

11.15 Water Supply Assessment

LINCOLN SPECIFIC PLAN WATER SUPPLY ASSESSMENT

July 21, 2014

Prepared for:
CITY OF WHITTIER
Whittier Utility Authority

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ABBREVIATIONS/ACRONYMS

AB	Assembly Bill
AF	Acre-feet
AFY	Acre-feet per year
CEQA	California Environmental Quality Act
City, Whittier	City of Whittier
CRA	Colorado River Aqueduct
LSP, Project	Lincoln Specific Plan
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ESA	Endangered Species Act
gpcd	Gallons per capita per day
gpd	Gallons per day
HGL	Hydraulic grade line
IRP	Integrated Resources Planning
ksf	Thousand square feet
LACDPW	Los Angeles County Department of Public Works
LRP	Local Resources Program
LSP, Project	Lincoln Specific Plan
LTFP	Long Term Facilities Plan
MAF	Million acre-feet
WMP	Water Master Plan
MGD	Million gallons per day
MWDSC, Metropolitan	Metropolitan Water District of Southern California
SB	Senate Bill
SCAG	Southern California Association of Governments
sf	Square feet
SGVWC	San Gabriel Valley Water Company
SWP	State Water Project
SWRCB	State Water Resources Control Board
USEPA	United States Environmental Protection Agency
USGVMWD, Upper District	Upper San Gabriel Valley Municipal Water District
UWMP	Urban Water Management Plan
WNOU	Whittier Narrows Operable Unit
WRD	Water Replenishment District of Southern California
WSA	Water Supply Assessment
WUA	Whittier Utility Authority

1.0 INTRODUCTION

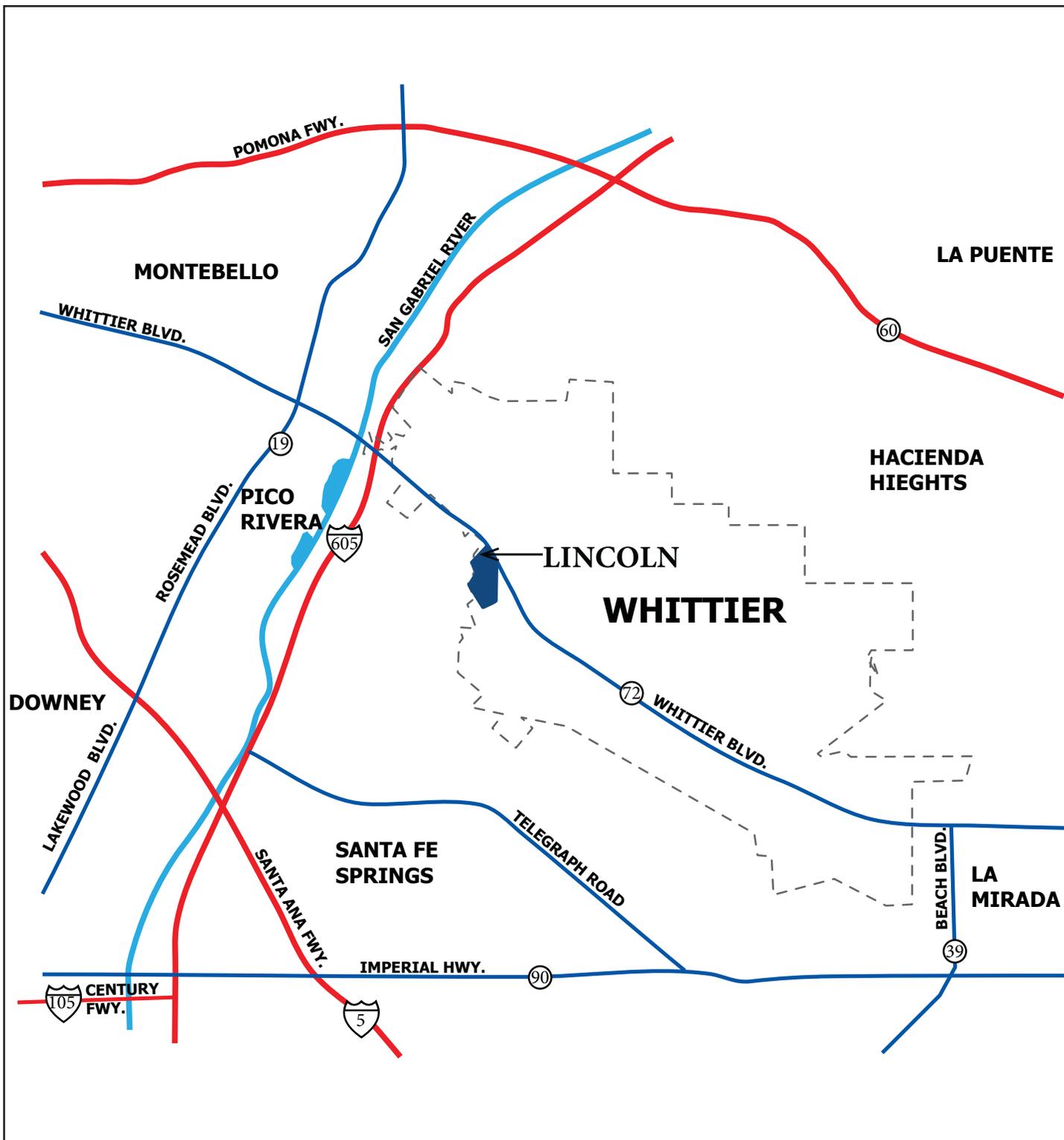
The City of Whittier (City) is a retail water supplier that serves approximately 65 percent of the residents of the City of Whittier. The City coordinated the preparation of this Water Supply Assessment with the Whittier Utility Authority. The City coordinates its water supplies with Central Basin Municipal Water District (CBMWD), County of Los Angeles, the Watermaster of the Main San Gabriel Basin, and the Upper San Gabriel Valley Municipal Water District (USGVMWD or Upper District).

Lincoln Specific Plan -- Background

The Lincoln Specific Plan (LSP or Project) is located in the County of Los Angeles, in the western portion of the City of Whittier, approximately 12 miles east of downtown Los Angeles. The Project site is more specifically located at the site of the former Fred C. Nelles Youth Correctional Facility, approximately 1.3 miles east of the San Gabriel River/605 Freeway, at 11850 Whittier Boulevard. The Project site consists of approximately 76 acres, generally bounded by Whittier Boulevard and Sorensen Avenue to the northeast and northwest, City of Whittier boundary to the west, and Presbyterian Intercommunity Hospital to the south. The Project site also includes an adjacent commercial area (approximately 2.3 acres) located at its eastern corner. The youth correctional facility is developed with structures, hardscapes, landscaping, and associated infrastructure related to the site's prior use. The commercial area is currently occupied by an auto recycling business. Exhibit 1 and Exhibit 2 show the Project's regional context and local context, respectively.

Purpose of this WSA

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



Source: City of Whittier, Lincoln Specific Plan, January 20, 2014.

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Regional Context



Source: City of Whittier, *Liberty Specific Plan*, October 23, 2013.

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Local Context

Exhibit 2

2.0 LEGISLATION

The LSP (Project) is a mixed-use project that meets or exceeds at least one of the development thresholds identified in Senate Bill 610, including the commonly-referred to “500-dwelling-unit” threshold. Therefore, the City must deem LSP as a “Project” as defined by the State of California within the SB 610 legislation, and require that a Water Supply Assessment be prepared to evaluate the sufficiency of water supply entitlements held by the City to serve the Project both now and 20 years from now.

2.1 SB 610 – Water Supply Planning

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

1. A discussion of whether the public water system’s total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system’s existing and planned future uses, including agricultural and manufacturing uses.
2. The identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts.
3. A description of the quantities of water received in prior years by the public water system under the existing water supply entitlements, water rights, or water service contracts.
4. A demonstration of water supply entitlements, water rights, or water service contracts by the following means:
 - a. Written contracts or other proof of entitlement to an identified water supply.
 - b. Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.
 - c. Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.
 - d. Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

5. The identification of other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.
6. If groundwater is included for the supply for a proposed project, the following additional information is required:
 - a. Review of any information contained in the Urban Water Management Plan (UWMP and Addendum No. 1 to the 2010 UWMP) relevant to the identified water supply for the proposed project.
 - b. Description of any groundwater basin(s) from which the proposed project will be supplied. Adjudicated basins must have a copy of the court order or decree adopted and a description of the amount of groundwater the public water system has the legal right to pump. For non-adjudicated basins, information on whether the DWR has identified the basin as over-drafted or has projected that the basin will become over-drafted if present management conditions continue, in the most current bulletin of DWR that characterizes the condition of the basin, and a detailed description of the efforts being undertaken in the basin to eliminate the long-term overdraft condition.
 - c. Description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin which the proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.
 - d. Description and analysis of the amount and location of groundwater projected to be pumped by the public water system from any groundwater basin by which the proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.
 - e. Analysis of the sufficiency of the groundwater from the basin(s) from which the proposed project will be supplied.

