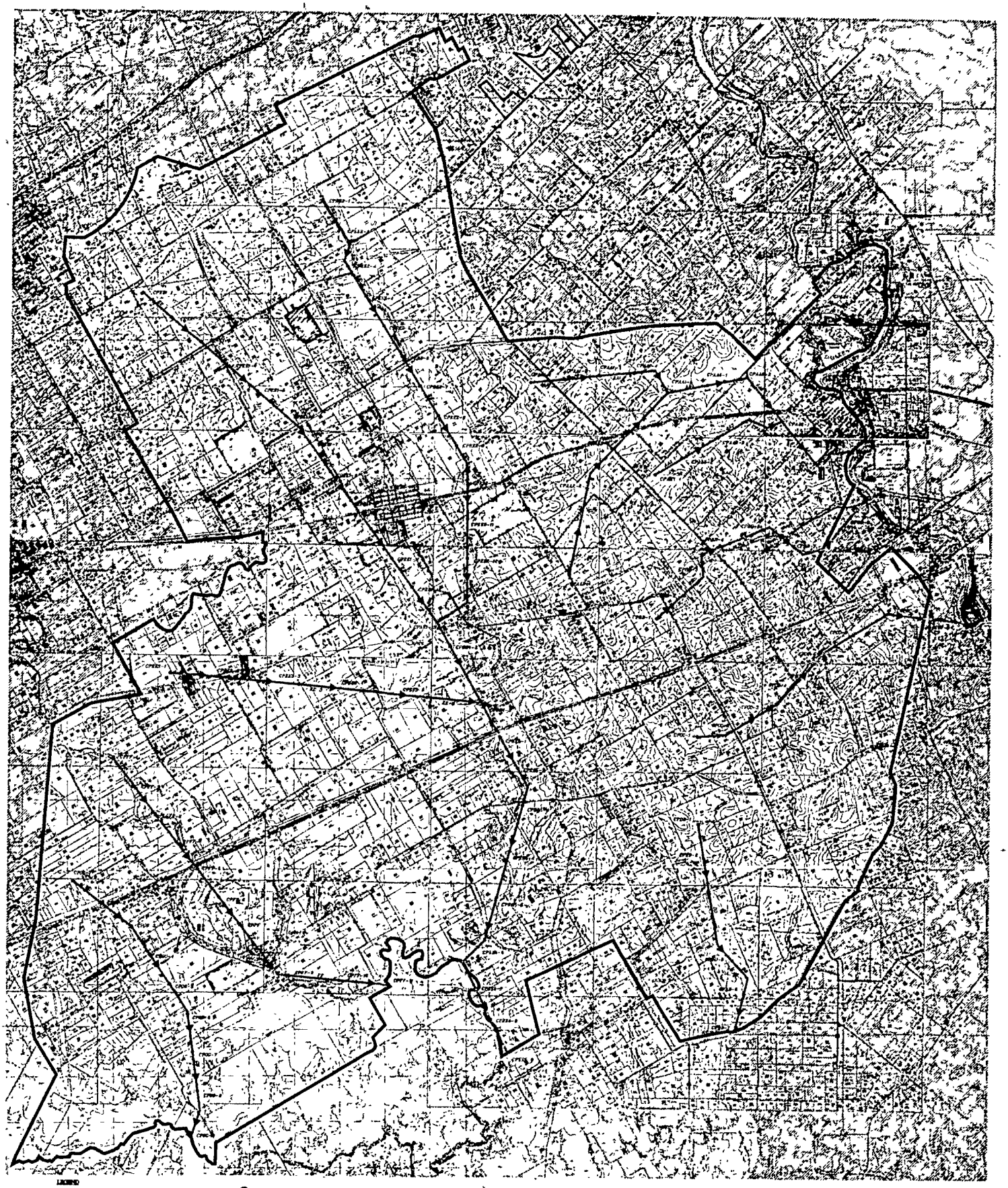

EXHIBIT-6

GVSUD PROPOSED GROWTH AND DEVELOPMENT

DESIGNED SH	PROJECT NO. 6096-07	DATE. 11/2006	SHEET NO 6 OF 6

RIVER CITY ENGINEERING, LTD.
CONSULTING CIVIL ENGINEERS

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Attachment 2
Calculation Tables

- Exhibit 1 Total Equivalent Dwelling Unit (EDU) Calculations
- Exhibit 2 Wastewater Main Collection System Calculations
- Exhibit 3 Proposed Costs for Wastewater Main Collection System
- Exhibit 4 Wastewater Treatment Plant Capacity and Costs

Green Valley Special Utility District
EDU Calculation Summary
Total EDU Calculations

Drainage Basin ID	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU 1	Development Density (3 EDU/acre)	Total EDU 3
A	9,211	1	9,211	3	27,633
B	4,690	1	4,690	3	14,070
C	5,636	1	5,636	3	16,908
D	6,688	1	6,688	3	20,064
E	35,618	1	35,618	3	106,854
F	6,515	1	6,515	3	19,545
G	7,511	1	7,511	3	22,533
	75,869		**75,869**		**227,607**

Green Valley Special Utility District
Drainage Area A
Total EDU Calculations

A

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe AA1								
A1	A46	256	520	776	1	776	3	2,328
A2	A43	177	144	321	1	321	3	963
A3	A38	169	129	298	1	298	3	894
A4	A37	175	114	289	1	289	3	867
A5	A28	210	73	283	1	283	3	849
			Total Acres =	**1967**	**Total EDU =**	**1,967**	**Total EDU =**	**5,901**
Pipe AA 2								
A45	A44	931	71	1002	1	1,002	3	3,006
A42	A41	486	287	773	1	773	3	2,319
A39	A40	234	394	628	1	628	3	1,884
A36	A35	131	119	250	1	250	3	750
A29	A30	34	133	167	1	167	3	501
			Total Acres =	**2820**	**Total EDU =**	**2,820**	**Total EDU =**	**8,460**
Pipe AA3								
A34	A33	93	246	339	1	339	3	1,017
A31	A32	127	195	322	1	322	3	966
A26	A25	93	262	355	1	355	3	1,065
A23	A24	127	220	347	1	347	3	1,041
A20	A19	50	240	290	1	290	3	870
			Total Acres =	**1653**	**Total EDU =**	**1,653**	**Total EDU =**	**4,959**
Pipe AA4								
A12	A11	211	17	228	1	228	3	684
A13	A10	314	69	383	1	383	3	1,149
A14	A9	252	36	288	1	288	3	864
A8	A48	269	72	340	1	340	3	1,021
			Total Acres =	**1239**	**Total EDU =**	**1,239**	**Total EDU =**	**3,718**
Pipe AA5								
A6	A27	233	103	336	1	336	3	1,008
A7	A22	266	118	384	1	384	3	1,152
			Total Acres =	**720**	**Total EDU =**	**720**	**Total EDU =**	**2,160**
PipeAA6								
A15	A21	181	62	243	1	243	3	730
			Total Acres =	**243**	**Total EDU =**	**243**	**Total EDU =**	**730**
PipeAA7								
A47	A18	208	92	301	1	301	3	902
			Total Acres =	**301**	**Total EDU =**	**301**	**Total EDU =**	**902**
PipeAA8								
A16	A17	253	15	268	1	268	3	804
			Total Acres =	**268**	**Total EDU =**	**268**	**Total EDU =**	**804**
			Basin A (acres) =	**9,211**	**Basin A (EDU) =**	**9,211**	**Basin A (EDU) =**	**27,633**

Green Valley Special Utility District
Drainage Area B
Total EDU Calculations

B

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe BB								
B1	B16	367	267	634	1	634	3	1,903
B2	B15	287	207	494	1	494	3	1,482
B3	B14	229	251	480	1	480	3	1,439
B4	B13	216	366	582	1	582	3	1,747
B5	B12	190	384	574	1	574	3	1,723
B6	B11	285	206	491	1	491	3	1,474
B7	B10	306	209	515	1	515	3	1,545
B8	B9	216	704	920	1	920	3	2,759
			Basin B (acres) =	**4690**	**Basin B (EDU) =**	**4,690**	**Basin B (EDU) =**	**14,071**

Green Valley Special Utility District
Drainage Area C
Total EDU Calculations

C

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe CC								
C1	C20	314	150	464	1	464	3	1,391
C2	C19	365	173	537	1	537	3	1,612
C3	C18	373	192	565	1	565	3	1,694
C4	C17	331	271	602	1	602	3	1,807
C5	C16	233	332	565	1	565	3	1,696
C6	C15	259	457	716	1	716	3	2,149
C7	C14	203	584	788	1	788	3	2,363
C8	C13	119	520	639	1	639	3	1,916
C9	C12	152	405	557	1	557	3	1,670
C10	C11	9	194	203	1	203	3	610
			Basin C (acres) =	**5636**	**Basin C (EDU) =**	**5,636**	**Basin C (EDU) =**	**16,908**

Green Valley Special Utility District
Drainage Area D
Total EDU Calculations

D

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe DD								
D14	D1	1068	401	1468	1	1,468	3	4,405
D13	D2	815	374	1189	1	1,189	3	3,567
D12	D3	725	411	1135	1	1,135	3	3,406
D11	D4	610	326	936	1	936	3	2,809
D10	D5	466	376	842	1	842	3	2,527
D9	D6	283	407	690	1	690	3	2,071
D8	D7	128	297	426	1	426	3	1,277
			Basin D (acres) =	**6688**	**Basin D (EDU) =**	**6,688**	**Basin D (EDU) =**	**20,063**

