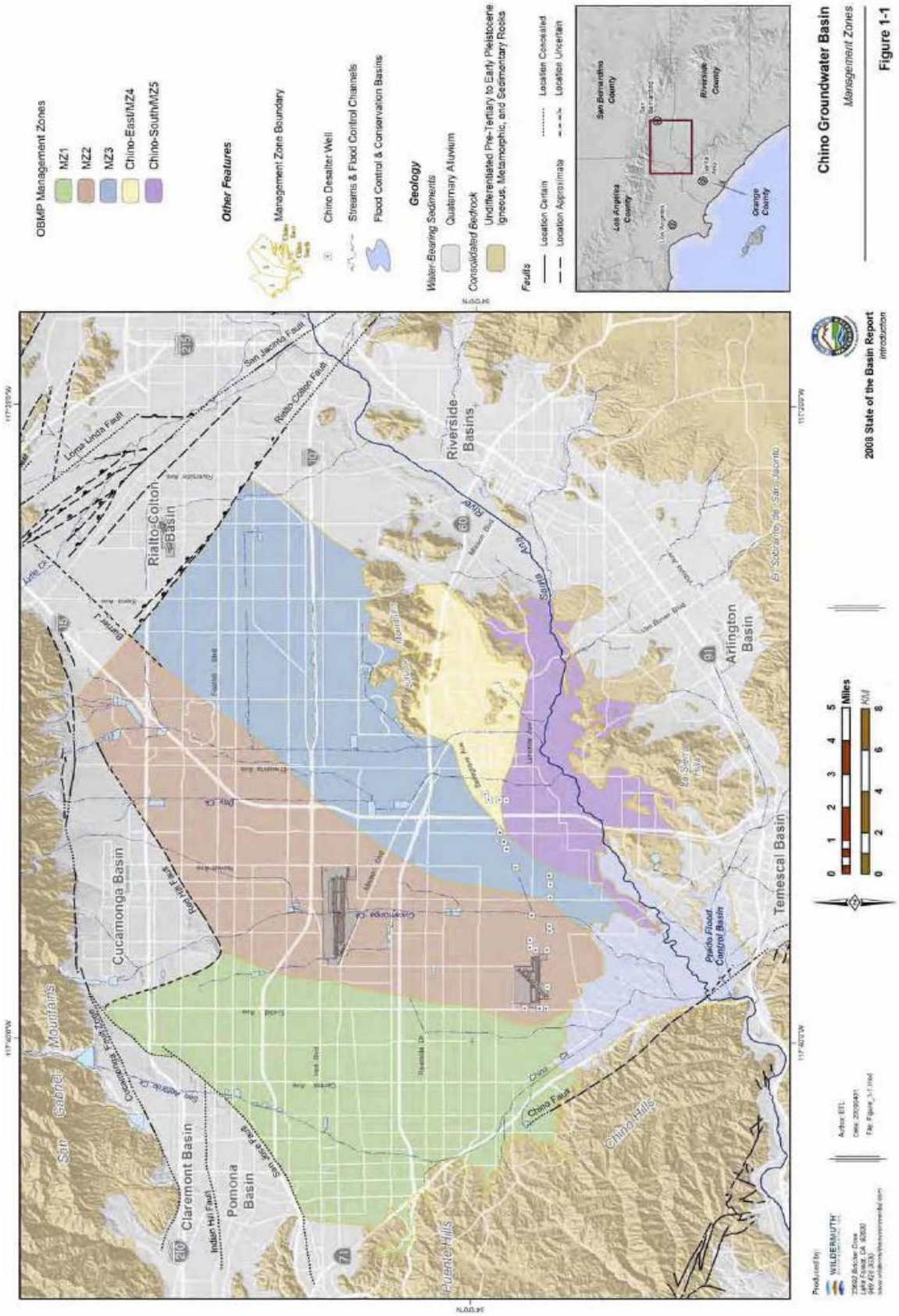
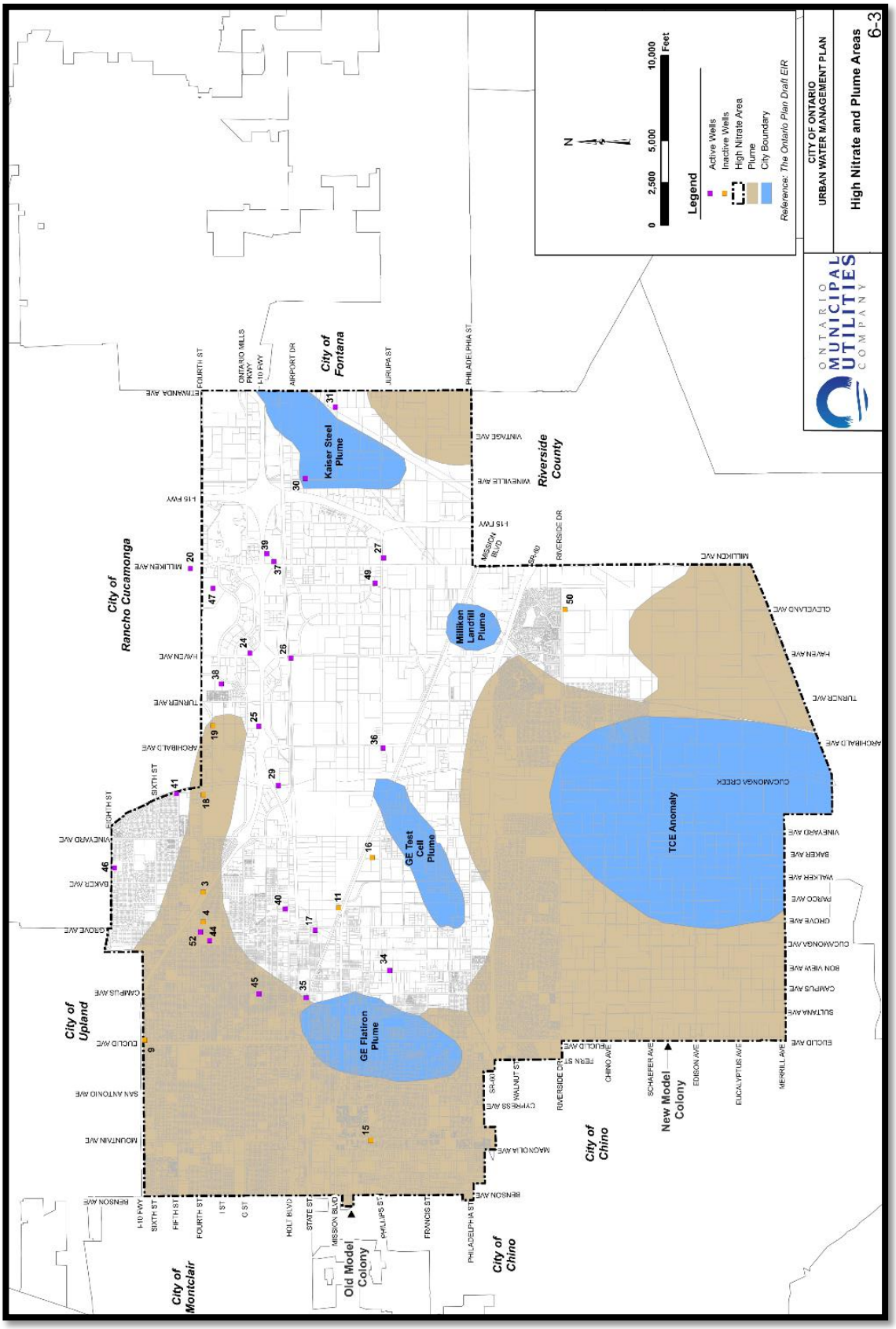


Figure 6-3 High Nitrate and Plume Areas



The City currently owns and operates 26 wells, 22 of which are active. Four (4) wells are currently inactive. The City's 2012 Potable Water Master Plan includes 9 new wells primarily to supply Ontario Ranch. Table 6-1 shows the City's groundwater production from 2011 to 2015.

Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Chino Basin	20,442	20,226	19,967	20,274	19,544
	TOTAL	20,442	20,226	19,967	20,274	19,544

6.1.1 Watermaster

The 1978 Judgment in the case of *Chino Basin Municipal Water District v. the City of Chino* defines the water rights in the Chino Groundwater Basin. The Judgment is administered by the Chino Basin Watermaster (Watermaster). The original Watermaster was the Chino Basin Municipal Water District (now IEUA). It was replaced in 1998 by a board which is made up of representatives from each of the Pools (described below). The Watermaster is responsible for managing water use and supplies within the Chino Basin. The Watermaster's primary responsibilities include:

- Maintain and increase the water supply
- Sustain and improve water quality
- Ensure that water will be fairly shared
- Provide cooperative leadership
- Study and increase understanding of the basin

The Watermaster is comprised of three stakeholder groups based on how they use the water extracted from the Basin. The groups are called Pools and are represented by Pool Committees:

- Overlying Agricultural Pool Committee, representing dairymen, farmers, and the State of California
- Overlying Non-Agricultural Pool Committee, representing businesses and industries
- Appropriative Pool Committee, representing local cities, public water districts, and private water companies

Representatives from the three Pools form an Advisory Committee to oversee the regular activities of the Watermaster. The Pool Committees handle business affecting their own members and then make recommendations to the Advisory Committee. The Advisory Committee, in turn makes recommendations to the Watermaster Board of Directors, consisting of nine members appointed by the San Bernardino County Superior Court.

The Watermaster publishes an annual report that summarizes the status and management of the Basin. The report updates the different Pool Committees on issues such as, groundwater pumping, stored groundwater accounts, progress on independence from imported water, the current water crisis and solutions to lessen its effects, and water supply programs.

As a member of both the Appropriative Pool and Overlying Non-Agricultural Pool, the City complies with any regulations imposed by the Watermaster. A copy of the Chino Basin Judgment and latest Watermaster Annual Report can be found at www.cbwm.com.

6.1.2 Optimum Basin Management Plan

The Optimum Basin Management Program (OBMP) was adopted by the Watermaster after a 1998 court decree required the development of a detailed plan outlining issues facing Chino Basin and solutions to resolve them. The purpose of the program is to address water quality problems within the Chino Groundwater Basin and increase and improve the water supply available from this source. The OBMP identifies groundwater recovery in the southern portion of the basin as a way to improve basin water supplies.

The OBMP and the specific actions contained within it have guided the Watermaster's activities ever since its adoption. The OBMP includes nine major tasks:

1. Comprehensive monitoring program for documenting changes in water level, quality, and flow by testing at wells within the Basin
2. Comprehensive recharge program
3. Water supply plan for the impaired areas of the Basin to improve water quality and supply
4. Regional supplemental water program
5. Comprehensive groundwater management plan for monitoring Zone 1 to stop land subsidence
6. Cooperative programs with the Regional Board and other agencies to improve Basin management
7. Salt management program
8. Groundwater storage management program
9. Conjunctive use programs

The 2000 "Peace Agreement" and the 2007 "Peace II Agreement" are agreements among the parties that allow the implementation of the OBMP and guides the management of the Chino Basin, including the construction and operations of the Desalters, hydraulic control of the Basin, groundwater production and replenishment for the Desalters, yield accounting and recharge. The OBMP, "Peace Agreement" and "Peace II Agreement" can be found at www.cbwm.com.

6.1.3 Dry Year Yield Storage Program

The Dry Year Yield Storage Program (DYY Program) is a cooperative conjunctive use program involving Metropolitan Water District of Southern California (MWD), IEUA, CBWM, Three Valleys Municipal Water District (TVMWD) and some of the Chino Basin groundwater producers. Under the DYY Program, MWD is allowed to store up to 100,000 AF of water in the Chino Basin when surplus water is available and the Chino Basin groundwater producers can extract 33,000 AFY for three years in dry, drought, or emergency periods.

The City authorized execution of an agreement with IEUA to participate in the DYY program in 2003. Participation obligates the City to reduce its use of imported water compared to the previous year by a fixed amount, known as the "shift obligation." The City's shift obligation is 8,076 AFY. During years when MWD calls for extraction, the City's WFA purchases would be reduced by 8,076 AFY compared

to the previous year. Because Jurupa Community Services District (JCSD) does not have an imported water connection, it has entered into an agreement with the City for meeting its shift obligation. Under this agreement, JCSD conveys groundwater to the City in an amount equal to its shift obligation.

DYY funds were used for the construction of three groundwater wells (Wells 45, 46, and 47) and an ion-exchange facility located at John Galvin Park to treat water extracted from Well 44 and Well 52. When the City is required to extract MWD's stored water, MWD will pay for the operation and maintenance costs and the City would pay MWD (through IEUA) the full service water rate. The City can use the DYY facilities to meet its normal water demands during other periods but is responsible for the cost of well operation and maintenance.

This program allows the City to be less reliant upon imported water supplies. The additional groundwater capacity allows the City to increase the percentage of groundwater supply used to meet peak demands.

6.1.4 Groundwater Rights

Chino Basin Judgment

The Judgment declared that the initial safe yield of the Chino Basin is 140,000 AFY. The safe yield is defined in the Judgment as "The long-term average annual quantity of groundwater (excluding replenishment or stored water but including return flow to the Basin from use of replenishment or stored water), which can be produced from the basin under cultural conditions of a particular year without causing an undesirable result." The Operating Safe Yield (OSY) is defined as "The annual amount of groundwater which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the physical solution herein."

The safe yield is allocated at 82,800 AFY to the Overlying Agricultural Pool, 7,366 AFY to the Overlying Non-Agricultural Pool, and 54,834 AFY to the Appropriative Pool.

Appropriative and Overlying Non-Agricultural Rights

Per the Judgment, the City has appropriative rights to 20.742 percent of the OSY. With an initial OSY of 54,834 AFY, Ontario's current appropriative right is 11,373.82 AFY. As the long term OSY is estimated by Watermaster at 49,834 AFY, the City's appropriative right will be 10,337 AFY in the future.

The City has purchased and has rights to 2,911 AF of Overlying Non-Agricultural Pool water.

Land Use Conversions

The City has existing rights to 2,041 AFY for land use conversions. This will increase to 16,602 AFY as agricultural land uses are converted in the future. Because of reduced basin recharge due to land use changes, climate change and other factors, annual adjustments may be made to the rights obtained through land use conversions.

Annual Early Transfers

The Peace Agreement authorized Watermaster to approve an "Early Transfer" of water to the Appropriative Pool in an amount not less than 32,800 AFY; which is the expected quantity of water not produced by the Overlying Agricultural Pool. The quantity of water subject to Early Transfer is the greater of 32,800 acre-feet or 32,800 acre-feet plus the actual quantity of water not produced by the

Overlying Agricultural Pool (if any). The Early Transfer Water is annually allocated among the Appropriative Pool members in accordance with their pro-rata share of the initial Safe Yield. For the City, this is 6,803 AFY (32,800 x 0.2074).

Increased Groundwater Recharge

The City is entitled to water rights due to increased groundwater recharge with stormwater and recycled water in accordance with OBMP. Stormwater recharge credit is assigned based on OSY percentage. Recycled water recharge credit is assigned based on wastewater contribution percentage. Based on the year 2035 total recharge of 35,000 AFY (20,000 AFY of recycled water and 15,000 AFY of stormwater), estimated by IEUA, Ontario would be entitled to approximately 9,600 AFY in the future.

Additionally, the City has a long term contract to purchase up to 3,000 AFY of recharged recycled water rights from the City of Fontana, which does not operate a water system.

Groundwater from San Antonio Water Company

The City owns 295 shares of the San Antonio Water Company (SAWC), which provides 765 AFY to the City. In the past, the City received its water from SAWC by a stored groundwater transfer, however, in 2015, SAWC made a connection to the WFA and is now able to deliver wet water to the City.

City Groundwater Storage

The City has rights to store water in the Chino Basin (Appropriative and Overlying Non-Agricultural) and has been increasing its various storage accounts in recent years. The City holds water in both local storage accounts and supplemental accounts. Local storage accounts hold un-pumped OSY groundwater rights and stormwater that has been recharged into the Chino Basin. Supplemental accounts hold both imported water and recycled water that has been recharged into the Chino Basin.