The water supply assessment shall be included in any environmental document prepared for the project. The assessment may include an evaluation of any information included in that environmental document. A determination shall be made whether the projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.

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

3.0 THE LINCOLN SPECIFIC PLAN

3.1 *Proposed Project Description*

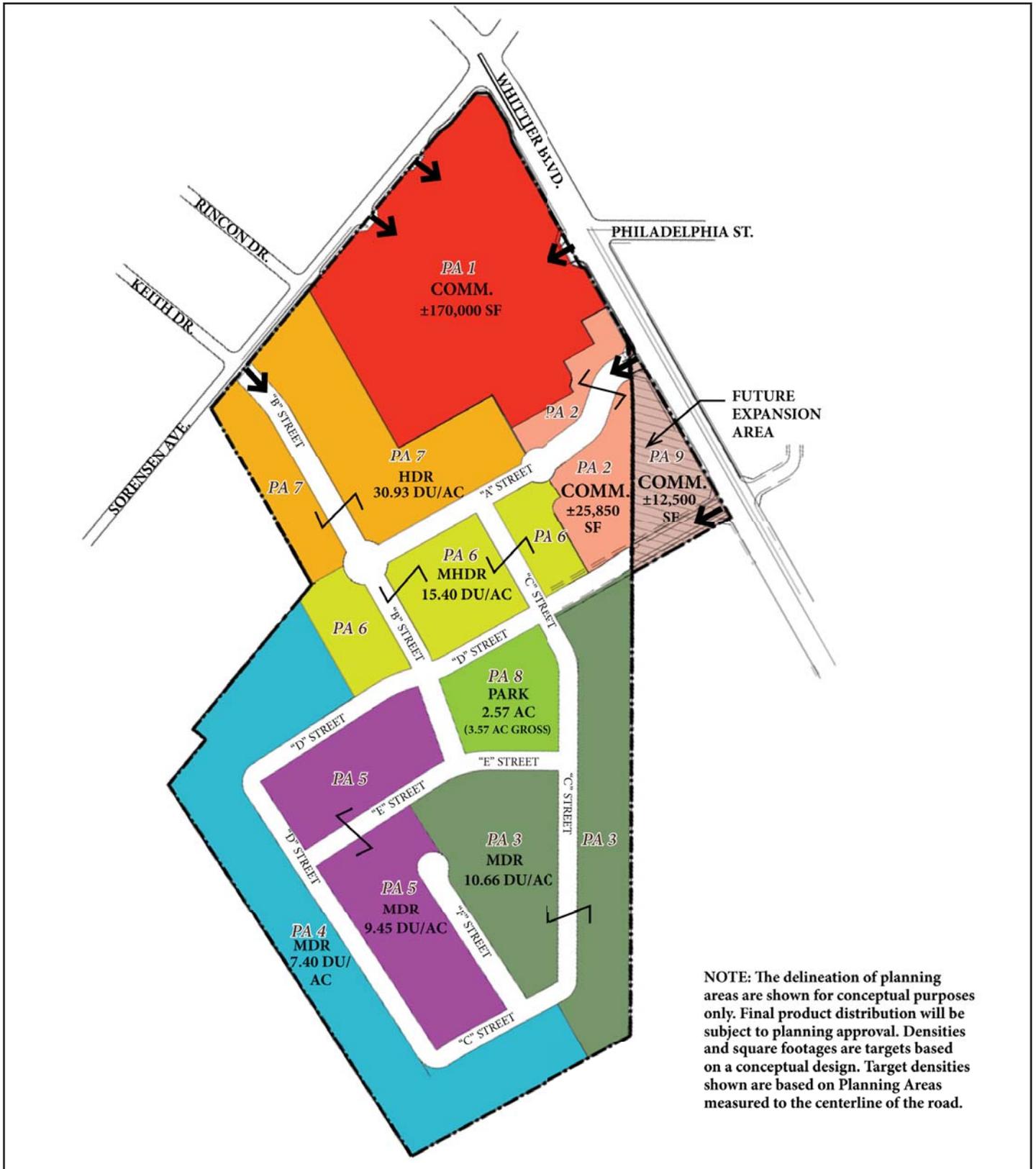
The Project encompasses approximately 76 acres, which consist of the former 73.7-acre Fred C. Nelles Youth Correctional Facility and a 2.3-acre property located immediately east of the Nelles facility (at 12090 Whittier Boulevard). The Project represents redevelopment of the site that would consist of the following primary components: demolition of existing on-site structures; construction of 750 residential dwelling units and approximately 208,350 square feet of commercial land uses; 4.91 acres of open space; and offsite infrastructure improvements including roadway improvements to Whittier Boulevard and Sorensen Avenue, future extension of Elmer Avenue, and wet and dry utilities.

The Lincoln Specific Plan is intended to provide an orderly and efficient development of the Specific Plan area, in accordance with the provisions of the Whittier General Plan. The Specific Plan would serve both planning and regulatory functions including land use regulations, circulation pattern, and development standards. The proposed Land Use Plan includes a varied mix of residential, commercial, and open space land uses. The Specific Plan establishes the maximum allowable development within the boundaries of the Specific Plan area.

The Planning Areas are illustrated in Exhibit 3. The Specific Plan identifies the maximum allowable development intensity of the site. The Lincoln Specific Plan would redevelop the site and replace the existing structures, which are proposed to be demolished. The proposed land uses are summarized in Table 3.1.

Table 3.1 – Lincoln Specific Plan Land Use

<i>LAND USE</i>	<i>ACRES</i>	<i>HOMES</i>	<i>AVERAGE DENSITY</i>	<i>SQUARE FEET</i>	<i>DENSITY RANGE (DU/AC)</i>
PLANNING AREA 1					
COMMERCIAL- THE MARKET	12.85				
TOTAL PLANNING AREA 1	12.85			170,000	
PLANNING AREA 2					
COMMERCIAL-HERITAGE COURT	2.86				
ROADS	0.91				
TOTAL PLANNING AREA 2	3.77			25,850	
PLANNING AREA 3					
MEDIUM DENSITY RESIDENTIAL	9.48				
OPEN SPACE-ETHOS PLUNGE	0.77				
OPEN SPACE - COMMUNITY GARDEN	0.15				
OPEN SPACE - POCKET PARK	0.60				
ROADS	2.04				
TOTAL PLANNING AREA 3	13.04	139	10.66		7.1-15.0
PLANNING AREA 4					
MEDIUM DENSITY RESIDENTIAL	10.14				
OPEN SPACE - POCKET PARKS	0.82				
ROADS	1.33				
TOTAL PLANNING AREA 4	12.29	91	7.40		7.1-15.0
PLANNING AREA 5					
MEDIUM DENSITY RESIDENTIAL	7.64				
ROADS	2.52				
TOTAL PLANNING AREA 5	10.16	96	9.45		7.1-15
PLANNING AREA 6					
MEDIUM HIGH DENSITY RESIDENTIAL	6.15				
ROADS	2.16				
TOTAL PLANNING AREA 6	8.31	128	15.40		15.1-25.0
PLANNING AREA 7					
HIGH DENSITY RESIDENTIAL	8.06				
ROADS	1.51				
TOTAL PLANNING AREA 7	9.57	296	30.93		25.1-35.0
PLANNING AREA 8					
OPEN SPACE -INDEPENDENCE GREEN	2.57				
ROADS	1.00				
TOTAL PLANNING AREA 8	3.57				
PLANNING AREA 9					
FUTURE EXPANSION-COMMERCIAL	2.00				
TOTAL PLANNING AREA 9	2.00			12,500	
RESIDENTIAL TOTAL	41.47	750	18.09		
COMMERCIAL TOTAL	17.71			208,350	
OPEN SPACE TOTAL	4.91				
ROADS	11.47				
SPECIFIC PLAN TOTAL	75.56	750	9.93	208,350	



NOTE: The delineation of planning areas are shown for conceptual purposes only. Final product distribution will be subject to planning approval. Densities and square footages are targets based on a conceptual design. Target densities shown are based on Planning Areas measured to the centerline of the road.