Green Valley Special Utility District
Drainage Area E
Total EDU Calculations

E

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe EE 1								
E86	E60	1455	442	1897	1	1,897	3	5,691
E61	E59	476	311	787	1	787	3	2,361
E62	E58	424	365	789	1	789	3	2,366
E63	E57	383	419	802	1	802	3	2,406
E64	E56	343	517	860	1	860	3	2,579
E65	E55	302	58	360	1	360	3	1,080
E66	E54	267	625	892	1	892	3	2,676
E67	E53	259	646	905	1	905	3	2,715
E68	E52	255	471	725	1	725	3	2,176
E69	E51	248	416	664	1	664	3	1,993
E70	E50	224	381	605	1	605	3	1,816
E71	E49	167	312	479	1	479	3	1,438
E72	E48	130	250	381	1	381	3	1,142
			Total Acres =	**10146**	**Total EDU =**	**10,146**	**Total EDU =**	**30,438**
Pipe EE 2								
E1	E85	2297	574	2871	1	2,871	3	8,612
E2	E84	519	347	866	1	866	3	2,598
E3	E83	484	322	806	1	806	3	2,417
E4	E82	464	279	743	1	743	3	2,230
E5	E81	419	273	692	1	692	3	2,076
E6	E80	406	266	673	1	673	3	2,018
E7	E79	229	260	489	1	489	3	1,466
E8	E78	151	253	404	1	404	3	1,213
E9	E77	135	247	382	1	382	3	1,146
E10	E76	142	232	374	1	374	3	1,122
E11	E75	161	183	345	1	345	3	1,034
E12	E74	151	140	291	1	291	3	874
E13	E73	291	110	401	1	401	3	1,204
			Total Acres =	**9337**	**Total EDU =**	**9,337**	**Total EDU =**	**28,011**
Pipe EE 3								
E39	E38	1168	50	1218	1	1,218	3	3,655
E40	E37	619	179	797	1	797	3	2,392
E41	E36	477	32	509	1	509	3	1,526
E42	E35	334	509	843	1	843	3	2,530
E43	E34	192	628	820	1	820	3	2,460
E44	E33	51	805	856	1	856	3	2,568
			Total Acres =	**5044**	**Total EDU =**	**5,044**	**Total EDU =**	**15,132**
Pipe EE 4								
E14	E47	466	184	649	1	649	3	1,948
E15	E46	414	106	520	1	520	3	1,560
E16	E45	578	28	606	1	606	3	1,817
			Total Acres =	**1775**	**Total EDU =**	**1,775**	**Total EDU =**	**5,325**
Pipe EE 5								
E17	E32	607	925	1532	1	1,532	3	4,596
E18	E31	644	1036	1679	1	1,679	3	5,038
E19	E30	585	1003	1588	1	1,588	3	4,764
E20	E29	67	801	868	1	868	3	2,603
E21	E28	621	650	1271	1	1,271	3	3,813
E22	E27	567	375	942	1	942	3	2,825
E23	E26	665	17	682	1	682	3	2,045
E24		564		564	1	564	3	1,692
E25		191		191	1	191	3	574
			Total Acres =	**9317**	**Total EDU =**	**9,317**	**Total EDU =**	**27,950**
			Basin E (acres) =	**35,618**	**Basin E (EDU) =**	**35,618**	**Basin E (EDU) =**	**106,855**

Green Valley Special Utility District
Drainage Area F
Total EDU Calculations

F

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe FF								
F1	F22	614	233	847	1	847	3	2,542
F2	F21	379	343	722	1	722	3	2,166
F3	F20	389	291	680	1	680	3	2,040
F4	F19	451	229	680	1	680	3	2,041
F5	F18	500	239	739	1	739	3	2,216
F6	F17	452	229	681	1	681	3	2,042
F7	F16	313	284	597	1	597	3	1,791
F8	F15	295	233	528	1	528	3	1,585
F9	F14	363	89	451	1	451	3	1,354
F10	F13	250	86	337	1	337	3	1,010
F11	F12	82	171	253	1	253	3	758
			Basin F (acres) =	**6515**	**Basin F (EDU) =**	**6,515**	**Basin F (EDU) =**	**19,544**

Green Valley Special Utility District
Drainage Area G
Total EDU Calculations

G

Sub-Area Left ID	Sub-Area Right ID	Sub-Area Left (acres)	Sub-Area Right (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU	Development Density (3 EDU/acre)	Total EDU
Pipe GG								
G1	G18	267	96	363	1	363	3	1,088
G2	G17	187	268	455	1	455	3	1,365
G3	G16	144	452	596	1	596	3	1,789
G4	G15	129	552	681	1	681	3	2,043
G5	G14	90	594	685	1	685	3	2,054
G6	G13	160	661	821	1	821	3	2,463
G7	G12	387	838	1225	1	1,225	3	3,674
G8	G11	563	600	1163	1	1,163	3	3,488
G9	G10	1410	113	1523	1	1,523	3	4,569
			Basin G (acres) =	**7511**	**Basin G (EDU) =**	**7,511**	**Basin G (EDU) =**	**22,534**

Green Valley Special Utility District Design Flow Summary		
Design Flow	Development Density	
	1 EDU/Acre	3 EDU/Acre
Average Dry Weather Flow	245 GPD/EDU	245 GPD/EDU
Maximum Dry Weatherh Flow	735 GPD/EDU	735 GPD/EDU
Maximum Wet Weather Flow	1485 GPD/EDU	985 GPD/EDU

Green Valley Special Utility District
Wastewater Design Flows
Three Design Flow Conditions

Drainage Basin	Total Area (acres)	Total EDU 1 (EDU/acre)	Total EDU 3 (EDU/acre)	Development Density of 1 EDU/acre			Development Density of 3 EDU/acre		
				Average Dry Weather Flow (GPD)	Maximum Dry Weather Flow (GPD)	Maximum Wet Weather Flow (GPD)	Average Dry Weather Flow (GPD)	Maximum Dry Weather Flow (GPD)	Maximum Wet Weather Flow (GPD)
Drainage Basin A	9,211	9,211	27,633	2,256,695	6,770,085	13,678,335	6,770,085	20,310,255	27,218,505
Drainage Basin B	4,690	4,690	14,070	1,149,050	3,447,150	6,964,650	3,447,150	10,341,450	13,858,950
Drainage Basin C	5,636	5,636	16,908	1,380,820	4,142,460	8,369,460	4,142,460	12,427,380	16,654,380
Drainage Basin D	6,688	6,688	20,064	1,638,560	4,915,680	9,931,680	4,915,680	14,747,040	19,763,040
Drainage Basin E	35,618	35,618	106,854	8,726,410	26,179,230	52,892,730	26,179,230	78,537,690	105,251,190
Drainage Basin F	6,515	6,515	19,545	1,596,175	4,788,525	9,674,775	4,788,525	14,365,575	19,251,825
Drainage Basin G	7,511	7,511	22,533	1,840,195	5,520,585	11,153,835	5,520,585	16,561,755	22,195,005

Green Valley Special Utility District
1 EDU/acre
Pipe Diameter Design Summary

Pipe Diameter (in)	Basin A Pipe Length (ft)	Basin B Pipe Length (ft)	Basin C Pipe Length (ft)	Basin D Pipe Length (ft)	Basin E Pipe Length (ft)	Basin F Pipe Length (ft)	Basin G Pipe Length (ft)	Total Pipe Length (ft)
8								0
10								0
12	5,600							5,600
15	8,200	2,600	2,600				2,700	16,100
18	19,800	5,600	5,600			2,500	2,700	36,200
21	9,000	7,000	5,600	2,500	7,350	2,500	5,000	38,950
24	3,500	5,000	5,200	2,500	17,200	5,000	2,500	40,900
27	2,500		5,000	5,300	22,300	5,000	2,800	42,900
30	2,500			5,600	15,450	12,200	2,900	38,650
33	11,400				21,650		3,000	36,050
36					5,800			5,800
42								0
48					7,000			7,000
54					18,500			18,500
60					9,600			9,600
66								0
72								0
Total	62,500	20,200	24,000	15,900	124,850	27,200	21,600	296,250
							56	Miles

Green Valley Special Utility District
Drainage Area A - 1 EDU
Pipe Flow Design Calculations

1 EDU A

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe AA1	Upstream	CP AA1-1	256	520	776	1.0	776	190,120	190,120	1,152,360	800	1.78	1.78								
Pipe AA1	CP AA1-1	CP AA1-2	177	144	321	1.0	321	78,645	268,765	476,685	331	0.74	2.52	600	585	2,500	0.0060	11.60	14.50	**15**	4.09
Pipe AA1	CP AA1-2	CP AA1-3	169	129	298	1.0	298	73,010	341,775	442,530	307	0.68	3.21	585	570	2,500	0.0060	12.70	15.87	**18**	4.62
Pipe AA1	CP AA1-3	CP AA1-4	175	114	289	1.0	289	70,805	412,580	429,165	298	0.66	3.87	570	555	2,500	0.0060	13.62	17.03	**18**	4.62
Pipe AA1	CP AA1-4	CP AA1-5	210	73	283	1.0	283	69,335	481,915	420,255	292	0.65	4.52	555	540	3,500	0.0050	14.94	18.68	**21**	4.67
1	**Total**		**987**	**980**	**1967**		**1967**	**481,915**		**2,920,995**	**2,028**	**4.52**				**11,000**	**0.0058**				
Pipe AA2	Upstream	CP AA2-1	931	71	1002	1.0	1002	245,490	245,490	1,487,970	1033	2.30	2.30								
Pipe AA2	CP AA2-1	CP AA2-2	486	287	773	1.0	773	189,385	434,875	1,147,905	797	1.78	4.08	590	578	3,500	0.0050	14.38	17.97	**18**	4.21
Pipe AA2	CP AA2-2	CP AA2-3	234	394	628	1.0	628	153,860	588,735	932,580	648	1.44	5.52	578	565	3,000	0.0050	16.11	20.14	**21**	4.67
Pipe AA2	CP AA2-3	CP AA2-4	131	119	250	1.0	250	61,250	649,985	371,250	258	0.57	6.10	565	553	2,500	0.0050	16.72	20.90	**21**	4.67
Pipe AA2	CP AA2-4	CP AA1-5	34	133	167	1.0	167	40,915	690,900	247,995	172	0.38	6.48	553	540	3,500	0.0050	17.10	21.38	**24**	5.11
2	**Total**		**1816**	**1004**	**2820**		**2820**	**690,900**		**4,187,700**	**2,908**	**6.48**				**12,500**	**0.0050**				
Pipe AA3	Upstream	CP AA3-1	93	246	339	1.0	339	83,055	83,055	503,415	350	0.78	0.78								
Pipe AA3	CP AA3-1	CP AA3-2	127	195	322	1.0	322	78,890	161,945	478,170	332	0.74	1.52	600	581	2,600	0.0073	9.25	11.56	**12**	3.89
Pipe AA3	CP AA3-2	CP AA3-3	93	262	355	1.0	355	86,975	248,920	527,175	366	0.82	2.33	581	563	2,700	0.0067	11.05	13.81	**15**	4.31
Pipe AA3	CP AA3-3	CP AA3-4	127	220	347	1.0	347	85,015	333,935	515,295	358	0.80	3.13	563	545	2,800	0.0064	12.42	15.53	**18**	4.78
Pipe AA3	CP AA3-4	CP AA6-1	50	240	290	1.0	290	71,050	404,985	430,650	299	0.67	3.80	545	525	2,500	0.0080	12.82	16.02	**18**	5.33
3	**Total**		**490**	**1163**	**1653**		**1653**	**404,985**		**2,454,705**	**1,705**	**3.80**				**10,600**	**0.0071**				
Pipe AA4	Upstream	CP AA4-1	211	17	228	1.0	228	55,860	55,860	338,580	235	0.52	0.52								
Pipe AA4	CP AA4-1	CP AA4-2	314	69	383	1.0	383	93,835	149,695	568,755	395	0.88	1.40	550	543	3,000	0.0050	9.64	12.05	**12**	3.22
Pipe AA4	CP AA4-2	CP AA4-3	252	36	288	1.0	288	70,560	220,255	427,680	297	0.66	2.07	543	536	3,000	0.0050	11.14	13.93	**15**	3.73
Pipe AA4	CP AA4-3	CP AA5-2	269	72	341	1.0	341	83,545	303,800	506,385	352	0.78	2.85	536	530	6,000	0.0050	12.57	15.71	**18**	4.21
4	**Total**		**1046**	**194**	**1240**		**1240**	**303,800**		**1,841,400**	**1,279**	**2.85**				**12,000**	**0.0050**				
Pipe AA1	Upstream	CP AA1-5	987	980	1967	1.0	1967	481,915	481,915	2,920,995	2028	4.52	4.52								
Pipe AA2	Upstream	CP AA1-5	1816	1004	2820	1.0	2820	690,900	1,172,815	4,187,700	2908	6.48	11.00								
Pipe AA5	CP AA1-5	CP AA5-1	233	103	336	1.0	336	82,320	1,255,135	498,960	347	0.77	11.77	540	535	2,500	0.0050	21.40	26.75	**27**	5.52
Pipe AA5	CP AA5-1	CP AA5-2	266	118	384	1.0	384	94,080	1,349,215	570,240	396	0.88	12.65	535	530	2,500	0.0050	21.98	27.48	**30**	5.92
5	**Total**		**3302**	**2205**	**5507**		**5507**	**1,349,215**		**8,177,895**	**5,679**	**12.65**				**5,000**	**0.0050**				
Pipe AA4	Upstream	CP AA5-2	1046	194	1240	1.0	1240	303,800	303,800	1,841,400	1279	2.85	2.85								
Pipe AA5	CP AA1-5	CP AA5-2	3302	2205	5507	1.0	5507	1,349,215	1,653,015	8,177,895	5679	12.65	15.50								
Pipe AA6	CP AA5-2	CP AA6-1	181	62	243	1.0	243	59,535	1,712,550	360,855	251	0.56	16.06	530	525	4,500	0.0050	24.04	30.05	**33**	6.31
6	**Total**		**4529**	**2461**	**6990**		**6990**	**1,712,550**		**10,380,150**	**7,208**	**16.06**				**4,500**	**0.0050**				
Pipe AA3	Upstream	CP AA6-1	490	1163	1653	1.0	1653	404,985	404,985	2,454,705	1705	3.80	3.80								
Pipe AA6	CP AA5-2	CP AA6-1	4529	2461	6990	1.0	6990	1,712,550	2,117,535	10,380,150	7208	16.06	19.86								
Pipe AA7	CP AA6-1	CP AA7-1	208	92	300	1.0	300	73,500	2,191,035	445,500	309	0.69	20.55	525	510	4,900	0.0050	26.37	32.96	**33**	6.31
7	**Total**		**5227**	**3716**	**8943**		**8943**	**2,191,035**		**13,280,355**	**9,222**	**20.55**				**4,900**	**0.0050**				
Pipe AA7	CP AA6-1	CP AA7-1	5227	3716	8943	1.0	8943	2,191,035	2,191,035	13,280,355	9222	20.55	20.55								
Pipe AA8	CP AA7-1	CP AA8-1	253	15	268	1.0	268	65,660	2,256,695	397,980	276	0.62	21.16	510	495	2,000	0.0075	24.71	30.89	**33**	7.73
8	**Total**		**5480**	**3731**	**9211**		**9211**	**2,256,695**		**13,678,335**	**9,499**	**21.16**				**2,000**	**0.0075**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD
Population per EDU =	3.5	capita/EDU
Development Average Density =	1	EDU/acre
Wastewater Demand =	70	GPD/capita
Maximum Flow Peak Factor =	3	
Inflow/Infiltration =	750	gallon/acres served

