

11.14 Water and Wastewater Facilities Evaluation

LINCOLN SPECIFIC PLAN

CITY OF WHITTIER, CALIFORNIA

WATER AND WASTEWATER FACILITIES EVALUATION

PREPARED BY:



August 1, 2014

JN: 135060

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List of Abbreviations/Acronyms

Ac	Acre
AF	Acre-feet
AFY	Acre-feet per year
d/D	Depth/diameter
DU	Dwelling Unit
EIR	Environmental Impact Report
FF	Fire flow
ft	Feet
ft/s	Feet per second
gpd	Gallons per day
gpm	Gallons per minute
HCEP	Hydraulic Capacity Enhancement Plan
HCF	Hundred cubic feet
hr	Hour
in	inch
LACSD	Los Angeles County Sanitation District
MDD	Maximum day demand
MGD	Million gallons per day
PA	Planning Area
PHD	Peak hour demand
PIH	Presbyterian Intercommunity Hospital
PP2	Pumping Plant No. 2
psi	Pounds per square inch
SF	Square feet
SGVWC	San Gabriel Valley Water Company
SP	Specific Plan
sq. ft.	Square feet
WMP	Water Master Plan
WUA	Whittier Utility Authority

1. Introduction and Purpose of Study

The Lincoln Specific Plan (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 (Nelles), 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 bound 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. Exhibit 1 shows the regional vicinity of the Project site, and Exhibit 2 shows the local vicinity within the City of Whittier.

The Project site is generally comprised of two areas: a former youth correctional facility area (approximately 73.7 acres); and an adjacent commercial area (approximately 2.3 acres) located at the eastern corner of the site. 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.

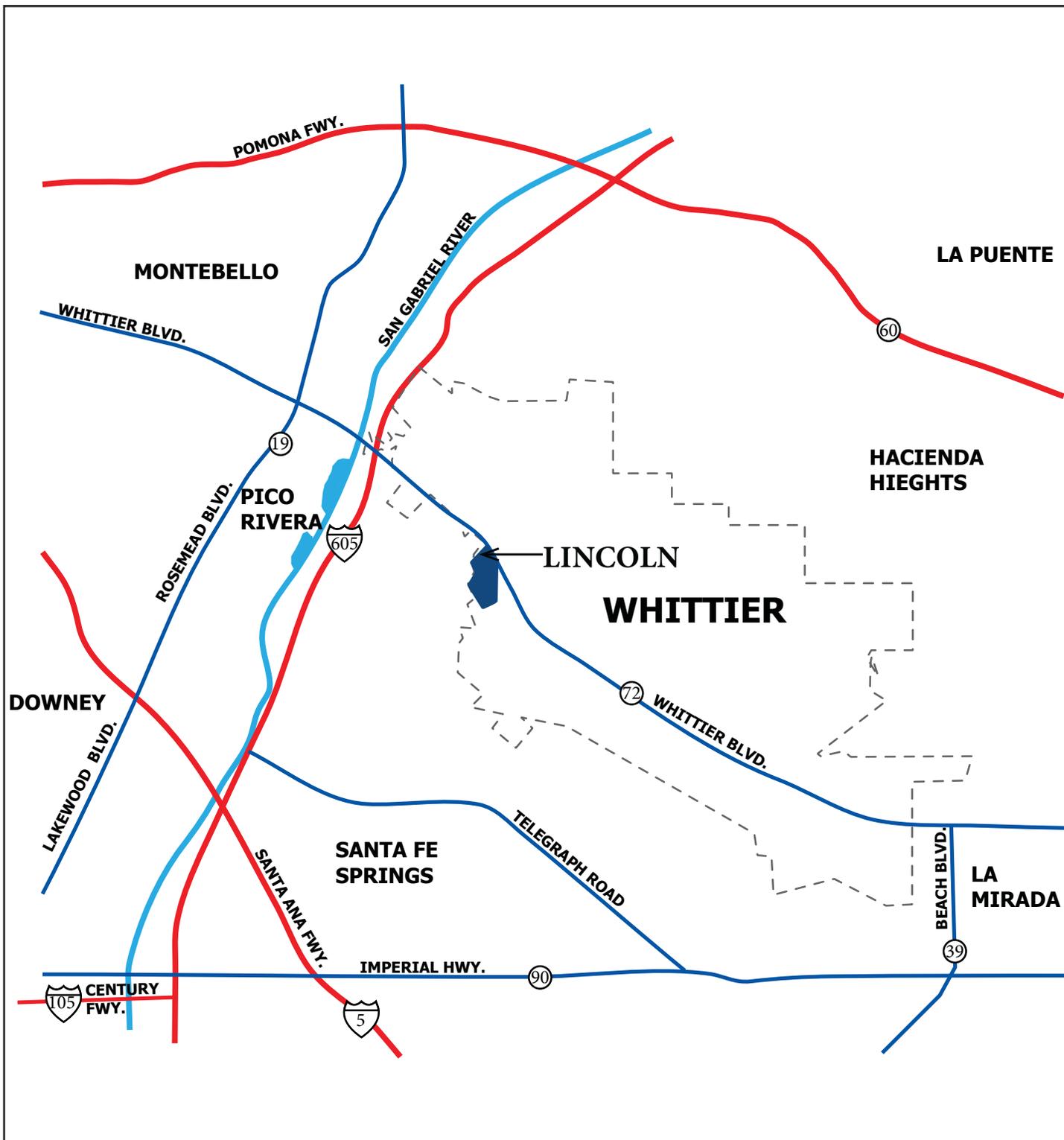
The Project represents redevelopment of the site that would consist of the following primary components: demolition of existing on-site structures; construction of 750 residential dwelling units and approximately 208,350 square feet of commercial land uses; 4.91 acres of open space; and offsite infrastructure improvements including roadway improvements to Whittier Boulevard and Sorensen Avenue, future extension of Elmer Avenue, and wet and dry utilities.

This water and wastewater facilities study (Study) is prepared in support of the Lincoln Specific Plan and associated Environmental Impact Report (EIR), with the objectives of identifying the existing water distribution system serving the surrounding area, estimating Project water demands and wastewater flows, identifying the proposed on-site water and wastewater systems, and providing hydraulic calculations to verify adequate operation of the on-site and off-site systems.

2. Reference Documents

The following reference documents were used in the preparation of this Study:

- City of Whittier Water Master Plan, prepared by AKM Consulting Engineers. April 2008.
- Lincoln Specific Plan. Whittier, California. July 16, 2014
- City of Whittier Hydraulic Capacity Enhancement Plan Final Report, City of Whittier Sewer System Management Plan, prepared by RMC Water and Environment. June 2009.
- City of Whittier Sewer System Management Plan, prepared by RMC Water and Environment in association with Larson Consulting. August 2009.
- Los Angeles Bureau of Engineering Sewer Design Manual June 1992
- 2008 County of Los Angeles Fire Code, Appendix C – Fire-Flow Requirements for Buildings.



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

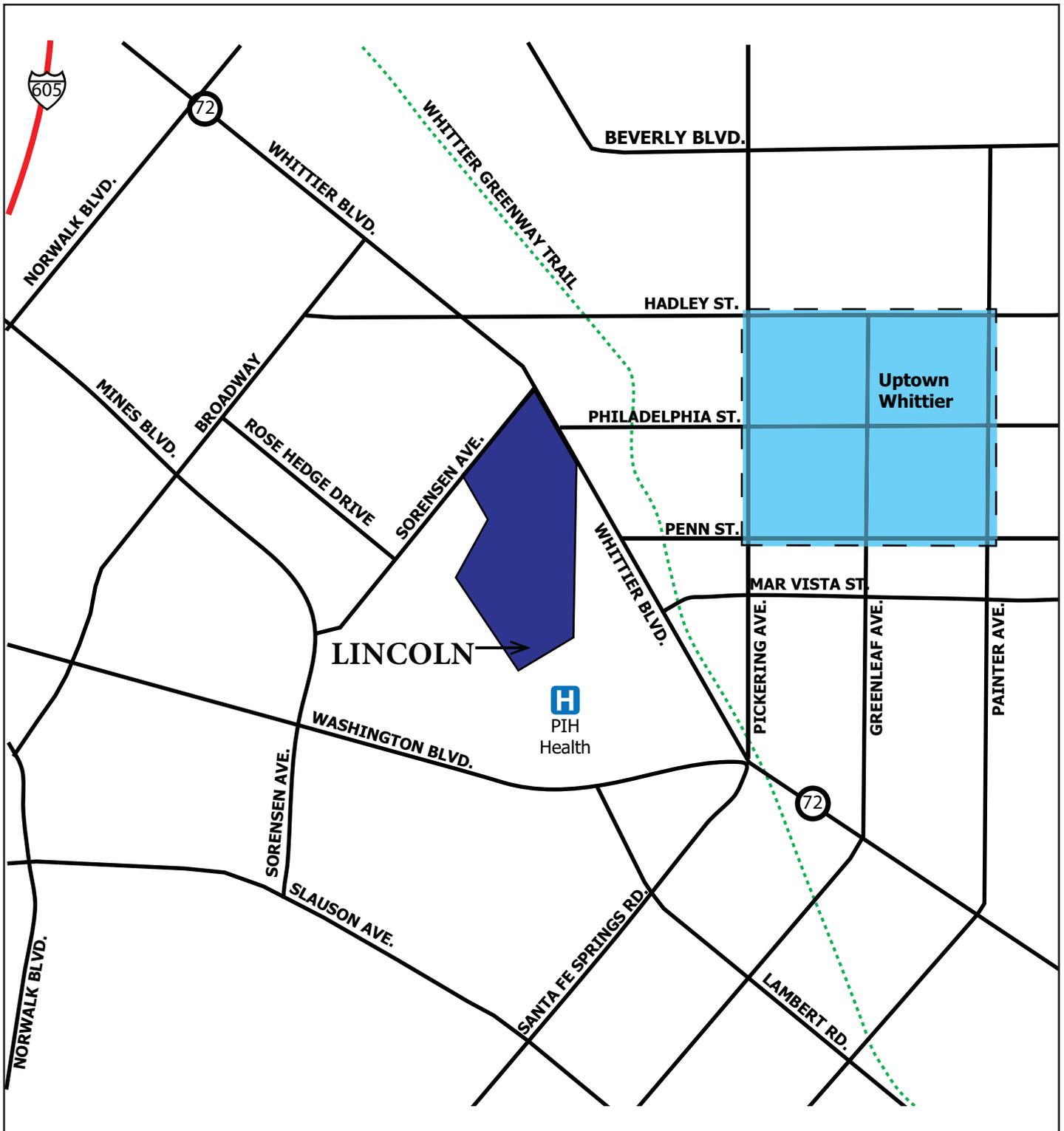
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LINCOLN SPECIFIC PLAN
WATER AND WASTEWATER FACILITIES EVALUATION