Source: City of Whittier, Liberty Specific Plan, July 15, 2014.

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Planning Areas

The Lincoln Specific Plan would be adopted as ordinance and serve as the zoning for the Project site. It would establish the necessary plans, development standards, regulations, infrastructure requirements, design guidelines, and implementation programs on which subsequent project-related development activities would be founded. It is intended that local public works projects, design review plans, detailed site plans, grading and building permits, or any other action requiring ministerial or discretionary approval applicable to the Project site be consistent with the Lincoln Specific Plan. The Project is expected to be developed in phases based on market trends and within the framework established by the Specific Plan guidelines. To accommodate flexibility with development, the WSA analyzes the maximum allowable intensity for conservative analysis of impacts.

3.2 Proposed Project Water Demands

The LSP Project consists of a mix of new residential, commercial and open space elements, which are proposed to replace the existing structures. The existing structures were part of the State-operated youth facility known as the Fred C. Nelles Youth Correctional Facility, which served the State of California in this capacity from 1895 to 2005.

Water demand estimates were calculated based on proposed land use type and gross acreages corresponding to the unit flow factors presented in the City of Whittier 2008 Water Master Plan. These unit flow factors are listed in Table 3.2. The 2008 WMP does not include a unit flow factor for open space and parks; therefore, it was estimated using an industry-standard factor of 3,500 gpd per acre, based on historic irrigation practices within southern California. This should be a conservative estimate as actual irrigation usage should be less due to the recent landscape ordinance mandated by California as part of the State’s water use reduction goals.

Table 3.2 – Unit Flow Factors ^[1]

Land Use	Designation	Unit Flow Factor
Single Family Residential	H-R, R-E, R-1	570 gpd/du
Multiple Family Residential	R-2, R-3, R-4	260 gpd/du
Commercial / Industrial	C-O, C-1, C-2, C-3, M	2,360 gpd/ac
Open space, Parks ^[2]	-	3,500 gpd/ac ^[2]

[1] Based on Table 5-5 Unit Flow Factors of City of Whittier Water Master Plan

[2] Assumed based on historical irrigation usage in southern California

The estimated project average day water demand is 394,721 gallons per day (442 AFY) as summarized in Table 3.3.

Table 3.3 – Estimated Project Water Demands ^[1]

Planning Area	Description	Acres	Commercial (SF)	Residential (DU)	Unit Demand Factor (gpd/ac) [2][4]	Average Demand		
						gpd	AFY	gpm
1	Commercial - The Market	12.85	170,000	-	2,360 gpd/ac	30,326 gpd	34 AF	21.06 gpm
2	Commercial - Heritage Court	2.86	25,850	-	2,360 gpd/ac	6,750 gpd	8 AF	4.69 gpm
	Roads	0.91	-	-	-	-	-	-
3	Medium Density Residential (10.66 DU/AC)	9.48	-	139	570 gpd/du	79,230 gpd	89 AF	55.02 gpm
	Open Space (potential irrigation)	1.52	-	-	3,500 gpd/ac [3]	5,320 gpd	6 AF	3.69 gpm
	Roads	2.04	-	-	-	-	-	-
4	Medium Density Residential (7.40 DU/AC)	10.14	-	91	570 gpd/du	51,870 gpd	58 AF	36.02 gpm
	Open Space (potential irrigation)	0.82	-	-	3,500 gpd/ac [3]	2,870 gpd	3 AF	1.99 gpm
	Roads	1.33	-	-	-	-	-	-
5	Medium Density Residential (9.45 DU/AC)	7.64	-	96	570 gpd/du	54,720 gpd	61 AF	38.00 gpm
	Roads	2.52	-	-	-	-	-	-
6	Medium High Density Residential (15.40 DU/AC)	6.15	-	128	570 gpd/du	72,960 gpd	82 AF	50.67 gpm
	Roads	2.16	-	-	-	-	-	-
7	High Density Residential (30.93 DU/AC)	8.06	-	296	260 gpd/du	76,960 gpd	86 AF	53.44 gpm
	Roads	1.51	-	-	-	-	-	-
8	Open Space (potential irrigation)	2.57	-	-	3,500 gpd/ac [3]	8,995 gpd	10 AF	6.25 gpm
	Roads	1.00	-	-	-	-	-	-
9	Future Expansion Area	2.00	12,500	-	2,360 gpd/ac	4,720 gpd	5 AF	3.28 gpm
Project Totals		75.56	208,350	750	-	394,721 gpd	442 AF	274.11 gpm
Project Total Domestic Water Demand						377,536 gpd	423 AF	262.18 gpm
Project Total Potential Irrigation Demand						17,185 gpd	19 AF	11.93 gpm

[1] Land Use statistics based on Lincoln Specific Plan, July 2014.

[2] Source: Table 5-5 Unit Flow Factors of City of Whittier Water Master Plan, prepared by AKM Consulting Engineers, April 2008.

[3] No value in City of Whittier Master Plan. Value assumed based on industry standard practice for landscape irrigation in southern California.

[4] Planning Area 7 consists of high-density multi-family residential usage, which has been assigned a flow factor of 260 gpd/DU. For conservative flow estimation purposes, residential land use in all other Planning Areas has been assigned a Single Family Residential unit flow factor.

4.0 CITY WATER DEMAND AND SUPPLY

4.1 Overview of Supply and Demand

The City currently obtains water from local groundwater basins and recycled water sources. In addition, the City maintains five emergency interconnections with adjacent water purveyors as follows:

- City of Pico Rivera
- City of Santa Fe Springs
- California Domestic Water Company
- San Gabriel Valley Water Company
- Suburban Water Systems

The City relies on groundwater pumped from the Main San Gabriel Basin and the Central Basin, and recycled water. Management of the basins requires supplemental water purchased from Metropolitan Water District of Southern California (Metropolitan or MWD). Therefore imported water is an important source of supply for the City due to its dependency on both basins. The City of Whittier water system operations are consistent with the Long Beach Judgment, Main San Gabriel Basin Judgment, Main Basin Watermaster Rules and Regulations, Main San Gabriel Basin Five-year Water Quality and Supply Plan, and Central Basin Judgment.

Population Growth

The City currently provides water to approximately 65 percent of the residents within its city boundaries. According to the City's 2010 Urban Water Management Plan and Addendum No. 1 to the 2010 UWMP, the Year 2010 population of the City was 85,331, and Year 2012 population was 85,654. The City's service area population is projected to increase by approximately one percent every 5 years to 58,800 by the year 2035, based on the Addendum No. 1 to the 2010 UWMP, as shown in Table 4.1 (Table 2B of Addendum No.1 to the 2010 UWMP).

Table 4.1 – City Water Service Area Population

Year	City Population ^[1]	Population of City Water Service Area ^[1]	Projected Project Growth
2010	85,331	55,155	-
2015	86,466	56,200	0
2020	87,600	56,900	1,274
2025	88,567	57,600	2,292
2030	89,533	58,200	2,547
2035	90,500	58,800	2,547

[1] Based on Table 2B, City of Whittier Addendum No. 1 to the 2010 UWMP.

This shows a Year 2035 population projection of 58,800 for the City water service area. The City identifies the baseline per-capita water use for the City’s water service area of 155 gallons per day per capita (Addendum No. 1 to the 2010 UWMP, Table 20). This can be used with the estimated average water demand of the Lincoln Specific Plan (394,721 gpd) to calculate a Project population of 2,547. For the purposes of the WSA, the Project development schedule is estimated to complete by Year 2026, with 50 percent occupancy by Year 2020 and 90 percent occupancy by Year 2025. This growth is compared to City’s overall population growth estimates of Table 4.1, as shown in Table 4.1a.

Table 4.1a - Lincoln Specific Plan Estimated Growth ^[1]

Year	Population of City Water Service Area	Projected City Water Service Area Population Growth	Projected Project Growth	Percent of Projected Population Growth attributable to Project
2010	55,155	-		
2015	56,200	1,045	0	0
2020	56,900	1,745	1,274	73%
2025	57,600	2,445	2,292	94%
2030	58,200	3,045	2,547	84%
2035	58,800	3,645	2,547	70%

[1] Based on LSP Project absorption schedule starting in 2015, 50% by 2020, 90% by 2025, 100% by 2026.

