

**HYDROLOGY COMPARISON BETWEEN 2012 UTILITY INFRASTRUCTURE MASTER PLAN CONDITIONS AND
MEASURE RR BUILD OUT CONDITIONS
(25-YEAR DESIGN FREQUENCY)**

	Utility Infrastructure Master Plan (UIMP) (2012)			MEASURE RR CONDITIONS						Difference Between Measure RR Conditions and UIMP			
				Farm Precinct (2015)			Hydrology Map - Overall 2016					Total Measure RR Conditions	
	Subarea	Area (ac)	Q25 (cfs)	Subarea	Area (ac)	Q25 (cfs)	Subarea	Area (ac)	Q25 (cfs)	Area (ac)	Q25 (cfs)	Area (ac)	Q25 (cfs)
LINE A	1-A	28.6	56.6	B-1	5.02	12.87	4-A	8.1	21.08				
							4-B	6.2	14.51				
							4-C	4.8	12.48				
							3-C**	5.8	13.44				
	Total	28.6	56.6		5.02	12.87		24.9	61.51	29.92	74.38	1.32	17.78
	2-A	13.4	29.7	E-1	8	19.53							
				A-1	5.98	14.7							
	Total	13.4	29.7		13.98	34.23				13.98	34.23	0.58	4.53
	3-B	22.2	44	D-2	16.34	36.96							
	Total	22.2	44		16.34	36.96				16.34	36.96	-5.86	-7.04
	4-C	47.2	100.3	B-2	24.41	55.55							
			C-1	4.99	12.78								
			C-2	18.52	39.95								
Total	47.2	100.3		47.92	108.28				47.92	108.28	0.72	7.98	
7-A	19.8	33.9				4-D	14.5	27.58					
						4-J	2.79	5.37					
Total	19.8	33.9					17.29	32.95	17.29	32.95	-2.51	-0.95	
8-B	20.9	40.1				4-F	20.9	39.75					
Total	20.9	40.1					20.9	39.75	20.9	39.75	0	-0.35	
9-B	35.9	77.3				4-E	23.2	46.71					
						4-G	9.1	24.97					
Total	35.9	77.3					32.3	71.68	32.3	71.68	-3.6	-5.62	
11-B	27	57.4				4-H	16	36.53					
						4-I*	12.7	34.85					
Total	27	57.4					28.7	71.38	28.7	71.38	1.7	13.98	
Total Area and Flow In Line A	215	439.3		83.26	192.34		124.09	277.27	207.35	469.61	-7.65	30.31	

LINE B	1-A	22	46.7			3-B	26.2	55.53				
	Total	22	46.7				26.2	55.53	26.2	55.53	4.2	8.83
	2-A	4.1	7.9			3-D	4.13	8.63				
	Total	4.1	7.9				4.13	8.63	4.13	8.63	0.03	0.73
3-A	28.6	54.8			3-A	27.3	51.88					
Total	28.6	54.8				27.3	51.88	27.3	51.88	-1.3	-2.92	
4-A	33.4	60.1			5-A	32.1	56.51					
Total	33.4	60.1				32.1	56.51	32.1	56.51	-1.3	-3.59	
Total Area and Flow In Line B	88.1	169.5				89.73	172.55	89.73	172.55	1.63	3.05	

LINE C	1-A	15.1	34.9			2-A	8.2	18.37				
						2-B	3.3	9.86				
						2-C	3.4	8.86				
Total	15.1	34.9				14.9	37.09	14.9	37.09	-0.2	2.19	
Total Area and Flow In Line C	15.1	34.9				14.9	37.09	14.9	37.09	-0.2	2.19	

LINE D	1-A	32.6	54.6			1-A	12.8	22.88				
						1-B	2.9	8.63				
						1-C	4.9	13.48				
						1-D	6.9	19.02				
						1-E	5.6	15.43				
Total	32.6	54.6				33.1	79.44	33.1	79.44	0.5	24.84	
Total Area and Flow In Line D	32.6	54.6				33.1	79.44	33.1	79.44	0.5	24.84	

*Measure RR hydrology included offsite Q. See attached calculation for comparable onsite Q only, included in table

**Measure RR area 3-C is tributary to Line B. However, 2012 UIMP shows it tributary to Line A.

Line	Utility Infrastructure Master Plan 2012		Measure RR		Difference		Percent Change	
	Area (Ac)	Q25 (cfs)	Area (Ac)	Q25 (cfs)	Area (Ac)	Q25 (cfs)	Area (Ac)	Q25 (cfs)
LINE A	215	439.3	207.35	469.61	-7.65	30.31	-3.6%	6.9%
LINE B	88.1	169.5	89.73	172.55	1.63	3.05	1.9%	1.8%
LINE C	15.1	34.9	14.9	37.09	-0.2	2.19	-1.3%	6.3%
LINE D	32.6	54.6	33.1	79.44	0.5	24.84	1.5%	45.5%
Total	350.8	698.3	345.08	758.69	-5.72	60.39	-1.6%	8.6%

Summary:

The calculations show that the areas tributary to Line A and Line D have the greatest increase in the 25-year storm flows.

Line A

The subareas 1-A, 11-B, and 4-C from the Utility Infrastructure Master Plan showed the largest increase in Q25 flow rates from tributary Measure RR and Farm Precint subareas. However, no new development occurred in these areas between 2012 and Measure RR Conditions. The differences may be derived from varying hydrology methods, including different subareas sizes and boundaries between the two studies (e.g. Measure RR and Farm Precint studies included additional subareas).

Line D

The Utility Infrastructure Master Plan subarea 1-A showed the greatest increase in Q25 the most when compared to the Measure RR analysis. The Food Services building is the only Measure RR new development in this area and should not have increased the runoff volume by the amount indicated in the calculations. The difference may have to do with varying hydrology methods, including increased subareas between the studies (e.g. Measure RR study included additional subareas).

For the purpose of the SEIR it may be helpful to analyze the difference in conditions within these subareas in order to provide site specific hydrology analysis for the 2012 conditions using the same subareas and methodology as was employed for the Measure RR conditions study.

Peak Flow Hydrologic Analysis

File location: W:/Mt_SAC/1MTS013200/ENGR/CALCS/1MTS013200 - 4-I.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	1MTS013200
Subarea ID	4-I
Area (ac)	12.7
Flow Path Length (ft)	783.91
Flow Path Slope (vft/hft)	0.05
50-yr Rainfall Depth (in)	6.9
Percent Impervious	0.25
Soil Type	2
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.0582
Peak Intensity (in/hr)	3.0858
Undeveloped Runoff Coefficient (Cu)	0.8857
Developed Runoff Coefficient (Cd)	0.8893
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	34.8515
Burned Peak Flow Rate (cfs)	34.8515
24-Hr Clear Runoff Volume (ac-ft)	3.3938
24-Hr Clear Runoff Volume (cu-ft)	147833.9464