Currently, the City has a total of 68,176 AF in storage. This consists of 31,466 AF in local storage accounts and 36,710 AF in supplemental accounts. Today, there is enough water in the City's storage accounts to meet more than two years of total demands, should its other water supply sources be unavailable.

Based on the City's projected increase in additional local supplies (desalter water and recycled water), the City's groundwater storage accounts are projected to continue to grow anywhere from 2,000 AFY to 5,000 AFY, further increasing the City's local resource reliability and reducing dependence on imported water.

6.2 Wastewater and Recycled Water

6.2.1 Recycled Water Coordination

The City has been using recycled water reclaimed by IEUA since 1972. Recycled water was first used at the Whispering Lakes Golf Course and Westwind Park.

IEUA began its planning for a regional recycled water production and delivery program, for both direct use and recharge purposes, in the early 1990s, and has completed several planning and implementation documents since then.

- 2002 – Regional Recycled Water Program Feasibility Study
- 2005 – Regional Recycled Water Implementation Plan

- 2007 – Regional Recycled Water Three Year Business Plan
- 2015 – Regional Recycled Water Program Strategy

The City prepared a Recycled Water Master Plan in 2006, and updated it in 2012, to incorporate recycled water into its supply portfolio efficiently. The 2012 Master Plan was fully coordinated with IEUA's recycled water planning efforts. The 2012 Recycled Water Master Plan is currently being updated.

6.2.2 Wastewater Collection, Treatment and Disposal

Wastewater is collected by the City's sewer system, a network made up of 391 miles of gravity pipe, 7,801 manholes, and 3 pump stations with 12,588 feet of associated force mains. The local sewers tie directly into IEUA's large trunk sewers that cross the City. An estimated 12,131 AF of City wastewater was collected in 2015 (Table 6-2).

Most sewage from the Old Model Colony (OMC) is transported to IEUA's Regional Plant No.1 (RP-1), which was constructed in 1948 by the Cities of Ontario and Upland, and purchased by IEUA in 1973. It has a current rated capacity of 44 mgd. RP-1 also serves the Cities of Rancho Cucamonga, Upland, Montclair, Fontana, and unincorporated San Bernardino County.

The remaining OMC flows and flows from Ontario Ranch (OR) are directed to RP-5, which began operation in 2004. The existing rated capacity of RP-5 is 16.3 mgd. RP-5 also serves the Cities of Chino and Chino Hills.

Both RP-1 and RP-5 are scheduled to be expanded, within the next 10-20 years, in order to treat the projected increase in wastewater flows.

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
100	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
IEUA	Estimated	12,131	IEUA	RP-1 & RP-5	Yes	No
Total Wastewater Collected from Service Area in 2015:		12,131				

The raw sewage, collected from the local cities, passes through screening and grit removal units, primary clarifiers, aeration basins, secondary clarifiers, chemical addition, tertiary filters, chlorination, and dechlorination prior to discharge. Biosolids removed during the treatment process are thickened, digested, and dewatered. Once the solids are stabilized and dewatered, they are directed to the Inland Empire Regional Composting Facility for processing into soil amendment.

A portion of the effluent is discharged to nearby creeks, and flows into the Santa Ana River, and then ultimately recharges Orange County's groundwater basin or flows to the Pacific Ocean. The rest of the flow is distributed to IEUA's recycled water customers, including the Cities of Chino, Chino Hills,

Fontana, Montclair, Cucamonga Valley Water District (CVWD) and San Bernardino County. The Fontana Water Company (FWC) and Monte Vista Water District (MVWD) purchase recycled water from the Cities of Fontana and Montclair, respectively.

Not all of the wastewater collected by IEUA can be treated with available, conventional means. A special pipeline, referred to as Non-reclaimable Waste (NRW) Line, transports non-reclaimable wastewater to the Los Angeles County Sanitation District and Orange County Sanitation District facilities for treatment and disposal.

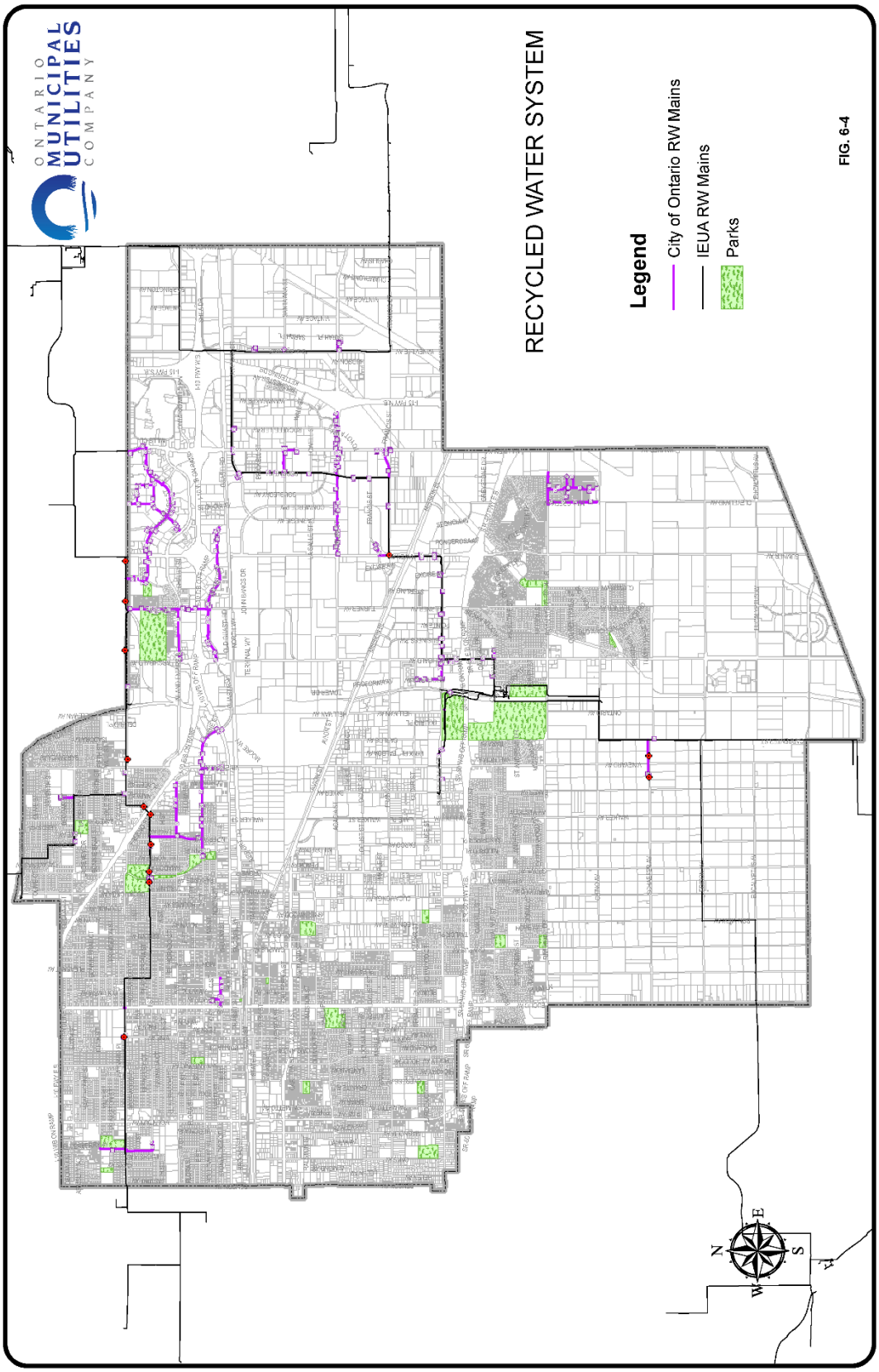
6.2.3 Recycled Water System and Beneficial Uses

Recycled water is currently used in the City for agricultural irrigation, landscape irrigation, golf course irrigation and industrial purposes. In 2015, there was 12,131 AF of recycled water supply available to the City and 7,208 AF of recycled water used (Table 6-5). Figure 6-4 shows the IEUA and City recycled water system, as well as the location of all existing customers.

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			3,349
Landscape irrigation (excludes golf courses)			2,330
Golf course irrigation			540
Commercial use			
Industrial use			989
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*All Uses*	4,173	
	Total	4,173	7,208

Figure 6-4 Recycled Water System



Based on the current 2012 Sewer and Recycled Water Master Plans and the 2010 UWMP, the City will have enough recycled water rights to meet future recycled water demands. The City is currently updating its 2012 Sewer and Recycled Water Master Plan which will include revisions to projected wastewater flows and subsequent recycled water rights available to the City. Recycled water demand projections developed for this document are summarized in Appendix B (Technical Memorandum – Ultimate Citywide Water Demand Estimate) and projects recycled water use of 16,547 AFY at buildout. Consisting of 9,189 AFY in OMC, and 7,358 AFY in the OR. Table 6-4 projects the estimated recycled water use through 2040 based on beneficial use type; including use for agricultural irrigation, landscape irrigation, golf course irrigation and industrial purposes. The update to the 2012 Recycled Water Master Plan will verify the technical and economic feasibility of serving these uses.

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Agency Producing (Treating) the Recycled Water:	IEUA
Name of Agency Operating the Recycled Water Distribution System:	City of Ontario
Supplemental Water Added in 2015	
Source of 2015 Supplemental Water	

Beneficial Use Type		General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation			Tertiary	3,349	2,177	1,372	1,118	529	295
Landscape irrigation (excludes golf courses)			Tertiary	2,330	4,195	6,174	8,297	11,491	14,575
Golf course irrigation			Tertiary	540	600	615	570	700	720
Commercial use									
Industrial use			Tertiary	989	957	957	957	957	957
Geothermal and other energy production									
Seawater intrusion barrier									
Recreational impoundment									
Wetlands or wildlife habitat									
Groundwater recharge (IPR)*									
Surface water augmentation (IPR)*									
Direct potable reuse									
Other	Type of Use								
			Total:	7,208	7,929	9,118	10,942	13,677	16,547

**IPR - Indirect Potable Reuse*

6.2.4 Actions to Encourage and Optimize Future Recycled Water Use

Metropolitan Water District of Southern California Program

Currently, Metropolitan Water District of Southern California (MWD) offers a rebate program for existing potable water customers that retrofit their onsite systems to come into compliance for the use of recycled water.

IEUA Programs

In the past, IEUA has offered a variety of incentives to encourage increased usage of recycled water within its service area. The City was able to utilize many of these incentives for both capital improvement projects and customer retrofits. Some of these incentives were:

- Financial assistance for capital improvement projects to customers that are required to have separate systems for potable and non-potable water
- Technical assistance to customers in preparing engineering reports needed for Department of Drinking water approval of recycled water use
- Discounts for NRW Line users who opt to use recycled water when it becomes available

These incentives were readily transferrable to the City's customers and resulted in reduced rates for recycled water compared to potable water rates.

City of Ontario Programs

The City of Ontario has been planning its recycled water system in cooperation with IEUA since 2005. This planning will allow the future development to take place with adequate water supply as required by law.

The City has and continues to take several measures to encourage the use of recycled water to the maximum extent feasible (Table 6-6). These consist of:

- Included in the Municipal Code, Title 6 Health and Sanitation, Section 8C, Recycled Water Use, which requires the use of recycled water through §1, Ordinance 2689, effective June 17, 1999, and §29, Ordinance 2816, effective December 1, 2005

- Developer agreements for new OMC and OR projects that require the installation of recycled water pipelines and appurtenances to common irrigation areas, parks, and schools

- Recycled water rates that are significantly lower than the potable water rates

  Municipal Code Section 6-8.703, Policy states "*It is the policy of the City that recycled water be used for any purposes approved for recycled water use, when it is economically, technically, and institutionally feasible. Recycled water shall be the primary source of supply for commercial and industrial uses, whenever available and/or feasible. Use of potable water for commercial and industrial uses shall be contrary to City policy; shall not be considered the most beneficial use of a natural resource; and shall be avoided to the maximum extent feasible.*"

  Sec. 6-8.715 Rates, fees, charges and deposits provides that "*Under certain circumstances, the City may contribute to the cost of designing and/or constructing the facilities needed to deliver recycled water to an applicant's property. Subject to the availability of funds, the City may:*

  (1) Reimburse an applicant for costs incurred to install oversized facilities in the public right-of-way.

  (2) Elect to participate in or construct pipelines, reservoirs, pumping stations or other facilities, as it determines necessary, and/or as funds are available.

The City's potable and recycled water rates are a combination of a Readiness-to-Serve (RTS) Charge, which is based on meter size, and a Usage Charge, which is based on the amount of water use. The RTS Charge for a recycled water meter is approximately 55% of the RTS Charge for a potable water meter. The variable Usage Charge for recycled water is approximately 60% of the charge for potable water. (The City's current and future recycled water charges largely depend on the rate that IEUA sells the recycled water for.)

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
RW Pipeline Construction & Retrofits	Developer agreements to construct backbone infrastructure & incetives to retrofit existing customers	2015-2040	9,339

6.3 Purchased or Imported Water

The City obtains imported water from the WFA, which was formed in 1980 as a Joint Powers Authority by the Cities of Chino, Chino Hills, Ontario and Upland, and MVWD. The WFA was formed to construct and operate water treatment facilities for providing supplemental potable water to its member agencies. The WFA constructed the Agua de Lejos Treatment Plant in Upland in 1988 with a rated capacity of 68 MGD. It is currently rated at 81 mgd. The Agua de Lejos Water Treatment Plant is a conventional plant with coagulation, flocculation, sedimentation, filtration, and chloramine disinfection. The plant operators are certified and ensure that effluent meets all primary and secondary drinking water standards. Treated water flows from the plant have varied from a low of 12 mgd during the low demand periods, to 70 mgd during the higher demand periods.

The source of supply to the WFA is the California Department of Water Resources (DWR) State Water Project (SWP) water purchased from MWD. The WFA purchases the water through IEUA, who is a MWD member agency. The WFA obtains the raw water from a connection to MWD's Rialto Feeder Pipeline, which starts at MWD's Silverwood Lake Reservoir in the San Bernardino Mountains. SWP water is generally low in dissolved minerals. MWD has identified total organic carbon, bromides, and salinity as the water quality issues in the SWP system. Because of a high potential for the creation of triahalomethanes from the SWP water, WFA utilizes chloramines for disinfection.

The City owns 31.4 percent of the plant capacity (25.4 mgd, 28,500 AFY). The treated water is delivered to the City's system via two turnouts. Turnout 1, is located adjacent to the 1212-1A and 1212-1B Reservoirs at the northwest corner of Eighth Street and Fern Avenue. Turnout 2, is located adjacent to the 1212-3 Reservoir at the southeast corner of Campus Avenue and A Street. The maximum capacity available to the City is assumed to be 19,924 AFY, which equals the total capacity of 28,000 AFY less the Dry Year Yield shift obligation of 8,076 AFY.

6.4 Desalinated Water Opportunities

The Chino Basin Desalter Authority (CDA) was formed in 2002 as a Joint Powers Authority consisting of Inland Empire Utilities Agency; Jurupa Community Services District; Cities of Chino, Chino Hills, Norco

and Ontario, and Santa Ana River Water Company. Western Municipal Water District joined in 2010. CDA's goals include:

- Achieve hydraulic control of the Chino Basin to prevent contaminated groundwater from entering Santa Ana River
- Remove contamination (primarily nitrates, as well as TCE, PCE, and TCP) from groundwater in the southern portion of the Basin
- Deliver the treated water to member agencies to offset the need for imported water

As part of the OBMP for Chino Basin, the member agencies are required to extract 40,000 AFY of groundwater from the southern portion of the Basin, treat it to potable water standards, and deliver it to the member agencies.

The CDA currently owns and operates two desalters that pump and treat approximately 28,000 acre feet of groundwater per year. The Chino I Desalter currently has a rated capacity of 14.2 mgd. The Chino II Desalter currently has a rated capacity of 10 mgd. CDA is currently expanding the Chino II Desalter to a rated capacity of 22.7 mgd.