Regional Context



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

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LINCOLN SPECIFIC PLAN
WATER AND WASTEWATER FACILITIES EVALUATION

Local Context

Exhibit 2

3. Land Use

3.1 Existing Land Use

The Project site is generally comprised of two areas: a former youth correctional facility area (approximately 73.7 acres); and an adjacent commercial area (approximately 2.3 acres) located at the eastern corner of the site. 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.

3.2 Proposed Land Use

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. Exhibit 3 illustrates the land use plan of the Lincoln Specific Plan.

4. Water Demand Calculations

Water demands present in the City’s existing water hydraulic model were allocated as part of the 2008 Water Master Plan (WMP). These demands were based on the City’s average daily production records for fiscal year 2006 – 2007. Historical demands of the Nelles Facility reached as high as 116,000 gallons per day before operations ceased in 2004 (Table 1 and Appendix A). While intermittent water usage still occurs at the Project site, the quantity is considered negligible and was assumed to be zero for the purpose of this analysis. It is assumed that the existing water model contains no demands from the Project site.

Table 1 – Nelles Facility Historical Water Consumption

Year	Total Consumption			
	(HCF)	(AFY)	(gpm)	(gpd)
2013	266	0.61	0.38	545
2012	151	0.35	0.21	309
2011	55	0.13	0.08	113
2010	0	0.00	0.00	0
2009	659	1.51	0.94	1,350
2008	0	0.00	0.00	0
2007	0	0.00	0.00	0
2006	335	0.77	0.48	687
2005	23,448	53.83	33.37	48,052
2004	31,929	73.30	45.44	65,433
2003	56,453	129.60	80.34	115,690
2002	44,180	101.42	62.87	90,539

4.1 Estimated Project Water Demand

Water demand estimates were calculated based on proposed land use type, number of dwelling units, and gross acreages corresponding to the unit flow factors presented in the 2008 WMP. These factors correspond to average daily demand, and are listed in Table 2. Since the 2008 WMP did not include a unit flow factor for open space / parks, a unit flow factor of 3,500 gallons per day per acre was utilized, based on industry standard practice for landscape irrigation in southern California.

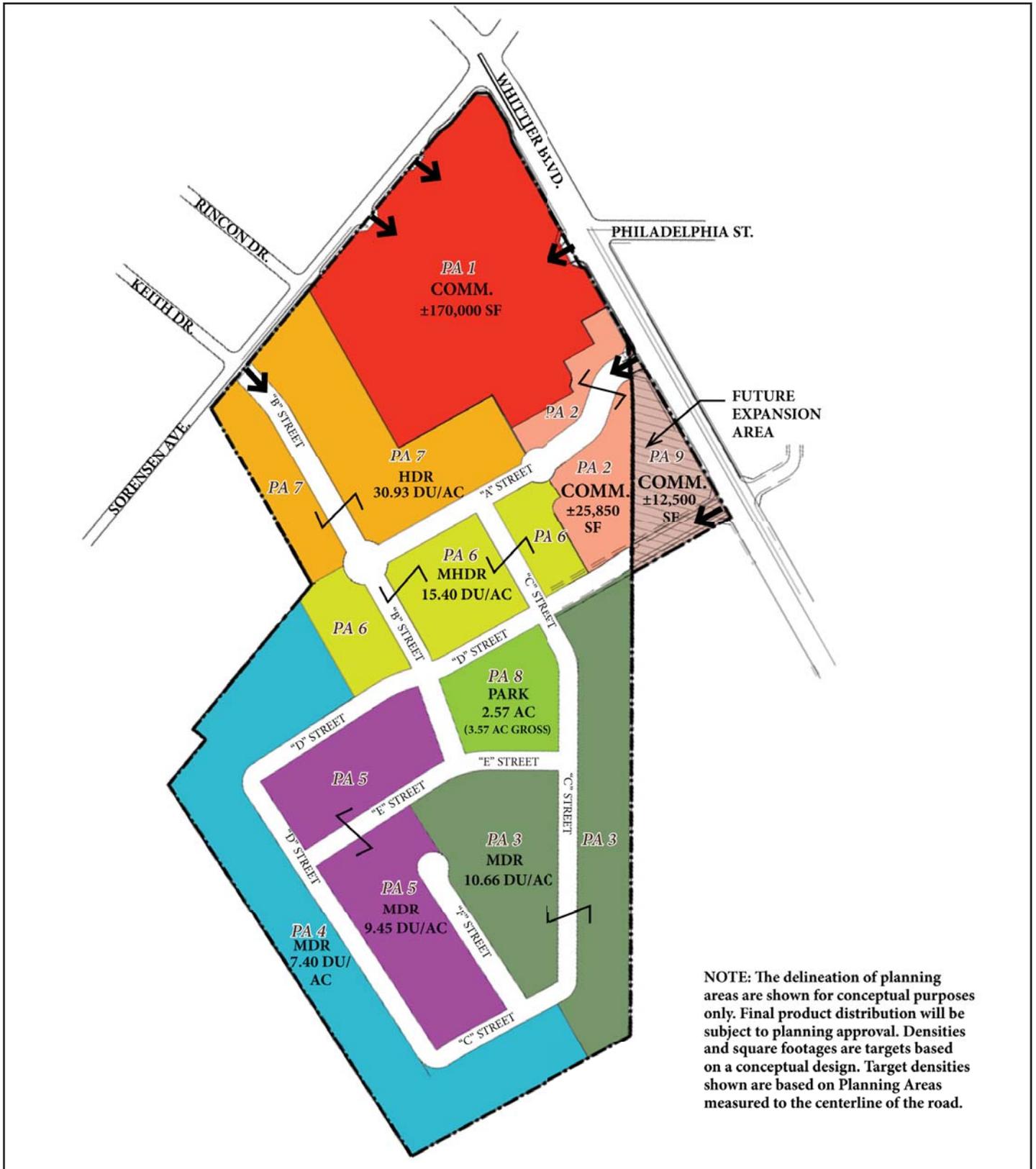
Table 2 – Unit Flow Factors ^[1]

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 total project average day water demand is calculated to be 394,721 gallons per day (442 AFY), as summarized in Table 3.



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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Table 3 – Estimated Project Water Demands [1]

Planning Area	Description	Acres	Commercial (SF)	Residential (DU)	Unit Demand Factor (gpd/ac) [2][4]	Average Demand		
						gpd	AF	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.

[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.

Water demand peaking factors were then applied to the total average day demand to calculate maximum day demand and peak hour demand, which are considered the critical demand conditions for this hydraulic analysis. Maximum day demand represents the highest demand day of the year, while the peak hour demand represents the hour of highest demand during a maximum day. Based on the peaking factors from the 2008 WMP of 2.00 for maximum day demand and 3.30 for peak hour demand, demand totals of 548 gpm and 905 gpm have been calculated for maximum day and peak hour demand, respectively, as shown in Table 4.

Table 4 – Peaking Factors and Estimated Project Demands

Demand Description	Peaking Factor [1]	Total Project Demand (gpm)
Average Day	1.00	274
Max Day	2.00	548
Peak Hour	3.30	905

[1] Source: Table 5-3 Water System Demands and Peaking Factors of City of Whittier Water Master Plan, prepared by AKM Consulting Engineers, April 2008. Peaking factors are with respect to average day demand.

4.2 Potential for Non-Domestic Irrigation

As part of the Project, a total average demand of 19 acre feet per year (AFY) has been identified as irrigation of open space. This demand could potentially be supplied by a non-domestic water source, which could potentially reduce the domestic demand of the Project by approximately 4 percent. It is recommended that the feasibility of utilizing non-domestic water for irrigation of open space be investigated.