Water Demand

The State implemented the 2009 Water Conservation Act (SBx7-7), which has become law and, thus, mandates water use reduction by all water agencies required to prepare Urban Water Management Plans. The City is a member agency of Central Basin Municipal Water District (CBMWD), and CBMWD is a signatory to the California Urban Water Conservation Council (CUWCC). Therefore, since 2001, the City has participated in the demand management measures (DMM) of CUWCC. The DMMs are a series of water conservation programs providing funding and other incentives for participating agencies. They include educational and system monitoring programs, landscaping restrictions and replacement programs for water-wasting toilets, dishwashers and clothes washing machines. New construction of residential, commercial, industrial and institutional developments are required to implement water conserving fixtures indoors, more efficient irrigation systems outdoors, and less water-demanding landscapes. The City has elected to meet its water use reduction obligations through CBMWD’s CUWCC programs.

Water demand is supplied from groundwater and recycled water. The variance between the Water Supply and Water Sales is the result of system losses and other unaccounted-for water.

According to the City of Whittier 2010 UWMP, the City’s water system has experienced an average unaccounted-for water loss of approximately 10 percent over the past five years. However, the calculated water loss based on production and sales figures provided in the 2010 UWMP and Addendum No. 1 to the 2010 UWMP calculate to an average water loss of a little over five (5) percent. Table 4.2 shows historic water production by source, total water sales, and water loss for the City’s water system since FY 2005/06.

Table 4.2 – City’s Historical Production by Source (AFY)

Source	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Groundwater - Main San Gabriel Basin ^[1]	7,741	7,909	7,060	8,064	6,482	6,238	4,972	3,672
Groundwater - Central Basin ^[1]	658	778	841	893	897	891	2,238	4,400
Recycled Water ^[1]	61	116	108	87	69	85	55	69
Total Water Production	8,460	8,803	8,009	9,044	7,448	7,214	7,265	8,141
Total Water Sales ^[2]	8,071	8,624	8,009	7,804	7,046	6,958	7,123	7,545
Water Loss	4.6%	2.0%	0.0%	13.7%	5.4%	3.5%	2.0%	7.3%

[1] Based on City "Water Supplies" from Addendum No. 1 to the 2010 UWMP, Table 5.

[2] Based on City total water sales from Addendum No. 1 to the 2010 UWMP, Table 8.

The population data presented in Table 4.1 was used to project City wide water demand on a per-capita basis. Although population is expected to increase within the City’s water service area, total water use will not increase at the same rate because of the mandated reduction in per capita water usage. Addendum No. 1 to the 2010 UWMP projected the City’s total service area water demand (supply needs, or ‘production’) as shown in Table 4.3 (Addendum No. 1 to the 2010 UWMP, Table 7). It should be noted that the estimated future water demands include measured water consumption within the City plus non-revenue water loss. The projected population and water demand is shown in Table 4.3.

Table 4.3 – Projected Potable Water Demand and GPCD ^[1]

Year	2013-14	2014-15	2019-20	2024-25	2029-30	2034-35
City Service Area Population	56,000	56,200	56,900	57,600	58,200	58,800
Total Water Production (AFY) ^[2]	8,700	7,600	7,676	7,753	7,830	7,909
Total Water Production (gpd)	7,767,663	6,785,545	6,853,400	6,922,148	6,990,897	7,061,431
Calculated GPCD	139	121	120	120	120	120
Required GPCD Targets	-	145	134	134	134	134

[1] Represents water consumption and water loss through City’s potable water supply and distribution system.

[2] Based on City of Whittier Addendum No. 1 to the 2010 UWMP, Table 5.

Most recent production data presented in Addendum No. 1 to the 2010 UWMP represents a significantly reduced per-capita water use from previous years primarily due to the current state-wide drought status and water conservation efforts. As shown in Table 4.3, the City's current per-capita water use reduction has met and exceeded the 2015 goal. However, as precipitation increases following droughts, per-capita water usage will increase. The mandated measures now in place due to the Water Conservation Act are designed to thwart the tendency to return to past water use habits and maintain this reduced water consumption on a permanent basis by Year 2020. The Act requires the State to reduce per-capita water consumption by 20 percent by 2020.

4.2 City Water System

General

The City of Whittier's service area is located within the Central Basin approximately 15 miles southeast of Los Angeles, and bounded by the San Gabriel River to the west, Puente Hills to the north, and the cities of La Habra Heights, La Habra, La Mirada, Santa Fe Springs and unincorporated Los Angeles County area to the south and east.

The City of Whittier is served by the City and three other water retailers – San Gabriel Valley Water Company, California Domestic Water Company and Suburban Water Systems. The City provides water service to approximately 65 percent of the City's residents. This equates to a service population of approximately 56,000 within its service area. Water use types within the City's service area include single family residential, multifamily residential, commercial, industrial, institutional and landscape irrigation.

The City's service area water supplies include groundwater pumped from the Main San Gabriel Basin (Main Basin) and the Central Basin, and recycled water. The City owns and operates groundwater wells that pump from both basins. The City operated the Whittier Narrows Operable Unit (WNOU) groundwater treatment plant under contract with the United States Environmental Protection Agency until 2013. The WNOU was constructed with federal funds to remediate groundwater contamination found in the early 1980's. Contaminant plumes produced by industrial activities in the area threatened the water quality of the groundwater basin. A federally-sponsored remediation program (superfund) determined the groundwater within the Main Basin needed treatment to maintain water quality within potable water standards. As a result of ensuing studies, the WNOU and treatment system was constructed by the USEPA and completed in 2002 to protect the Main Basin's water supply for the region.

According to the San Gabriel Valley Groundwater Cleanup Superfund Progress Report (January 2014), as the levels of contamination have decreased at the Whittier Narrows, USEPA has modified the cleanup systems by reducing extraction and treatment capacity. As a result of water quality testing, the City opted to forego renewal of its plant operating contract with USEPA. The City has been using its own wells for groundwater supply to its customers since last year. The WNOU treatment system operation is now the responsibility of the California Department of

Toxic Substances Control (DTSC), which has contracted with another water purveyor to operate the treatment plant. This has allowed the City to take advantage of the successful basin cleanup over a span of almost 12 years and reduce operating expenses.

Supply and Distribution Systems

The City operates both water supply and distribution systems. The water supply system is a pressurized collection system that conveys the groundwater produced from its Main Basin and Central Basin wells to the main supply facility, Pumping Plant No. 2 (PP2). In general, the Whittier Narrows Dam represents the division between the two Basins. Exhibit 4 shows the facilities involved with the WNOU and City well supply system.