Treated water is sold to CDA members through "take or pay" contracts. Chino I and Chino II Desalters are built with groundwater extraction wells, pumps and pipelines that direct water to advanced treatment facilities for pretreatment, filtration, air stripping of volatile organic compounds, ion exchange for nitrate removal, reverse osmosis for salt removal, and disinfection. The final product is a high quality drinking water, which is transported to member agencies through pipelines, pumps, and reservoirs.

The City has 1,500 AFY capacity in the Chino I Desalter. It is transmitted to the City's 1010 Zone near the intersection of Archibald Avenue and the extension of Schaeffer Avenue. In addition, the City has 3,500 AFY capacity from the Chino II Desalter, which is delivered to the 1010 Zone and 925 Zone near the intersection of Philadelphia Street and Milliken Avenue. When the current expansion of the Chino II Desalter is completed, the City's total deliveries will increase to 8,533 AFY.

6.5 Summary of Existing and Planned Sources of Water

As described in the sections above, the City will increase its total water supply from 33,802 AF of water delivered in 2015 (Table 6-8) to 73,640 AFY in 2040 (Table 6-9).

Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*
Groundwater		19,544	Drinking Water
Purchased or Imported Water	Chino Basin Desalter Authority (CDA)	3,543	Drinking Water
Purchased or Imported Water	Water Facilities Authority (WFA)	6,413	Drinking Water
Purchased or Imported Water	San Antonio Water Company (SAWCo)	443	Drinking Water
Recycled Water	Inland Empire Utilities Agency (IEUA)	3,859	Recycled Water
	Total	33,802	
NOTES: Recycled Water does not include agriculture deliveries (3,349 AF).			

The increased water supply will come from full utilization of the City's groundwater rights in the Chino Basin allowed under the Judgment (including increased groundwater recharge of stormwater and recycled water), continued expansion of recycled water use and expansion of desalter water. The increase in imported water is assumed to be available in wet and normal years. With the ability for the City to store water in the Chino Basin, in its local and supplemental storage accounts as well as the DYY Program storage account, the City has the capability and water supply available to reduce imported water deliveries in dry years and increase groundwater production to meet future demands.

Table 6-9 Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	**Projected Water Supply** *Report To the Extent Practicable*				
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2020**	**2025**	**2030**	**2035**	**2040** *(opt)*
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater		11,782	13,465	16,234	21,627	30,795
Purchased or Imported Water	Water Facilities Authority	10,000	11,000	13,000	15,000	17,000
Purchased or Imported Water	Chino Desalter Authority	8,533	8,533	8,533	8,533	8,533
Purchased or Imported Water	San Antonio Water Company	765	765	765	765	765
Recycled Water	Inland Empire Utilities Agency	8,289	9,947	12,434	15,545	16,547
	Total	39,369	43,710	50,966	61,470	73,640

6.6 Climate Change Impacts to Supply

Climate change impacts have already started to create critical challenges for water resources management in Southern California. More intense storm events and the changing frequency and duration of drought years are becoming evident throughout the State and the West. This makes future water supplies available to the region more uncertain, particularly imported water resources that are uniquely vulnerable to changes in the state's snowpack.

The *Regional Integrated Resources Plan: Water Supply and Climate Change Impacts 2015 – 2040*, developed in partnership with Inland Empire Utilities Agency (IEUA) and its member agencies, recognizes and incorporates an assessment of a range of impacts that climate change could have on water supplies for the whole region, including impacts on the City's water supplies. The Plan can be found at www.ieua.org.

CHAPTER 7
WATER SUPPLY RELIABILITY

The City of Ontario (City) strives to maximize local water supplies that results in minimizing the need for imported water from other regions. Currently, the City's water supply portfolio (including conservation measures) will provide adequate supply in average, single or multiple dry years. About two-thirds of the City's water supply is groundwater pumped through its own wells in the Chino Groundwater Basin. The construction of Wells 45, 46, and 47, as part of the Dry Year Yield Storage Program (DYY Program), also increases the City's groundwater pumping capacity to meet peak demands. In addition to the DYY Program, the City currently has substantial amounts of stored water in the Chino Basin (68,176 AF) and participates in an ongoing groundwater recharge program (stormwater, recycled water and imported water) that will further reduce its dependence on imported water and enhance the City's stored groundwater, as well as improve the water quality in the groundwater basin. The ongoing expansion of both the groundwater desalter program and recycled water program will also substantially reduce dependence on imported water. Additionally, the City in coordination with the development community, plans on constructing additional wells to serve the future development in Ontario Ranch (OR).

The City practices rigorous water conservation programs through its participation in the California Urban Water Conservation Council (CUWCC), adoption of ordinances pertaining to water shortage contingency planning, conservation pricing, and various public outreach programs designed to encourage its customers to reduce their water consumption. The water conservation programs are described in Chapter 9.

7.1 Constraints on Water Sources

Even with adequate water supply to meet the demands in various forecasted conditions, there are several constraints on the City's supplies. The two primary constraints on the City's water supply sources are the reliability and quality of the State Water Project (SWP), which is the City's imported water source, and water quality in the local groundwater basin.

7.1.1 Imported Water Constraints

Imported water is purchased from Water Facilities Authority (WFA) and the Inland Empire Utilities Agency (IEUA). The source water for WFA is SWP water which originates from rain and snow of the Sierra Nevada, Cascade, and Coastal mountain ranges. It travels through several rivers and canals, and is pumped over the Tehachapi Mountains to the East Branch and West Branch of the SWP. The East Branch supplies the Silverwood Lake Reservoir in the San Bernardino Mountains, which in turn supplies the Rialto Pipeline, the Metropolitan Water District of Southern California (MWD) conveyance facility feeding WFA's Agua de Lejos Treatment Plant.

To address concerns about the reliability of SWP imported water, the City participates in the DYY Program. This Program stores imported water supplies in wet and normal years, in the Chino Groundwater Basin (Chino Basin) and allows the City to pump this water in dry years. This Program

reduces the City's demand on imported water supplies by 8,076 AFY, as it fulfills its "shift obligation" during dry or emergency periods. During normal years, however, there will be no obligatory supply reduction and, and the City benefits from the construction of Wells 45, 46, and 47, which were funded by the DYY Program. MWD determines if and when a "shift obligation" is necessary.

The reduction of 8,076 AFY of imported water supplies will have no significant impact on the City's overall supply since it is only 29% of the 28,000 AFY that the City has rights to purchase. Moreover, the City only purchased an average of 10,724 AFY from WFA from 2005 – 2015. Even if the City continues to import an amount of water equal to the average and at the same time fulfill its "shift obligation," there will still be an excess of 9,200 AFY of water available from WFA.

In conjunction with IEUA, the City participated in the development of the *Regional Integrated Resources Plan: Water Supply and Climate Change Impacts 2015 – 20140*. The impact to the City's imported water supply, due to climate change, is described in this Plan. The Plan can be found at www.ieua.org.

The SWP water is generally of good quality. The MWD has identified total inorganic carbon, bromides and salinity as the water quality issues in the SWP water. The SWP water is low in dissolved minerals such as calcium, magnesium, sodium, potassium, iron, manganese, nitrate and sulphates. The chloride levels vary widely from a low of 40 mg/L to over 400 mg/L depending on Bay-Delta conditions. Bromides and total organic carbon can react with ozone and chlorine and create disinfection byproducts (DBP), which have been linked to cancer and reproductive and developmental effects. The United States Environmental Protection Agency (USEPA) adopted stringent DBP regulations in 1998, and more stringent regulations are expected in the future. Concerned with the formation of Trihalomethanes, WFA utilizes chloramines for disinfection, and produces high quality potable water that meets all federal and state drinking water regulations.

The salinity level of the SWP water is a concern for WFA member agencies because of its potential impacts on the recycled water and groundwater programs. The Regional Basin Plan regulates the amount of salt that can enter the groundwater. The regional salinity management and removal programs that are being implemented, such as desalters, have made it possible to utilize SWP water without impacting the quality of recycled water and groundwater.

Reports on the quality of water that the City delivers to its customers are made available annually and can be found at www.ontarioca.gov.

7.1.2 Groundwater Constraints

Overall, groundwater quality in Chino Basin is generally good with better quality in the northern portion of the basin where recharge occurs. However, salinity (TDS) and nitrate-nitrogen concentrations increase in the southern portion of the basin. CDA treats the impaired groundwater by means of reverse osmosis, ion exchange, and air stripping, resulting in high quality drinking water. Volatile organic compound (VOC) plumes throughout Chino Basin, several of which are located within the City, are constantly being monitored.

The City has already inactivated several wells (Well 3, 4, 9, and 15) due to high nitrate and perchlorate concentrations detected above the maximum contaminant levels (MCL). Areas of high nitrate concentrations are shown in Figure 6-3. The impact on supply due to the closure of these wells is minimized by constructing replacement wells at other locations where contaminant levels are low, and constructing wellhead treatment facilities.

High levels (maximum concentration of 5,620 µg/L at one site) of trichloroethene (TCE) and chromium (485 µg/L) were found at one of the City's inactive well sites in 1987. They were found to have come from the General Electric Flatiron Facility, which operated a clothes iron manufacturing plant in the City from the early 1900s to 1982. Detectable, but low, concentrations of tetrachloroethene (PCE), toluene, and total xylenes were also found. The plant is no longer in operation, but an industrial park occupies the site. Since 1991, that area has been regularly monitored, and in 1995, two wells were constructed to extract groundwater, treat it, and direct it to the Ely Basins via the West Cucamonga Channel. The Ely Basins allows the treated water to percolate back into the Chino Basin. In 2010, an injection well was also constructed to inject treated water into Chino Basin. VOCs are also removed from contaminated soil through a Soil Vapor Extraction (SVE) system, which began in 2003.

VOCs were also located at the General Electric Test Facility, whose operations include testing and maintenance of commercial and military aircraft engines. In the past, hazardous wastes were disposed in dry wells, and this activity caused VOCs, such as TCE, PCE, cis-1,2-DCE, 1,2-dichloropropane, 1,1-DCE, 1,1-DCA, and chloroform, to appear in the soils and groundwater. A maximum concentration of 1,240 µg/L of TCE was measured at the site and 190 µg/L was quantified at an offsite monitoring well. Groundwater and soil remediation began in 1988 after a Consent Order was agreed upon by General Electric and the California Department of Public Health (CDPH). Since then, regular monitoring has been conducted, and status reports have been submitted. In 1996, vapor extraction treatment began, and as recently as 2008, contaminant levels in shallow soils have been deemed acceptable. The remediation process will continue until most, if not all, of the VOCs have been eliminated.

Additionally, organic and inorganic compounds were discovered in the underlying groundwater when groundwater monitoring at the Milliken Sanitary Landfill began in 1987 as part of Solid Waste Assessment Test. An Evaluation Monitoring Program (EMP) was then launched, and 29 monitoring wells were drilled to assess the extent of damage of the compounds on the groundwater. Amounts of TCE, PCE, and dichlorodifluoromethane were found in combined concentrations as high as 159.6 µg/L. Other VOCs found at the site are vinyl chloride, benzene, 1,1-dichloroethane, and 1,2-dichloropropane. The landfill is owned by the County of San Bernardino and managed by the County's Waste System Division. It was inactivated in 1999.

In the past, treated municipal wastewater from the Cucamonga County Water District (now the CVWD) and IEUA was discharged in ponds in the southern portion of the City. Although these ponds, called the Cucamonga ponds, have been out of operation since the mid-1980s, groundwater contaminants may still be present. The contaminants have never been identified.

Quantities of TCE are found in wells located south of the Ontario International Airport. The maximum concentration of TCE found at one of the wells was 38 µg/L during the 2003 to 2008 period.

The TCE is believed to have come from several parties related to various activities at the airport. These groups have voluntarily begun investigating the extent and source of the TCE. TCE is also present south of the Ontario International Airport in the area bounded by State Route 60 on the north, Bellegrave Ave. to the south, Turner Avenue on the east, and Grove Avenue on the west. The maximum concentration detected was 156 ug/L in 1990. Since 2005, the highest detected concentration was 49 ug/L. The Santa Ana Regional Water Quality Control Board is currently pursuing remedial action through several potentially responsible parties. The preferred remediation alternative involves the use of existing and proposed CDA production wells and facilities. The proposed project includes the construction and operation of three new CDA production wells and pipeline to convey produced groundwater from the wells to the CDA Desalter II facility for treatment.

Water quality in the Chino Basin is closely monitored by the Chino Basin Watermaster (Watermaster) in compliance with the Optimum Basin Management Plan (OBMP). Data are collected by Regional Water Quality Control Board (RWQBC), California Department of Toxic Substances Control (DTSC), and other agencies that obtain groundwater from Chino Basin. The Watermaster then combines all data into a comprehensive database.

7.2 Reliability by Type of Year

As previously mentioned, the City's water supply proves to be stable and reliable due to its many available sources. However, drought periods are inevitable since the City only gets an average of 11.3 inches of rain annually. Table 7-1 lists the average, single-dry, and multiple-dry water years. Base years are selected based on recent annual rainfall, instead of runoff, because the majority of the City's water supply comes from groundwater and not surface water. Average year is chosen to be 2005 since the rainfall for that year most closely resembles the City's average annual rainfall. The single-dry year selected is 2001 during which only 2.58" of rainfall was measured. The driest 3-year period is determined to be 2006 to 2009, where the average annual rainfall was 6.63".

Supply reliability, based on historical conditions, is presented in Table 7-1. The City's ability to store significant amounts of water in the Chino Basin is the primary driver for having above average supplies available in dry years. In addition, the City's desalter water supply is a fixed annual supply required by the Court to be pumped and the City's recycled water supply is provided by wastewater; which is also considered a constant available supply due to indoor demands hardening over time. These reliable water supply sources allows the City to reduce its dependence on imported water in dry years.

Table 7-1 Retail: Basis of Water Year Data			
Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal or water year, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	2005	42,205	100%
Single-Dry Year	2001	44,011	104%
Multiple-Dry Years 1st Year	2006	43,901	104%
Multiple-Dry Years 2nd Year	2007	45,259	107%
Multiple-Dry Years 3rd Year	2008	43,164	102%

7.3 Supply and Demand Assessment

For the purposes of this document, it is assumed that demands and supplies are the same in normal years. However, as described above, the City has substantially more supplies available than there are demands in wet, dry and normal years. Normal year supply and demand projections are presented in Table 7-2.

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill from Table 6-9)*	39,369	43,710	50,966	61,470	73,640
Demand totals *(autofill from Table 4-3)*	39,369	43,710	50,966	61,470	73,640
Difference	0	0	0	0	0

The following assumptions are made to estimate supply and demand during a single dry year:

- The provisions of a Stage 1 water shortage will be implemented, and customers will be subjected to a 10% consumption reduction.
- The supply of recycled water will be the same as in normal years and dry years.
- The reduction in WFA supplies (8,076 AFY) will be compensated by the extra groundwater production from the designated DYY wells during dry years. The DYY Program will expire in 2025 (unless renewed or replaced).

- The groundwater supply will be the same as in a normal year. The City has rights, storage and leases and can also purchase replenishment water.
- Water losses have been included in the potable water demands as 7% of the annual demand.

Supply and demand projections for a single dry year are presented in Table 7-3.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 (Opt)
Supply totals	39,369	43,710	50,966	61,470	73,640
Demand totals	35,432	39,339	45,869	55,323	66,276
Difference	3,937	4,371	5,097	6,147	7,364

The following assumptions are made to estimate supply and demand for a three-year multiple-dry year period:

- The first dry year is similar to a single dry year, in which customers voluntarily reduce consumption by 10%.
- The second dry year is considered a Stage 2 water shortage, and a 15% reduction in consumption is made mandatory. This will be imposed at the City Council's discretion.
- The third dry year is considered a Stage 3 water shortage, and a minimum of 20% consumption reduction is required. This will be imposed at the City Council's discretion.
- The supply of recycled water will be the same in normal years and dry years.
- The reduction in WFA supplies (8,076 AFY) will be compensated by extra groundwater production from the designated DYY wells during dry years. The DYY will expire in 2025 (unless renewed or replaced).
- The groundwater supply will be the same as in a normal year. The City has rights, storage and leases. The City can also purchase replenishment water.
- Water losses have been included in the potable water demands as 7% of the annual demand.