4.3 Fire Flow Requirements

The City’s domestic water distribution system must be capable of providing the maximum day demand plus the required fire flow for the Project. The Lincoln SP is comprised of commercial land uses at the north, and residential land uses at the central and southern areas of the Project site. To minimize construction constraints for the Project in terms of building size, type, and location, it is assumed that a single commercial or residential building could be constructed anywhere within its respective planning area that would require the maximum fire flow and volume, i.e. type V-B construction material and 85,101 square feet or greater. This would require a fire flow of 8,000 gpm; however, reductions in required fire flow of up to 75 percent may be allowed. For the purpose of this analysis, it is assumed that a 50 percent reduction would be allowed as a conservative approach. The fire flow requirements used for this analysis are summarized in Table 5.

Table 5 – Fire Flow Requirements

Building Occupancy Classification	Fire Flow (gpm)	Duration (hrs)	Residual Pressure (psi)	Average Spacing Between Hydrants (ft) [1]	Max Distance from Hydrant to any Point on Lot Frontage (ft) [1]
Residential Multi-Family	4,000 [2][3]	4	20	300	200
Commercial	4,000 [2][3]	4	20	300	200

[1] Figures based on Tables 6-3 and 6-4 of City of Whittier Water Master Plan, prepared by AKM Consulting Engineers, April 2008.

[2] Based on single building construction using Type V-B material, and building area exceeding 85,101 square feet.

[3] Based on a 50 percent reduction from 8,000 gpm per 2008 County of Los Angeles Fire Code Appendix C.

The worst case Project fire flow location was identified using the hydraulic model, and its fire flow simulation results at this location were included in this Study. It should be noted that Project fire flow requirements are subject to the governing Fire Authority and will be set prior to Project design, and based on building floor area and materials of construction used.

5. Water Service and Design Criteria

The service and design criteria listed in Tables 6 and 7 were used for this Study to size the proposed facilities and to evaluate the hydraulic performance of the Project’s distribution system.

Table 6 – Service Criteria [1]

Description	Criteria
Reservoir Operational Storage	133% of Maximum Day Demand
Minimum Pipe Size	8-inch, except on short cul-de-sac dead-end mains where 6-inch is allowed
Maximum Velocities	5 ft/s at peak flows
	10 ft/s at fire flows
Static Pressures	Minimum 45 psi
	Desired 60 - 80 psi
	With pressure regulation over 80 psi
Dynamic Pressures	Minimum 45 psi during peak hour demand

[1] Source: Table 6-1 of City of Whittier Water Master Plan, prepared by AKM Consulting Engineers, April 2008.

Table 7 – Minimum Pipe Sizes

Land Use	Fire Flow [1] (gpm)	Max Allowable Velocity (ft/s)	Minimum Pipe Diameter (in)	
			Dead-End	Looped
Residential Multi-Family	4,000	10	16	12
Commercial	4,000	10	16	12

[1] See Table 5 for determination of Fire Flow requirements.

6. Domestic Water Distribution System

Domestic water service to the Lincoln Specific Plan area will be provided by the City of Whittier. The Project is located on the western border of the 464 Pressure Zone. Adjacent water purveyors include the Suburban Water System’s Whittier / La Mirada District to the south, and San Gabriel Valley Water Company to the west.

6.1 Existing Water Distribution System

The Project site is within the service area of the 464 Pressure Zone. The 464 Zone is served by the Pumping Plant No. 2 pumping station, which boosts the groundwater supply to storage tanks and end users within the 464 Zone. Storage for the zone is provided by Greenleaf No. 2 and 7A Reservoirs, and the Ocean View Reservoir. An existing 14-inch diameter water pipeline is located in Whittier Boulevard to the east of the site. A 12-inch diameter pipeline at the south end of the Project site loops from Washington Boulevard, Crowndale Avenue, and Barnum Drive, and through easements, connecting to an 8-inch diameter pipeline in the Whittier Boulevard frontage street. An existing 4-inch meter served the Nelles facility from the 12-inch pipeline. A 3/4-inch meter serves the auto recycling business from the 8-inch pipeline adjacent to Whittier Boulevard.

6.2 Current Water System Projects

The replacement of the City of Whittier’s aging Pumping Plant No. 2 has been designed and is currently under construction, and scheduled for completion in 2015. This project will increase pumping capacity and improve system hydraulics. This will also mitigate storage deficiency and improve water quality as recommended in the 2008 WMP. Additional upcoming projects are slated to include installation or replacement of an aging storage tank and a chlorination facility.

6.3 Proposed Project System

The Project is proposed to be served by a single water system, as shown in Exhibit 4, that will meet both domestic and fire flow demands. Primary water service to the Project is proposed by two connection points: one connection to the existing 14-inch diameter main in Whittier Boulevard, and a second to the existing 12-inch diameter main at the south end of the Project. Based on staff direction, the Project’s internal water distribution system will develop as a public system. Dead-end pipelines in the water system should be avoided, as these limit reliability, redundancy, and available fire flow, and could require regular flushing. Looping pipelines would also eliminate the need for 16-inch dead-end pipelines within the Project that would otherwise

be required for fire flow purposes in order to maintain velocities within the criteria identified in Table 6 (see “B” and “F” Streets, Exhibit 3).

The Project’s water system should include the following:

1. A 12-inch pipeline connecting the cul-de-sac “F” Street to “E” Street to add looping to avoid a dead-end line in “F” Street.
2. A looping pipeline to avoid a dead-end line at the north end of “B” Street. Because Sorensen Avenue at this location represents the City’s service area limits, and the City has no distribution pipeline currently in operation within Sorensen Avenue south of Whittier Boulevard, the City should consider the following two options:
 - a. Construct a new pipeline in Sorensen Avenue from “B” Street to the existing 14-inch pipeline in Whittier Boulevard. It should be noted that an easement may be required for any portion of this pipeline located outside of City limits.
 - b. Loop the on-site system for circulation between Planning Areas 1, 2, and 7 to eliminate dead-end pipelines.

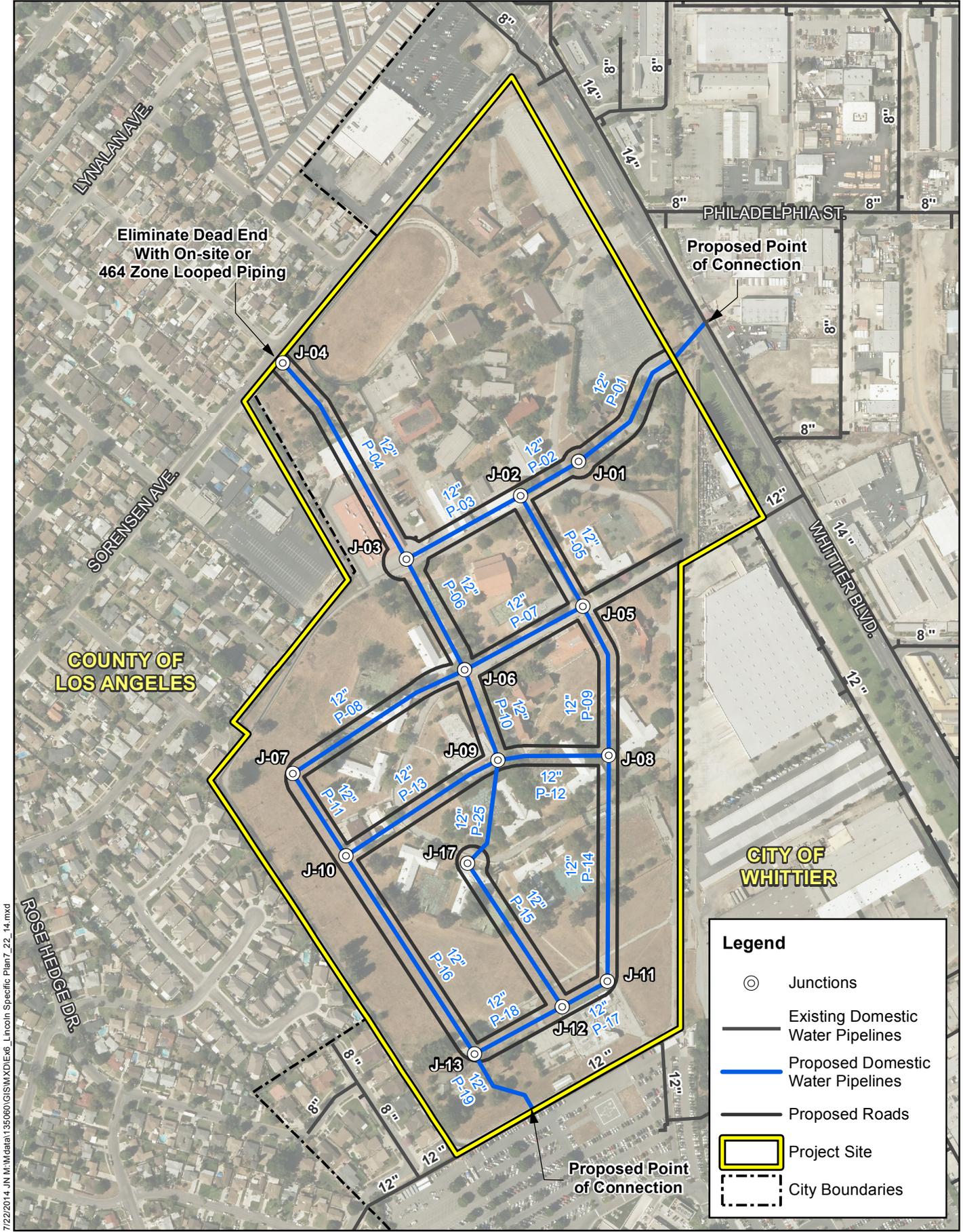
The San Gabriel Valley Water Company serves the residents on the north side of Sorensen Avenue, and is in close proximity to the Project; however, the City has indicated that a mutually-beneficial interconnection would not be feasible due to the limited hydraulic capacity of SGVWC facilities at this location. The preferred looping option should be determined during the design phase.