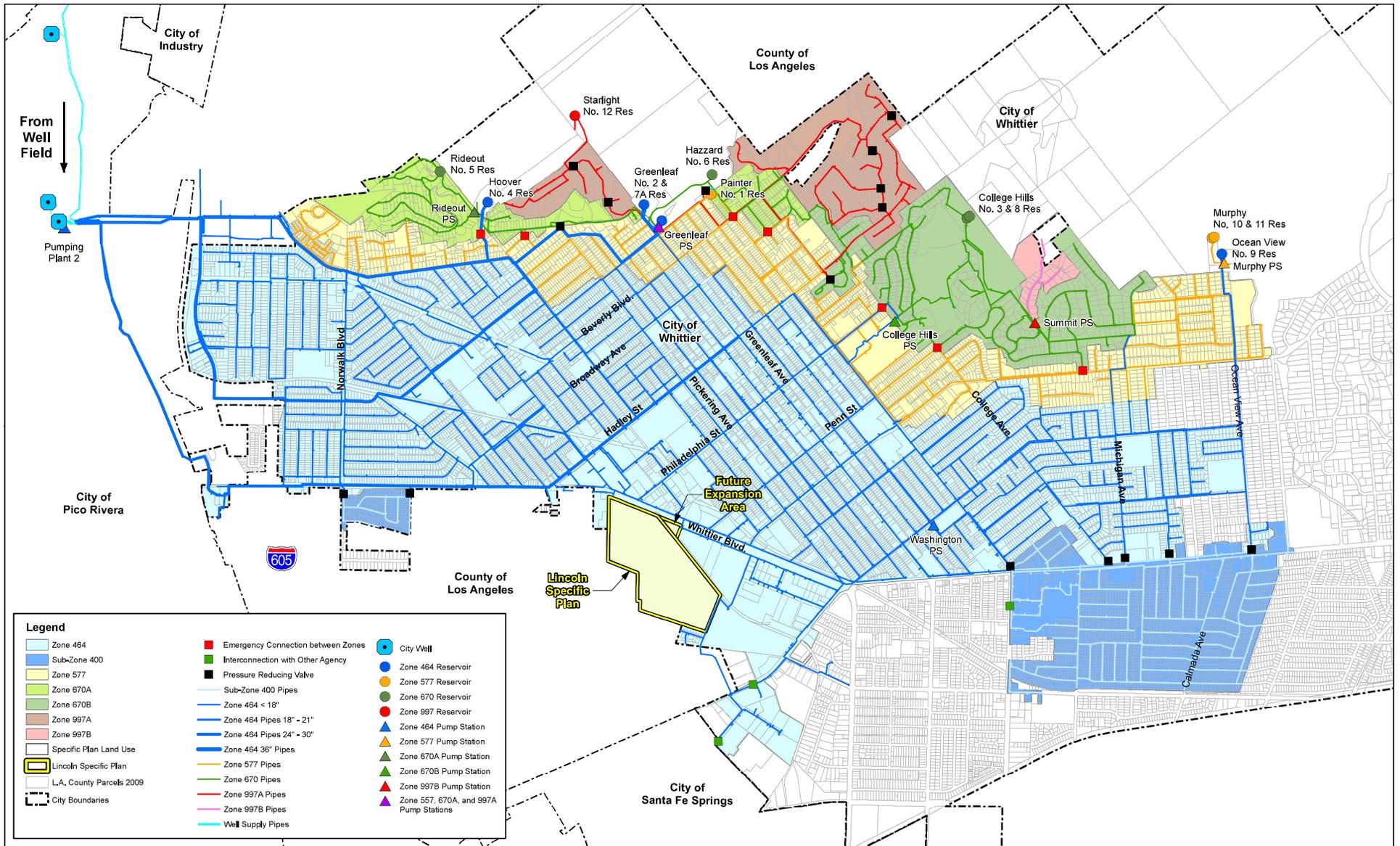
PP2 pumps directly into the main pressure zone of the City's distribution system, which is a network of pipelines, pump stations, storage tanks and regulation valves. The distribution system necessarily operates within several pressure zones due to the wide range of elevations of its end-use customers. Each pressure zone is designed to provide adequate pressures for daily operation, as well as emergency fire protection. The City's Water Master Plan includes an updated Capital Improvement Program which recommends replacing the aging PP2 in order to maintain service reliability. Construction of the new plant has begun and is scheduled to be completed in 2015.

The main pressure zone of the City's system is the 464 Zone. All other pressure zones operated by the City are supplied directly from this zone either by pumping to higher zones or pressure-regulating to lower zones. The Lincoln Specific Plan development area is within the 464 Zone and situated within City's service area as shown in Exhibit 5.



10/19/10 JN10-107297 WhittierReplacementProject.mxd JM KO
Source: Eagle Aerial, 2009

LINCOLN SPECIFIC PLAN
WATER SUPPLY ASSESSMENT
WNOU and City Well Supply System



Legend		
[Light Blue Box] Zone 464	[Red Square] Emergency Connection between Zones	[Blue Circle] City Well
[Dark Blue Box] Sub-Zone 400	[Green Square] Interconnection with Other Agency	[Blue Circle] Zone 464 Reservoir
[Yellow Box] Zone 577	[Black Square] Pressure Reducing Valve	[Orange Circle] Zone 577 Reservoir
[Light Green Box] Zone 670A	[Blue Line] Sub-Zone 400 Pipes	[Green Circle] Zone 670 Reservoir
[Medium Green Box] Zone 670B	[Blue Line] Zone 464 < 18"	[Red Circle] Zone 997 Reservoir
[Brown Box] Zone 997A	[Blue Line] Zone 464 Pipes 18" - 21"	[Blue Triangle] Zone 464 Pump Station
[Pink Box] Zone 997B	[Blue Line] Zone 464 Pipes 24" - 30"	[Orange Triangle] Zone 577 Pump Station
[White Box] Specific Plan Land Use	[Blue Line] Zone 464 36" Pipes	[Green Triangle] Zone 670A Pump Station
[Yellow Box] Lincoln Specific Plan	[Orange Line] Zone 577 Pipes	[Green Triangle] Zone 670B Pump Station
[Grey Box] L.A. County Parcels 2009	[Green Line] Zone 670 Pipes	[Red Triangle] Zone 997B Pump Station
[Dashed Line] City Boundaries	[Pink Line] Zone 997A Pipes	[Purple Triangle] Zone 557, 670A, and 997A Pump Stations
	[Red Line] Zone 997B Pipes	
	[Cyan Line] Well Supply Pipes	

4.3 Main Basin

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

Basin Description

The Main Basin is located within the San Gabriel Valley in southeastern Los Angeles County and is bounded on the north by the San Gabriel Mountains; on the west by the San Rafael and Merced Hills, on the south by the Puente Hills and the San Jose Hills, and on the east by the San Jose and Puente Hills.

The San Gabriel River and its distributary, the Rio Hondo, drain an area of about 490 square miles upstream of Whittier Narrows. Whittier Narrows is a low gap between the Merced and Puente Hills, just northwest of the City, through which the San Gabriel River and the Rio Hondo flow to the coastal plain of Los Angeles County. Whittier Narrows is a natural topographic divide and a subsurface restriction to the movement of groundwater between the Main Basin and the Coastal Plain. Of the approximately 490 square miles of drainage area upstream of Whittier Narrows, about 167 square miles are valley lands, and about 323 square miles are mountains and foothills.

The Main Basin is a large groundwater basin replenished by stream runoff from the adjacent mountains and hills, by rainfall directly on the surface of the San Gabriel Valley floor, subsurface inflow from Raymond Basin and Puente Basin, and by return flow from water applied for overlying uses. Additionally, the Main Basin is replenished with imported water. The Main Basin serves as a natural storage reservoir, transmission system and filtering medium for wells constructed therein.

The City pumps groundwater from the Main Basin using the City's three active wells located near Whittier Narrows Dam – Wells No. 13, No. 15 and No. 16. These wells have a combined capacity of approximately 9,200 gallons per minute (gpm). Until recently, the City received treated water from the WNOU in lieu of producing the same quantity of water from City-owned wells in the Main Basin. The City stopped receiving treated water from the WNOU treatment plant in 2013 but continues to pump groundwater from City-owned wells in the Main Basin. The City has the legal right to a pumper's share of 4.18519 percent of the Operating Safe Yield of the Main Basin. If the City pumps more than the allowed amount of water, replacement water may be purchased from Upper District to recharge the Main Basin. The Main Basin is located north of the Whittier Narrows Dam.

Water Quality

In the early 1980s, widespread contamination by VOCs associated with past industry practices was discovered in the Main Basin. In the late 1990s, groundwater contaminated with VOCs was found to have reached the City's production wells at its Whittier Narrows wellfield. The City's

Whittier Narrows wellfield is located near the estimated leading edge of the contaminated groundwater plume of the WNOU. EPA constructed the treatment plant as part of the WNOU to treat contaminated groundwater from several extraction wells located in the vicinity of the City's Whittier Narrows wellfield. The WNOU treatment plant consists of one dedicated granular activated carbon treatment system to treat four shallow zone extraction wells and another dedicated granular-activated carbon treatment system to treat three intermediate zone extraction wells.

Judgments

In 1959, the Board of Water Commissioners of the City of Long Beach, CBMWD and the City of Compton filed an action against the San Gabriel Valley Water Company and 24 other producers of groundwater from the San Gabriel Valley (Upper Area). This action sought a determination of the rights of the defendants in and to the waters of the San Gabriel River system and to restrain the defendants from an alleged interference with the rights of plaintiffs and persons represented by the CBMWD in such waters. After six years of study and negotiation the Long Beach Judgment was entered in 1965. Under the terms of the Long Beach Judgment, the water supply of the San Gabriel River system was divided at Whittier Narrows, the boundary between San Gabriel Valley upstream and the coastal plain of Los Angeles County downstream.