Supply and demand projections for multiple dry years are presented in Table 7-4.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	39,369	43,710	50,966	61,470	73,640
	Demand totals	35,432	39,339	45,869	55,323	66,276
	Difference	3,937	4,371	5,097	6,147	7,364
Second year	Supply totals	39,369	43,710	50,966	61,470	73,640
	Demand totals	33,464	37,154	43,321	52,250	62,594
	Difference	5,905	6,557	7,645	9,221	11,046
Third year	Supply totals	39,369	43,710	50,966	61,470	73,640
	Demand totals	31,495	34,968	40,773	49,176	58,912
	Difference	7,874	8,742	10,193	12,294	14,728

7.4 Regional Supply Reliability

As described in Chapter 6, the City has heavily invested and participated in local supply development in order to reduce its dependence on imported water. The City, in conjunction with its regional partners, is implementing a number of water resource management initiatives. Below is a list of all the water resource programs that the City directly participates in (ie. there are numerous programs that MWD implements, which the City is indirectly participating in).

- Optimum Basin Management Plan
- Integrated Resource Plan
- Recycled Water Program
- Desalter Program
- Water Use Efficiency Program(s)
- Dry Year Yield Program

CHAPTER 8
WATER SHORTAGE CONTINGENCY PLANNING

8.1 Stages of Action

To prepare for water shortages, the City adopted Ordinance No. 3027 on September 1, 2015, in response to the Emergency Conservation Regulations mandated by the State Water Resources Control Board (SWRCB). Under this ordinance, Chapter 8A ("Water Conservation Plan") was updated with more stringent prohibitions and penalties as previously outlined in Title 6 of the Ontario Municipal Code under the 2009 Ordinance No. 2907. Chapter 8A establishes a voluntary conservation stage that is always in effect and mandatory water shortage stages 1 thru 4, which target a strict enforcement of water conservation routines following a water crisis. A copy of Ordinance No. 3027 can be found at www.ontarioca.gov.

Depending on the City's customer's initiative to voluntarily conserve water at times of crisis, the City can determine when and how quickly to implement the mandatory conservation phases. The severity of the water shortage will influence which methods will be implemented. Public hearings will be held prior to declaration of the stages to evaluate the extent of the water shortage and to inform customers about the water crisis. When conservation goals are not met simply through voluntary reduction in water use or when supplies are reduced by 10%, Stage 1 prohibitions are implemented. Stage 2 occurs when there is a 10% to 20% reduction in supplies. A reduction in supplies by more than 20% constitutes Stage 3 prohibitions. Severe water supply interruptions, resulting in a reduction in supplies 50%, caused by earthquakes, wide-spread fires, or other natural disasters, prompt Stage 4 prohibitions (Table 8-1). A Stage 4 water shortage will target the implementation of all consumption reduction methods.

Table 8-1 Retail
Stages of Water Shortage Contingency Plan

Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition *(Narrative description)*
Add additional rows as needed		
0	0-10%	Voluntary
1	0-10%	Mandatory
2	11-20%	Mandatory
3	>20%	Mandatory
4	>50%	Mandatory

[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*

Water savings estimates are based on the amount of reduction needed at each stage of water shortage. Voluntary conservation is expected to reduce consumption by 5%. A Stage 1 shortage will reduce consumption by up to 10%. For a Stage 2 shortage, between 10% and 20% of supply will be lost, so a consumption reduction of at least 15% will be necessary. For Stage 3, more than 20% of supply will be unavailable, and mandatory consumption reduction will have to be at least 20%. Since a Stage 4 shortage will only be declared at times of wide-spread fires and natural calamities, such as earthquakes and floods, a major disruption in water deliveries will be expected. When this happens, customers will be mandated to reduce their consumption by more than 20%, and up to 50%.

8.2 Prohibitions and End Uses

During a water shortage crisis, certain mandatory restrictions on water use will be imposed on the public. Stage 0 prohibitions are entirely voluntary. Stages 1 to 4 prohibitions will be progressively implemented according to the severity of the water crisis. Table 8-2 lists the mandatory water conservation efforts that correspond to each of the stages.

City water customers desiring to be wholly or partly exempt from the mandatory prohibitions have to file a written application to the City Manager, who will then review the application and decide if the exemption can be granted or rejected. An application may be approved if the water customer can prove that he/she has already taken the all practical steps to reduce his/her water consumption.

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users *Drop down list* *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed			
0 to 4	Other - Prohibit use of potable water for washing hard surfaces		Yes
0 to 4	Other - Require automatic shut of hoses		Yes
0 to 4	Water Features - Restrict water use for decorative water features, such as fountains		Yes
0 to 4	CII - Restaurants may only serve water upon request		Yes
0 to 4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
0 to 4	Landscape - Limit landscape irrigation to specific times		Yes
0 to 4	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
0 to 4	Other	The use of water from fire hydrants shall be limited to fire fighting and related activities necessary to maintain the public health, safety, and welfare. An exception may be made for construction use through a proper city-designated meter. The use of potable water for construction activities shall be restricted in areas where recycled water is available for such use.	Yes
2 to 4	Other water feature or swimming pool restriction	Filling or refilling of empty swimming pools shall not occur without the written permission of the City Manager or his/her designee.	Yes
2 to 4	Landscape - Other landscape restriction or prohibition	All customers are prohibited from irrigating turf or ornamental landscapes during and within 48 hours following measurable rainfall.	Yes
2 to 4	CII - Lodging establishment must offer opt out of linen service		Yes
2 to 4	Landscape - Prohibit all landscape irrigation	All persons, including the City, are prohibited from irrigating with potable water any ornamental turf on public street medians.	Yes
2 to 4	Landscape - Other landscape restriction or prohibition	The use of potable water for irrigation outside of newly constructed homes and buildings shall be consistent with California Building Standards Commission and Department of Housing & Community Development.	Yes
3 and 4	Other - Prohibit use of potable water for construction and dust control	The use of water from fire hydrants shall be limited to fire fighting and related activities and other uses of water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare. Unless written permission has been granted by the City Manager or his/her designee, the use of potable water for construction activities and grading shall be prohibited.	Yes
4	Landscape - Prohibit all landscape irrigation	Commercial nurseries shall be prohibited from the use of potable water for irrigation of outdoor, landscape and turf except by use of a hand-held hose equipped with a positive shutoff nozzle.	Yes
4	Landscape - Other landscape restriction or prohibition		Yes
4	Other water feature or swimming pool restriction	The following nonessential uses of water shall be prohibited: the filling, cycling, filtering, or refilling swimming pools, spas, Jacuzzis, fountains or other like devices.	Yes

8.3 Penalties, Charges, Other Enforcement of Prohibitions

Ordinance No. 3027 includes fines and penalties that will be imposed on customers who fail to comply with the provisions of each water shortage stage. All fines and penalties may apply to each of the water shortage stages. Fines for water waste violations begin with a written violation notice and subsequent violations include fines of $100, $200 and $500. The written violation notice will be sent by regular mail for the and by certified mail for any subsequent violations to the customer's billing address. In response to the SWRCB's Emergency Conservation Regulations, included in Ordinance No. 3027 are volumetric penalties that may be imposed if the City determines that additional water use reductions are necessary. This would require the City Council to adopt a resolution establishing water use limitations. The fines, penalties and other consumption reduction methods are listed in Table 8-3.

Table 8-3 Retail Only:
Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
Add additional rows as needed		
All	Expand Public Information Campaign	
All	Improve Customer Billing	
All	Provide Rebates on Plumbing Fixtures and Devices	
All	Provide Rebates for Landscape Irrigation Efficiency	
All	Provide Rebates for Turf Replacement	
All	Increase Water Waste Patrols	
All	Other	Fines for water waste violations (up to $500)
All	Other	Penalties based on volume of water use

In addition to the consumption reduction methods listed in Table 8-3, the City regularly implements monitoring mechanisms to track both water production and consumption to determine water savings and losses. These mechanisms are listed below:

- Reading of water meters
- Remote Metering Program
- Replacement of residential meters every 15 years and large meters every 5 to 10 years
- Meter readings at inter-agency connections
- Valve Exercising Programs
- Recording of water production from groundwater wells, purchases of imported water, desalter water and recycled water, and other inter-agency connections

8.4 Determining Water Shortage Reductions

Anytime the City enforces one of the mandatory water shortage stages (1 thru 4), both water production and water consumption data is metered, tracked and recorded. This data is then compared to a previous time period to determine actual water reductions.

8.5 Revenue and Expenditure Impacts

To illustrate the potential financial impact of a 10% to 50% reduction in potable water demand, total deliveries and production for 2014 have been used. The following assumptions are made:

- Revenue is calculated using an average usage rate for 2014 of $2.40 per hundred cubic feet (HCF).
- The amount of water that is unaccounted for is assumed to remain at 7% of demand during water shortages. Unaccounted for water is due to line flushing, maintenance, fire hydrant usage, leaks, and the difference in the accuracies of the sales and production/purchase meters.
- The unit cost of WFA water is $850 per acre-feet (AF) and $800 per AF for CDA water.
- The unit cost of groundwater with safe yield and rights purchased is $250 per AF (inclusive of operations and maintenance costs).
- The water shortage is assumed to last one year.

As shown in Figure 8-1, when demand is reduced by 10% - 50%, groundwater production and desalter water purchases will be sufficient to meet demands. It is assumed that at a 50% reduction there will be no imported water available. It is also assumed that desalter water will be taken in order to continue the hydraulic control and water quality requirements of the OBMP.

Figure 8-1
Demand and Production Volumes at Each Reduction Stage

Volume (AF)	Baseline Year	10% Reduction	15% Reduction	20% Reduction	50% Reduction
Total Demand	35,160	31,644	29,886	28,128	17,580
Total Production	35,697	33,859	31,978	30,097	18,811
Expected Water Loss	0	2,215	2,092	1,969	1,231
Imported Water	10,135	7,601	5,068	2,534	0
Desalter Water	5,288	5,288	5,288	5,288	5,288
Groundwater	20,274	16,540	17,438	18,337	11,061
Total		31,644	29,886	28,128	17,580

Figure 8-2 illustrates that although reduction in demand results in lower overall cost of water supply, a significant drop in demand causes the revenue to lower as well. Stages 1 – 3 result in an overall

revenue reduction of approximately 2%. On an interim basis, this reduction in revenue can be made up with reserve funds. Stage 4 has a significant drop in revenue that would not be sustainable for an extended period of time.

Figure 8-2
Revenue and Supply Costs at Each Demand Reduction Stage

	BASELINE YEAR 2014	Stage 1 (10% Demand Reduction)	Stage 2 (15% Demand Reduction)	Stage 3 (20% Demand Reduction)	Stage 4 (50% Demand Reduction)
Total Revenue from Sales	**$36,757,670**	**$33,081,903**	**$31,244,020**	**$29,406,136**	**$ 18,378,835**
Groundwater (cost)	$ 5,068,500	$ 4,134,918	$ 4,359,620	$ 4,584,323	$ 2,765,350
Imported Water (cost)	$ 8,614,750	$ 6,461,063	$ 4,307,375	$ 2,153,688	$ -
Desalter Water (cost)	$ 4,230,400	$ 4,230,400	$ 4,230,400	$ 4,230,400	$ 4,230,400
Total Water Supply Cost	**$17,913,650**	**$14,826,380**	**$12,897,395**	**$10,968,410**	**$ 6,995,750**
Revenue minus Supply Cost	**$18,844,020**	**$18,255,523**	**$18,346,625**	**$18,437,726**	**$ 11,383,085**
Compared to Baseline	$ -	$ (588,497)	$ (497,396)	$ (406,294)	$ (7,460,935)
Compared to Baseline		-1.6%	-1.4%	-1.1%	-20.3%

Note: Imported and desalter costs do not include any employment, debt service, O&M or capital expenses.

In the event that the City's revenues and expenditures are severely affected by a water shortage, the following measures could be taken to alleviate the financial impacts:

- Rate Adjustment
- Development of Reserves
- Decrease in Capital Expenditure
- Decrease in O&M Expenditure

Rate increases are not viewed positively by the customers particularly when they reduce consumption. Negative consequences that could arise from the cost-cutting actions include dissatisfaction of the customers, reduced funding for Capital Improvement Projects and system maintenance, and reduced staff availability for emergency response.

8.6 Catastrophic Supply Interruption

As required by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the City has an adopted Emergency Response Plan (ERP) to address catastrophic water supply interruptions, such as; natural disasters, power outages, earthquakes and other emergencies. The ERP describes the following:

- The Municipal Utilities Company emergency management organization required to assist in mitigating any significant emergency or disaster.

- Authorities, policies, responsibilities and procedures required to protect the health and safety of customers, personnel and facility property.
- Operational concepts and procedures associated with field response to emergencies, Emergency Operations Center (EOC) activities and the recovery process.
- Implementation of the Standardized Emergency Management System (SEMS) for use within the San Bernardino County Operational Area, regional and state systems.
- Multi-agency and multi-jurisdictional coordination, particularly between the City's Water Operations Division and local, state and federal agencies during emergency operations.

The City has Mutual Aid Agreements with the following agencies: Chino, Chino Hills, Fontana, Monte Vista Water District, Cucamonga Valley Water District and IEUA.

The City also has several existing inter-agency and emergency connections with neighboring cities and water agencies. There are additional inter-agency and emergency connections planned as the City continues to expand. These existing and future connections provide reliable water supply, in the event of a catastrophic supply interruption, from multiple sources of supply.

8.7 Minimum Supply Next Three Years

Supplies from CDA and groundwater are expected to remain the same during dry years. The supply from CDA is under a contract, and the City's current capacity is 5,000 AFY. It will increase to 8,533 AFY when the Chino II Desalter capacity is expanded in 2016. Moreover, the City is entitled to extract an additional 8,076 AFY from the designated DYY wells (Wells 45, 46, and 47) in dry years when imported water supply from WFA is reduced by 8,076 AFY as required by the DYY Program. Increased groundwater production is feasible since the DYY Program allows MWD to store up to 100,000 AFY of water during normal years and to produce 33,000 AFY during dry, drought, or emergency periods. Ultimately, however, the net change in the City's supplies will be zero since the imported water from WFA can easily be replaced by groundwater from the DYY wells, and additional groundwater pumping from the City's stored groundwater reserves.

Table 8-4 Retail: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	46,026	46,127	44,841

Supply reliability, based on current sources, is presented in Table 8-4. This assumes that the years 2016, 2017, and 2018 are dry years. In addition to the DYY Program described above, if supply from WFA is reduced according to MWD's Water Supply Allocation Program, that same amount of supply can be made up from the City's stored groundwater supply.

CHAPTER 9
DEMAND MANAGEMENT MEASURES

As part of its commitment to conserve water, the City of Ontario (City) implements various water programs and ratifies ordinances that obligate its customers to reduce water consumption. As a member of the California Urban Water Conservation Council (CUWCC) and a signatory of the Memorandum of Understanding (MOU), the City has adopted the Best Management Practices (BMPs) that help promote not only the importance of water conservation but also the economic benefits that come with it.