The two primary points of connection should be sized for full service to the development within the Lincoln Specific Plan. As the Lincoln Specific Plan builds out, it is anticipated that the existing 3/4-inch line serving the auto recycling business would be abandoned. The on-site water system is proposed to be sized as a looped 12-inch diameter system, which can serve the most critical operating scenario, i.e. maximum day demand plus the required fire flow.

It is recommended that the sizing of all facilities outlined in this study, including pipelines and service connections, be verified during the design phase of the Project. Exhibit 4 illustrates the proposed on-site distribution system for the Lincoln Specific Plan.

7. Distribution Storage

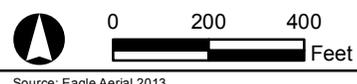
The water demands of the Project amount to approximately five (5) percent of the City’s total service area water demands. The City criteria states that reservoir operational storage shall be equal to 133 percent of maximum day demand, which would equate to approximately 1.05 million gallons. The WMP identifies an existing storage surplus of 3.42 million gallons in Zone 464. The City’s distribution storage is also expected to be enhanced with the completion of the PP2 pump station replacement project, which is currently under construction. In light of the current storage surplus and PP2 project, existing distribution storage capacity within the City’s system appears to be sufficient for the Lincoln project. As part of a future water operations efficiency and optimization study, the City should confirm this upon completion of the PP2 project.



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Legend

- ⊙ Junctions
- Existing Domestic Water Pipelines
- Proposed Domestic Water Pipelines
- Proposed Roads
- ▭ Project Site
- - - City Boundaries



Source: Eagle Aerial 2013

LINCOLN SPECIFIC PLAN
 WATER AND WASTEWATER FACILITIES EVALUATION
Proposed Domestic Water System

8. Water Hydraulic Analysis and Results

This analysis was performed using the existing City of Whittier domestic water system hydraulic model. The on-site piping for the Lincoln Specific Plan was added to the existing model based on the conceptual layout in the Lincoln SP and criteria established herein. The looping pipe between “F” Street and “E” Street has been included in the modeled simulations; however, the looping facilities near the north end of “B” Street have not been included due to the nature of uncertainty. Elevations were assigned to model junctions based on data obtained from Google™ Earth software. Demands were allocated to the model using a distribution method based on junction location and corresponding percentage of area served for each Planning Area. A total of three hydraulic model scenarios were established, which have been determined to be the critical demand scenarios for the Project; these scenarios are listed in Table 8.

Table 8 – Hydraulic Model Scenarios

Scenario No.	Description
1	Max Day Demand w/ Lincoln SP
2	Peak Hour Demand w/ Lincoln SP
3	Max Day Demand w/ Lincoln SP + 4,000 gpm Fire Flow @ Model Junction J-04

Hydraulic model results are included for on-site junctions and pipelines. The results for all three scenarios are included in Tables 9 and 10. Model junction and pipe IDs are included in Exhibit 4. Also, a field fire hydrant flow test was performed by City staff in order to substantiate the results of the model. The field test was performed at Hydrant 494, which is located on the northeast side of Whittier Boulevard where it intersects with Sorensen Avenue. Based on the field results, it was concluded that the model is a reasonably accurate simulation of actual field conditions. The results of this test are included in Appendix B. (It should be noted that the “Observed Flow” reading of “80” on the test form corresponds to a flow rate of 1,500 gpm.)

Table 9 – Hydraulic Model Results - Junctions

Node	Pressure Zone	Elev (ft)	Static Press (psi)	① MDD + Lincoln SP		② Ex PHD + Lincoln SP		③ Ex MDD + Lincoln SP + 4000 gpm FF @ J-04	
				Pressure (psi)	Head (ft)	Pressure (psi)	Head (ft)	Pressure (psi)	Head (ft)
J-01	464	219.00	106.1	98.8	447	89.7	426	82.5	409
J-02	464	213.00	108.7	101.0	446	91.9	425	82.2	403
J-03	464	203.00	113.0	105.2	446	96.1	425	84.3	397
J-04	464	202.00	113.4	105.7	446	96.6	425	74.1	373
J-05	464	213.00	108.7	100.9	446	91.8	425	81.4	401
J-06	464	204.00	112.6	104.7	446	95.6	425	84.9	400
J-07	464	187.00	119.9	112.0	446	102.9	425	92.4	400
J-08	464	213.00	108.7	100.8	446	91.7	425	81.2	400
J-09	464	203.00	113.0	105.1	446	96.0	425	85.5	400
J-10	464	190.00	118.6	110.7	446	101.6	425	91.1	400
J-11	464	205.00	112.1	104.2	445	95.1	424	84.7	400
J-12	464	201.00	113.9	105.9	445	96.8	424	86.4	400
J-13	464	190.00	118.6	110.6	445	101.6	424	91.2	400
J-17	464	196.00	116.0	108.1	446	99.0	425	88.5	400

Table 10 – Hydraulic Model Results - Pipelines

ID	Diameter (in)	Length (ft)	Roughness	① MDD + Lincoln SP		② Ex PHD + Lincoln SP		③ Ex MDD + Lincoln SP + 4000 gpm FF @ J-04	
				Flow (gpm)	Velocity (ft/s)	Flow (gpm)	Velocity (ft/s)	Flow (gpm)	Velocity (ft/s)
P-01	12	443	130	1,259	3.6	1,378	3.9	4,000	11.4
P-02	12	208	130	1,201	3.4	1,282	3.6	3,942	11.2
P-03	12	403	130	526	1.5	584	1.7	2,444	6.9
P-04	12	720	130	53	0.2	88	0.3	4,053	11.5
P-05	12	392	130	633	1.8	630	1.8	1,456	4.1
P-06	12	387	130	410	1.2	393	1.1	1,673	4.8
P-07	12	415	130	237	0.7	237	0.7	873	2.5
P-08	12	621	130	248	0.7	240	0.7	285	0.8
P-09	12	480	130	354	1.0	325	0.9	542	1.5
P-10	12	297	130	357	1.0	319	0.9	559	1.6
P-11	12	303	130	208	0.6	175	0.5	325	0.9
P-12	12	343	130	76	0.2	53	0.2	419	1.2
P-13	12	556	130	162	0.5	140	0.4	56	0.2
P-14	12	699	130	243	0.7	213	0.6	88	0.3
P-15	12	531	130	218	0.6	145	0.4	248	0.7
P-16	12	730	130	335	1.0	256	0.7	306	0.9
P-17	12	161	130	211	0.6	160	0.5	55	0.2
P-18	12	307	130	408	1.2	270	0.8	217	0.6
P-19	12	263	130	711	2.0	474	1.3	554	1.6
P-25	12	344	130	247	0.7	193	0.6	219	0.6

Based on the hydraulic model results for the Lincoln Specific Plan, all static pressures were observed to be greater than the minimum required 45 psi. Since all static pressures were observed to be in excess of 80 psi, individual services should be equipped with pressure regulating devices pursuant to the Uniform Plumbing Code. All dynamic pressures resulting from maximum-day and peak hour demand simulations were observed to be greater than the minimum required 45 psi. Under fire flow conditions, the required fire flow for the worst case location was observed to be met with residual pressures exceeding the required 20 psi. For pipelines, all velocities resulting from peak hour flow simulation were observed to be less than the maximum allowable five (5) feet per second. Under fire flow conditions, all velocities were observed to be less than the maximum allowable 10 feet per second with the exception of pipes P-01, P-02, and P-04. These velocities only marginally exceed the maximum allowable velocity of 10 feet per second and, therefore, are deemed acceptable.

9. Wastewater Generation Calculations

9.1 Estimated Project Wastewater Generation

Wastewater generation estimates were calculated based on proposed land use type, building square footages for commercial uses, number of residential units, and unit flow factors from the Los Angeles County Sanitation District (LACSD) Table 1 – Loadings for Each Class of Land Use (Appendix C). These factors correspond to average daily flows, and are listed in Table 11.

Table 11 – Unit Flow Factors

Land Use	Unit Flow Factor
Single-Family Residential	260 gpd/DU
Multi-Family Residential	156 gpd/DU
Commercial Use	325 gpd per 1000 gr. sq. ft.

Source: LACSD Table 1, Loadings for Each Class of Land Use (www.lacsd.org)

The estimated total Project average wastewater generation is calculated to be 231,390 gallons per day (gpd), as summarized in Table 12. This represents approximately 59 percent of the average daily water demands. The LACSD estimated total Project average wastewater generation is slightly higher in the February 26, 2014 Notice of Preparation of a Draft Environmental Impact Report letter (Appendix D). The revised estimate herein is based on subsequent discussions with LACSD staff and a more detailed breakdown of unit types and counts. This was explained to staff during personal communication on June 30, 2014.