Average Dry Weather Flow =	245	GPD/EDU
Maximum Dry Weather Flow =	735	GPD/EDU
Maximum Wet Weather Flow =	1485	GPD/EDU

Manning's Roughness Coefficient =	0.013
Percent of Pipe Flowing Full =	80%

Green Valley Special Utility District

Drainage Area B - 1 EDU

Pipe Flow Design Calculations

1 EDU B

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe BB	Upstream	CP BB-1	267	367	634	1.0	634	155,330	155,330	941,490	654	1.46	1.46								
Pipe BB	CP BB-1	CP BB-2	207	287	494	1.0	494	121,030	276,360	733,590	509	1.14	2.59	600	580	2,600	0.0077	11.19	13.99	15	4.63
Pipe BB	CP BB-2	CP BB-3	251	229	480	1.0	480	117,600	393,960	712,800	495	1.10	3.69	580	560	2,800	0.0071	12.96	16.20	18	5.04
Pipe BB	CP BB-3	CP BB-4	366	216	582	1.0	582	142,590	536,550	864,270	600	1.34	5.03	560	540	2,800	0.0071	14.55	18.19	18	5.04
Pipe BB	CP BB-4	CP BB-5	384	190	574	1.0	574	140,630	677,180	852,390	592	1.32	6.35	540	520	2,600	0.0077	15.66	19.57	21	5.79
Pipe BB	CP BB-5	CP BB-6	206	285	491	1.0	491	120,295	797,475	729,135	506	1.13	7.48	520	490	4,400	0.0068	17.03	21.29	21	5.45
Pipe BB	CP BB-6	CP BB-7	209	306	515	1.0	515	126,175	923,650	764,775	531	1.18	8.66	490	470	2,500	0.0080	17.46	21.83	24	6.46
Pipe BB	CP BB-7	CP BB-8	704	216	920	1.0	920	225,400	1,149,050	1,366,200	949	2.11	10.78	470	450	2,500	0.0080	18.95	23.69	24	6.46
Total			2594	2096	4690		4690	1,149,050		6,964,650	4,837	10.78				20,200	0.0076				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area C - 1 EDU
Pipe Flow Design Calculations

1 EDU C

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Actual (ft/sec)
Pipe CC	Upstream	CP CC-1	150	314	464	1.0	464	113,680	113,680	689,040	479	1.07	1.07								
Pipe CC	CP CC-1	CP CC-2	173	365	538	1.0	538	131,810	245,490	798,930	555	1.24	2.30	600	580	2,600	0.0077	10.70	13.38	15	4.63
Pipe CC	CP CC-2	CP CC-3	192	373	565	1.0	565	138,425	383,915	839,025	583	1.30	3.60	580	560	2,800	0.0071	12.83	16.04	18	5.04
Pipe CC	CP CC-3	CP CC-4	271	331	602	1.0	602	147,490	531,405	893,970	621	1.38	4.98	560	540	2,800	0.0071	14.50	18.12	18	5.04
Pipe CC	CP CC-4	CP CC-5	332	233	565	1.0	565	138,425	669,830	839,025	583	1.30	6.28	540	520	2,800	0.0071	15.81	19.77	21	5.58
Pipe CC	CP CC-5	CP CC-6	457	259	716	1.0	716	175,420	845,250	1,063,260	738	1.65	7.93	520	500	2,800	0.0071	17.25	21.57	21	5.58
Pipe CC	CP CC-6	CP CC-7	584	203	787	1.0	787	192,815	1,038,065	1,168,695	812	1.81	9.74	500	480	2,600	0.0077	18.38	22.97	24	6.33
Pipe CC	CP CC-7	CP CC-8	520	119	639	1.0	639	156,555	1,194,620	948,915	659	1.47	11.20	480	460	2,600	0.0077	19.37	24.22	24	6.33
Pipe CC	CP CC-8	CP CC-9	405	152	557	1.0	557	136,465	1,331,085	827,145	574	1.28	12.48	460	440	2,500	0.0080	20.03	25.03	27	6.99
Pipe CC	CP CC-9	CP CC-10	194	9	203	1.0	203	49,735	1,380,820	301,455	209	0.47	12.95	440	420	2,500	0.0080	20.31	25.38	27	6.99
	Total		3278	2358	5636		5636	1,380,820		8,369,460	5,812	12.95				24,000	0.0075				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area D - 1 EDU
Pipe Flow Design Calculations

1 EDU D

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Actual (ft/sec)
Pipe DD	Upstream	CP DD-1	401	1068	1469	1.0	1469	359,905	359,905	2,181,465	1515	3.38	3.38								
Pipe DD	CP DD-1	CP DD-2	374	815	1189	1.0	1189	291,305	651,210	1,765,665	1226	2.73	6.11	570	562	2,500	0.0050	16.73	20.91	21	4.01
Pipe DD	CP DD-2	CP DD-3	411	725	1136	1.0	1136	278,320	929,530	1,686,960	1172	2.61	8.72	562	554	2,500	0.0050	19.12	23.90	24	4.39
Pipe DD	CP DD-3	CP DD-4	326	610	936	1.0	936	229,320	1,158,850	1,389,960	965	2.15	10.87	554	546	2,500	0.0050	20.77	25.96	27	4.64
Pipe DD	CP DD-4	CP DD-5	376	466	842	1.0	842	206,290	1,365,140	1,250,370	868	1.93	12.80	546	538	2,800	0.0050	22.08	27.60	27	4.83
Pipe DD	CP DD-5	CP DD-6	407	283	690	1.0	690	169,050	1,534,190	1,024,650	712	1.59	14.39	538	530	3,000	0.0050	23.07	28.84	30	4.97
Pipe DD	CP DD-6	CP DD-7	297	128	425	1.0	425	104,125	1,638,315	631,125	438	0.98	15.37	530	522	2,600	0.0050	23.64	29.56	30	5.05
Total			2592	4095	6687		6687	1,638,315		9,930,195	6,896	15.37				15,900	0.0050				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area E - 1 EDU
Pipe Flow Design Calculations