9.1 Demand Management Measures for Retail Agencies

As part of fulfillment of the BMPs, which cover all the Demand Management Measures (DMMs), the City has implemented the water use efficiency and education programs listed in Table 9-1, both in the residential and Commercial/Industrial/Institutional (CII) sectors, in the past 5 years and will continue to provide on a go forward basis:

Table 9-1 Demand Management Measures

Water Use Efficiency and Education Programs	
1. PSA Contest	23. WBIC Rebate
2. Project WET	24. Water-Wise Turf Removal Incentive
3. Quakes Stadium Messaging	25. Synthetic Turf Rebate (Residential and CII)
4. Edu-Grant	26. National Theatre for Children
5. Demonstration Garden at LA County Fair	27. CII Rebate (Save-A-Buck)
6. WEWAC Website	28. Garden in Every School
7. Ontario Cares Program	29. Cooling Tower Conductivity Controller Rebate (CII)
8. Ultra-Low Flush Toilet Giveaway	30. California Friendly Landscaping Classes
9. HET/ULF Toilet Exchange	31. Public Outreach Materials
10. High Efficiency Toilet/ULF Toilet Rebate (Residential and CII)	32. Water Fair
11. High Efficiency Clothes Washer Rebate (Residential and CII)	33. Film Presentation, "Cadillac Desert "
12. Zero Water Urinal Upgrade/New Construction Rebate (CII)	34. "Splash into Reading" Program
13. Water Broom Rebate (CII)	35. Recycled Water Connections
14. Pre-Rinse Nozzle Rebate	36. MFHET Direct Installation Program
15. Conductivity Controller Rebate	37. Landscape Evaluation Audit Program (LEAP)
16. Weather Based Irrigation Controller – Standard (Residential)	38. Steam Sterilizer Rebate (CII)
17. Weather Based Irrigation Controller Rebate (CII)	39. Connectionless Food Steamer Rebate (CII)
18. Sprinkler Nozzle Rebate (Residential)	40. Air-Cooled Ice Machine Rebate (CII)
19. Centralized Computer Irrigation Controller Rebate (CII)	41. Dry Vacuum Pump Rebate (CII)
20. PH/Conductivity Controller Rebate (CII)	42. Ultra-Low Water Urinal Rebate (CII)
21. High Efficiency Nozzle for Large Rotary Sprinklers Rebate (CII)	43. High Efficiency Toilet 1.28 gpf or less (Flushometer and Tank) Rebate (CII)
22. Rotating Nozzles with Pressure Regulating Heads Rebate (CII)	44. HET Dual Flush (Flushometer & Tank) Rebate (CII)

9.1.1 Water Waste Prevention Ordinances

As described in Chapter 8, the City adopted Ordinance No. 3027 on September 1, 2015. Under this ordinance, Chapter 8A ("Water Conservation Plan") was updated with more stringent prohibitions and penalties as previously outlined in Title 6 of the Ontario Municipal Code under the 2009 Ordinance No. 2907. A copy of Ordinance No. 3027 can be found at www.ontarioca.gov.

9.1.2 Metering

The City has always been fully metered and has had in place an active meter replacement program for more than 20 years. The City actively replaces 10% of the existing meters annually and calibrates the top 25 water users meters and 25 random meters, annually. The City is also currently implementing an Advanced Metering Infrastructure (AMI) pilot program that initially will install 1,000 meters and pending success will expand to the rest of the City.

9.1.3 Conservation Pricing

The City adopted a permanent tiered rate structure in 2002 that acts a conservation pricing signal to the City's water customers, regarding their water use. The current water service charges can be found at www.ontarioca.gov. The City is also evaluating a variety of budget based rate structures.

9.1.4 Programs to Assess and Manage Distribution System Real Loss

The City has an active Capital Improvement Program that replaces aging infrastructure, a Breaks/Leaks Response Program that ensures a timely response to any known breaks/leaks and as mentioned above an AMI pilot program that includes a software program that provides real-time leak detection notifications to the City.

9.1.5 Water Conservation Program Coordination and Staffing Support

The City has an extensive network of coordination efforts related to water its water use efficiency and education programs. In coordination with its regional local partners, the City is actively implementing these programs and communicating with its customers about water supply conditions, incentive/rebate programs and free education/training opportunities.

Internally, the City has several departments and staff that are involved with water use efficiency and education programs. The Municipal Utilities Company has dedicated staff that manage the day to day activities to implement the water use efficiency and education programs, as well as the water waste prevention program. The City also has a MediaTeam that reviews and approves all marketing materials, which provides additional internal coordination resulting in cohesive messaging to the public.

9.2 Water Use Efficiency Programs, Public Education and Outreach

In partnership with the Inland Empire Utilities Agency (IEUA) and the Chino Basin Water Conservation District (CBWCD) and its other member agencies, the City has heavily invested in water use efficiency initiatives over the years and will continue to do so in the future. The City actively promotes using water more efficiently and eliminating water waste, in an effort to reduce water demands.

9.2.1 Planned Implementation to Achieve Reduction Targets

The IEUA and its member agencies recently completed the Regional Water Use Efficiency Business Plan (Business Plan), which provides the road map to achieve long-term water use efficiency in a cost effective manner.

The Business Plan references AB 1420, SB x7-7 and the State Water Resources Control Board's (SWRCB) Emergency Conservation Regulations as the legislative drivers that help guide the development of water reduction goals. The Business Plan describes in detail how the region, and the City, will achieve the water reduction goals. Below is a summary of how the City will achieve the water reduction goals.

- **Water Use Efficiency Active Programs** – offering customers incentives/rebates through a portfolio of indoor and outdoor programs in order to use water efficiently
- **Water Use Efficiency Passive Policy Initiative** – these water savings would come through current and future building code standards, plumbing code standards and landscape ordinances
- **Recycled Water** – the continued expansion of recycled water use will reduce demands for potable water supply

The full Business Plan can be found at www.ieua.org.

9.2.2 Water Use Efficiency Programs

Since the City is located in an inland arid region where approximately 60-70% of water is used outdoors, there is a heightened focus on outdoor water use efficiency programs. The City offers outdoor rebates and incentives through a number of programs, such as; free sprinkler nozzles, turf removal programs, landscape evaluations, landscape workshops and smart irrigation controller installations.

The City also offers an assortment of indoor rebate programs for residential, commercial, industrial, institutional and irrigation customers, such as; HET/ULF toilets, HECW, waterless urinals, water brooms, pre-rinse nozzles, conductivity controllers, rotating nozzles and WBIC. Many of these programs are co-sponsored by Metropolitan Water District of Southern California (MWD).

9.2.3 Public Education and Outreach

In conjunction with offering incentives/rebates to reduce water use, the City has implemented a variety of public education and outreach programs. The focus and goal of these programs is to empower customers with the knowledge on how to use water efficiently.

In addition to IEUA, the City has a partnership with the Chino Basin Water Conservation District (CBWCD) and is part of the Water Education Water Awareness Committee (WEWAC). The CBWCD offers several education programs to the City and its customers, as well as provides a number of water use efficiency programs. The WEWAC was specifically created for the purpose of providing water education programs to the public (primarily schools).

Collectively with all its partners, the City offers a number of education program, such as: National Theatre for Children, Shows That Teach, Public Service Announcement Contest, Project WET, EduGrant, Water Scholar Essay Contest, Garden in Every School and Water Saving Garden Friendly.

The City is actively marketing these water use efficiency and education programs through public events/fairs, communicating through the utility bill, social media, newsletters and flyers. The City recently developed a new website www.ontariowaterwise.org, which is specifically dedicated to water use efficiency.

CHAPTER 10

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

10.1 Notice of Preparation and Public Hearing

Table 10-1 shows all the Cities and Agencies that received the City's Notice of Preparation and Public Hearing for its 2015 Urban Water Management Plan (UWMP), distributed on April 13, 2016.

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Water Facilities Authority (WFA)	☑	☑
Chino Basin Desalter Authority (CDA)	☑	☑
Inland Empire Utilities Agency (IEUA)	☑	☑
Metropolitan Water District (MWD)	☑	☑
Chino Basin Watermaster (CBWM)	☑	☑
City of Chino	☑	☑
City of Chino Hills	☑	☑
City of Fontana	☑	☑
City of Montclair	☑	☑
City of Pomona	☑	☑
City of Rancho Cucamonga	☑	☑
City of Upland	☑	☑
Monte Vista Water District (MVWD)	☑	☑
Fontana Water Company (FWC)	☑	☑
Jurupa Community Services District (JCSD)	☑	☑
San Antonio Water Company (SAWC)	☑	☑
Cucamonga Valley Water District (CVWD)	☑	☑
Santa Ana Watershed Project Authority (SAWPA)		
General public	☑	☑
Other	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
County of San Bernardino	☑	☑

This Notice included the time and place of the public hearing, the location that the draft 2015 UWMP can be acquired and was distributed well in advance of the 60 days prior to the public hearing.

10.2 Notice to the Public

The City noticed the public hearing in the local newspaper, Daily Bulletin, twice: 2 weeks prior to the public hearing (June 7, 2016) and 1 week prior to the public hearing (June 14, 2016). A copy of these notices are included as Appendix A.

10.3 Public Hearing and Adoption

The 2015 UWMP was adopted by the City Council on June 21, 2016, immediately following the public hearing (Resolution xx is included as Attachment A). The City will make any necessary amendments or "significant changes" requested by the California Department of Water Resources (DWR) until the 2015 UWMP is deemed "complete."

As part of the public hearing, the city provided information on its baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009.

10.4 Plan Submittal

Following the adoption of the 2015 UWMP, the City submitted the 2015 UWMP to the DWR via its online submittal tool, WUEdata, prior to the July 1, 2016 deadline. The City has forwarded copies of the 2015 UWMP to California State Library and any city or county that it supplies water too. Adopted copies of the 2015 UWMP were made available for public review on the City web site www.ontarioca.gov beginning August 19, 2016.

Appendix A

Notice of Preparation and Public Hearing for the

2015 Urban Water Management Plan

May 18, 2016

TO: Interested Parties

SUBJECT: NOTICE OF PREPARATION AND PUBLIC HEARING FOR THE 2015 URBAN WATER MANAGEMENT PLAN

The City of Ontario is currently preparing an update to its Urban Water Management Plan (UWMP) in compliance with the California Urban Water Management Planning Act. The current UWMP was completed in 2010. An update is required every five years. The City welcomes your agency's assistance and involvement as we update our UWMP.

The UWMP documents the City's planning efforts to ensure adequate water supply to meet existing and future water demands under a range of water supply conditions, including water shortages. Draft portions of the UWMP will be made available to appropriate water agencies including wholesale suppliers, water management agencies, and neighboring retail agencies as they are developed. The completed Draft 2015 UWMP will be available for public review starting June 7, 2016 on the City's website at www.ci.ontario.ca.us.

The City Council will conduct a public hearing at the following time and place to receive comments on the Draft 2015 UWMP.

Date:	*Tuesday, June 21, 2016*
Time:	*6:00 p.m.*
Location:	*Ontario City Hall – Council Chambers* *303 East "B" Street* *Ontario, CA 91761*

All interested persons are invited to attend the public hearing and provide comments regarding the Draft 2015 UWMP. Oral statements will be heard, but for accuracy of the record, all important testimony should be submitted in writing.

For more information, please feel free to contact Ryan Shaw, Utilities Water Resources Manager at (909) 395-2679 (rshaw@ontarioca.gov) or Cynthia Heredia-Torres, Assistant Engineer at (909) 395-2647 (ctorres@ontarioca.gov).

Sincerely,

Scott Burton

Scott Burton, P.E.
Utilities General Manager

Appendix B

Technical Memorandum – Ultimate Citywide Water Demand Estimate

AKM Consulting Engineers

May 2016

Technical Memorandum

To: Dennis Mejia, P.E.
City of Ontario

From: Diann Pay, P.E.

CC: Zeki Kayiran, P. E.

Subject: Ultimate Citywide Water Demand Estimate

A. Purpose and Background

The purpose of this technical memorandum is to discuss the step by step process of developing the City of Ontario's ultimate water demand estimate. AKM has worked in conjunction with City staff to develop the methods and calculations described in this memorandum.

The major components of the ultimate citywide water demand estimate are as follows:

1. Existing water use areas in Old Model Colony (OMC)
2. Vacant and undeveloped areas in OMC
3. Densification areas in OMC
4. Future mixed use areas in OMC and New Model Colony (NMC)
5. Future residential areas in NMC
6. Future commercial, industrial, and other Areas in NMC
7. Existing recycled water use
8. Future recycled water use in OMC
9. Future recycled water use in NMC

B. Production and Purchase Data

In order to evaluate the changes in water use since the last time the City established them (based on 2008 Water Use data), historical production and purchase data was reviewed as shown in Table 1. From 2008 to 2014, the overall potable and recycled water production decreased by 5.1 percent with an increase of 187 active connections. In the same time period, the total overall metered water deliveries decreased by 10.1 percent. This is largely believed to be due to water conservation efforts by the public during the long standing drought conditions experienced in Southern California. The percentage decrease in water use by meter type was utilized extensively as the basis for updating the unit demand factors and the overall citywide water demand estimates.

Table 1
Historical Production and Purchase Data

Customer Class	2008 Potable (meters)	2008 Recycled (meters)	2009 Potable (meters)	2009 Recycled (meters)	2010 Potable (meters)	2010 Recycled (meters)	2011 Potable (meters)	2011 Recycled (meters)	2012 Potable (meters)	2012 Recycled (meters)	2013 Potable (meters)	2013 Recycled (meters)	2014 Potable (meters)	2014 Recycled (meters)	Change 2014-2008 Potable (meters)	Change 2014-2008 Recycled (meters)
Single Family Residential	26,179		27,324		29,473		26,136		26,239		26,614		26,491	3	312	3
Multi Family Residential	2,004		1,995		2,069		1,974		1,972		1,955		1,959	4	-45	4
Commercial / Institutional	3,337		3,042		3,285		3,260		3,296		2,917		3,185		-152	0
Industrial	47		269		278	2	49	2	243	2	248	2	277	2	230	2
Landscape Irrigation	1,460	65	1,213	135	1,245	146	1,389	216	1,470	203	1,134	204	1,121	207	-339	142
Other	50		381		308	14			84		43		69		19	0
Agricultural Irrigation		8				16		16		16		17		19	0	11
SubTotal	**33,077**	**73**	**34,224**	**135**	**36,658**	**178**	**32,808**	**234**	**33,304**	**221**	**32,911**	**223**	**33,102**	**235**	**25**	**162**
Total	**33,150**		**34,359**		**36,836**		**33,042**		**33,525**		**33,134**		**33,337**		**187**	

Production - Total Water Into System

Source	2008 AF	2009 AF	2010 AF	2011 AF	2012 AF	2013 AF	2014 AF	Change 2014-2008 (AF)	Change % Change
Wells	29,061	28,996	21,997	20,442	20,226	19,967	20,274	-8,787	-30.2
Surface					10,185				
Purchased	14,240	10,542	12,993	14,046	4,886	15,954	15,396	1,156	8.1
Total Potable	**43,301**	**39,538**	**34,990**	**34,488**	**35,297**	**35,921**	**35,670**	**-7,631**	**-17.6**
Recycled	3,684	5,774	5,175	6,718	7,125	7,438	8,923	5,239	142.2
Total	**46,985**	**45,312**	**40,165**	**41,206**	**42,422**	**43,359**	**44,593**	**-2,392**	**-5.1**

Purchase = Metered Water Deliveries

Meter Type	2008 AF	2008 gpd/meter	2009 AF	2009 gpd/meter	2010 AF	2010 gpd/meter	2011 AF	2011 gpd/meter	2012 AF	2012 gpd/meter	2013 AF	2013 gpd/meter	2014 AF	2014 gpd/meter	Change 2014-2008 gpd/meter	Change % Change
Single Family Residential	14,846	506	14,556	476	13,253	401	13,547	463	13,763	468	14,349	481	13,474	454	-52	-10.3
Multi-Family Residential	5,964	2,657	5,696	2,549	5,425	2,341	5,554	2,512	5,595	2,533	5,456	2,491	5,365	2,445	-212	-8.0
Commercial / Institutional	11,500	3,077	7,695	2,258	6,692	1,819	7,088	1,941	7,831	2,121	6,972	2,134	7,644	2,143	-934	-30.4
Industrial	256	4,863	2,050	6,803	2,044	6,564	1,928	35,127	1,244	4,570	1,245	4,482	1,557	5,018	155	3.2
Landscape Irrigation	9,506	5,813	6,694	4,927	7,170	5,141	8,841	5,682	9,085	5,517	5,993	4,718	6,347	5,055	-758	-13.0
Other			1,017		819		777		134		197		774			
Total Urban Retail	**42,072**		**37,708**		**35,403**		**37,735**		**37,652**		**34,212**		**35,161**		**-6,911**	**-16.4**
Agricultural Irrigation	2,587		3,820		3,031		3,199		3,375		3,497		4,999			
Total	**44,659**		**41,528**		**38,434**		**40,934**		**41,027**		**37,709**		**40,160**		**-4,499**	**-10.1**

Meter Type	2008 AF	2008 gpd/meter	2009 AF	2009 gpd/meter	2010 AF	2010 gpd/meter	2011 AF	2011 gpd/meter	2012 AF	2012 gpd/meter	2013 AF	2013 gpd/meter	2014 AF	2014 gpd/meter	Change 2014-2008 gpd/meter	Change % Change
Combine Comm/Industrial	11,756	3,101	9,745	2,628	8,736	2,189	9,016	2,432	9,075	2,289	8,217	2,318	9,201	2,373	-729	-23.5

	2008	2009	2010	2011	2012	2013	2014	Average
Unaccounted for Water = Production - Purchase	2,326	3,784	1,731	272	1,395	5,650	4,433	2,799
% Unaccounted for Water	5.0	8.4	4.3	0.7	3.3	13.0	9.9	6.4

C. Future Domestic Water Unit Demand Factors

Future domestic water unit demand factors are shown in Table 2 and represent average day demands. Explanations for the basis of the factors are described in the following sections of this memorandum.