Following the Long Beach Judgment, the Upper Area sought a water resources management plan to optimize the conservation of the natural water supplies of the area. Studies were made of various methods of management of the Main Basin as an adjudicated area and a report thereon was prepared for the Upper San Gabriel Valley Water Association, an association of water producers in the Main Basin, including the City of Whittier. After consideration by the Association membership, Upper District filed an action in 1968, seeking an adjudication of the water rights of the Main Basin and its Relevant Watershed. In this Judgment, the City was included as a defendant. After several years of study (including verification of annual water production) and negotiations, a stipulation for entry of Judgment was approved by a majority of the Parties, by both the number of parties and the quantity of rights to be adjudicated. The Judgment (Main Basin Judgment) was entered in 1973.

Main Basin Adjudication

Under the terms of the Main Basin Judgment, all rights to the diversion of surface water and production of groundwater within the Main Basin and its Relevant Watershed were adjudicated. The Main Basin Judgment provides for the administration of the provisions of the Main Basin Judgment by a nine-member Watermaster. Six of those members are nominated by water producers (producer members) and three members (public members) are nominated by the Upper District and SGVMWD, which overlie most of the Main Basin. The nine-member board employs a staff, an attorney and a consulting engineer. The Main Basin Watermaster holds public meetings on a regular monthly basis through the year.

The Main Basin Judgment does not restrict the quantity of water, which Parties may extract from the Main Basin. Rather, it provides a means for replacing all annual extractions in excess of a Party's annual right to extract water with Supplemental Water. The Main Basin Watermaster annually establishes an Operating Safe Yield for the Main Basin which is then used to allocate to each Party its portion of the Operating Safe Yield which can be produced free of a Replacement Water Assessment.

The City's water rights are adjusted annually based on an Operating Safe Yield. If the City extracts water in excess of its right under the annual Operating Safe Yield, it must pay an assessment for Replacement Water, which is sufficient to purchase one acre-foot of Supplemental Water to be spread in the Main Basin for each acre-foot of excess production. All water production is metered and reported quarterly to the Main Basin Watermaster. The City must also pay its share of the Make-up Obligation to the Central Basin assessed to the Upper District under the Long Beach Judgment. The City has a right to a pumper's share of 4.18519 percent of the Operating Safe Yield for the Main Basin. The City's prescriptive right to 8,271 AFY based on Operating Safe Yield of 198,000 AFY. Currently (FY 2013-14), the City's Main Basin pumping rights are 7,533 AFY based on the calculated Operating Safe Yield of 180,000 AFY.

The water deliveries from Metropolitan to the Upper District are used for direct use and basin replenishment. The City's supplies do not include direct use, and imported water supply through the Upper District is used only for meeting its needs for Water Replenishment and Make-up obligations under the Main Basin and Long Beach Judgments.

Based on June 2012 amendments to the Main Basin Judgment provides that the Main Basin Watermaster will, insofar as practical, spread imported water in the Main Basin to maintain the groundwater elevation at the Baldwin Park Key Well (Key Well) above 200 feet. Under the terms of the Long Beach Judgment, any excess surface flows that pass through the Main Basin at Whittier Narrows to the Lower Area (which is then conserved in the Lower Area through percolation to groundwater storage) is credited to the Upper Area as Usable Surface Flow.

4.4 Central Basin

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

Basin Description

Central Basin is located in Los Angeles County approximately 20 miles southeasterly of downtown Los Angeles. On its north, Central Basin is bounded by the Hollywood Basin which runs through the City of Los Angeles. The remainder of the northern boundary of Central Basin extends along the Merced Hills, across Whittier Narrows, and then along Puente Hills. The northern Basin boundary terminates at the Orange County line, which forms the eastern boundary of the Central Basin. This boundary is a political and not a geologic one, and the aquifers in this area reach into the East Coastal Plan area of Orange County. The south-southwest boundary of the Central Basin is known as the Newport-Inglewood Uplift (NIU), separating Central and West Basin from Long Beach up to the Baldwin Hills just north of the City of Inglewood. DWR Bulletin 118 does not identify Central Basin as currently being in overdraft.

The City pumps groundwater from Central Basin through its two active wells within the Basin – Well Nos. 8 and 14. According to the Central Basin Adjudication, the City has an allowed pumping allocation of 895 acre-feet per year. The Central Basin Adjudication allows Parties to the Judgment to pump up to 20 percent more of its annual allowed pumping allocation plus any “carry-over”. Carryover was modified in the 1991 amended Judgment, along with the over-production provisions, to 20 percent of allowed pumping allocation or 20 acre-feet. The Water Replenishment District of Southern California (WRD) is responsible for recharging Central Basin.

Water Quality

The contaminant plume detected in the early 1980’s within the Main Basin continued to travel south, passing through the Whittier Narrows into the Central Basin area and toward the Montebello Forebay, threatening the local groundwater supplies. A \$10-million project, federally funded by the United States Bureau of Reclamation within its superfund program, was constructed to prevent the contaminant plume in the Main Basin from spreading into the Central Basin's local groundwater supply. As part of the project, two wells were constructed in northern Pico Rivera that pump contaminated water to a treatment plant in the City of Whittier. The contaminated water is treated using a granular-activated carbon treatment system. In 2004, CBMWD received its domestic drinking water permit from CDPH to distribute the water for potable use.

The City currently has two active wells in the Central Basin. Well No. 8 has a CDPH-approved blending plan for manganese. Well No. 14 meets all CDPH standards for drinking water. The water supply from these wells will provide a reliable source of water for the City for the next 20 years.

Judgments

In 1962, the Central and West Basin Water Replenishment District (now WRD) filed Case No. 786,656 in the Superior Court, County of Los Angeles, naming more than 700 parties as defendants. It sought to adjudicate water rights of groundwater and regulate pumping from the Central Basin. Later that year, a proposed agreement had been approved by a sufficient number of water producers (producers owning over 75 percent of the Assumed Relative Rights within Central Basin) to guarantee control over groundwater pumping in Central Basin. The Court signed the “Order Pursuant to Stipulation and Interim Agreement and Petition for Order” and appointed DWR as Watermaster in 1962.

Subsequently, a stipulated judgment was drafted. Approval was received by public utility water companies and other producers representing over 200,000 acre-feet, or 75 percent, of the total rights within Central Basin. This was a prerequisite to filing the stipulated judgment with the Court. In 1965, the case went to trial. Following testimony on engineering, geology, hydrology, and safe yield of Central Basin and arguments on water right entitlement, DWR was appointed Watermaster. The final Judgment became affective in 1966.

Under the current Judgment, water rights are fixed and do not vary year to year. Water producers cannot exceed their water rights by more than 20 percent in any year and an adjustment is made the following year. In addition, water producers cannot carry over more than 20 percent of their water rights for use in the following year.

In December 2013, the Court approved amendments to the Judgment which implement a water storage program. The amendment allows parties to the Judgment to store up to 200 percent of a party’s Allowed Pumping Allocation, if space is available. In addition, the amendments allow parties to convert unused Allowed Pumping Allocation to stored water and revise the amount of carryover to be equal to 100 percent of the party’s Allowed Pumping Allocation minus the amount of carryover water set aside for storage. The purpose of the storage program creates an added reliability in water supply from the Central Basin. Based on the amendments, the City may store up to 200 percent of its Allowed Pumping Allocation of 895 acre-feet, or a total of 1,790 acre-feet. This stored water may be used as an additional source of supply within the Central Basin.

4.5 Recycled Water

The City has used recycled water since 1994 when CBMWD extended its system into the northern portion of their service area. The City has seven recycled water service connections with CBMWB. In fiscal years 2005-06 through 2012-13, the City received and delivered 55 to 116 acre-feet of recycled water per year. The City expects recycled water deliveries to remain within this range through its UWMP planning horizon. The City’s past and projected recycled water supply is shown in Table 4.2.

CBMWD is proceeding with the Southeast Water Reliability Project (SWRP), in an effort to reduce reliance on imported water and conserve regional groundwater. The SWRP will reduce current regional demand on imported water by 25 percent through delivery of more than 5 billion gallons of recycled water annually to the many large industrial and irrigation sites in the area. A 15-mile long pipeline will be constructed that extends from Pico Rivera through Montebello and southeast Los Angeles County, connecting to the existing system in Vernon. Construction of SWRP is divided into two phases, with Phase 1 extending from Pico Rivera to Bicknell Park in Montebello. Construction of Phase 1 began in early 2010.