Table 12 – Estimated Project Wastewater Generation [1]

Planning Area	Description	Acres	Commercial (SF)	Residential (DU)	Wastewater Flow Factor (gpd/ac) [2][3]	Average Wastewater Flow	
						gpd	gpm
1	Commercial - The Market	12.85	170,000	-	325 gpd/1000 sqft	55,250 gpd	38.37 gpm
2	Commercial - Heritage Court	2.86	25,850		325 gpd/1000 sqft	8,401 gpd	5.83 gpm
	Roads	0.91	-		-	-	-
3	Medium Density Residential (10.66 DU/AC)	9.48	-	139	260 gpd/DU	36,140 gpd	25.10 gpm
	Open Space (potential irrigation)	1.52	-	-	-	-	-
	Roads	2.04	-	-	-	-	-
4	Medium Density Residential (7.40 DU/AC)	10.14	-	91	260 gpd/DU	23,660 gpd	16.43 gpm
	Open Space (potential irrigation)	0.82	-	-	-	-	-
	Roads	1.33	-	-	-	-	-
5	Medium Density Residential (9.45 DU/AC)	7.64	-	96	260 gpd/DU	24,960 gpd	17.33 gpm
	Roads	2.52	-	-	-	-	-
6	Medium High Density Residential (15.40 DU/AC)	6.15	-	128	260 gpd/DU	33,280 gpd	23.11 gpm
	Roads	2.16	-	-	-	-	-
7	High Density Residential (30.93 DU/AC)	8.06	-	296	156 gpd/DU	46,176 gpd	32.07 gpm
	Roads	1.51	-	-	-	-	-
8	Open Space (potential irrigation)	2.57	-	-	-	0 gpd	0.00 gpm
	Roads	1.00	-	-	-	-	-
9	Future Expansion Area	2.00	12,500	-	325 gpd/1000 sqft	4,063 gpd	2.82 gpm
Project Totals		75.56	208,350	750	-	231,930 gpd[4]	161.06 gpm

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

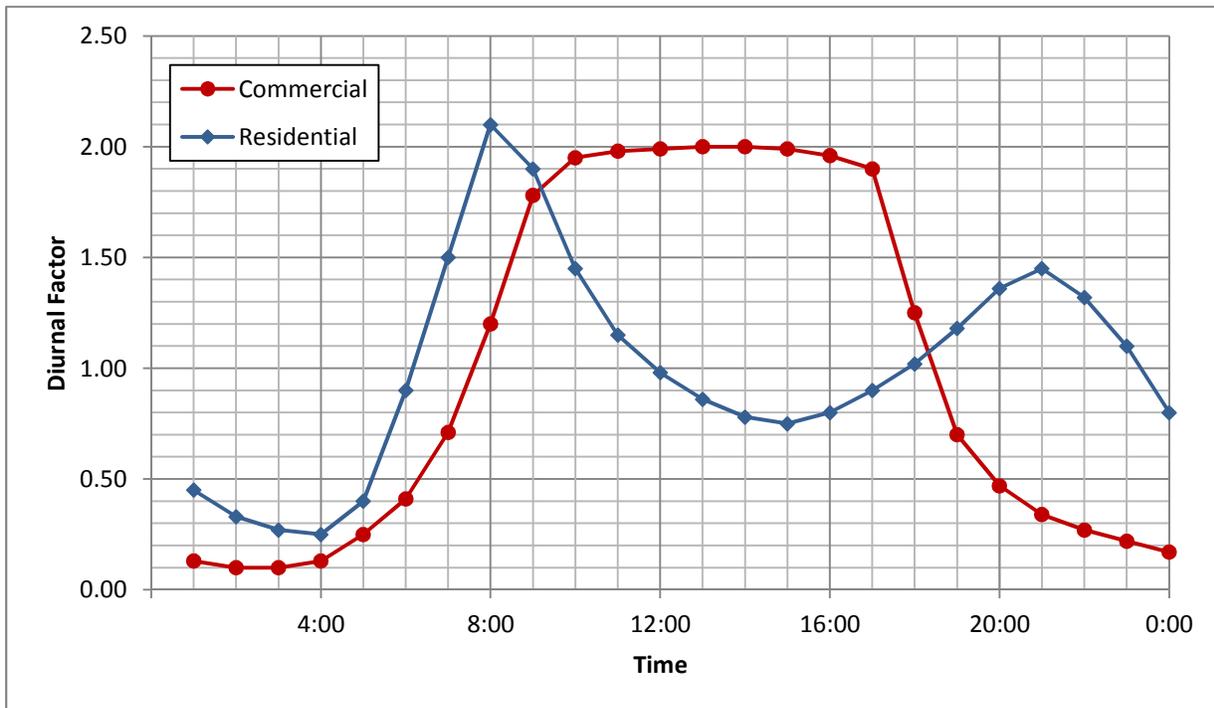
[2] Source: LACSD Table 1, Loadings for Each Class of Land Use (www.lacsd.org)

[3] Planning Area 7 consists of high-density multi-family residential usage, which has been assigned a flow factor of 156 gpd/DU. For conservative flow estimation purposes, residential land use in all other Planning Areas has been assigned a Single Family Home loading factor.

[4] Estimated total project average wastewater generation of 231,930 gpd was discussed with LACSD on June 30, 2014.

Wastewater flows typically vary over the course of day. These variations correspond to land use type and are represented by diurnal curves. The diurnal curves utilized in the model are based on the calibrated weekday Commercial and Residential curves from the Whittier Hydraulic Capacity Enhancement Plan. Because the diurnal curves were generated at downstream locations in the Whittier HCEP as part of a City-wide analysis, the patterns would represent significant attenuation. Therefore, adjustments were made to more accurately simulate higher peaks in upstream sewers. The modified diurnal curves applied to the Lincoln simulation are shown in Figure 1.

Figure 1 – Diurnal Curves^[1]



[1] Adapted and modified based on Figure 3-3 City of Whittier Hydraulic Capacity Enhancement Plan

While the Commercial peak factor is approximately 2.0 and the Residential peak factor is approximately 2.1, actual combined peak flows observed in the model depend on the system configuration and travel time as the flows are conveyed through the system.

9.2 Infiltration and Inflow

Based on Section 4.3 of the Whittier HCEP, pipe capacities are evaluated based on peak dry weather flow criteria with the knowledge that reserve capacity will be needed for rainfall-dependent infiltration and inflow. Therefore, sewer capacity analyses for the City are performed with strict adherence to maximum depth ratios. For the gravity sewer sizes needed for the Lincoln Specific Plan development (less than 15-inch diameter), 50 percent depth-to-diameter governs, as discussed in *Wastewater Design Criteria*.

10. Wastewater Design Criteria

The design criteria for new facilities is based on the requirements listed in the Los Angeles Bureau of Engineering Sewer Design Manual. The criteria pertinent to this analysis are listed in Table 13 and have been utilized for this Study to size the proposed facilities and to evaluate the hydraulic performance of the collection system proposed for the Project.

Table 13 – Service Criteria [1]

Description	Criteria
Minimum Pipe Diameter	8-inch
Pipe Depth / Diameter Ratio	50 percent during peak dry weather flow
Manning's Roughness Coefficient "n"	0.014
Minimum Slope	0.0044 ft/ft
	0.0060 ft/ft for last upstream reach to terminal manhole

[1] Adapted from Section F 250 of the Los Angeles Bureau of Engineering Sewer Design Manual 6/92.

11. Wastewater Collection System

Wastewater service to the Lincoln Specific Plan area is provided by collection facilities owned, operated, and maintained by the City of Whittier, which ultimately discharge to Los Angeles County Sanitation District (LACSD) trunk sewers. According to LACSD, the Project is located within the jurisdictional boundaries of District No. 18. (Appendix D)

11.1 Existing Wastewater Collection System

According to the Whittier HCEP, wastewater flows from the former Nelles facility were conveyed by a private sewer that connects to the City's system. Approximately 2,220 feet of 8-inch and 10-inch City-owned sewers were used to serve the Nelles facility. The wastewater flows from the existing auto recycling business are apparently served by the 10-inch sewer in Whittier Boulevard (to be verified).

11.2 Current Wastewater System Projects

Based on the results in the Whittier HCEP, there were no proposed projects identified for City sewer facilities downstream of the Nelles facility under "existing" or "future" conditions. The depth ratios in the Washington Boulevard sewer resulting from the HCEP analysis are less than 50 percent; however, the LACSD sewer that appears to be adjacent to Rincon Drive to the northwest of the Project was identified with a depth ratio between 0.50 and 0.75. It should be noted that the HCEP analysis did not simulate the flows estimated here for the Lincoln Specific Plan or evaluate downstream sewers owned and operated by LACSD.

11.3 Proposed Project Collection System

The Project sewer system is proposed to convey wastewater off-site at three points of connection: (1) the existing 8-inch sewer in Bexley Drive, which is an LACSD facility; (2) the existing 8-inch sewer in Townley Drive, which is also an LACSD facility; and (3) the existing 8-inch sewer in Barnum Drive, which is a City facility that ultimately discharges to an LACSD facility.