Table 2
Future Domestic Water Unit Demand Factors

Landuse		Max Density (du/ac)[1]	Density (people/ du)[2]	Domestic Water Unit Demand Factors			Recycled Water Unit Demand Factors		Total Water Unit Demand Factors	
				gpd/person or gpd/job or gpd/room or gpd/student	gpd/ac	gpd/du	gpd/ac	gpd/du	gpd/ac	gpd/du
Residential										
Rural Residential	RR	2	3.997	172 gpd/person	1,375	687			1,375	
Low Density Residential (w/o RW)	LDR	4	3.997	123 gpd/person	1,970	492			1,970	492
Low Density Residential (w/ RW)	LDR	5	3.997	95 gpd/person	1,900	380	540	108	2,440	488
Low Medium Density Residential (w/o RW)	LMDR	8.5	3.997	105 gpd/person	3,570	420			3,570	420
Low Medium Density Residential (w/ RW)	LMDR	11	3.997	90 gpd/person	3,960	360	625	57	4,585	417
Medium Density Residential (w/o RW)	MDR	18	3.347	90 gpd/person	5,420	301			5,420	301
Medium Density Residential (w/ RW)	MDR	25	3.347	80 gpd/person	6,690	268	670	27	7,360	295
High Density Residential (w/o RW)	HDR	35	3.347	70 gpd/person	8,200	234			8,200	234
High Density Residential (w/ RW)	HDR	40	3.347	60 gpd/person	8,030	201	720	18	8,750	219
Commercial										
Business Park (w/o RW)	BP			103 gpd/job	3,140				3,140	
Business Park (w/ RW)	BP	-	-	59 gpd/job	1,800	-	1,340	-	3,140	
General Commercial (w/o RW)	GC			258 gpd/job	3,140				3,140	
General Commercial (w/ RW)	GC	-	-	148 gpd/job	1,800	-	1,340	-	3,140	
Hospitality[3] (w/o RW)	HOS			155 gpd/room	5,980				5,980	
Hospitality[3] (w/ RW)	HOS	-	-	130 gpd/room	5,000	-	980	-	5,980	
Neighborhood Commercial (w/o RW)	NC			99 gpd/job	3,140				3,140	
Neighborhood Commercial (w/ RW)	NC	-	-	57 gpd/job	1,800	-	1,340	-	3,140	
Office Commercial (w/o RW)	OC			53 gpd/job	3,840				3,840	
Office Commercial (w/ RW)	OC	-	-	35 gpd/job	2,500	-	1,340	-	3,840	
Industrial										
Industrial (w/o RW)	IND	-	-	110 gpd/job	2,290	-		-	2,290	
Industrial (w/ RW)	IND	-	-	67 gpd/job	1,400	-	890	-	2,290	
Mixed Use										
High Density Residential (w/o RW)	MU-HDR	35	2.000	70 gpd/person	4,900	140			4,900	140
High Density Residential (w/ RW)	MU-HDR	40	2.000	60 gpd/person	4,800	120	720	18	5,520	138
Office (w/o RW)	MU-O			53 gpd/job	3,840				3,840	
Office (w/ RW)	MU-O	-	-	35 gpd/job	2,500	-	1,340	-	3,840	
Non-Office (w/o RW)	MU-NO			179 gpd/job	2,690				2,690	
Non-Office (w/ RW)	MU-NO	-	-	102 gpd/job	1,800	-	890	-	2,690	
Open Space										
Open Space Non-Recreational (w/o RW)	OS-NR				2,340				2,340	
Open Space Non-Recreational (w/ RW)	OS-NR	-	-	-	1,000	-	1,340	-	2,340	
Open Space Recreational (w/o RW)	OS-R				2,340				2,340	
Open Space Recreational (w/ RW)	OS-R	-	-	-	1,000	-	1,340	-	2,340	
Public										
Public Facility (w/o RW)	PF				3,040				3,040	
Public Facility (w/ RW)	PF	-	-	-	1,700	-	1,340	-	3,040	
Public Middle or High School (w/o RW)	PS	-	-	30 gpd/student	2,500	-		-	2,500	
Public Middle or High School (w/RW)	PS	-	-	5 gpd/student	400	-	2,100	-	2,500	
Public Elementary School (w/o RW)	PS	-	-	15 gpd/student	2,500	-		-	2,500	
Public Elementary School (w/RW)	PS	-	-	5 gpd/student	400	-	2,100	-	2,500	

[1] Max Density per the City's 2010 General Plan (The Ontario Plan) for OMC without recycled water. Density for LDR, LMDR, MDR, and HDR with recycled water were increased per the City Planning Department recommendation (March 2016).

[2] Density per the City's 2010 General Plan (The Ontario Plan)

[3] If possible it is recommended to use 130 gpd/room on a case by case basis. It is difficult to estimate the number of rooms or square footage per acre.

[4] Mixed Use demands should be based on the types of landuse that make up the specific area and the unit demand factors provided above. The City's 2010 General Plan (The Ontario Plan) provides detailed information on the landuses that make up each mixed use area.

Definitions: w/ RW = with Recycled Water
wo/ RW = without Recycled Water

C.1 Residential Water Use Demand Factors

A modified version of The Ontario Plan Approved Land Use Buildout Estimate (2010 General Plan) is shown in Table 3. The modifications were provided by the City planning department and are related to the residential densities defined for the New Model Colony area and high density areas. The modifications are highlighted in red text. These changes in residential densities (du/ac) result in an increase in estimated population. The Ontario Plan Land Use Buildout was originally estimated the citywide population at 358,270. For this study, the population estimate is increased to 372,392.

C.1-1 Demand Factors in Areas without Recycled Water

The Old Model Colony production and purchase data was used for developing the demand factors for residential areas without recycled water service.

Rural Residential

There is one area on the west side of the service area considered rural residential. The 2014 water use specific to this area was used to develop a unit demand factor of 687 gpd/du. Based on the general plan defined maximum density of 2 du/ac and 3.997 people per du, the demand factor was translated into 172 gpd/person and 1,375 gpd/ac.

Low Density Residential – without recycled water

The low density demand factor was previously set at 136 gpd/person. The new factor of 123 gpd/person was established by decreasing this factor by about 10 percent based on the decrease in overall single family residential usage between 2008 and 2014. Based on the defined maximum density of 4 du/ac and 3.997 people per du, the demand factor was translated into 492 gpd/du and 1,970 gpd/ac.

Low Medium Density Residential – without recycled water

The low medium density demand factor was previously set at 116 gpd/person. The new factor of 105 gpd/person was established by decreasing this factor by about 10 percent based on the decrease in overall single family residential usage between 2008 and 2014. Based on the defined maximum density of 8.5 du/ac and 3.997 people per du, the demand factor was translated into 420 gpd/du and 3,570 gpd/ac.

Medium Density Residential – without recycled water

The medium density demand factor was previously set at 98 gpd/person. The new factor of 90 gpd/person was established by decreasing this factor by about 8 percent based on the decrease in overall multi-family residential usage between 2008 and 2014. Based on the defined maximum density of 18 du/ac and 3.347 people per du, the demand factor was translated into 301 gpd/du and 5,420 gpd/ac.

Table 3
The Ontario Plan Approved Land Use Buildout Estimate (Modified)

Land Use Category	OMC/ NMC	Acres[2]	Density (du/ac)[3]	Intensity (FAR)[3]	Units	Population[4]	Square Feet (Non-Office)	Square Feet (Office)	Total Square Feet	Jobs[5] (Non-Office)	Jobs[5] (Office)	Total Jobs[5]
Residential												
Rural Residential (RR)	OMC	453	2.0		906	3,621						
Low Density Residential (LDR)	OMC	4,308	4.0		17,232	68,876						
Low Density Residential (LDR)	NMC	3,158	5.0 [6]		15,790	63,113						
Low Medium Density Residential (LMDR)	OMC	295	8.5		2,508	10,026						
Low Medium Density Residential (LMDR)	NMC	505	11.0 [6]		5,558	22,217						
Medium Density Residential (MDR)	OMC	896	18.0		16,124	53,968						
Medium Density Residential (MDR)	NMC	1,059	25.0 [6]		26,470	88,595						
High Density Residential (HDR)	OMC	241	40.0 [6]		9,624	32,212						
Subtotal		***10,915***			***94,213***	***342,628***						
Mixed Use												
1. Downtown	OMC	109	35.0		2,279	4,557	756,202	756,202	1,512,403	543	2,163	2,706
2. Euclid & Francis	OMC	10	30.0		156	312	181,210	0	181,210	419	0	419
3. Holt	OMC	55	30.0		412	824	478,289	1,195,722	1,674,011	343	3,420	3,763
4. Meredith	OMC	246	40.0		800 [7]	1,600	2,146,637	5,366,592	7,513,229	1,541	15,348	16,890
5. Hospitality	OMC	76	60.0		457	914	1,493,672	1,493,672	2,987,345	1,072	4,272	5,344
6. Ontario Festival (MxU in 14)	OMC	37	20.0		368	736	112,211	240,451	352,662	81	688	768
7. Guasti	OMC	83	30.0		500	1,001	1,089,871	1,271,516	2,361,388	783	3,637	4,419
8. Ontario Center (E. of Haven)	OMC	345	40.0		4,139	8,278	1,502,384	7,511,922	9,014,306	1,079	21,484	22,563
9. Mills	OMC	240	40.0		479	958	3,912,233	1,564,893	5,477,126	2,809	4,476	7,285
10. NMC south	NMC	316	35.0		3,315	6,630	962,632	5,775,795	6,738,427	691	16,519	17,210
11. NMC east	NMC	264	25.0		1,978	3,956	1,378,413	1,206,111	2,584,524	990	3,449	4,439
12. SR60 & Hamner	OMC	41	0.0		0	0	349,112	313,305	662,417	251	896	1,147
Subtotal		***1,822***			***14,882***	***29,765***	***14,362,865***	***26,696,182***	***41,059,046***	***10,601***	***76,351***	***86,952***
Retail/Service												
Neighborhood Commercial (NC)	OMC/NMC	277		0.30			2,896,914	724,229	3,621,143	6,692	2,071	8,763
General Commercial (GC)	OMC/NMC	552		0.30			6,488,654	720,962	7,209,616	4,659	2,062	6,721
Office Commercial (OC)	OMC/NMC	526		0.75			5,151,406	12,019,946	17,171,352	3,699	34,377	38,076
Hospitality (HOS)	OMC/NMC	145		1.00			5,049,475	1,262,369	6,311,844	3,626	3,610	7,236
Subtotal		***1,499***					***19,586,449***	***14,727,505***	***34,313,954***	***18,675***	***42,121***	***60,796***
Employment												
Business Park (BP)	OMC/NMC	1,357		0.40			11,821,313	11,821,313	23,642,626	7,684	33,809	41,493
Industrial (IND)	OMC/NMC	6,747		0.55			145,469,382	16,163,265	161,632,647	94,555	46,227	140,782
Subtotal		***8,103***					***157,290,695***	***27,984,578***	***185,275,273***	***102,239***	***80,036***	***182,275***
Other												
Open Space Non-Recreational (OS-NR)	OMC/NMC	1,243										
Open Space Recreational (OS-R)	OMC/NMC	991										
Open Space Water (OS-W)	OMC/NMC	59										
Public Facility (PF)	OMC/NMC	99										
Public School (PS)	OMC/NMC	627										
Airport (ARPT)	OMC	1,422										
Railroad (Rail)	OMC	247										
Landfill (LF)	OMC	137										
Right-of-Way (ROW)	OMC/NMC	4,794										
Subtotal		***9,619***										
Total		***31,958***			***109,095***	***372,392***	***191,240,009***	***69,408,264***	***260,648,273***	***131,515***	***198,508***	***330,023***

Notes
1 Historically, citywide buildout levels do not achieve the maximum allowable density/intensity on every parcel and are, on average, lower than allowed by the General Plan. Accordingly, the buildout estimates in this General Plan do not assume buildout at the maximum density or intensity and instead are adjusted downward to account for variations in buildout intensity. Buildout assumptions are as agreed upon on 2-4-08.
2 Acres are given as adjusted gross acreages, which do not include the right-of-way for roadways, flood control facilities, or railroads.
3 Density/Intensity includes both residential density, expressed as units per acre, and non-residential intensity, expressed as floor area ratio (FAR), which is the amount of building square feet in relation to the size of the lot.
4 Estimates of population by residential designation are based on a persons-per-household factor that varies by housing type. 3.347 pph for MF, 3.278 pph for sfa, and 3.997 pph for sfd.
5 The factors used to generate the number of employees are 2.310 e/1000 sf of community commercial; .718 e/1000 sf of regional commercial; .650 e/1000 sf of industrial; and 2.86 e/1000 sf of office.
6 Density for LDR, LMDR, MDR, and HDR with recycled water were increased per the City Planning Department recommendation (March 2016).
7 Number of dwelling units from Meredith International Centre SPA, 2014

High Density Residential – without recycled water

The high density demand factor was previously set at 76 gpd/person. The new factor of 70 gpd/person was established by decreasing this factor by about 8 percent based on the decrease in overall multi-family residential usage between 2008 and 2014. Based on the defined maximum density of 35 du/ac and 3.347 people per du, the demand factor was translated into 234 gpd/du and 8,200 gpd/ac.

For mixed use high density residential, the maximum density is 35 du/ac and 2.000 persons/du. Therefore the demand factor is translated into 140 gpd/du and 4,900 gpd/ac.

C.1-2 Demand Factors in Areas with Recycled Water

The most recent developments and planned future residential developments will have recycled water systems. The Edenglen development is the most well-established of the new developments and it has a recycled water system. Therefore, the most recent Edenglen billing data was used as the basis for development of the demand factors.

The recommended residential densities (seen in Table 2 and Table 3) for newer development areas were determined and provided for this study by the City's planning department in March 2016.

Low Density Residential – with recycled water

The low density demand factor was established following the development of the recycled water unit demand factor (see Section D.9) for this land use. The potable water unit demand factor was adjusted until the total water demand factor for low density was approximately equivalent with and without recycled water available. The resulting potable water demand factor was calculated to be 95 gpd/person if recycled water is available. Based on the maximum density of 5 du/ac and 3.997 people per du, the demand factor was translated into 380 gpd/du and 1,900 gpd/ac.

Low Medium Density Residential – with recycled water

The low medium density demand factor was established following the development of the recycled water unit demand factor (see Section D.9) for this land use. The potable water unit demand factor was adjusted until the total water demand factor for low medium density was approximately equivalent with and without recycled water available. The resulting potable water demand factor was calculated to be 90 gpd/person if recycled water is available. Based on the maximum density of 11 du/ac and 3.997 people per du, the demand factor was translated into 360 gpd/du and 3,960 gpd/ac.

