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7. TECHNICAL APPENDICES

Appendix A Sewer Demand Calculations

Appendix B Water Demand Calculations

Appendix C Existing Water Quality Data

Appendix D Hydromodification Susceptibility Map

Appendix E LID Calculations

APPENDIX A

SEWER DEMAND CALCULATIONS

College Town Sewer Analysis

9/27/13

Existing and Proposed Development Intensities Per Initial Study Non-Residential Generation Factors Per OCSD Residendial Generation Factors Per City of Fullerton Master Plan

						AND FLOWS US	ENERATION FACTORS ING OCSD FACTORS	PROPOSED LANDUSE						PROPOSED SEWER GENERATION FACTORS AND FLOWS						
PA	EXISTING LOT ACRES	PROPOSED LOT ACRES	EXISTING LANDUSE	TOTAL EXISTING RESIDENTIAL DUS & NON RESIDENTIAL AC	OCSD LANDUSE	GENERATION FACTORS NON RES (gpd/ac) & RES (gpd/du)	EXISTING SEWER FLOW (gpd)	RESIDENTI		NON-RES FAR		OFFICE (ac)	INSTITUTIONAL (ac)	GENERATION FACTOR RESIDENTIAL (gpd/du)	SEWER FLOW RESIDENTIAL (gpd)	GENERATION FACTOR COMMERCIAL / OFFICE (gpd/ac)	GENERATION FACTOR INSTITUTIONAL (gpd/ac)	SEWER FLOW NON- RESIDENTIAL (gpd)		DIFFERENCE BETWEEN EXISTING AND PROPOSED SEWER FLOW (gpd)
1 1 1 1 1 TOTAL	0.59 6.32 6.56 1.46	14.84	LDS Nutwood East Nutwood West LDS Office	504 2.13	MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL OFFICE	240 2,262	120,960 4,818 125,778	80	1,195	0.14	0	2.13	0	240	286,800	2,262	2,715	4,818	291,618	
2 2 2 TOTAL	0.39 2.76 8.17 11.32	12.01	College Terrace Apts HIU-Dorm HIU- School	164 8.17	MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL INSTITUTIONAL	240 2,715	39,360 22,182 61,542	20	240	0.52	0.14	0	6.16	240	57,600	2,262	2,715	17,052	74,652	
3 TOTAL	8.18 8.18	9.81	CSUF	8.18	INSTITUTIONAL	2,715	22,209 22,209	50	490	0.82	1.42	1.80	4.77	240	117,600	5,429	2,715	30,456	148,056	
4 TOTAL	5.00 5.00	4.78	University Square	5.00	COMMERCIAL/ OFFICE	2,262	11,310 11,310	0	0	1.63	2.02	5.75	0	240	0	5,429	2,715	42,219	42,219	
5 5 5 5 5 5 707AL	3.77 3.37 0.99 0.85 0.85 0.86	10.71	Waterton The Pointe Vanguard Business Vanguard Business Vanguard Business Vanguard Business	273 4.40	MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE	240	65,520 9,953 75,473	110	1.175	0.09	0.91	0	0	240	282.000	2.262	2.715	2.067	284.067	
6 6 6 6 6 TOTAL	1.75 3.50 0.36 0.25 4.58 10.44	9.94	Univ. Office Park College Square College Square College Square College Square	10.44	COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE	2,262	23,615 23,615	70	730	0.37	2.73	0.92	0	240	175,200	2,262	2,715	8,262	183,462	
7 7 7 7 7 TOTAL	1.42 0.47 1.66 4.93 8.48	8.38	College Place College Place College Place College Place	8.48	COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE COMMERCIAL/ OFFICE	2,262	19,182 19,182	60	510	0.33	2.72	0	0	240	122,400	2,262	2,715	6,164	128,564	
TOTALS	69.04	70.47					339,108		4,340		9.95	10.61	10.94		1,041,600			111,038	1,152,638	
TOTAL EXISTING SEWER FLOW GPD							339,108	TOTAL FLOW INCREASE DUE TO PROJECT									813,530			

ADJUSTED TOTAL SEWER GENERATION (EXISTING)

Adjustment for Systems losses; 6% of Total Water Use (0.6 x 339,108 GPD) Per City of Fullerton

Adjustment for Landscape Uses

Per Orange County Landscape and Irrigation Code Turf Area Use = 1,450 GPD/AC Ordinance No. 09-010 General Landscape = 720 GPD/AC Total Developed Area Excluding Streets = 69 Acres

Landscaped Area; 10% of Developed Area = 6.9 Acres Turf Area = 20% of Landscaped Area = 1.4 Acres

General Landscape Area = 5.5 Acres

5975 GPD Total Landscape Use =

TOTAL ADJUSTED SEWER GENERATION = 312,787 GPD

20.346 GPD

ADJUSTED TOTAL SEWER GENERATION (PROPOSED)

Adjustment For System Losses; 6% of Total Water Use (.06 X 1,251,154 GPD) Per City of Fullerton

Adjustment For Landscape Uses

Turf Area Use = 1,450 GPD/AC General Landscape = 720 GPD/AC

Methodology: Total Developed Area Excluding Streets = 69 Acres Landscaped Area; 15% of Developed Area = 10.4 Acres

Turf Area = 20% of Landscaped Area = 2.1 Acres General Landscape Area = 8.3 Acres