1 EDU E

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe EE1	Upstream	CP EE1-1	442	1455	1897	1.0	1897	464,765	464,765	2,817,045	1956	4.36	4.36								
Pipe EE1	CP EE1-1	CP EE1-2	311	476	787	1.0	787	192,815	657,580	1,168,695	812	1.81	6.17	830	811	2,750	0.0069	15.80	19.75	21	5.49
Pipe EE1	CP EE1-2	CP EE1-3	365	424	789	1.0	789	193,305	850,885	1,171,665	814	1.81	7.98	811	792	2,750	0.0069	17.41	21.76	24	6.00
Pipe EE1	CP EE1-3	CP EE1-4	419	383	802	1.0	802	196,490	1,047,375	1,190,970	827	1.84	9.82	792	773	2,750	0.0069	18.82	23.52	24	6.00
Pipe EE1	CP EE1-4	CP EE1-5	517	343	860	1.0	860	210,700	1,258,075	1,277,100	887	1.98	11.80	773	754	2,750	0.0069	20.16	25.19	27	6.49
Pipe EE1	CP EE1-5	CP EE1-6	58	302	360	1.0	360	88,200	1,346,275	534,600	371	0.83	12.63	754	735	2,750	0.0069	20.67	25.84	27	6.49
Pipe EE1	CP EE1-6	CP EE1-7	625	267	892	1.0	892	218,540	1,564,815	1,324,620	920	2.05	14.68	735	716	2,750	0.0069	21.87	27.34	27	6.49
Pipe EE1	CP EE1-7	CP EE1-8	646	259	905	1.0	905	221,725	1,786,540	1,343,925	933	2.08	16.76	716	697	2,600	0.0073	22.75	28.43	30	7.16
Pipe EE1	CP EE1-8	CP EE1-9	471	255	726	1.0	726	177,870	1,964,410	1,078,110	749	1.67	18.42	697	678	2,600	0.0073	23.57	29.46	30	7.16
Pipe EE1	CP EE1-9	CP EE1-10	416	248	664	1.0	664	162,680	2,127,090	986,040	685	1.53	19.95	678	659	2,600	0.0073	24.29	30.36	30	7.16
Pipe EE1	CP EE1-10	CP EE1-11	381	224	605	1.0	605	148,225	2,275,315	898,425	624	1.39	21.34	659	640	2,600	0.0073	24.91	31.13	33	7.63
Pipe EE1	CP EE1-11	CP EE1-12	312	167	479	1.0	479	117,355	2,392,670	711,315	494	1.10	22.44	640	621	2,600	0.0073	25.38	31.73	33	7.63
Pipe EE1	CP EE1-12	CP EE1-13	250	130	380	1.0	380	93,100	2,485,770	564,300	392	0.87	23.31	621	600	3,100	0.0068	26.12	32.64	33	7.35
Total			**5213**	**4933**	**10146**		**10146**	**2,485,770**		*******	**10,463**	**23.31**				**32,600**	**0.0071**				
Pipe EE2	Upstream	CP EE2-1	574	2297	2871	1.0	2871	703,395	703,395	4,263,435	2961	6.60	6.60								
Pipe EE2	CP EE2-1	CP EE2-2	347	519	866	1.0	866	212,170	915,565	1,286,010	893	1.99	8.59	700	692	2,500	0.0050	19.01	23.76	24	5.11
Pipe EE2	CP EE2-2	CP EE2-3	322	484	806	1.0	806	197,470	1,113,035	1,196,910	831	1.85	10.44	692	684	2,900	0.0050	20.45	25.57	27	5.52
Pipe EE2	CP EE2-3	CP EE2-4	279	464	743	1.0	743	182,035	1,295,070	1,103,355	766	1.71	12.15	684	676	2,550	0.0050	21.65	27.06	27	5.52
Pipe EE2	CP EE2-4	CP EE2-5	273	419	692	1.0	692	169,540	1,464,610	1,027,620	714	1.59	13.74	676	668	2,550	0.0050	22.67	28.34	30	5.92
Pipe EE2	CP EE2-5	CP EE2-6	266	406	672	1.0	672	164,640	1,629,250	997,920	693	1.54	15.28	668	660	2,550	0.0050	23.60	29.49	30	5.92
Pipe EE2	CP EE2-6	CP EE2-7	260	229	489	1.0	489	119,805	1,749,055	726,165	504	1.12	16.40	660	652	2,550	0.0050	24.23	30.29	30	5.92
Pipe EE2	CP EE2-7	CP EE2-8	253	151	404	1.0	404	98,980	1,848,035	599,940	417	0.93	17.33	652	644	2,550	0.0050	24.74	30.92	33	6.31
Pipe EE2	CP EE2-8	CP EE2-9	247	135	382	1.0	382	93,590	1,941,625	567,270	394	0.88	18.21	644	636	2,500	0.0050	25.20	31.50	33	6.31
Pipe EE2	CP EE2-9	CP EE2-10	232	142	374	1.0	374	91,630	2,033,255	555,390	386	0.86	19.07	636	628	2,700	0.0050	25.64	32.05	33	6.31
Pipe EE2	CP EE2-10	CP EE2-11	183	161	344	1.0	344	84,280	2,117,535	510,840	355	0.79	19.86	628	620	2,800	0.0050	26.03	32.54	33	6.31
Pipe EE2	CP EE2-11	CP EE2-12	140	151	291	1.0	291	71,295	2,188,830	432,135	300	0.67	20.53	620	612	2,800	0.0050	26.36	32.95	33	6.31
Pipe EE2	CP EE2-12	CP EE2-13	110	291	401	1.0	401	98,245	2,287,075	595,485	414	0.92	21.45	612	604	4,400	0.0050	26.80	33.49	36	6.69
Pipe EE2	CP EE2-13	CP EE1-13	0	0	0	1.0	0	0	2,287,075	0	0	0.00	21.45	604	600	1,400	0.0050	26.80	33.49	36	6.69
Total			**3486**	**5849**	**9335**		**9335**	**2,287,075**		*******	**9,627**	**21.45**				**34,750**	**0.0050**				
Pipe EE3	Upstream	CP EE3-1	1168	50	1218	1.0	1218	298,410	298,410	1,808,730	1256	2.80	2.80								
Pipe EE3	CP EE3-1	CP EE3-2	619	179	798	1.0	798	195,510	493,920	1,185,030	823	1.83	4.63	665	646	4,600	0.0050	15.08	18.85	21	4.67
Pipe EE3	CP EE3-2	CP EE3-3	477	32	509	1.0	509	124,705	618,625	755,865	525	1.17	5.80	646	627	4,600	0.0050	16.41	20.51	24	5.11
Pipe EE3	CP EE3-3	CP EE3-4	334	509	843	1.0	843	206,535	825,160	1,251,855	869	1.94	7.74	627	608	4,600	0.0050	18.28	22.85	24	5.11
Pipe EE3	CP EE3-4	CP EE3-5	192	628	820	1.0	820	200,900	1,026,060	1,217,700	846	1.88	9.62	608	589	4,600	0.0050	19.84	24.80	27	5.52
Pipe EE3	CP EE3-5	CP EE4-3	51	805	856	1.0	856	209,720	1,235,780	1,271,160	883	1.97	11.59	589	570	4,000	0.0050	21.27	26.59	27	5.52
Total			**2841**	**2203**	**5044**		**5044**	**1,235,780**		**7,490,340**	**5,202**	**11.59**				**22,400**	**0.0050**				
Pipe EE1	Upstream	CP EE1-13	5213	4933	10146	1.0	10146	2,485,770	2,485,770	15,066,810	10463	23.31	23.31								
Pipe EE2	Upstream	CP EE1-13	3486	5849	9335	1.0	9335	2,287,075	4,772,845	13,862,475	9627	21.45	44.76								
Pipe EE4	CP EE1-13	CP EE4-1	184	466	650	1.0	650	159,250	4,932,095	965,250	670	1.49	46.26	600	590	2,000	0.0050	35.74	44.68	48	8.10
Pipe EE4	CP EE4-1	CP EE4-2	106	414	520	1.0	520	127,400	5,059,495	772,200	536	1.19	47.45	590	580	2,500	0.0050	36.09	45.11	48	8.10
Pipe EE4	CP EE4-2	CP EE4-3	28	578	606	1.0	606	148,470	5,207,965	899,910	625	1.39	48.84	580	570	2,500	0.0050	36.48	45.60	48	8.10
Total			**9017**	**12240**	**21257**		**21257**	**5,207,965**		*******	**21,921**	**48.84**				**7,000**	**0.0050**				
Pipe EE3	Upstream	CP EE4-3	2841	2203	5044	1.0	5044	1,235,780	1,235,780	7,490,340	5202	11.59	11.59								
Pipe EE4	CP EE1-13	CP EE4-3	9017	12240	21257	1.0	21257	5,207,965	6,443,745	31,566,645	21921	48.84	60.43								
Pipe EE5	CP EE4-3	CP EE5-1	925	607	1532	1.0	1532	375,340	6,819,085	2,275,020	1580	3.52	63.95	570	566	2,500	0.0050	40.36	50.45	54	8.77
Pipe EE5	CP EE5-1	CP EE5-2	1036	644	1680	1.0	1680	411,600	7,230,685	2,494,800	1733	3.86	67.81	566	561	2,500	0.0050	41.26	51.57	54	8.77
Pipe EE5	CP EE5-2	CP EE5-3	1003	585	1588	1.0	1588	389,060	7,619,745	2,358,180	1638	3.65	71.46	561	556	3,000	0.0050	42.08	52.60	54	8.77
Pipe EE5	CP EE5-3	CP EE5-4	801	67	868	1.0	868	212,660	7,832,405	1,288,980	895	1.99	73.46	556	551	3,500	0.0050	42.51	53.14	54	8.77
Pipe EE5	CP EE5-4	CP EE5-5	650	621	1271	1.0	1271	311,395	8,143,800	1,887,435	1311	2.92	76.38	551	546	3,500	0.0050	43.14	53.93	54	8.77
Pipe EE5	CP EE5-5	CP EE5-6	375	567	942	1.0	942	230,790	8,374,590	1,398,870	971	2.16	78.54	546	541	3,500	0.0050	43.60	54.49	54	8.77
Pipe EE5	CP EE5-6	CP EE5-7	17	665	682	1.0	682	167,090	8,541,680	1,012,770	703	1.57	80.11	541	536	4,400	0.0050	43.92	54.90	60	9.40
Pipe EE5	CP EE5-7	CP EE5-8	0	564	564	1.0	564	138,180	8,679,860	837,540	582	1.30	81.41	536	531	2,500	0.0050	44.18	55.23	60	9.40
Pipe EE5	CP EE5-8	CP EE5-9	0	191	191	1.0	191	46,795	8,726,655	283,635	197	0.44	81.85	531	526	2,700	0.0050	44.27	55.34	60	9.40
Total			**16665**	**18954**	**35619**		**35619**	**8,726,655**		*******	**36,732**	**81.85**				**28,100**	**0.0050**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area F - 1 EDU
Pipe Flow Design Calculations

1 EDU F

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe FF	Upstream	CP FF 1	233	614	847	1.0	847	207,515	207,515	1,257,795	873	1.95	1.95								
Pipe FF	CP FF 1	CP FF 2	343	379	722	1.0	722	176,890	384,405	1,072,170	745	1.66	3.61	650	645	2,500	0.0050	13.73	17.16	18	4.21
Pipe FF	CP FF 2	CP FF 3	291	389	680	1.0	680	166,600	551,005	1,009,800	701	1.56	5.17	645	640	2,500	0.0050	15.71	19.64	21	4.67
Pipe FF	CP FF 3	CP FF 4	229	451	680	1.0	680	166,600	717,605	1,009,800	701	1.56	6.73	640	635	2,500	0.0050	17.35	21.69	24	5.11
Pipe FF	CP FF 4	CP FF 5	239	500	739	1.0	739	181,055	898,660	1,097,415	762	1.70	8.43	635	630	2,500	0.0050	18.88	23.60	24	5.11
Pipe FF	CP FF 5	CP FF 6	229	452	681	1.0	681	166,845	1,065,505	1,011,285	702	1.56	9.99	630	625	2,500	0.0050	20.12	25.15	27	5.52
Pipe FF	CP FF 6	CP FF 7	284	313	597	1.0	597	146,265	1,211,770	886,545	616	1.37	11.36	625	620	2,500	0.0050	21.12	26.39	27	5.52
Pipe FF	CP FF 7	CP FF 8	233	295	528	1.0	528	129,360	1,341,130	784,080	545	1.21	12.58	620	615	2,500	0.0050	21.93	27.42	30	5.92
Pipe FF	CP FF 8	CP FF 9	89	363	452	1.0	452	110,740	1,451,870	671,220	466	1.04	13.62	615	610	2,700	0.0050	22.60	28.25	30	5.92
Pipe FF	CP FF 9	CP FF 10	86	250	336	1.0	336	82,320	1,534,190	498,960	347	0.77	14.39	610	605	3,600	0.0050	23.07	28.84	30	5.92
Pipe FF	CP FF 10	CP FF 11	171	82	253	1.0	253	61,985	1,596,175	375,705	261	0.58	14.97	605	600	3,400	0.0050	23.41	29.27	30	5.92
Total			**2427**	**4088**	**6515**		**6515**	**1,596,175**		**9,674,775**	**6,719**	**14.97**				**27,200**	**0.0050**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area G - 1 EDU
Pipe Flow Design Calculations