Medium Density Residential – with recycled water

The medium density demand factor for newer type developments with recycled water systems was based upon 2015 water use specific to the Edenglen community, located south of Riverside Drive and east of Mill Creek Avenue. This is one of the newer developments in the service area

yet has been for the most part established for several years. The 2010 Census data was utilized to determine population and number of dwelling units in the community. The demand factors for the multi-family dwellings ranged from 63 to 76 gpd/person for indoor use and was calculated to be 9 gpd/person for potable irrigation. The demand factor selected is a total of 80 gpd/person. Based on a maximum density of 25 du/ac and 3.347 persons/du, the demand factor was translated into 268 gpd/du and 6,700 gpd/ac.

High Density Residential – with recycled water

The high density demand factor for newer type developments with recycled water systems was based upon 2015 water use specific to the Edenglen community, located south of Riverside Drive and east of Mill Creek Avenue. This is one of the newer developments in the service area yet has been for the most part established for several years. The 2010 Census data was utilized to determine population and number of dwelling units in the community. The demand factors for the multi-family dwellings ranged from 41 to 49 gpd/person for indoor use and was calculated to be 13 gpd/person for potable irrigation. The demand factor selected is a total of 60 gpd/person. Based on a maximum density of 40 du/ac and 3.347 persons/du, the demand factor was translated into 201 gpd/du and 8,030 gpd/ac.

For mixed use high density residential, the maximum density is 40 du/ac and 2.000 persons/du. Therefore the demand factor is translated into 120 gpd/du and 4,800 gpd/ac.

C.2 Commercial and Industrial Water Demand Factors

The commercial and industrial water demand factors were established by analyzing water use data for sample commercial and industrial areas with recycled water throughout the City.

First the indoor demand factors were established in units of gpd/ac by excluding the irrigation meters from the calculation. These factors were used for commercial and industrial landuses with recycled water, assuming the landscape irrigation would be provided with recycled water.

Then, the total number of jobs and acreages for each land use shown in Table 3 was used along with the newly established demand factors in gpd/ac, to calculate the demand factors in units of gpd/job. For example: The Ontario Plan estimates the neighborhood commercial acreage at 277. The average water use estimate for this land use category is 498,780 gpd. With an estimate of 8,763 jobs, the demand factor is calculated to be 57 gpd/job.

The demand factors without recycled water is a combination of the indoor demand factor plus the developed recycled water unit demand factor (see Section D.9).

Future commercial and industrial water use was estimated by using the following factors:

Business Park without recycled water = 103 gpd/job or 3,140 gpd/ac

Business Park with recycled water = 59 gpd/job or 1,800 gpd/ac

General Commercial without recycled water = 258 gpd/job or 3,140 gpd/ac

General Commercial with recycled water = 148 gpd/job or 1,800 gpd/ac

Neighborhood Commercial without recycled water = 99 gpd/job or 3,140 gpd/ac

Neighborhood Commercial with recycled water = 57 gpd/job or 1,800 gpd/ac

Office Commercial without recycled water = 53 gpd/job or 3,840 gpd/ac

Office Commercial with recycled water = 35 gpd/job or 2,500 gpd/ac

Industrial without recycled water = 110 gpd/job or 2,290 gpd/ac

Industrial with recycled water = 67 gpd/job or 1,400 gpd/ac

Mixed use office without recycled water = 53 gpd/job or 3,840 gpd/ac

Mixed use office with recycled water = 35 gpd/job or 2,500 gpd/ac

Mixed use non-office without recycled water = 179 gpd/job or 2,690 gpd/ac

Mixed use non-office with recycled water = 102 gpd/job or 1,800 gpd/ac

The hospitality water demand factors were based upon analysis of water use data from 2015 at the hotels located adjacent the Ontario airport. The demand factors without recycled water is a combination of the indoor demand factor plus the developed recycled water unit demand factor (see Section D.9).

Hospitality without recycled water = 155 gpd/room or 5,980 gpd/ac

Hospitality with recycled water = 130 gpd/job or 5,000 gpd/ac

C.3 Open Space Water Demand Factors

The open space unit demand factor is recommended at 2,340 gpd/ac without recycled water and 1,000 gpd/ac with recycled water.

C.4 Public Facility Water Demand Factors

The public facility water demand factor was established by decreasing the factor by 23 percent based on the decrease in the combined commercial and industrial usage between 2008 and 2014.

Public Facility without recycled water = 3,040 gpd/ac

Public Facility with recycled water = 1,700 gpd/ac

C.5 School Water Demand Factors

The water demand factors for schools were based upon analysis of water use data from 2015 at various schools. The data was separated based on whether or not the school was an elementary school or a middle/high school and whether or not the site had recycled water for irrigation purposes or not.

Middle/High School without recycled water = 30 gpd/student or 2,500 gpd/ac

Middle/High School with recycled water = 5 gpd/student or 400 gpd/ac

Elementary School without recycled water = 15 gpd/student or 2,500 gpd/ac

Elementary School with recycled water = 5 gpd/student or 400 gpd/ac

D. Ultimate Citywide Water Demand Estimate

The total average day water demand, for both potable and recycled water combined, is currently estimated to be 73,640 AFY or 65.7 mgd. The maximum day water demand is currently estimated at 105.8 mgd. These estimates apply to the total projected service area population of 368,239 which excludes the population served water by Cucamonga Valley Water District (total City population is estimated at 372,392 per the City's 2010 General Plan with updated densities based on development data). Each of the aforementioned components that make up the ultimate citywide water demand estimate is summarized in Table 4.

D.1 Component 1 – Existing Water Use Areas in OMC

Water meter records from 2014 were used to estimate the demands of the existing water use areas in OMC. It is assumed that the land use type of these areas will not change in the future. Recycled water meter and fire hydrant records were excluded from this component. Future mixed use areas, identified per the City's 2010 General Plan (The Ontario Plan) were excluded from this component and later accounted for in Component 4. An amount of 4,371 AFY was subtracted out in anticipation of potable to recycled water conversions. The water use data extracted from meter records was increased by 7 percent to account for unaccounted for water / system losses.

The 2014 time frame represents a time period where water conservation efforts are in place by the public but water restrictions are not as extreme as in 2015. This is believed to be what the "normal" water usage will be from this point forward and the best number to use for planning purposes. Therefore, additional reductions of the water use was not factored into these calculations.

D.2 Component 2 – Vacant / Undeveloped Areas in OMC

Demands for existing vacant or undeveloped areas in OMC were estimated by using the lot acreage and the unit demand factors (gpd/ac) shown in Table 2. The vacant and undeveloped areas under this category can be seen on Figure 1, Existing Land Use. It does not include the vacant and undeveloped land in the future mixed use areas shown on Figure 2, Ultimate Land Use.

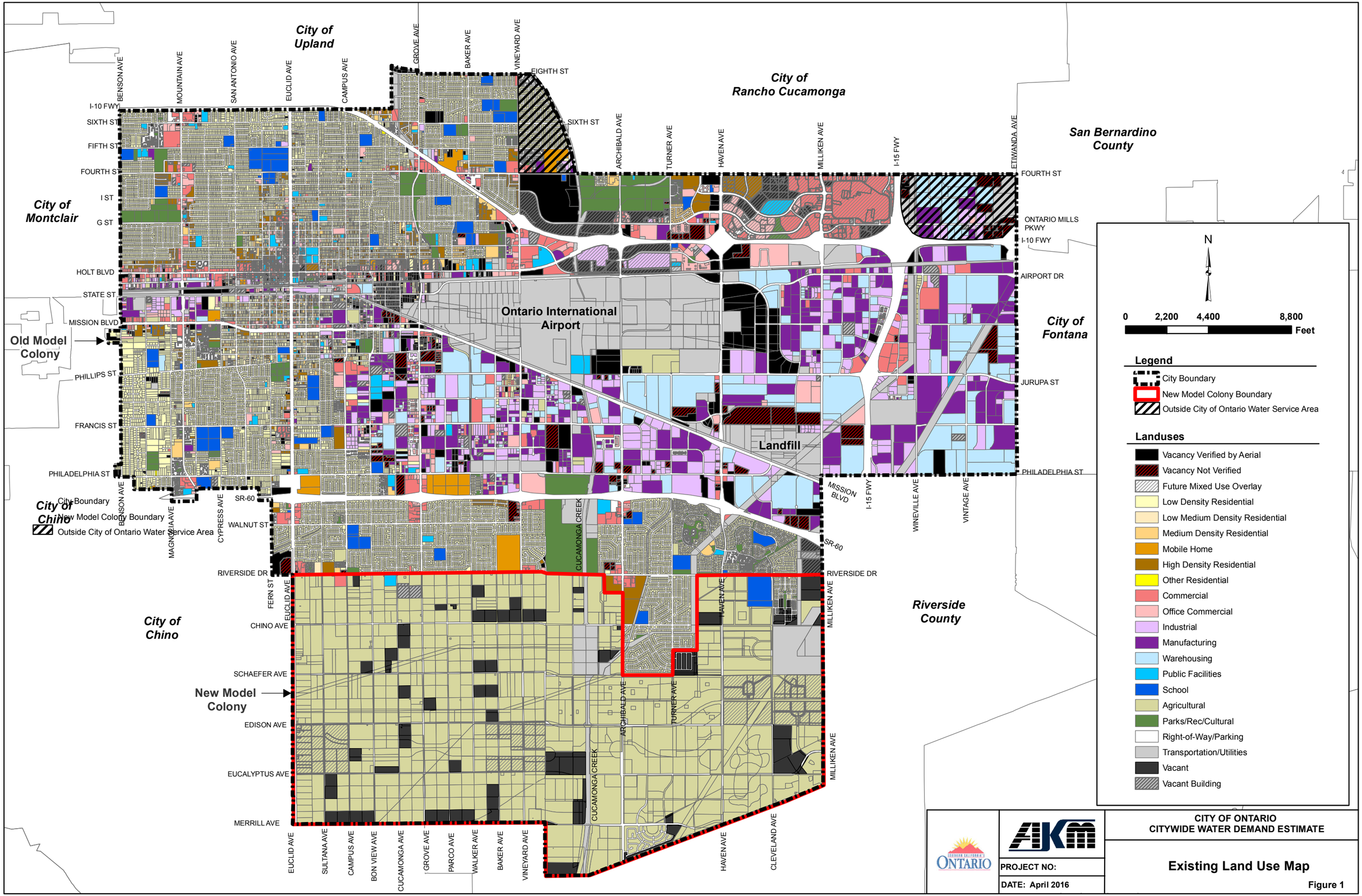
D.3 Component 3 – Densification Areas in OMC

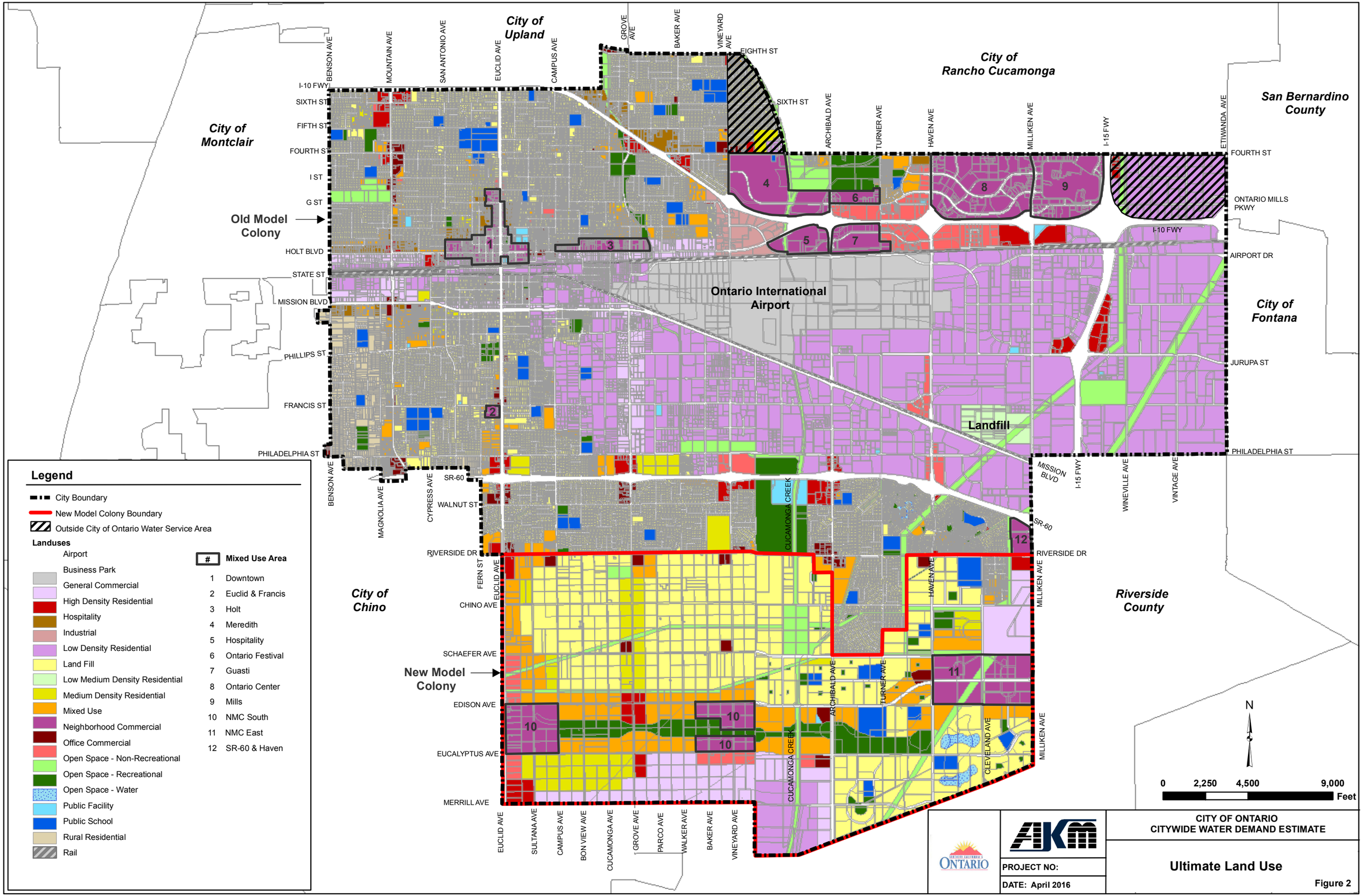
Demands for areas in OMC with existing land uses that are planned for redevelopment / densification in the future (per The Ontario Plan) were estimated by using the lot acreage and the unit demand factors (gpd/ac) shown in Table 2. Densification areas were identified by comparing the existing land use map (Figure 1) to The Ontario Plan land use map (Figure 2).