2.1 ac X 1,450 = 3,045 GPD 8.3 ac X 720 = 5,976 GPD Total Landscape Use =

9,024 GPD

75,069 GPD

TOTAL ADJUSTED SEWER GENERATION = 1,068,548 GPD

SEWER GENERATION RATES AGENCY COMPARISON

GENERATION	PEOPLE	
FACTOR	PER DU	GPD/DU
105 gpcd	3.3	347
75 gpcd	3.2	240
142 gpd/du	NA	142
200 gpd/du	NA	200
75 gpcd	3	225
	FACTOR 105 gpcd 75 gpcd 142 gpd/du 200 gpd/du	FACTOR PER DU 105 gpcd 3.3 75 gpcd 3.2 142 gpd/du NA 200 gpd/du NA

APPENDIX B

WATER DEMAND CALCULATIONS

College Town Water Analysis 9/25/13

Existing and Proposed Development Intensities Per Initial Study Non-Residential Generation Factors Per City of Fullerton Water Department Consumption Records Residential Generation Factor of 71.8 gpcd Per City of Fullerton Water Department Consumption Records Residential Generation Based on Population For High Density Units(71.8 gpcd-3.2 persons per DU: 230 gpd/du)

					EXISTING WATER DEMAN	D FACTORS AND FLOWS	PROPOSED LANDUSE						PROPOSED WATER DEMAND FACTORS AND FLOWS						
						RESIDENTIAL NON-RESIDENTIAL													
РА	EXISTING LOT ACRES	PROPOSED LOT ACRES	EXISTING LANDUSE	TOTAL EXISTING RESIDENTIAL DU'S & NON RESIDENTIAL AC	NON-RESIDENTIAL GENERATION FACTORS (gpd/ac) & RESIDENTIAL (gpd/du)	TOTAL EXISTING WATER DEMAND (gpd)		DUs	NON-RES FAR	COMMERCIAL (ac)		INSTITUTIONAL (ac)	GENERATION FACTOR RESIDENTIAL (gpd/du)	WATER DEMAND RESIDENTIAL (gpd)	GENERATION FACTOR COMMERCIAL / OFFICE (gpd/ac) (1)	GENERATION FACTOR INSTITUTIONAL (gpd/ac) (1)	WATER DEMAND NON-RESIDENTIAL (gpd)	PROPOSED WATER DEMAND TOTAL (gpd)	DIFFERENCE BETWEEN EXISTING AND PROPOSED WATER DEMAND (gpd)
1	0.59		LDS																
1	6.32		Nutwood East																
1	6.56		Nutwood West																
1	1.46		LDS	503	230	115,690													
			Office	2.05	3,052	6,257													
TOTAL	14.93	14.84				121,947	80	1,195	0.14	0	2.05	0	230	274,850	5,654	1,567	11,591	286,441	
2 2 2	0.39 2.76 8.17	12.04	College Terrace Apts HIU-Dorm HIU- School	164 8.17	230 639	37,720 5,221	20	240	0.53	247		6.00	220	55,200	5.654	4567	24.674	76.074	
TOTAL	11.32	12.01				42,941	20	240	0.52	2.17	0	6.00	230	55,200	5,654	1,567	21,671	76,871	-
3	8.18		CSUF	8.18	639	5,227													
TOTAL	8.18	9.81	CSUF	0.10	059	5,227	50	490	0.82	1.65	2.03	4.50	230	112,700	5,654	1,567	27,858	140,558	
TOTAL	0.10	5.61				3,221	30	430	0.02	1.03	2.03	4.50	250	112,700	3,034	1,507	27,030	140,556	-
4 TOTAL	5.00 5.00	4.78	University Square	5.00	3,052	15,260 15,260	0	0	1.63	1.76	3.24	0	0	0	5,654	0	28,270	28,270	
5 5 5 5	3.77 3.37 0.99 0.85		Waterton The Pointe Vanguard Business Vanguard Business	273	230	62,790													
5 5 TOTAL	0.85 0.86 10.69	10.71	Vanguard Business Vanguard Business	3.55	3,052	10,835 73,625	110	1,175	0.09	3.55	0	0	230	270,250	5,654	0	20,072	290,322	
6 6 6 6 6 70TAL	1.75 3.50 0.36 0.25 4.58 10.44	9.94	Univ. Office Park College Square College Square College Square College Square	10.44	3,052	31,863 31,863	70	730	0.37	6.93	3.51	0	230	167,900	5,654	0	59,028	226,928	
7 7 7 7 TOTAL	1.42 0.47 1.66 4.93 8.48	8.38	College Place College Place College Place College Place	8.48	3,052	25,881 25,881	60	510	0.33	8.48	0	0	230	117,300	5,654	0	47,946	165,246	
TOTALS	69.04					100,543	2.5	4,340		24.54	10.83	10.50		998,200	-,		216,435	1,214,635	
EXISTING RESIDENTIAL DEMAND TOTAL EXISTING DEMAND GPD						216,200 316,743				1		1		1			TOTAL DEMA DUE TO		897,893

⁽¹⁾ Based on Proportion of Proposed to Existing Building Square Footage.

Existing Commercial Office Building SF = 398,760 SF Proposed Commercial Office Building SF =895,500 SF

Commercial Office Proportion = 2.25

Commercial Office Proposed Generation Factor = 6,853 (2.25 X 3,052)

Existing Institutional Building SF = 302,620 SF Proposed Institutional Building SF = 476,400 SF Institutional Proportion = 1.57

Institutional Proposed Generation Factor = 1,006 (1.57 X 639)

APPENDIX C

EXISTING WATER QUALITY DATA