1 EDU G

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Actual (ft/sec)
Pipe GG	Upstream	CP GG-1	96	267	363	1.0	363	88,935	88,935	539,055	374	0.83	0.83								
Pipe GG	CP GG-1	CP GG-2	268	187	455	1.0	455	111,475	200,410	675,675	469	1.05	1.88	640	629	2,700	0.0050	10.75	13.44	**15**	3.73
Pipe GG	CP GG-2	CP GG-3	452	144	596	1.0	596	146,020	346,430	885,060	615	1.37	3.25	629	618	2,700	0.0050	13.20	16.50	**18**	4.21
Pipe GG	CP GG-3	CP GG-4	552	129	681	1.0	681	166,845	513,275	1,011,285	702	1.56	4.81	618	607	2,500	0.0050	15.30	19.13	**21**	4.67
Pipe GG	CP GG-4	CP GG-5	594	90	684	1.0	684	167,580	680,855	1,015,740	705	1.57	6.39	607	596	2,500	0.0050	17.01	21.26	**21**	4.67
Pipe GG	CP GG-5	CP GG-6	661	160	821	1.0	821	201,145	882,000	1,219,185	847	1.89	8.27	596	585	2,500	0.0050	18.74	23.43	**24**	5.11
Pipe GG	CP GG-6	CP GG-7	838	387	1225	1.0	1225	300,125	1,182,125	1,819,125	1263	2.81	11.09	585	573	2,800	0.0050	20.92	26.15	**27**	5.52
Pipe GG	CP GG-7	CP GG-8	600	563	1163	1.0	1163	284,935	1,467,060	1,727,055	1199	2.67	13.76	573	563	2,900	0.0050	22.69	28.36	**30**	5.92
Pipe GG	CP GG-8	CP GG-9	113	1410	1523	1.0	1523	373,135	1,840,195	2,261,655	1571	3.50	17.26	563	550	3,000	0.0050	24.70	30.87	**33**	6.31
Total			**4174**	**3337**	**7511**		**7511**	**1,840,195**		**11,153,835**	**7,746**	**17.26**				**21,600**	**0.0050**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
3 EDU/acre
Pipe Flow Design Summary

Pipe Diameter (in)	Basin A Pipe Length (ft)	Basin B Pipe Length (ft)	Basin C Pipe Length (ft)	Basin D Pipe Length (ft)	Basin E Pipe Length (ft)	Basin F Pipe Length (ft)	Basin G Pipe Length (ft)	Total Pipe Length (ft)
8								0
10								0
12								0
15	2,600							2,600
18	11,200	2,600	2,600				2,700	19,100
21	13,800	2,800	2,800				2,700	22,100
24	9,500	2,800	2,800		4,600	2,500	2,500	24,700
27	5,500	2,600	2,800	2,500	7,350	2,500	2,500	25,750
30	3,500	9,400	5,400		12,600	5,000	2,500	38,400
33			7,600	2,500	13,000	2,500	2,800	28,400
36	5,000			5,300	14,450	7,700	2,900	35,350
42	11,400			5,600	31,950	7,000	3,000	58,950
48					5,800			5,800
54								0
60					7,000			7,000
66					5,000			5,000
72					23,100			23,100
Total	62,500	20,200	24,000	15,900	124,850	27,200	21,600	296,250
							56	Miles

Green Valley Special Utility District
Drainage Area A - 3 EDU
Pipe Flow Design Calculations

3 EDU A

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather						Pipe Design					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe AA1	Upstream	CP AA1-1	256	520	776	3.0	2328	570,360	570,360	2,293,080	1592	3.55	3.55								
Pipe AA1	CP AA1-1	CP AA1-2	177	144	321	3.0	963	235,935	806,295	948,555	659	1.47	5.02	600	585	2,500	0.0060	15.02	18.77	**18**	4.62
Pipe AA1	CP AA1-2	CP AA1-3	169	129	298	3.0	894	219,030	1,025,325	880,590	612	1.36	6.38	585	570	2,500	0.0060	16.43	20.54	**21**	5.12
Pipe AA1	CP AA1-3	CP AA1-4	175	114	289	3.0	867	212,415	1,237,740	853,995	593	1.32	7.70	570	555	2,500	0.0060	17.63	22.04	**24**	5.59
Pipe AA1	CP AA1-4	CP AA1-5	210	73	283	3.0	849	208,005	1,445,745	836,265	581	1.29	8.99	555	540	3,500	0.0050	19.34	24.18	**24**	5.11
1	**Total**		**987**	**980**	**1967**		**5901**	**1,445,745**		**5,812,485**	**4,036**	**8.99**				**11,000**	**0.0058**				
Pipe AA2	Upstream	CP AA2-1	931	71	1002	3.0	3006	736,470	736,470	2,960,910	2056	4.58	4.58								
Pipe AA2	CP AA2-1	CP AA2-2	486	287	773	3.0	2319	568,155	1,304,625	2,284,215	1586	3.53	8.12	590	578	3,500	0.0050	18.61	23.26	**24**	5.11
Pipe AA2	CP AA2-2	CP AA2-3	234	394	628	3.0	1884	461,580	1,766,205	1,855,740	1289	2.87	10.99	578	565	3,000	0.0050	20.85	26.06	**27**	5.52
Pipe AA2	CP AA2-3	CP AA2-4	131	119	250	3.0	750	183,750	1,949,955	738,750	513	1.14	12.13	565	553	2,500	0.0050	21.64	27.05	**27**	5.52
Pipe AA2	CP AA2-4	CP AA1-5	34	133	167	3.0	501	122,745	2,072,700	493,485	343	0.76	12.89	553	540	3,500	0.0050	22.14	27.67	**30**	5.92
2	**Total**		**1816**	**1004**	**2820**		**8460**	**2,072,700**		**8,333,100**	**5,787**	**12.89**				**12,500**	**0.0050**				
Pipe AA3	Upstream	CP AA3-1	93	246	339	3.0	1017	249,165	249,165	1,001,745	696	1.55	1.55								
Pipe AA3	CP AA3-1	CP AA3-2	127	195	322	3.0	966	236,670	485,835	951,510	661	1.47	3.02	600	581	2,600	0.0073	11.97	14.96	**15**	4.51
Pipe AA3	CP AA3-2	CP AA3-3	93	262	355	3.0	1065	260,925	746,760	1,049,025	728	1.62	4.65	581	563	2,700	0.0067	14.30	17.88	**18**	4.87
Pipe AA3	CP AA3-3	CP AA3-4	127	220	347	3.0	1041	255,045	1,001,805	1,025,385	712	1.59	6.23	563	545	2,800	0.0064	16.08	20.10	**21**	5.30
Pipe AA3	CP AA3-4	CP AA6-1	50	240	290	3.0	870	213,150	1,214,955	856,950	595	1.33	7.56	545	525	2,500	0.0080	16.59	20.74	**21**	5.91
3	**Total**		**490**	**1163**	**1653**		**4959**	**1,214,955**		**4,884,615**	**3,392**	**7.56**				**10,600**	**0.0071**				
Pipe AA4	Upstream	CP AA4-1	211	17	228	3.0	684	167,580	167,580	673,740	468	1.04	1.04								
Pipe AA4	CP AA4-1	CP AA4-2	314	69	383	3.0	1149	281,505	449,085	1,131,765	786	1.75	2.79	550	543	3,000	0.0050	12.48	15.60	**18**	4.21
Pipe AA4	CP AA4-2	CP AA4-3	252	36	288	3.0	864	211,680	660,765	851,040	591	1.32	4.11	543	536	3,000	0.0050	14.42	18.03	**18**	4.21
Pipe AA4	CP AA4-3	CP AA5-2	269	72	341	3.0	1023	250,635	911,400	1,007,655	700	1.56	5.67	536	530	6,000	0.0050	16.27	20.34	**21**	4.67
4	**Total**		**1046**	**194**	**1240**		**3720**	**911,400**		**3,664,200**	**2,545**	**5.67**				**12,000**	**0.0050**				
Pipe AA1	Upstream	CP AA1-5	987	980	1967	3.0	5901	1,445,745	1,445,745	5,812,485	4036	8.99	8.99								
Pipe AA2	Upstream	CP AA1-5	1816	1004	2820	3.0	8460	2,072,700	3,518,445	8,333,100	5787	12.89	21.89								
Pipe AA5	CP AA1-5	CP AA5-1	233	103	336	3.0	1008	246,960	3,765,405	992,880	690	1.54	23.42	540	535	2,500	0.0050	27.69	34.62	**36**	6.69
Pipe AA5	CP AA5-1	CP AA5-2	266	118	384	3.0	1152	282,240	4,047,645	1,134,720	788	1.76	25.18	535	530	2,500	0.0050	28.46	35.57	**36**	6.69
5	**Total**		**3302**	**2205**	**5507**		**16521**	**4,047,645**		**16,273,185**	**11,301**	**25.18**				**5,000**	**0.0050**				
Pipe AA4	Upstream	CP AA5-2	1046	194	1240	3.0	3720	911,400	911,400	3,664,200	2545	5.67	5.67								
Pipe AA5	CP AA1-5	CP AA5-2	3302	2205	5507	3.0	16521	4,047,645	4,959,045	16,273,185	11301	25.18	30.85								
Pipe AA6	CP AA5-2	CP AA6-1	181	62	243	3.0	729	178,605	5,137,650	718,065	499	1.11	31.96	530	525	4,500	0.0050	31.12	38.90	**42**	7.41
6	**Total**		**4529**	**2461**	**6990**		**20970**	**5,137,650**		**20,655,450**	**14,344**	**31.96**				**4,500**	**0.0050**				
Pipe AA3	Upstream	CP AA6-1	490	1163	1653	3.0	4959	1,214,955	1,214,955	4,884,615	3392	7.56	7.56								
Pipe AA6	CP AA5-2	CP AA6-1	4529	2461	6990	3.0	20970	5,137,650	6,352,605	20,655,450	14344	31.96	39.52								
Pipe AA7	CP AA6-1	CP AA7-1	208	92	300	3.0	900	220,500	6,573,105	886,500	616	1.37	40.89	525	510	4,900	0.0050	34.13	42.66	**42**	7.41
7	**Total**		**5227**	**3716**	**8943**		**26829**	**6,573,105**		**26,426,565**	**18,352**	**40.89**				**4,900**	**0.0050**				
Pipe AA7	CP AA6-1	CP AA7-1	5227	3716	8943	3.0	26829	6,573,105	6,573,105	26,426,565	18352	40.89	40.89								
Pipe AA8	CP AA7-1	CP AA8-1	253	15	268	3.0	804	196,980	6,770,085	791,940	550	1.23	42.12	510	495	2,000	0.0075	31.98	39.98	**42**	9.08
8	**Total**		**5480**	**3731**	**9211**		**27633**	**6,770,085**		**27,218,505**	**18,902**	**42.12**				**2,000**	**0.0075**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area B - 3 EDU
Pipe Flow Design Calculations