As part of Phase 1 of SWRP, the CBMWD also constructed the Pico Rivera Recycled Water Project on Mines Avenue in the City of Pico Rivera. The pipeline was constructed in partnership with the Los Angeles County Department of Public Works and the City of Pico Rivera. This project is complete and will be part of a larger water conduit that will move stormwater and recycled water through separate channels between the San Gabriel River and Rio Hondo Spreading Grounds. This will directly benefit the Basin's groundwater system capacity and reduce the need for imported water to meet replenishment and make-up water obligations. The Pico Rivera Recycled Water Project will provide recycled water to irrigate the green spaces along the perimeter of the two spreading grounds. Recycled water will also be provided to schools, parks, and other irrigation sites in the City of Pico Rivera.

4.6 Metropolitan Water District of Southern California

As a sub-agency of the Upper District, the City of Whittier is entitled to supplemental imported water supplies for groundwater replenishment. The Upper District receives its imported water supplies from the Metropolitan Water District of Southern California, whose principal sources of water are the Colorado River via the Colorado River Aqueduct (CRA) and the Lake Oroville watershed in Northern California through the SWP. Upper District sub-agencies are not limited in the amount of groundwater they can pump, but each agency is assessed by Upper District in order to purchase a like amount of imported water for basin replenishment if they pump from the basin in excess of their allotted amount set by the Watermaster.

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

Metropolitan's SWP supplies have been impacted in recent years by restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008 and June 4, 2009, respectively.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs.

The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

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

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

5.0 RELIABILITY OF WATER SUPPLIES

The management of the groundwater resources utilized by the City, namely the Main Basin and Central Basin demonstrates their reliability as primary water supply sources for the City in average, single-dry and multiple-dry water years. Historical data indicate the Main Basin and Central Basin have been well managed for over 40 years of adjudication, resulting in a stable and reliable water supply.

The planned use of recycled water for groundwater replenishment under the Southeast Water Reliability Project will enhance this reliability by reducing the need for imported water supplies for make-up water. The sub-agencies of the Upper District that pump more than their annual allocation are required to pay a Replacement Water Assessment, as described in the Main Basin Adjudication, to Upper District. Upper District is a wholesale water agency of Metropolitan, a contract agency with the Department of Water Resources and the State Water Project. Upper District is entitled to receive untreated imported water from Metropolitan sources for the purposes of replenishing the Main Basin due to over-pumping.

5.1 Main Basin Management Assessment

During the period of management under the Main Basin Judgment, significant drought events have occurred from 1969 to 1977, 1983 to 1991, 1998 to 2004, and 2006-07 to 2008-09. In each drought cycle, the Main Basin was managed to maintain its water levels. Historical data indicate the Main Basin has been well managed for over 40 years of adjudication, resulting in a stable and reliable water supply. There are no contemplated basin management changes, other than the planned use of recycled water for groundwater replenishment. Therefore, based on historical and on-going management practices, the groundwater supply in the Main Basin is deemed reliable and the City will be able to rely on the Main Basin for adequate supply over the next 20 years under single year and multiple year droughts.

5.2 Central Basin Management Assessment

The successful management of the reduction in groundwater withdrawals by the Central Basin Judgment, combined with the spreading program and the guaranteed minimum inflow from the Main Basin, resulted in recovery of water levels in wells throughout the Central Basin. Water levels have remained steady since then in spite of several drought periods. Historical data indicate the Central Basin has been well managed for over 40 years of adjudication, resulting in a stable and reliable water supply. There are no contemplated basin management changes, other than the planned use of recycled water for groundwater replenishment. Therefore, based on historical and on-going management practices, the groundwater supply in the Central Basin is deemed reliable and the City will be able to rely on the Central Basin for adequate supply over the UWMP planning horizon under single-dry year and multiple-dry year droughts.

5.3 Imported Water

The Upper District supplies wholesale imported treated and untreated water from Metropolitan to its sub-agencies for direct use and groundwater replenishment, respectively. Although not a direct user of treated water supplies, the City of Whittier relies on untreated supplies in the event of an assessment due to over-pumping. Allocations of imported supplies to each of the Upper District's sub-agencies are governed by Metropolitan's Water Surplus and Drought Management (WSDM) program and Water Supply Allocation Plan (WSAP). According to Upper District's 2010 UWMP (Table 3), Upper District has assessed its sub-agencies between 7,861 AFY and 57,069 AFY of untreated imported water from Metropolitan for basin replenishment between FY 2000-01 and 2008-09. Annual Metropolitan deliveries to Upper District have decreased from approximately 72,200 AF in 2003 to 15,563 AF in 2013, of which untreated supplies have been between 55 and 84 percent. This represents a significantly reduced reliance on imported water supplies. Table 5.1 compiles the deliveries as recorded in Upper District's 2010 UWMP (Appendix I.1) and Metropolitan's annual reports through 2013.

Table 5.1 - Historic Metropolitan Water Deliveries to Upper District

Year	2003	2004	2005	2006	2007	2008	2009	09/10 ^[1]	10/11 ^[1]	11/12 ^[1]	12/13 ^[1]
AF	72,214	45,160	44,917	47,937	23,243	12,642	5,891	22,633	38,814	25,401	15,563

Source: Upper District 2010 UWMP, Table A.2-2, except as noted otherwise.

[1] "MWD Total Deliveries" from Metropolitan Water District Annual Reports 2010, 2011, 2012, and 2013, respectively.

Upper District anticipates a relatively constant supply of untreated water deliveries for the UWMP planning horizon from Metropolitan of between 16,000 AFY and 25,000 AFY. This capacity will be primarily for basin replenishment. It is anticipated that Metropolitan's supplies will be sufficient for the Upper District and its other contract agencies throughout the UWMP planning horizon under normal, single-dry and multiple-dry years.

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multiple-year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply). For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992. The results of Metropolitan's analyses are summarized in Table 5.2, which are based on Metropolitan's 2010 RUWMP Tables 2-11, 2-9 and 2-10. These tables show that the region can provide reliable water supplies under normal conditions, as well as under single-dry year and the multiple-dry year hydrologies.

Table 5.2 – Metropolitan’s Regional Imported Water Supply Reliability Projections, AFY

Region Wide Projections	2015	2020	2025	2030	2035
Supply Information					
Projected Supply During an Average Year [1]	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
Projected Supply During a Single Dry Year [2]	2,457,000	2,782,000	2,977,000	2,823,000	2,690,000
Projected Supply During Year 3 of Multiple Dry Year Period [3]	2,248,000	2,417,000	2,520,000	2,459,000	2,415,000
Demand Information					
Projected Demand During an Average Year [1]	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
Projected Demand During a Single Dry Year [2]	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
Projected Demand During Year 3 of Multiple Dry Year Period [3]	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
Surplus Information					
Projected Surplus During an Average Year [1]	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
Projected Surplus During a Single Dry Year [2]	286,000	620,000	776,000	569,000	371,000
Projected Surplus During Year 3 of Multiple Dry Year Period [3]	12,000	229,000	237,000	120,000	16,000
Supply Under Development Information					
Potential Supply During an Average Year [1]	588,000	689,000	1,051,000	1,051,000	1,051,000
Potential Supply During a Single Dry Year [2]	762,000	862,000	1,036,000	1,036,000	1,036,000
Potential Supply During Year 3 of Multiple Dry Year Period [3]	404,000	553,000	733,000	755,000	755,000
Potential Surplus Information					
Potential Surplus During an Average Year [1]	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
Potential Surplus During a Single Dry Year [2]	1,048,000	1,482,000	1,812,000	1,605,000	1,407,000
Potential Surplus During Year 3 of Multiple Dry Year Period [3]	416,000	782,000	970,000	875,000	771,000

Source: Metropolitan Water District of Southern California 2010 RUWMP, November 2010.

[1] MWDSC 2010 RUWMP, Table 2-11

[2] MWDSC 2010 RUWMP, Table 2-9

[3] MWDSC 2010 RUWMP, Table 2-10

Table 5.3 summarizes the historic and projected groundwater deliveries from each basin by the City.

Table 5.3 (Addendum No. 1 to the 2010 UWMP Table 5) - Groundwater Supplies for City, AF

Year	Main Basin	Central Basin	Total
1995-96	7,928	873	8,801
1996-97	8,512	901	9,413
1997-98	9,044	1,044	10,088
1998-99	8,702	739	9,441
1999-00	8,952	896	9,848
2000-01	8,107	893	9,000
2001-02	8,116	979	9,095
2002-03	7,411	1,242	8,652
2003-04	8,021	1,213	9,234
2004-05	7,564	972	8,536
2005-06	7,741	658	8,399
2006-07	7,909	778	8,687
2007-08	7,060	841	7,901
2008-09	8,064	893	8,957
2009-10	6,482	897	7,379
2010-11	6,238	891	7,129
2011-12	4,972	2,238	7,210
2012-13	3,672	4,400	8,072
2013-14	7,533	895	8,426
2014-15	6,278	895	7,173
2019-20	8,287	895	9,182
2024-25	8,287	895	9,182
2029-30	8,287	895	9,182
2034-35	8,287	895	9,182

Source: City of Whittier, Addendum No. 1 to the 2010 UWMP.