Table 4
Ultimate Citywide Water Use Estimate

Component No.	Description of Water Consumption	Comments	Residential Population	Employment Population	Average Day Demand			Maximum Day Demand[1]		
					gpd	mgd	AFY	gpd	mgd	AFY
1	Existing Water Use Areas in OMC	2014 water meter data w/o recycled water meters, hydrants, and meters in future mixed use development areas; Subtracted out CVWD population of 4,153 for area in CVWD water service area. Subtracted 4,371 AFY for Recycled Water Conversions. **Added 7% for unaccounted for water.**	164,550	208,970	25,476,914	25.5	28,538	40,763,062	40.8	45,661
2	Vacant or Undeveloped areas in OMC (excluding future mixed use areas)	UFF by landuse type x Ac	-		1,810,714	1.8	2,028	2,897,142	2.9	3,245
3	Densification areas in OMC	UFF by landuse type x Ac			405,418	0.4	454	648,669	0.6	727
4	Mixed Use Areas in OMC Residential	**80** gpd/person (<=25 du/ac) or **60** gpd/person (>25 du/ac) x population	19,179		1,165,478	1.2	1,306	1,864,765	1.9	2,089
	Mixed Use Areas in OMC Office and Non-Office	**35** gpd/job x number of jobs for office. **102** gpd/job x number of jobs for non-office.		65,303	2,858,654	2.9	3,202	4,573,847	4.6	5,123
	Mixed Use Areas in NMC Residential	**80** gpd/person (<=25 du/ac) or **60** gpd/person (>25 du/ac) x population	10,585		714,222	0.7	800	1,071,333	1.1	1,200
	Mixed Use Areas in NMC Office and Non-Office	**35** gpd/job x number of jobs for office. **102** gpd/job x number of jobs for non-office.		21,649	861,125	0.9	965	1,291,687	1.3	1,447
5	Residential Areas in NMC	**95** gpd/person for LDR **90** for LMDR and **80** gpd/person for MDR x population	173,924		15,082,794	15.1	16,895	22,624,191	22.6	25,342
6	Retail/Service Areas in NMC	Used detailed TAZ data provided by Planning **5/7/10**. **35** gpd/job x number of jobs for office commercial. **57** gpd/job for neighborhood commercial. **148** gpd/job for general commercial.		5,020	752,225	0.8	843	1,128,338	1.1	1,264
	Employment Areas in NMC	Used detailed TAZ data provided by Planning **5/7/10**. **59** gpd/person x number of jobs for business park. **67** gpd/person x number of jobs for industrial.		29,081	1,757,950	1.8	1,969	2,636,925	2.6	2,954
	Other Areas (Public Facilties, Schools) in NMC - excluded parks, ROW, non-recreational open space because it will be served with recycled water	Used detailed TAZ data provided by Planning **5/7/10**. UFF by landuse type x Ac; **UFF for indoor use only**	-		83,341	0.1	93	125,012	0.1	140
		Potable Water Total			***50,968,836***	***51.0***	***57,093***	***79,624,972***	***79.6***	***89,192***
7	2014 Recycled Water Use	Recylced Water Production less Agricultural Irrigation			3,503,571	3.5	3,924	9,109,286	9.1	10,204
8	Future Recycled Water Use in OMC (Vacant Areas & Conversions)	10% less than total RW allocation based on estimated % of total EDU's (*Ref: 2011 Recycled WMP*)			4,700,683	4.7	5,265	12,221,776	12.2	13,690
9	Future Recycled Water Use in NMC (Vacant Areas)				6,569,853	6.6	7,358	17,081,617	17.1	19,134
		Recycled Water Total			***14,774,107***	***14.8***	***16,547***	***38,412,679***	***38.4***	***43,028***
		Grand Total	***368,239***	***330,023***	***65,742,943***	***65.7***	***73,640***	***118,037,650***	***105.8***	***132,219***

[1] *Potable Water Maximum Day Demand in OMC = 1.60 x Average Day Demand per water production data from 2008 and 2009*
Potable Water Maximum Day Demand in NMC = 1.50 x Average Day Demand
Recycled Water Maximum Day Demand = 2.60 x Average Day Demand per 2006 Water and Recycled Water Master Plan


City of Upland
City of Rancho Cucamonga
San Bernardino County
City of Montclair
City of Fontana
Ontario International Airport
Landfill
Old Model Colony
New Model Colony
City of Chino
Riverside County
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ETIWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
MISSION BLVD
WINEVILLE AVE
VINTAGE AVE
SR-60
RIVERSIDE DR
CUCAMONGA CREEK
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
MAGNOLIA AVE
CYPRESS AVE
SULTANA AVE
BON VIEW AVE
CUCAMONGA AVE
PARCO AVE
WALKER AVE
CLEVELAND AVE
N
0 2,200 4,400 8,800 Feet
Legend
City Boundary
New Model Colony Boundary
Outside City of Ontario Water Service Area
Landuses
Vacancy Verified by Aerial
Vacancy Not Verified
Future Mixed Use Overlay
Low Density Residential
Low Medium Density Residential
Medium Density Residential
Mobile Home
High Density Residential
Other Residential
Commercial
Office Commercial
Industrial
Manufacturing
Warehousing
Public Facilities
School
Agricultural
Parks/Rec/Cultural
Right-of-Way/Parking
Transportation/Utilities
Vacant
Vacant Building
ONTARIO
AKM
PROJECT NO:
DATE: April 2016
CITY OF ONTARIO
CITYWIDE WATER DEMAND ESTIMATE
Existing Land Use Map
Figure 1


City of Upland
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WALNUT ST
FERN ST
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STATE ST
PHILLIPS ST
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12
Legend
City Boundary
New Model Colony Boundary
Outside City of Ontario Water Service Area
Landuses
Airport
Business Park
General Commercial
High Density Residential
Hospitality
Industrial
Low Density Residential
Land Fill
Low Medium Density Residential
Medium Density Residential
Mixed Use
Neighborhood Commercial
Office Commercial
Open Space - Non-Recreational
Open Space - Recreational
Open Space - Water
Public Facility
Public School
Rural Residential
Rail
Mixed Use Area
1 Downtown
2 Euclid & Francis
3 Holt
4 Meredith
5 Hospitality
6 Ontario Festival
7 Guasti
8 Ontario Center
9 Mills
10 NMC South
11 NMC East
12 SR-60 & Haven
N
0 2,250 4,500 9,000 Feet
ONTARIO
AKM
PROJECT NO:
DATE: April 2016
CITY OF ONTARIO
CITYWIDE WATER DEMAND ESTIMATE
Ultimate Land Use
Figure 2

D.4 Component 4 – Future Mixed Use Areas in OMC & NMC

Demands for the future mixed use areas in OMC and NMC were calculated using the demand factors shown in Table 2 (gpd/person or gpd/job). For residential areas with a density less than or equal to 25 du/ac was considered medium density residential. A factor of 80 gpd/person was then applied. For residential areas with a density greater than 25 du/ac was considered high density residential. A factor of 60 gpd/person was then applied. For commercial and industrial areas, a factor of 35 gpd/job was used for offices and 102 gpd/job was used for non-offices. All unit demand factors assumed that recycled water will be available. The populations and densities for each category are shown in Table 3.

D.5 Component 5 – Future Residential Areas in NMC

Demands for the future residential areas in NMC were calculated using 95 gpd/person for LDR, 90 gpd/person for LMDR areas and 80 gpd/person for MDR areas. The population for each category is provided in Table 3.

D.6 Component 6 – Future Commercial, Industrial, and Other Areas in NMC

Demands for future commercial, industrial, open spaces, and school areas were calculated using the demand factors (gpd/ac) determined from actual water billing data in sample areas and shown in Table 2. The population and acreages were provided by the City with their updated Traffic Area Zone (TAZ) data. The population and acreages provided in Table 3 could not be utilized because the OMC data is also included.

D.7 Component 7 – Recycled Water Use

The City's total recycled water use in 2014 was 3,924 AFY. This was calculated by subtracting the agricultural irrigation (4,999 AFY) from recycled water production (8,923 AFY).

D.8 Component 8 – Future Recycled Water Use in OMC (Vacant Areas)

The future recycled water use estimate for vacant and undeveloped areas in OMC is 894 AFY as shown in Table 5. In addition it is assumed that 4,371 AFY of potable irrigation in the OMC will be converted to recycled water use. The converted usage was calculated by the following equation:

Total RW allocation = 18,385 AFY

Future RW use = 10% less than allocation = 16,547 AFY

OMC RW conversion = Future RW use – existing RW use – future OMC RW use - future NMC RW use

= 16,547 AFY – 3,924 AFY – 894 AFY – 7,358 AFY

= 4,371 AFY

D.9 Component 9 – Future Recycled Water Use in NMC (Vacant Areas)

The future recycled water use estimate for vacant and undeveloped areas in NMC is 7,358 AFY as shown in Table 5.

The recycled water irrigation unit demand factors were developed based upon analysis of irrigation water use data from 2015. Irrigation billing data was categorized by land use type to develop and average demand factor for the different land uses.

Table 5
Recycled Water Irrigation Unit Demand Factors and Vacant Land Demand Estimates

Recycled Water Use Factors			OMC Proposed		NMC Proposed		Total Proposed
Use		Factor	Area	Demand	Area	Demand	Demand
PROP_GP		[AFY/AC]	[AC]	[AF]	[AC]	[AF]	[AF]
Residential							
RR	Rural Residential	0.00					0
LDR	Low Density Residential	0.60			*3,158*	1,895	1,895
LMDR	Low Medium Density Residential	0.70			*505*	354	354
MDR	Medium Density Residential	0.75			*1,059*	794	794
HDR	High Density Residential	0.80					0
Mixed Use							
MU	Mixed Use	1.50	*326*	*489*	*579*	869	1,358
Retail/Service							
NC	Neighborhood Commercial	1.50			*94*	141	141
GC	General Commercial	1.50			*146*	220	220
OC	Office Commercial	1.50	*11*	*16*	*125*	187	204
HOS	Hospitality	1.10	*4*	*4*			4
Employment							
BP	Business Park	1.50	*19*	*29*	*767*	1,151	1,180
IND	Industrial	1.00	*257*	*257*	*269*	269	526
Other							
OS-NR	Open Space - NonRecreational	0.00			*449*	0	0
OS-R	Open Space - Recreational	1.50			*461*	692	692
OS-W	Open Space - Water	1.50			*51*	76	76
PF	Public Facilities	1.50			*2*	4	4
PS	Public School	2.35			*198*	465	465
ARPT	Airport	0.50	*196*	*98*			98
Rail	Railroad	0.00					0
ROW	Right of Way	1.50			*161*	242	242
		Vacant Acres	**813**		**8,026**		
		Total Vacant Demand		**894**		**7,358**	**8,252**

E. Comparison of Adjacent Agency Water Demand Factors

A comparison of the City's potable water demand factors with adjacent agencies (i.e. City of Chino and Jurupa Community Service District) is provided in Table 6. A true one to one comparison is difficult due to the differences in densities and the definition of land uses between agencies.

Table 6
Comparison of Potable Water Demand Factors

City of Ontario Water Demand Factors

Landuse		Max Density (du/ac)[1]	Density (people/ du)[2]	Domestic Water Unit Demand Factors: gpd/person or gpd/job or gpd/room or gpd/student	Domestic Water Unit Demand Factors: gpd/ac	Domestic Water Unit Demand Factors: gpd/du	Recycled Water Unit Demand Factors: gpd/ac	Recycled Water Unit Demand Factors: gpd/du	Total Water Unit Demand Factors: gpd/ac	Total Water Unit Demand Factors: gpd/du
Residential										
Rural Residential	RR	2	3.997	172 gpd/person	1,375	687			1,375	
Low Density Residential (w/o RW)	LDR	4	3.997	123 gpd/person	1,970	492			1,970	492
Low Density Residential (w/ RW)	LDR	5	3.997	95 gpd/person	1,900	380	540	108	2,440	488
Low Medium Density Residential (w/o RW)	LMDR	9	3.997	105 gpd/person	3,570	420			3,570	420
Low Medium Density Residential (w/ RW)	LMDR	11	3.997	90 gpd/person	3,960	360	625	57	4,585	417
Medium Density Residential (w/o RW)	MDR	22	3.347	90 gpd/person	6,630	301			6,630	301
Medium Density Residential (w/ RW)	MDR	25	3.347	80 gpd/person	6,690	268	670	27	7,360	295
High Density Residential (w/o RW)	HDR	35	3.347	70 gpd/person	8,200	234			8,200	234
High Density Residential (w/ RW)	HDR	40	3.347	60 gpd/person	8,030	201	720	18	8,750	219
Commercial										
Business Park (w/o RW)	BP			103 gpd/job	3,140				3,140	
Business Park (w/ RW)	BP	-	-	59 gpd/job	1,800	-	1,340	-	3,140	
General Commercial (w/o RW)	GC			258 gpd/job	3,140				3,140	
General Commercial (w/ RW)	GC	-	-	148 gpd/job	1,800	-	1,340	-	3,140	
Hospitality[3] (w/o RW)	HOS			155 gpd/room	5,980				5,980	
Hospitality[3] (w/ RW)	HOS	-	-	130 gpd/room	5,000	-	980	-	5,980	
Office Commercial (w/o RW)	OC			53 gpd/job	3,840				3,840	
Office Commercial (w/ RW)	OC	-	-	35 gpd/job	2,500	-	1,340	-	3,840	
Industrial										
Industrial (w/o RW)	IND	-	-	110 gpd/job	2,290	-		-	2,290	
Industrial (w/ RW)	IND	-	-	67 gpd/job	1,400	-	890	-	2,290	
Mixed Use										
High Density Residential (w/o RW)	MU-HDR	35	2.000	70 gpd/person	4,900	140			4,900	140
High Density Residential (w/ RW)	MU-HDR	40	2.000	60 gpd/person	4,800	120	720	18	5,520	138
Office (w/o RW)	MU-O			53 gpd/job	3,840				3,840	
Office (w/ RW)	MU-O	-	-	35 gpd/job	2,500	-	1,340	-	3,840	
Non-Office (w/o RW)	MU-NO			179 gpd/job	2,690				2,690	
Non-Office (w/ RW)	MU-NO	-	-	102 gpd/job	1,800	-	890	-	2,690	
Open Space										
Open Space Non-Recreational (w/o RW)	OS-NR				2,340				2,340	
Open Space Non-Recreational (w/ RW)	OS-NR	-	-	-	1,000	-	1,340	-	2,340	
Open Space Recreational (w/o RW)	OS-R				2,340				2,340	
Open Space Recreational (w/ RW)	OS-R	-	-	-	1,000	-	1,340	-	2,340	
Public										
Public Facility (w/o RW)	PF				3,040				3,040	
Public Facility (w/ RW)	PF	-	-	-	1,700	-	1,340	-	3,040	
Public Middle or High School (w/o RW)	PS	-	-	30 gpd/student	2,500	-		-	2,500	
Public Middle or High School (w/RW)	PS	-	-	5 gpd/student	400	-	2,100	-	2,500	
Public Elementary School (w/o RW)	PS	-	-	15 gpd/student	2,500	-		-	2,500	
Public Elementary School (w/RW)	PS	-	-	5 gpd/student	400	-	2,100	-	2,500	

City of Chino Domestic Water Unit Demand Factors

Landuse		Density (du/ac)	Unit Demand Factor
Residential			
Estate Density	EDR	1-3	455 gpd/du
Low Density	LDR-1	3-5	630 gpd/du
Low Density	LDR	5-7	420 gpd/du
Medium Density	MDR	7-9	343 gpd/du
Medium Density	MDR-2	9-11	258 gpd/du
Medium Density	MDR-3	11-13	201 gpd/du
High Density	HDR-1	13-16	186 gpd/du
High Density	HDR-1	16+	186 gpd/du
Commercial			
Commercial	-	-	3,500 gpd/ac
Industrial			
-	-	-	-
Mixed Use			
-	-	-	-
Open Space			
-	-	-	-
Parks & School Fields	-	-	2,400 gpd/ac
Public			
-	-	-	-
	-	-	-
Chaffey College	-	-	17 gpd/student
	-	-	-
Elementary School	-	-	17 gpd/student
	-	-	-

Jurupa Community Services District Domestic Water Unit Demand Factors

Landuse	Density (du/ac)	Unit Demand Factor
Residential		
Rural	0-0.5	1,310 gpd/ac
Very Low Density	0.5-2	1,786
Low Density	2-5	1,901 gpd/ac
Medium Density	5-8	2,261 gpd/ac
-	-	- gpd/ac
Medium High Density	8-14	2,736 gpd/ac
-	-	- gpd/ac
High Density	16-20	4,608 gpd/ac
-	-	- gpd/ac
Commercial		
Commercial	-	1,843 gpd/ac
Industrial		
Industrial/Manufacturing	-	1,354 gpd/ac
Mixed Use		
-	-	- -
Open Space		
-	-	- -
Parks/Recreation	-	1,498 gpd/ac
Public		
-	-	- -
-	-	- -
-	-	- -
-	-	- -
-	-	- -
-	-	- -

[1] Max Density per the City's 2010 General Plan (The Ontario Plan) for OMC without recycled water. Density for LDR, LMDR, MDR, and HDR with recycled water were increased per the City Planning Department recommendation (March 2016).

[2] Density per the City's 2010 General Plan (The Ontario Plan)

[3] If possible it is recommended to use 130 gpd/room on a case by case basis. It is difficult to estimate the number of rooms or square footage per acre.

[4] Mixed Use demands should be based on the types of landuse that make up the specific area and the unit demand factors provided above. The City's 2010

Definitions: w/ RW = with Recycled Water
wo/ RW = without Recycled Water