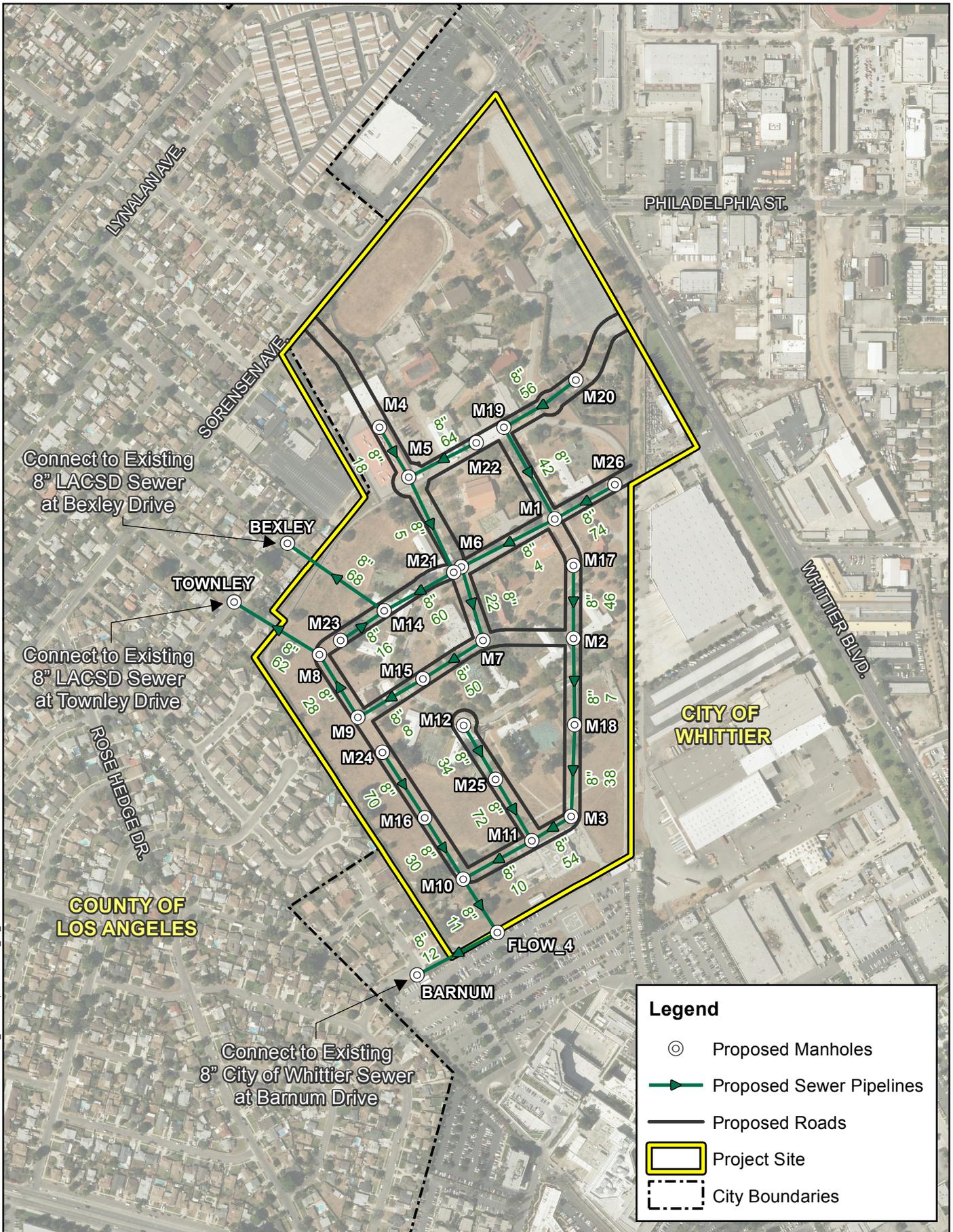
Due to the sensitivity of gravity systems, the sizing and alignment of all proposed sewers should be verified during the design phase of the Project. Exhibit 5 illustrates the proposed on-site wastewater collection system based on existing site elevations and land use concept outlined for the Lincoln Specific Plan.

12. Sewer Hydraulic Analysis and Results

A hydraulic model of the on-site and off-site sewer was created based on conceptual information in the Lincoln SP and on discussions with City staff. Manhole rim elevations were assigned to the model based on data obtained from Google™ Earth software. Pipe slopes were set parallel to the slope of existing topography, or based on minimum slope criteria for areas with flat or minimally sloping topography. Manhole inverts at points of connection were assumed based on standard depths. Wastewater flows were allocated to the model using a distribution method based on manhole location and corresponding percentage of area served for each Planning Area. A 24-hour extended-period hydraulic model scenario for peak dry weather conditions was modeled. It is assumed that the conservative depth ratio (50 percent) would allow capacity within the sewers for wet-weather flow. This Study excludes evaluation of LACSD facilities.

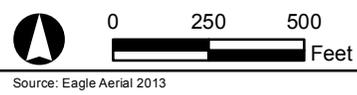
Hydraulic model results for on- and off-site manholes and pipelines are summarized in Tables 14 and 15 below. Model pipe and manhole IDs are included in Exhibit 5.

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Legend

- ⊙ Proposed Manholes
- ➔ Proposed Sewer Pipelines
- Proposed Roads
- ▭ Project Site
- - - City Boundaries



LINCOLN SPECIFIC PLAN
 WATER AND WASTEWATER FACILITIES EVALUATION
Proposed Wastewater Collection System

Table 14 – Hydraulic Model Results - Manholes

ID	Rim Elev (ft)	Maximum Grade (ft)	Maximum Grade Time (hour)	Load (gpm)	Status	Depth (ft)
M1	213	201.8	09:00 hr	6.7	Not Full	0.1
M2	212	204.6	07:00 hr	6.6	Not Full	0.1
M3	206	198.1	07:00 hr	6.6	Not Full	0.1
M4	205	194.7	08:00 hr	52.4	Not Full	0.2
M5	202	192.9	08:00 hr	0.0	Not Full	0.2
M6	204	192.9	08:00 hr	17.6	Not Full	0.2
M7	204	191.6	08:00 hr	9.3	Not Full	0.1
M8	187	179.3	08:00 hr	7.2	Not Full	0.3
M9	190	180.5	08:00 hr	7.2	Not Full	0.3
M10	190	176.7	07:00 hr	4.3	Not Full	0.2
M11	202	188.6	07:00 hr	4.3	Not Full	0.1
M12	195	191.3	07:00 hr	10.2	Not Full	0.1
M14	193	181.4	08:00 hr	7.2	Not Full	0.3
M15	193	181.8	08:00 hr	9.3	Not Full	0.3
M16	190	178.6	07:00 hr	8.0	Not Full	0.1
M17	215	207.6	07:00 hr	6.6	Not Full	0.1
M18	209	201.6	07:00 hr	6.6	Not Full	0.1
M19	213	203.7	09:00 hr	16.8	Not Full	0.2
M20	225	215.6	13:00 hr	44.2	Not Full	0.1
M21	203	191.2	08:00 hr	17.6	Not Full	0.1
M22	210	200.8	07:00 hr	26.9	Not Full	0.1
M23	190	182.1	07:00 hr	8.0	Not Full	0.1
M24	189	180.1	07:00 hr	8.0	Not Full	0.1
M25	197	189.8	07:00 hr	10.2	Not Full	0.1
FLOW_4	191	175.2	07:00 hr	0.0	Not Full	0.2

Table 15 – Hydraulic Model Results - Pipelines

ID	Diameter (in)	Length (ft)	Slope	From ID	To ID	Manning "n" Coeff	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Adjusted d/D	Maximum Adjusted Velocity (ft/s)
4	8	404.6	0.0220	M1	M6	0.014	76.3	08:09 hr	0.29	0.48
5	8	405.1	0.0044	M5	M21	0.014	76.7	08:06 hr	0.34	1.66
7	8	334.7	0.0090	M2	M18	0.014	13.2	07:04 hr	0.12	0.08
8	8	292.7	0.0044	M15	M9	0.014	111.1	08:12 hr	0.40	0.70
10	8	303.2	0.0400	M11	M10	0.014	50.9	07:06 hr	0.22	0.32
11	8	244.8	0.0060	M10	FLOW_4	0.014	71.0	07:08 hr	0.30	0.44
12	8	349.9	0.0044	FLOW_4	FLOW_5	0.014	71.0	07:12 hr	0.32	1.66
16	8	204.8	0.0044	FLOW_5	FLOW_6	0.014	8.0	07:02 hr	0.25	0.05
18	8	223.4	0.0080	FLOW_6	FLOW_8	0.014	52.4	08:01 hr	0.28	0.33
22	8	296.8	0.0044	FLOW_7	TO_LACSD	0.014	93.3	08:10 hr	0.37	1.77
28	8	283.9	0.0044	M23	M14	0.014	117.9	08:13 hr	0.42	0.75
30	8	278.6	0.0070	M4	M5	0.014	15.8	07:05 hr	0.21	0.10
34	8	241.1	0.0060	M6	M7	0.014	10.2	07:02 hr	0.14	0.07
38	8	354.3	0.0100	M9	M8	0.014	19.7	07:06 hr	0.14	1.55
42	8	404.9	0.0044	M16	M10	0.014	60.1	08:06 hr	0.29	1.62
46	8	279.4	0.0110	M12	M25	0.014	6.6	07:01 hr	0.10	0.04
50	8	274.8	0.0360	M18	M3	0.014	102.2	08:11 hr	0.31	0.65
54	8	178.9	0.0530	M19	M1	0.014	26.2	07:05 hr	0.13	0.17
56	8	333.0	0.0360	M17	M2	0.014	44.2	12:01 hr	0.22	0.28
60	8	307.2	0.0330	M7	M15	0.014	93.9	08:06 hr	0.31	0.60
62	8	385.9	0.0044	M3	M11	0.014	124.8	08:14 hr	0.42	1.98
64	8	292.4	0.0270	M20	M19	0.014	26.9	07:01 hr	0.23	0.17
68	8	455.3	0.0044	FLOW_8	FLOW_7	0.014	108.0	08:06 hr	0.40	1.80
70	8	302.3	0.0050	M21	M14	0.014	8.0	07:03 hr	0.12	0.05
72	8	276.0	0.0044	M8	TOWNLEY	0.014	20.4	07:04 hr	0.17	1.17
74	8	266.3	0.0380	M22	M5	0.014	8.6	12:01 hr	0.14	0.06

Note: "Adjusted" results account for backwater effects.