5.4 Normal Year Supply and Demand

The City’s projected normal water year demand over the UWMP planning horizon in five-year increments was based on the City’s 2015 and 2020 Urban Water Use Targets of 145 GPCD and 134 GPCD, respectively. The City’s projected supply is based on the reliability of supply in the Main Basin and Central Basin. During 2015, the City will have estimated carryover rights to approximately 3,983. A comparison of the City’s projected supply and demand during a normal water year is shown in Table 5.4, which shows the City’s supply can meet demands during a normal water year through 2035.

Table 5.4 (Addendum No. 1 to the 2010 UWMP Table 21) - Supply and Demand, Normal Year (AFY) ^[1]

	2015	2020	2025	2030	2035
Supply	7,263	9,272	9,272	9,272	9,272
Carryover	3,983	-	-	-	-
Supply Total	11,246	9,272	9,272	9,272	9,272
Demand Total	7,690	7,766	7,843	7,920	7,999
Difference (supply minus demand)	3,556	1,506	1,429	1,351	1,273
Difference as percent of supply	32%	16%	15%	15%	14%
Difference as percent of demand	46%	19%	18%	17%	16%

[1] City of Whittier Addendum No. 1 to the 2010 UWMP.

5.5 Single-dry Year Supply and Demand

The City experienced a single-dry year during fiscal year 2006-07 and a normal water year during fiscal year 2005-06. The ratio between the normal water year and single-dry year and the 2015 and 2020 Urban Water Use Targets were estimated for the City's demand. This ratio and the projected demand during a normal water year from Table 5.4 was used to estimate the City's projected demand during a single-dry year through 2035. The City's projected supply is based on the reliability of supply in the Main Basin and Central Basin. The comparison of the City's projected supply and demand during a single-dry year is shown in Table 5.5, which shows the City's supply can meet demands during a single-dry year through 2035.

Table 5.5 (Addendum No. 1 to the 2010 UWMP Table 22) - Supply and Demand, Single-Dry Year (AFY) ^[1]

	2015	2020	2025	2030	2035
Supply	7,263	9,272	9,272	9,272	9,272
Carryover	3,983	-	-	-	-
Supply Total	11,246	9,272	9,272	9,272	9,272
Demand Total	8,002	8,081	8,161	8,241	8,323
Difference (supply minus demand)	3,244	1,191	1,111	1,030	949
Difference as percent of supply	29%	13%	12%	11%	10%
Difference as percent of demand	40%	15%	14%	13%	11%

[1] City of Whittier Addendum No. 1 to the 2010 UWMP.

5.6 Multiple-dry Years Supply and Demand

The City experienced multiple dry years during fiscal years 2006-07, 2007-08 and 2008-09. The ratio between the normal water year in 2005-06 and multiple dry years and the 2015 and 2020 Urban Water Use Targets were estimated for the City's demand. This ratio and the projected demand during a normal water year from Table 5.4 was used to estimate the City's projected demand during multiple dry years through 2035. The City's projected supply is based on the reliability of supply in the Main Basin and Central Basin. The comparison of the City's projected supply and demand during multiple dry years is shown in Table 5.6, which shows the City's supply can meet demands during multiple dry years through 2035.

Table 5.6 (Addendum No. 1 to the 2010 UWMP Table 23) - Supply and Demand, Multiple-Dry Years (AFY) ^[1]

		2015	2020	2025	2030	2035
Multiple-Dry Year First Year Supply	Supply	7,263	9,272	9,272	9,272	9,272
	Carryover	3,983	-	-	-	-
	Supply Total	11,246	9,272	9,272	9,272	9,272
	Demand Total	8,002	8,081	8,161	8,241	8,323
	Difference (supply minus demand)	3,244	1,191	1,111	1,031	949
	Difference as percent of supply	29%	13%	12%	11%	10%
	Difference as percent of demand	41%	15%	14%	13%	11%
Multiple-Dry Year Second Year Supply	Supply	7,263	9,272	9,272	9,272	9,272
	Carryover	3,983	-	-	-	-
	Supply Total	11,246	9,272	9,272	9,272	9,272
	Demand Total	7,280	7,352	7,425	7,498	7,572
	Difference (supply minus demand)	3,966	1,920	1,847	1,774	1,700
	Difference as percent of supply	35%	21%	20%	19%	18%
	Difference as percent of demand	54%	26%	25%	24%	22%
Multiple-Dry Year Third Year Supply	Supply	7,263	9,272	9,272	9,272	9,272
	Carryover	3,983	-	-	-	-
	Supply Total	11,246	9,272	9,272	9,272	9,272
	Demand Total	8,221	8,302	8,384	8,467	8,551
	Difference (supply minus demand)	3,025	970	888	805	721
	Difference as percent of supply	27%	10%	10%	9%	8%
	Difference as percent of demand	37%	12%	11%	10%	8%

[1] City of Whittier Addendum No. 1 to the 2010 UWMP.

6.0 CONCLUSION

The City's current (2012-13) water demand is approximately 6.6 MGD (8,141 AFY) including unaccounted for water. This represents a significant decrease in per-capita usage and overall usage from previous years prior to the recent State-wide drought. The reduced demands are attributable to conservation implemented as a result of the recent drought and economic recession. By Year 2035 the Addendum No. 1 to the 2010 UWMP estimates total production requirements of the City to be approximately 8,323 AFY.

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

1. The City of Whittier is the Public Water System (supplier) for the Lincoln Specific Plan (LSP).
2. The City is a member agency of CBMWD, and CBMWD is a signatory to the CUWCC, which is the foundation of CBMWD water use reduction plan for meeting its SBx7-7 water use goals.
3. The City is a member agency of the Upper San Gabriel Valley Municipal Water District
4. The LSP project is not specifically identified in the City's 2010 UWMP nor in the Addendum No. 1 to the 2010 UWMP; however, demand growth in the City's service area through Year 2035 has been projected to be equal to or greater than the demands estimated for the Project and other development projects, which is planned to be met by the City's current groundwater production and imported water rights.
5. The LSP development schedule will be impacted by future market trends. For the purposes of the WSA, the construction schedule is estimated to begin in 2015 and complete in 2026.
6. The estimated average annual water demand increase due to buildout of the Project is 442 AFY, which is equivalent to approximately 70 to 94 percent of the expected demand growth of the City's service area for the duration of the Project.
7. Under single and multi-dry year conditions, the City will meet its water demand through a combination of (1) increasing production of groundwater within the rules and regulations of the Main and Central Basin Watermasters, and their respective groundwater management plans, and/or (2) decreasing demand through water conservation measures.

8. In general, the City's current groundwater supply is highly reliable now and through the UWMP 2035 planning horizon because of its participation in the groundwater management practices of both the Main and Central Basins.

Upon evaluation of the estimated water demands of the LSP, and the information presented in the Water Supply Assessment, the City of Whittier and its Whittier Utility Authority conclude that sufficient water supply exists now, and will be available for the Project for the next 20 years.

7.0 REFERENCES

- City of Whittier, *2010 Urban Water Management Plan* (Stetson Engineers, May 2011).
- City of Whittier, *Addendum No. 1 to 2010 Urban Water Management Plan* (Stetson Engineers, July 2014).
- City of Whittier, *Water Master Plan* (AKM, 2008).
- Upper San Gabriel Valley Municipal Water District, *2010 Urban Water Management Plan* (Stetson Engineers, June 2011).
- Metropolitan Water District of Southern California, Annual Reports for 2008 through 2013
- Central Basin Municipal Water District, *Southeast Water Reliability Project Fact Sheet*, www.centralbasin.org.
- Metropolitan Water District of Southern California, *2010 Regional Urban Water Management Plan*, (MWDSC, November 2010)
- United States EPA, *San Gabriel Valley Groundwater Cleanup Superfund Progress Report*, (EPA, January 2014)
- City of Whittier, *Lincoln Specific Plan* (RBF, January 20, 2014).
- State of California, Senate Bill 610 legislation (January 24, 2002).