3 EDU B

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe BB	Upstream	CP BB-1	267	367	634	3.0	1902	465,990	465,990	1,873,470	1301	2.90	2.90								
Pipe BB	CP BB-1	CP BB-2	207	287	494	3.0	1482	363,090	829,080	1,459,770	1014	2.26	5.16	600	580	2,600	0.0077	14.48	18.10	18	5.23
Pipe BB	CP BB-2	CP BB-3	251	229	480	3.0	1440	352,800	1,181,880	1,418,400	985	2.19	7.35	580	560	2,800	0.0071	16.77	20.97	21	5.58
Pipe BB	CP BB-3	CP BB-4	366	216	582	3.0	1746	427,770	1,609,650	1,719,810	1194	2.66	10.01	560	540	2,800	0.0071	18.83	23.54	24	6.10
Pipe BB	CP BB-4	CP BB-5	384	190	574	3.0	1722	421,890	2,031,540	1,696,170	1178	2.62	12.64	540	520	2,600	0.0077	20.27	25.34	27	6.85
Pipe BB	CP BB-5	CP BB-6	206	285	491	3.0	1473	360,885	2,392,425	1,450,905	1008	2.25	14.88	520	490	4,400	0.0068	22.04	27.55	30	6.92
Pipe BB	CP BB-6	CP BB-7	209	306	515	3.0	1545	378,525	2,770,950	1,521,825	1057	2.35	17.24	490	470	2,500	0.0080	22.60	28.25	30	7.49
Pipe BB	CP BB-7	CP BB-8	704	216	920	3.0	2760	676,200	3,447,150	2,718,600	1888	4.21	21.44	470	450	2,500	0.0080	24.53	30.67	30	7.49
Total			2594	2096	4690		14070	3,447,150		13,858,950	9,624	21.44				20,200	0.0076				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area C - 3 EDU
Pipe Flow Design Calculations

3 EDU C

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe CC	Upstream	CP CC-1	150	314	464	3.0	1392	341,040	341,040	1,371,120	952	2.12	2.12								
Pipe CC	CP CC-1	CP CC-2	173	365	538	3.0	1614	395,430	736,470	1,589,790	1104	2.46	4.58	600	580	2,600	0.0077	13.85	17.32	**18**	5.23
Pipe CC	CP CC-2	CP CC-3	192	373	565	3.0	1695	415,275	1,151,745	1,669,575	1159	2.58	7.16	580	560	2,800	0.0071	16.61	20.77	**21**	5.58
Pipe CC	CP CC-3	CP CC-4	271	331	602	3.0	1806	442,470	1,594,215	1,778,910	1235	2.75	9.92	560	540	2,800	0.0071	18.77	23.46	**24**	6.10
Pipe CC	CP CC-4	CP CC-5	332	233	565	3.0	1695	415,275	2,009,490	1,669,575	1159	2.58	12.50	540	520	2,800	0.0071	20.47	25.59	**27**	6.60
Pipe CC	CP CC-5	CP CC-6	457	259	716	3.0	2148	526,260	2,535,750	2,115,780	1469	3.27	15.77	520	500	2,800	0.0071	22.33	27.92	**30**	7.08
Pipe CC	CP CC-6	CP CC-7	584	203	787	3.0	2361	578,445	3,114,195	2,325,585	1615	3.60	19.37	500	480	2,600	0.0077	23.79	29.74	**30**	7.35
Pipe CC	CP CC-7	CP CC-8	520	119	639	3.0	1917	469,665	3,583,860	1,888,245	1311	2.92	22.29	480	460	2,600	0.0077	25.08	31.35	**33**	7.83
Pipe CC	CP CC-8	CP CC-9	405	152	557	3.0	1671	409,395	3,993,255	1,645,935	1143	2.55	24.84	460	440	2,500	0.0080	25.92	32.40	**33**	7.99
Pipe CC	CP CC-9	CP CC-10	194	9	203	3.0	609	149,205	4,142,460	599,865	417	0.93	25.77	440	420	2,500	0.0080	26.28	32.85	**33**	7.99
	Total		**3278**	**2358**	**5636**		**16908**	**4,142,460**		**16,654,380**	**11,566**	**25.77**				**24,000**	**0.0075**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area D - 3 EDU
Pipe Flow Design Calculations

3 EDU D

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe DD	Upstream	CP DD-1	401	1068	1469	3.0	4407	1,079,715	1,079,715	4,340,895	3015	6.72	6.72								
Pipe DD	CP DD-1	CP DD-2	374	815	1189	3.0	3567	873,915	1,953,630	3,513,495	2440	5.44	12.15	570	562	2,500	0.0050	21.65	27.07	27	5.52
Pipe DD	CP DD-2	CP DD-3	411	725	1136	3.0	3408	834,960	2,788,590	3,356,880	2331	5.19	17.35	562	554	2,500	0.0050	24.75	30.93	33	6.31
Pipe DD	CP DD-3	CP DD-4	326	610	936	3.0	2808	687,960	3,476,550	2,765,880	1921	4.28	21.63	554	546	2,500	0.0050	26.88	33.60	36	6.69
Pipe DD	CP DD-4	CP DD-5	376	466	842	3.0	2526	618,870	4,095,420	2,488,110	1728	3.85	25.48	546	538	2,800	0.0050	28.58	35.73	36	6.69
Pipe DD	CP DD-5	CP DD-6	407	283	690	3.0	2070	507,150	4,602,570	2,038,950	1416	3.15	28.63	538	530	3,000	0.0050	29.86	37.33	42	7.41
Pipe DD	CP DD-6	CP DD-7	297	128	425	3.0	1275	312,375	4,914,945	1,255,875	872	1.94	30.58	530	522	2,600	0.0050	30.60	38.26	42	7.41
Total			2592	4095	6687		20061	4,914,945		19,760,085	13,722	30.58				15,900	0.0050				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area E - 3 EDU
Pipe Flow Design Calculations