The hydraulic model analysis was used to verify conceptual sizing and alignments of sewers proposed to serve the Lincoln Specific Plan development. Results indicate a peak flow of approximately 108 gpm to the Bexley Drive connection, 125 gpm to the Townley Drive connection, and 71 gpm to the Barnum Drive connection. The results indicate the proposed on-site collection system will provide adequate service for the Lincoln SP planned land uses, i.e. all depth ratios are less than 50 percent. It should be noted that this does not include evaluation of LACSD's receiving systems.

12.1 Off-site Sewer Evaluation

The Project site boundary is at the extreme westerly bounds of the City's service area. Existing topography slopes to the west. The currently proposed higher density land uses for the Project site is estimated to roughly triple historical water demands; therefore, it can be assumed that wastewater flows could triple, similarly.

The City had initially evaluated an off-site sewer alternative including approximately 1,900 linear feet of gravity sewer extending from the south end of the Project through easements within the Presbyterian Intercommunity Hospital property and a retirement community; however, recent discussions and negotiations with the land owners regarding the requested easements indicate this may not be feasible.

Currently, the Project applicant proposes to sewer to three points of connection: (1) an existing 8-inch sewer in Bexley Drive (LACSD facility); (2) an existing 8-inch sewer in Townley Drive (LACSD facility); and an existing 8-inch sewer in Barnum Drive (City facility that ultimately discharges to an LACSD facility). Elevations of off-site sewer facilities should be verified to confirm that adequate slope exists for gravity service.

In order to obtain formal approval of this sewer option, the City should confirm that adequate capacity is available in the downstream City sewer in Barnum Drive, and seek formal approval of this option from LACSD for the other two points of connection. Formal approval may include coordination meetings and evidence that the LACSD sewer system has capacity to serve the Lincoln SP development flows from the north and south ends of the project. In addition, the Sewer System Management Plan (July 2011 Update) identified grease accumulation "hot-spots" in the vicinity of the Project, which could be impacted by flows from the Lincoln development project.

13. Conclusions and Recommendations

The following conclusions and recommendations are made by this Study:

Domestic Water Service:

- The Lincoln Specific Plan is estimated to have an average water demand of 394,721 gallons per day, a maximum day demand of 789,441 gpd, and peak hour demand of 905 gpm.
- A total average demand of 19 acre feet per year has been identified as irrigation of open space, which could potentially be supplied by a non-domestic water source.

- A maximum estimated fire flow is 4,000 gallons per minute for the Project. The final fire flow requirement will be determined during the design phase of Project development by the governing Fire Authority.
- It is understood that the Project's on-site water system is proposed to be a public system. The on-site water system should be sized and configured as shown in Exhibit 4. Hydraulic model results indicate that a 12-inch looped on-site system is required in order to operate within City standards.
- Looping pipelines should be provided between the "F" Street cul-de-sac and "E" Street, and near "B" Street and Sorensen Avenue.
- The primary service connections should be designed with a total capacity to serve a minimum of 100 percent of the Project's estimated demands plus a factor of safety deemed sufficient by City engineers. Service connection design should be verified during the design phase of Project development.
- Distribution storage capacity within the City's regional distribution system should be evaluated to determine the impacts of the Lincoln Specific Plan development on current storage capacity.
- The sizing of all facilities outlined here, including pipelines and interconnections, should be verified during the design phase of Project development.

Wastewater Collection Service:

- The Lincoln Specific Plan is estimated to generate an average flow of 231,930 gallons per day (161 gallons per minute). This value was developed based on discussions with LACSD on June 30, 2014. During these discussions, staff indicated the acceptance of the revised flow estimate.
- It is anticipated that the Project site will be sewered via three points of connection: (1) an existing 8-inch sewer in Bexley Drive (LACSD facility); (2) an existing 8-inch sewer in Townley Drive (LACSD facility); and (3) an existing 8-inch sewer in Barnum Drive (City facility that ultimately discharges to an LACSD facility).
- Peak dry weather flows are estimated at 108 gpm to the Bexley Drive connection, 125 gpm to the Townley Drive connection, and 71 gpm to the Barnum Drive connection.
- The City should coordinate with Los Angeles County Sanitation Districts to determine if sufficient capacity is available in LACSD trunk sewers to serve the flows of the proposed Project at Bexley Drive, Townley Drive, and downstream of Barnum Drive.
- Hydraulic model simulation was performed to verify the proposed sewer system will operate within City standards under peak dry weather conditions. These results are based on conceptual pipe slopes, which should be verified during final design, and assumes wet-weather flow can be served within the remaining physical capacity of the

collection system. Manhole invert elevations at points of connection should also be verified.

- The on-site wastewater collection system should be sized and configured as shown in Exhibit 5. Hydraulic model results indicate that the proposed collection system will require 8-inch gravity sewers in order to operate within City standards.

APPENDIX A

Consumption History

Service Information

Account Number: 0910940 - 1
 Customer Name: FRED C NELLES SCHOOL C/O CYA
 Service Address: 11850 WHITTIER BLVD

Service	Title	Status	Meter ID	Meter #	Location
520	WATER-POTABLE	Closed	C8993605	2	
520	WATER-POTABLE	Closed	3361350	1	
540	POTABLE-COMM/INSTITUTNL	Active	C8993605	1	

Read Date	Consumption	Bill Amount	Dial 1	Dial 2	Dial 3	Estimate	Alert
03/07/05	2673.00000	4116.42	11327	114032		None	None
01/06/05	2952.00000	4546.08	10746	111940		None	None
11/04/04	2560.00000	3942.40	10127	109607		None	None
09/08/04	5469.00000	8422.26	9561	107613		None	None
07/08/04	6613.00000	10184.02	8971	102734		None	None
05/06/04	8651.00000	13063.01	8553	96539		None	None
03/04/04	5684.00000	8582.84	8091	88350		None	None
01/08/04	6513.00000	9834.63	7656	83101		None	None
11/06/03	11805.00000	17825.55	7178	77066		None	None
09/08/03	15826.00000	23897.26	6713	65726		None	None
07/08/03	9300.00000	14043.00	6242	50371		None	None
05/07/03	6957.00000	9391.95	5759	41554		None	None
03/06/03	6052.00000	8170.20	5229	35127		None	None
01/08/03	7208.00000	9730.80	4610	29694		None	None
11/05/02	10947.00000	14778.45	3816	23280		None	None
09/09/02	13150.00000	17752.50	3119	13030		None	None
07/08/02	2999.00000	7341.30	1813	1186		None	None
06/21/02	0.00000	4612.95	0	0		None	None
PREV METER							
06/21/02	2439.00000	7341.30	26857	8894		None	None
05/07/02	3417.00000	4612.95	26857	6455		None	None
03/07/02	4020.00000	5427.00	26857	3038		None	None
01/09/02	5527.00000	7461.45	26257	9618		None	None
11/07/01	3318.00000	4479.30	24257	6091		None	None
09/10/01	5443.00000	7348.05	24252	2778		None	None
07/09/01	4598.00000	6207.30	22743	8844		None	None
05/07/01	4303.00000	5809.05	22096	4893		None	None
03/07/01	0.00000	0.00	21833	853		None	None

Consumption History

Service Information

Account Number: 0910940 - 1
 Customer Name: FRED C NELLES SCHOOL C/O CYA
 Service Address: 11850 WHITTIER BLVD

Service	Title	Status	Meter ID	Meter #	Location
520	WATER-POTABLE	Closed	C8993605	2	
520	WATER-POTABLE	Closed	3361350	1	
540	POTABLE-COMM/INSTITUTNL	Active	C8993605	1	

Read Date	Consumption	Bill Amount	Dial 1	Dial 2	Dial 3	Estimate	Alert
11/06/09	0.00000	0.00	13509	133616		None	None
09/09/09	0.00000	0.00	13509	133616		None	None
07/09/09	0.00000	0.00	13509	133616		None	None
05/07/09	0.00000	0.00	13509	133616		None	None
03/09/09	0.00000	0.00	13509	133616		None	None
01/09/09	659.00000	1311.41	13509	133616		None	None
11/10/08	0.00000	0.00	13496	132970		None	None
09/08/08	0.00000	0.00	13496	132970		None	None
07/08/08	0.00000	0.00	13496	132970		None	None
05/07/08	0.00000	0.00	13496	132970		None	None
03/07/08	0.00000	0.00	13496	132970		None	None
01/08/08	0.00000	0.00	13496	132970		None	None
11/07/07	0.00000	0.00	13496	132970		None	None
09/10/07	0.00000	0.00	13496	132970		None	None
07/09/07	0.00000	0.00	13496	132970		None	None
05/04/07	0.00000	0.00	13496	132970		None	None
03/08/07	0.00000	0.00	13496	132970		None	None
01/11/07	0.00000	0.00	13496	132970		None	None
11/07/06	0.00000	0.00	13496	132970		None	None
09/12/06	0.00000	0.00	13496	132973		None	None
07/11/06	317.00000	561.09	13496	132973		None	None
05/04/06	0.00000	0.00	13487	132665		None	None
03/07/06	18.00000	29.70	13487	132665		None	None
01/09/06	7016.00000	11576.40	13487	132647		None	None
11/07/05	4230.00000	6979.50	13160	125958		None	None
09/08/05	3948.00000	6514.20	12754	122134		None	None
07/11/05	3475.00000	5733.75	12336	118604		None	None
05/05/05	2106.00000	3243.24	11818	115647		None	None

Consumption History

Service Information

Account Number: 0910940 - 1

Customer Name: FRED C NELLES SCHOOL C/O CYA

Service Address: 11850 WHITTIER BLVD

Service	Title	Status	Meter ID	Meter #	Location
520	WATER-POTABLE	Closed	C8993605	2	
520	WATER-POTABLE	Closed	3361350	1	
540	POTABLE-COMM/INSTITUTNL	Active	C8993605	1	

Read Date	Consumption	Bill Amount	Dial 1	Dial 2	Dial 3	Estimate	Alert
	0.00000	0.00	0	0		None	None
01/07/14	0.00000	0.00	13532	134065		None	None
11/07/13	0.00000	0.00	13532	134065		None	None
09/09/13	0.00000	0.00	13532	134065		None	None
07/09/13	266.00000	468.16	13532	134065		None	None
05/07/13	0.00000	0.00	13526	133805		None	None
03/06/13	0.00000	0.00	13526	133805		None	None
01/08/13	0.00000	0.00	13526	133805		None	None
11/08/12	151.00000	265.76	13526	133805		None	None
09/10/12	0.00000	0.00	13512	133668		None	None
07/10/12	0.00000	0.00	13512	133668		None	None
05/04/12	0.00000	0.00	13512	133668		None	None
03/07/12	0.00000	0.00	13512	133668		None	None
01/06/12	0.00000	0.00	13512	133668		None	None
11/04/11	0.00000	0.00	13512	133668		None	None
09/07/11	0.00000	0.00	13512	133668		None	None
07/11/11	55.00000	129.25	13512	133668		None	None
05/06/11	0.00000	0.00	13509	133616		None	None
03/08/11	0.00000	0.00	13509	133616		None	None
01/06/11	0.00000	0.00	13509	133616		None	None
11/05/10	0.00000	0.00	13509	133616		None	None
09/08/10	0.00000	0.00	13509	133616		None	None
07/09/10	0.00000	0.00	13509	133616		None	None
05/07/10	0.00000	0.00	13509	133616		None	None
03/04/10	0.00000	0.00	13509	133616		None	None
01/06/10	0.00000	0.00	13509	133616		None	None
11/06/09	0.00000	0.00	13509	133616		None	None
11/06/09	0.00000	0.00	13509	133616		None	None

APPENDIX B

Whittier Water Division
Fire Flow Information

5:30

Date 7-10-84

Address N/E CORNER WHITTIER BLVD & SALFARSON

Static Pressure 92

Residual Pressure 90

Observed Flow 80

Flow at 20 P.S.I. 9,000 GPM

F.H. Size 6 x 4 x 2 1/2

Distance From Proposed Structure 154 ~~300~~

F.H. Location WHITTIER BLVD

Hvdrant # 494

Employee # 611

APPENDIX C

TABLE 1
LOADINGS FOR EACH CLASS OF LAND USE

<u>DESCRIPTION</u>	<u>UNIT OF MEASURE</u>	<u>FLOW (Gallons Per Day)</u>	<u>COD (Pounds Per Day)</u>	<u>SUSPENDED SOLIDS (Pounds Per Day)</u>
RESIDENTIAL				
Single Family Home	Parcel	260	1.22	0.59
Duplex	Parcel	312	1.46	0.70
Triplex	Parcel	468	2.19	1.05
Fourplex	Parcel	624	2.92	1.40
Condominiums	Parcel	195	0.92	0.44
Single Family Home (reduced rate)	Parcel	156	0.73	0.35
Five Units or More	No. of Dwlg. Units	156	0.73	0.35
Mobile Home Parks	No. of Spaces	156	0.73	0.35
COMMERCIAL				
Hotel/Motel/Rooming House	Room	125	0.54	0.28
Store	1000 ft ²	100	0.43	0.23
Supermarket	1000 ft ²	150	2.00	1.00
Shopping Center	1000 ft ²	325	3.00	1.17
Regional Mall	1000 ft ²	150	2.10	0.77
Office Building	1000 ft ²	200	0.86	0.45
Professional Building	1000 ft ²	300	1.29	0.68
Restaurant	1000 ft ²	1,000	16.68	5.00
Indoor Theatre	1000 ft ²	125	0.54	0.28
Car Wash				
Tunnel - No Recycling	1000 ft ²	3,700	15.86	8.33
Tunnel - Recycling	1000 ft ²	2,700	11.74	6.16
Wand	1000 ft ²	700	3.00	1.58
Financial Institution	1000 ft ²	100	0.43	0.23
Service Shop	1000 ft ²	100	0.43	0.23
Animal Kennels	1000 ft ²	100	0.43	0.23
Service Station	1000 ft ²	100	0.43	0.23
Auto Sales/Repair	1000 ft ²	100	0.43	0.23
Wholesale Outlet	1000 ft ²	100	0.43	0.23
Nursery/Greenhouse	1000 ft ²	25	0.11	0.06
Manufacturing	1000 ft ²	200	1.86	0.70
Dry Manufacturing	1000 ft ²	25	0.23	0.09
Lumber Yard	1000 ft ²	25	0.23	0.09
Warehousing	1000 ft ²	25	0.23	0.09
Open Storage	1000 ft ²	25	0.23	0.09
Drive-in Theatre	1000 ft ²	20	0.09	0.05

TABLE 1
(continued)
LOADINGS FOR EACH CLASS OF LAND USE

<u>DESCRIPTION</u>	<u>UNIT OF MEASURE</u>	<u>FLOW (Gallons Per Day)</u>	<u>COD (Pounds Per Day)</u>	<u>SUSPENDED SOLIDS (Pounds Per Day)</u>
COMMERCIAL				
Night Club	1000 ft ²	350	1.50	0.79
Bowling/Skating	1000 ft ²	150	1.76	0.55
Club	1000 ft ²	125	0.54	0.27
Auditorium, Amusement	1000 ft ²	350	1.50	0.79
Golf Course, Camp, and Park (Structures and Improvements	1000 ft ²	100	0.43	0.23
Recreational Vehicle Park	No. of Spaces	55	0.34	0.14
Convalescent Home	Bed	125	0.54	0.28
Laundry	1000 ft ²	3,825	16.40	8.61
Mortuary/Cemetery	1000 ft ²	100	1.33	0.67
Health Spa, Gymnasium				
With Showers	1000 ft ²	600	2.58	1.35
Without Showers	1000 ft ²	300	1.29	0.68
Convention Center, Fairground, Racetrack, Sports Stadium/Arena	Average Daily Attendance	10	0.04	0.02
INSTITUTIONAL				
College/University	Student	20	0.09	0.05
Private School	1000 ft ²	200	0.86	0.45
Church	1000 ft ²	50	0.21	0.11

APPENDIX D



COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

GRACE ROBINSON HYDE
Chief Engineer and General Manager

February 26, 2014

Ref File No.: 2858264

RECEIVED
FEB 27 2014
Community Development

Mr. Aldo E. Schindler
Director of Community Development
City of Whittier
13230 Penn Street, 2nd Floor
Whittier, CA 90602-1772

Dear Mr. Schindler:

The Lincoln Specific Plan

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on January 24, 2014. The proposed development is located within the jurisdictional boundaries of District No. 18. We offer the following comments regarding sewerage service:

1. Availability of sewer capacity depends upon project size and timing of connection to the sewerage system. Because there are other proposed developments in the area, the availability of trunk sewer capacity should be verified as the project advances. Please submit a copy of the project's build-out schedule to the undersigned to ensure the project is considered when planning future sewerage system relief and replacement projects.
2. The wastewater flow originating from the proposed project will discharge to a local sewer line, which is not maintained by the Districts, for conveyance to the Districts' South Plant Outfall Trunk Sewer, located in Washington Boulevard at Rivera Road. This 21-inch diameter trunk sewer has a design capacity of 3.6 million gallons per day (mgd) and conveyed a peak flow of 2.4 mgd when last measured in 2013.
3. The wastewater generated by the proposed project will be treated at the Long Beach Water Reclamation Plant, which has a design capacity of 25 mgd and currently processes an average flow of 17.5 mgd.
4. The expected average wastewater flow from the project site is 262,714 gallons per day. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.
5. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System for increasing the strength or quantity of wastewater attributable to a particular parcel or operation already

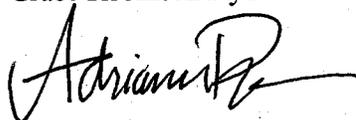
connected. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before a permit to connect to the sewer is issued. For a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Wastewater & Sewer Systems, Will Serve Program, and click on the appropriate link. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

6. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CCA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Grace Robinson Hyde



Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR:ar

cc: M. Tremblay
J. Ganz