3 EDU E

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe EE1	Upstream	CP EE1-1	442	1455	1897	3.0	5691	1,394,295	1,394,295	5,605,635	3893	8.67	8.67								
Pipe EE1	CP EE1-1	CP EE1-2	311	476	787	3.0	2361	578,445	1,972,740	2,325,585	1615	3.60	12.27	830	811	2,750	0.0069	20.45	25.57	27	6.49
Pipe EE1	CP EE1-2	CP EE1-3	365	424	789	3.0	2367	579,915	2,552,655	2,331,495	1619	3.61	15.88	811	792	2,750	0.0069	22.53	28.16	30	6.96
Pipe EE1	CP EE1-3	CP EE1-4	419	383	802	3.0	2406	589,470	3,142,125	2,369,910	1646	3.67	19.55	792	773	2,750	0.0069	24.36	30.44	30	6.96
Pipe EE1	CP EE1-4	CP EE1-5	517	343	860	3.0	2580	632,100	3,774,225	2,541,300	1765	3.93	23.48	773	754	2,750	0.0069	26.09	32.61	33	7.42
Pipe EE1	CP EE1-5	CP EE1-6	58	302	360	3.0	1080	264,600	4,038,825	1,063,800	739	1.65	25.13	754	735	2,750	0.0069	26.76	33.45	33	7.42
Pipe EE1	CP EE1-6	CP EE1-7	625	267	892	3.0	2676	655,620	4,694,445	2,635,860	1830	4.08	29.20	735	716	2,750	0.0069	28.31	35.39	36	7.86
Pipe EE1	CP EE1-7	CP EE1-8	646	259	905	3.0	2715	665,175	5,359,620	2,674,275	1857	4.14	33.34	716	697	2,600	0.0073	29.44	36.80	36	8.09
Pipe EE1	CP EE1-8	CP EE1-9	471	255	726	3.0	2178	533,610	5,893,230	2,145,330	1490	3.32	36.66	697	678	2,600	0.0073	30.51	38.14	42	8.96
Pipe EE1	CP EE1-9	CP EE1-10	416	248	664	3.0	1992	488,040	6,381,270	1,962,120	1363	3.04	39.70	678	659	2,600	0.0073	31.43	39.29	42	8.96
Pipe EE1	CP EE1-10	CP EE1-11	381	224	605	3.0	1815	444,675	6,825,945	1,787,775	1242	2.77	42.46	659	640	2,600	0.0073	32.24	40.30	42	8.96
Pipe EE1	CP EE1-11	CP EE1-12	312	167	479	3.0	1437	352,065	7,178,010	1,415,445	983	2.19	44.65	640	621	2,600	0.0073	32.85	41.07	42	8.96
Pipe EE1	CP EE1-12	CP EE1-13	250	130	380	3.0	1140	279,300	7,457,310	1,122,900	780	1.74	46.39	621	600	3,100	0.0068	33.80	42.25	42	8.63
Total			**5213**	**4933**	**10146**		**30438**	**7,457,310**		**29,981,430**	**20,820**	**46.39**				**32,600**	**0.0071**				
Pipe EE2	Upstream	CP EE2-1	574	2297	2871	3.0	8613	2,110,185	2,110,185	8,483,805	5892	13.13	13.13								
Pipe EE2	CP EE2-1	CP EE2-2	347	519	866	3.0	2598	636,510	2,746,695	2,559,030	1777	3.96	17.09	700	692	2,500	0.0050	24.60	30.76	30	5.92
Pipe EE2	CP EE2-2	CP EE2-3	322	484	806	3.0	2418	592,410	3,339,105	2,381,730	1654	3.69	20.77	692	684	2,900	0.0050	26.47	33.09	33	6.31
Pipe EE2	CP EE2-3	CP EE2-4	279	464	743	3.0	2229	546,105	3,885,210	2,195,565	1525	3.40	24.17	684	676	2,550	0.0050	28.02	35.03	36	6.69
Pipe EE2	CP EE2-4	CP EE2-5	273	419	692	3.0	2076	508,620	4,393,830	2,044,860	1420	3.16	27.33	676	668	2,550	0.0050	29.35	36.68	36	6.69
Pipe EE2	CP EE2-5	CP EE2-6	266	406	672	3.0	2016	493,920	4,887,750	1,985,760	1379	3.07	30.41	668	660	2,550	0.0050	30.54	38.18	42	7.41
Pipe EE2	CP EE2-6	CP EE2-7	260	229	489	3.0	1467	359,415	5,247,165	1,444,995	1003	2.24	32.64	660	652	2,550	0.0050	31.36	39.21	42	7.41
Pipe EE2	CP EE2-7	CP EE2-8	253	151	404	3.0	1212	296,940	5,544,105	1,193,820	829	1.85	34.49	652	644	2,550	0.0050	32.02	40.02	42	7.41
Pipe EE2	CP EE2-8	CP EE2-9	247	135	382	3.0	1146	280,770	5,824,875	1,128,810	784	1.75	36.24	644	636	2,500	0.0050	32.62	40.77	42	7.41
Pipe EE2	CP EE2-9	CP EE2-10	232	142	374	3.0	1122	274,890	6,099,765	1,105,170	767	1.71	37.95	636	628	2,700	0.0050	33.19	41.48	42	7.41
Pipe EE2	CP EE2-10	CP EE2-11	183	161	344	3.0	1032	252,840	6,352,605	1,016,520	706	1.57	39.52	628	620	2,800	0.0050	33.70	42.12	42	7.41
Pipe EE2	CP EE2-11	CP EE2-12	140	151	291	3.0	873	213,885	6,566,490	859,905	597	1.33	40.85	620	612	2,800	0.0050	34.12	42.65	42	7.41
Pipe EE2	CP EE2-12	CP EE2-13	110	291	401	3.0	1203	294,735	6,861,225	1,184,955	823	1.83	42.68	612	604	4,400	0.0050	34.68	43.35	48	8.10
Pipe EE2	CP EE2-13	CP EE1-13	0	0	0	3.0	0	0	6,861,225	0	0	0.00	42.68	604	600	1,400	0.0050	34.68	43.35	48	8.10
Total			**3486**	**5849**	**9335**		**28005**	**6,861,225**		**27,584,925**	**19,156**	**42.68**				**34,750**	**0.0050**				
Pipe EE3	Upstream	CP EE3-1	1168	50	1218	3.0	3654	895,230	895,230	3,599,190	2499	5.57	5.57								
Pipe EE3	CP EE3-1	CP EE3-2	619	179	798	3.0	2394	586,530	1,481,760	2,358,090	1638	3.65	9.22	665	646	4,600	0.0050	19.52	24.40	24	5.11
Pipe EE3	CP EE3-2	CP EE3-3	477	32	509	3.0	1527	374,115	1,855,875	1,504,095	1045	2.33	11.55	646	627	4,600	0.0050	21.24	26.55	27	5.52
Pipe EE3	CP EE3-3	CP EE3-4	334	509	843	3.0	2529	619,605	2,475,480	2,491,065	1730	3.85	15.40	627	608	4,600	0.0050	23.66	29.58	30	5.92
Pipe EE3	CP EE3-4	CP EE3-5	192	628	820	3.0	2460	602,700	3,078,180	2,423,100	1683	3.75	19.15	608	589	4,600	0.0050	25.68	32.10	33	6.31
Pipe EE3	CP EE3-5	CP EE4-3	51	805	856	3.0	2568	629,160	3,707,340	2,529,480	1757	3.91	23.06	589	570	4,000	0.0050	27.53	34.42	36	6.69
Total			**2841**	**2203**	**5044**		**15132**	**3,707,340**		**14,905,020**	**10,351**	**23.06**				**22,400**	**0.0050**				
Pipe EE1	Upstream	CP EE1-13	5213	4933	10146	3.0	30438	7,457,310	7,457,310	29,981,430	20820	46.39	46.39								
Pipe EE2	Upstream	CP EE1-13	3486	5849	9335	3.0	28005	6,861,225	14,318,535	27,584,925	19156	42.68	89.07								
Pipe EE4	CP EE1-13	CP EE4-1	184	466	650	3.0	1950	477,750	14,796,285	1,920,750	1334	2.97	92.05	600	590	2,000	0.0050	46.27	57.83	60	9.40
Pipe EE4	CP EE4-1	CP EE4-2	106	414	520	3.0	1560	382,200	15,178,485	1,536,600	1067	2.38	94.42	590	580	2,500	0.0050	46.71	58.39	60	9.40
Pipe EE4	CP EE4-2	CP EE4-3	28	578	606	3.0	1818	445,410	15,623,895	1,790,730	1244	2.77	97.20	580	570	2,500	0.0050	47.22	59.03	60	9.40
Total			**9017**	**12240**	**21257**		**63771**	**15,623,895**		**62,814,435**	**43,621**	**97.20**				**7,000**	**0.0050**				
Pipe EE3	Upstream	CP EE4-3	2841	2203	5044	3.0	15132	3,707,340	3,707,340	14,905,020	10351	23.06	23.06								
Pipe EE4	CP EE1-13	CP EE4-3	9017	12240	21257	3.0	63771	15,623,895	19,331,235	62,814,435	43621	97.20	120.26								
Pipe EE5	CP EE4-3	CP EE5-1	925	607	1532	3.0	4596	1,126,020	20,457,255	4,527,060	3144	7.00	127.26	570	566	2,500	0.0050	52.24	65.31	66	10.02
Pipe EE5	CP EE5-1	CP EE5-2	1036	644	1680	3.0	5040	1,234,800	21,692,055	4,964,400	3448	7.68	134.94	566	561	2,500	0.0050	53.40	66.76	66	10.02
Pipe EE5	CP EE5-2	CP EE5-3	1003	585	1588	3.0	4764	1,167,180	22,859,235	4,692,540	3259	7.26	142.21	561	556	3,000	0.0050	54.46	68.08	72	10.62
Pipe EE5	CP EE5-3	CP EE5-4	801	67	868	3.0	2604	637,980	23,497,215	2,564,940	1781	3.97	146.17	556	551	3,500	0.0050	55.03	68.79	72	10.62
Pipe EE5	CP EE5-4	CP EE5-5	650	621	1271	3.0	3813	934,185	24,431,400	3,755,805	2608	5.81	151.99	551	546	3,500	0.0050	55.84	69.80	72	10.62
Pipe EE5	CP EE5-5	CP EE5-6	375	567	942	3.0	2826	692,370	25,123,770	2,783,610	1933	4.31	156.29	546	541	3,500	0.0050	56.43	70.54	72	10.62
Pipe EE5	CP EE5-6	CP EE5-7	17	665	682	3.0	2046	501,270	25,625,040	2,015,310	1400	3.12	159.41	541	536	4,400	0.0050	56.85	71.06	72	10.62
Pipe EE5	CP EE5-7	CP EE5-8	0	564	564	3.0	1692	414,540	26,039,580	1,666,620	1157	2.58	161.99	536	531	2,500	0.0050	57.19	71.49	72	10.62
Pipe EE5	CP EE5-8	CP EE5-9	0	191	191	3.0	573	140,385	26,179,965	564,405	392	0.87	162.86	531	526	2,700	0.0050	57.31	71.63	72	10.62
Total			**16665**	**18954**	**35619**		**106857**	**26,179,965**		**#######**	**73,093**	**162.86**				**28,100**	**0.0050**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area F - 3 EDU
Pipe Flow Design Calculations

3 EDU F

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe FF	Upstream	CP FF 1	233	614	847	3.0	2541	622,545	622,545	2,502,885	1738	3.87	3.87								
Pipe FF	CP FF 1	CP FF 2	343	379	722	3.0	2166	530,670	1,153,215	2,133,510	1482	3.30	7.17	650	645	2,500	0.0050	17.77	22.21	24	5.11
Pipe FF	CP FF 2	CP FF 3	291	389	680	3.0	2040	499,800	1,653,015	2,009,400	1395	3.11	10.28	645	640	2,500	0.0050	20.34	25.42	27	5.52
Pipe FF	CP FF 3	CP FF 4	229	451	680	3.0	2040	499,800	2,152,815	2,009,400	1395	3.11	13.39	640	635	2,500	0.0050	22.46	28.07	30	5.92
Pipe FF	CP FF 4	CP FF 5	239	500	739	3.0	2217	543,165	2,695,980	2,183,745	1516	3.38	16.77	635	630	2,500	0.0050	24.43	30.54	30	5.92
Pipe FF	CP FF 5	CP FF 6	229	452	681	3.0	2043	500,535	3,196,515	2,012,355	1397	3.11	19.89	630	625	2,500	0.0050	26.04	32.56	33	6.31
Pipe FF	CP FF 6	CP FF 7	284	313	597	3.0	1791	438,795	3,635,310	1,764,135	1225	2.73	22.61	625	620	2,500	0.0050	27.33	34.17	36	6.69
Pipe FF	CP FF 7	CP FF 8	233	295	528	3.0	1584	388,080	4,023,390	1,560,240	1084	2.41	25.03	620	615	2,500	0.0050	28.39	35.49	36	6.69
Pipe FF	CP FF 8	CP FF 9	89	363	452	3.0	1356	332,220	4,355,610	1,335,660	928	2.07	27.10	615	610	2,700	0.0050	29.25	36.56	36	6.69
Pipe FF	CP FF 9	CP FF 10	86	250	336	3.0	1008	246,960	4,602,570	992,880	690	1.54	28.63	610	605	3,600	0.0050	29.86	37.33	42	7.41
Pipe FF	CP FF 10	CP FF 11	171	82	253	3.0	759	185,955	4,788,525	747,615	519	1.16	29.79	605	600	3,400	0.0050	30.31	37.88	42	7.41
Total			2427	4088	6515		19545	4,788,525		19,251,825	13,369	29.79				27,200	0.0050				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Drainage Area G - 3 EDU
Pipe Flow Design Calculations

3 EDU G

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather				Pipe Design							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Wet Weather Flow (gpm)	Wet Weather Flow (cfs)	Cumulative Wet Weather Flow (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (ft)	Pipe Diameter Actual (inches)	Pipe Diameter 80% Full (inches)	Pipe Diameter Nominal (inches)	Pipe Velocity Nominal (ft/sec)
Pipe GG	Upstream	CP GG-1	96	267	363	3.0	1089	266,805	266,805	1,072,665	745	1.66	1.66								
Pipe GG	CP GG-1	CP GG-2	268	187	455	3.0	1365	334,425	601,230	1,344,525	934	2.08	3.74	640	629	2,700	0.0050	13.92	17.40	**18**	4.21
Pipe GG	CP GG-2	CP GG-3	452	144	596	3.0	1788	438,060	1,039,290	1,761,180	1223	2.73	6.47	629	618	2,700	0.0050	17.09	21.36	**21**	4.67
Pipe GG	CP GG-3	CP GG-4	552	129	681	3.0	2043	500,535	1,539,825	2,012,355	1397	3.11	9.58	618	607	2,500	0.0050	19.80	24.76	**24**	5.11
Pipe GG	CP GG-4	CP GG-5	594	90	684	3.0	2052	502,740	2,042,565	2,021,220	1404	3.13	12.71	607	596	2,500	0.0050	22.02	27.52	**27**	5.52
Pipe GG	CP GG-5	CP GG-6	661	160	821	3.0	2463	603,435	2,646,000	2,426,055	1685	3.75	16.46	596	585	2,500	0.0050	24.26	30.33	**30**	5.92
Pipe GG	CP GG-6	CP GG-7	838	387	1225	3.0	3675	900,375	3,546,375	3,619,875	2514	5.60	22.06	585	573	2,800	0.0050	27.08	33.85	**33**	6.31
Pipe GG	CP GG-7	CP GG-8	600	563	1163	3.0	3489	854,805	4,401,180	3,436,665	2387	5.32	27.38	573	563	2,900	0.0050	29.36	36.70	**36**	6.69
Pipe GG	CP GG-8	CP GG-9	113	1410	1523	3.0	4569	1,119,405	5,520,585	4,500,465	3125	6.96	34.34	563	550	3,000	0.0050	31.97	39.96	**42**	7.41
Total			**4174**	**3337**	**7511**		**22533**	**5,520,585**		**22,195,005**	**15,413**	**34.34**				**21,600**	**0.0050**				

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU		
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU	Manning's Roughness Coefficient =	0.013
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU	Percent of Pipe Flowing Full =	80%
Wastewater Demand =	70	GPD/capita					
Maximum Flow Peak Factor =	3						
Inflow/Infiltration =	750	gallon/acres served					

Green Valley Special Utility District
Summary Costs
Proposed Main Wastewater Collection System
Engineer's Opinion of Probable Costs

Basin	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)	Variance
A	$ 11,212,950.00	$ 13,229,734.00	$ 2,016,784.00
B	$ 3,379,449.00	$ 3,848,841.00	$ 469,392.00
C	$ 4,151,280.00	$ 4,773,440.00	$ 622,160.00
D	$ 3,072,068.00	$ 4,188,876.00	$ 1,116,808.00
E	$ 34,601,813.00	$ 43,682,177.00	$ 9,080,364.00
F	$ 5,230,109.00	$ 6,739,925.00	$ 1,509,816.00
G	$ 3,963,086.00	$ 4,673,334.00	$ 710,248.00
Total	**$ 65,610,755.00**	**$ 81,136,327.00**	$ 15,525,572.00

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Green Valley Special Utility District
Summary Drainage Basin A
Engineer's Opinion of Probable Costs

A

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ 336,000.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ 533,000.00	$ 169,000.00
3	18" SDR 35, PVC (0'-6' cut)	$ 1,386,000.00	$ 784,000.00
4	21" SDR 35, PVC (0'-6' cut)	$ 720,000.00	$ 1,104,000.00
5	24" SDR 35, PVC (0'-6' cut)	$ 315,000.00	$ 855,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ 250,000.00	$ 550,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ 275,000.00	$ 385,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ 1,425,000.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ 750,000.00
10	42", PVC (0'-6' cut)	$ -	$ 2,280,000.00
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 625,000.00	$ 625,000.00
17	Bore and Case Roadways	$ 406,250.00	$ 406,250.00
18	Bore and Case Creek Crossings	$ 250,000.00	$ 250,000.00
19	Trench Safety	$ 125,000.00	$ 125,000.00
20	Sewer Main Television Inspection	$ 1,625,000.00	$ 1,625,000.00
21	Erosion Control Devices	$ 62,500.00	$ 62,500.00
22	Sewer Junction Structure	$ 35,000.00	$ 35,000.00
23	Lift Station	$ 200,000.00	$ 200,000.00
	Total Construction	**$ 8,568,750.00**	**$ 10,205,750.00**
	Contingencies	$ 856,875.00	$ 1,020,575.00
	Total	**$ 9,425,625.00**	**$ 11,226,325.00**
	Easements	$ 312,500.00	$ 312,500.00
	Easements and Surveys and Acquisition Costs	$ 125,000.00	$ 125,000.00
	Environmental Investigation	$ 93,750.00	$ 93,750.00
	Total Easement Costs	**$ 531,250.00**	**$ 531,250.00**
	Basic Engineering	$ 942,562.50	$ 1,122,632.50
	Survey	$ 125,000.00	$ 125,000.00
	Construction Phase Services	$ 188,512.50	$ 224,526.50
	Total Engineering Costs	**$ 1,256,075.00**	**$ 1,472,159.00**
	Total Project Costs	**$ 11,212,950.00**	**$ 13,229,734.00**

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Green Valley Special Utility District
Drainage Basin A - 1 EDU/acre
Engineer's Opinion of Probable Costs

A

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 60.00	$ 336,000.00
2	15" SDR 35, PVC (0'-6' cut)	LF	8,200	$ 65.00	$ 533,000.00
3	18" SDR 35, PVC (0'-6' cut)	LF	19,800	$ 70.00	$ 1,386,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	9,000	$ 80.00	$ 720,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	3,500	$ 90.00	$ 315,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 100.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 110.00	$ 275,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	11,400	$ 125.00	$ 1,425,000.00
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**62,500**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	125	$ 5,000.00	$ 625,000.00
17	Bore and Case Roadways	LF	3125	$ 130.00	$ 406,250.00
18	Bore and Case Creek Crossings	LF	2,500	$ 100.00	$ 250,000.00
19	Trench Safety	LF	62,500	$ 2.00	$ 125,000.00
20	Sewer Main Television Inspection	LF	62,500	$ 26.00	$ 1,625,000.00
21	Erosion Control Devices	LF	62,500	$ 1.00	$ 62,500.00
22	Sewer Junction Structure	EA	1	$ 35,000.00	$ 35,000.00
23	Lift Station	EA	1	$200,000.00	$ 200,000.00
	Total Construction				**$ 8,568,750.00**
	Contingencies	10%			$ 856,875.00
	Total				**$ 9,425,625.00**
	Easements	LF	62,500	$ 5.00	$ 312,500.00
	Easements and Surveys and Acquisition Costs	LF	62,500	$ 2.00	$ 125,000.00
	Environmental Investigation	LF	62,500	$ 1.50	$ 93,750.00
	Total Easement Costs				**$ 531,250.00**
	Basic Engineering	10%			$ 942,562.50
	Survey	LF	62,500	$ 2.00	$ 125,000.00
	Construction Phase Services	2%			$ 188,512.50
	Total Engineering Costs				**$ 1,256,075.00**
	Total Project Costs				**$11,212,950.00**

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Green Valley Special Utility District
Drainage Basin A - 3 EDU/acre
Engineer's Opinion of Probable Costs

A

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 65.00	$ 169,000.00
3	18" SDR 35, PVC (0'-6' cut)	LF	11,200	$ 70.00	$ 784,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	13,800	$ 80.00	$ 1,104,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	9,500	$ 90.00	$ 855,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	5,500	$ 100.00	$ 550,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	3,500	$ 110.00	$ 385,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 150.00	$ 750,000.00
10	42" SDR 35, PVC (0'-6' cut)	LF	11,400	$ 200.00	$ 2,280,000.00
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**62,500**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	125	$ 5,000.00	$ 625,000.00
17	Bore and Case Roadways	LF	3125	$ 130.00	$ 406,250.00
18	Bore and Case Creek Crossings	LF	2,500	$ 100.00	$ 250,000.00
19	Trench Safety	LF	62,500	$ 2.00	$ 125,000.00
20	Sewer Main Television Inspection	LF	62,500	$ 26.00	$ 1,625,000.00
21	Erosion Control Devices	LF	62,500	$ 1.00	$ 62,500.00
22	Sewer Junction Structure	EA	1	$ 35,000.00	$ 35,000.00
23	Lift Station	EA	1	$200,000.00	$ 200,000.00
	Total Construction				**$10,205,750.00**
	Contingencies	10%			$ 1,020,575.00
	Total				**$11,226,325.00**
	Easements	LF	62,500	$ 5.00	$ 312,500.00
	Easements and Surveys and Acquisition Costs	LF	62,500	$ 2.00	$ 125,000.00
	Environmental Investigation	LF	62,500	$ 1.50	$ 93,750.00
	Total Easement Costs				**$ 531,250.00**
	Basic Engineering	10%			$ 1,122,632.50
	Survey	LF	62,500	$ 2.00	$ 125,000.00
	Construction Phase Services	2%			$ 224,526.50
	Total Engineering Costs				**$ 1,472,159.00**
	Total Project Costs				**$13,229,734.00**

This cost estimate is based on River City Engineering's experience and qualifications, and represents River City Engineering's best judgment. This cost estimate was prepared for feasibility analysis purposes only. River City Engineering does not guarantee that the actual construction cost will not vary from this estimate. Unit prices were used from SAWS average unit price list revised October 2005. Units prices will not remain constraint and will vary due to market variations such as inflation.

Green Valley Special Utility District
Summary Drainage Basin B
Engineer's Opinion of Probable Costs

B

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ 169,000.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ 392,000.00	$ 182,000.00
4	21" SDR 35, PVC (0'-6' cut)	$ 560,000.00	$ 224,000.00
5	24" SDR 35, PVC (0'-6' cut)	$ 450,000.00	$ 252,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ -	$ 260,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ -	$ 1,034,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ -	$ -
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ -
10	42", PVC (0'-6' cut)	$ -	$ -
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 202,000.00	$ 202,000.00
17	Bore and Case Roadways	$ 131,300.00	$ 131,300.00
18	Bore and Case Creek Crossings	$ 80,800.00	$ 80,800.00
19	Trench Safety	$ 40,400.00	$ 40,400.00
20	Sewer Main Television Inspection	$ 525,200.00	$ 525,200.00
21	Erosion Control Devices	$ 20,200.00	$ 20,200.00
22	Sewer Junction Structure	$ -	$ -
23	Lift Station	$ -	$ -
	Total Construction	**$ 2,570,900.00**	**$ 2,951,900.00**
	Contingencies	$ 257,090.00	$ 295,190.00
	Total	**$ 2,827,990.00**	**$ 3,247,090.00**
	Easements	$ 101,000.00	$ 101,000.00
	Easements and Surveys and Acquisition Costs	$ 40,400.00	$ 40,400.00
	Environmental Investigation	$ 30,300.00	$ 30,300.00
	Total Easement Costs	**$ 171,700.00**	**$ 171,700.00**
	Basic Engineering	$ 282,799.00	$ 324,709.00
	Survey	$ 40,400.00	$ 40,400.00
	Construction Phase Services	$ 56,559.80	$ 64,941.80
	Total Engineering Costs	**$ 379,758.80**	**$ 430,050.80**
	Total Project Costs	**$ 3,379,448.80**	**$ 3,848,840.80**

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Green Valley Special Utility District
Drainage Basin B - 1 EDU/acre
Engineer's Opinion of Probable Costs

B

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 65.00	$ 169,000.00
3	18" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 70.00	$ 392,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	7,000	$ 80.00	$ 560,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 90.00	$ 450,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	0	$ 100.00	$ -
7	30" SDR 35, PVC (0'-6' cut)	LF	0	$ 110.00	$ -
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**20,200**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	40	$ 5,000.00	$ 202,000.00
17	Bore and Case Roadways	LF	1010	$ 130.00	$ 131,300.00
18	Bore and Case Creek Crossings	LF	808	$ 100.00	$ 80,800.00
19	Trench Safety	LF	20,200	$ 2.00	$ 40,400.00
20	Sewer Main Television Inspection	LF	20,200	$ 26.00	$ 525,200.00
21	Erosion Control Devices	LF	20,200	$ 1.00	$ 20,200.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 2,570,900.00**
	Contingencies	10%			$ 257,090.00
	Total				**$ 2,827,990.00**
	Easements	LF	20,200	$ 5.00	$ 101,000.00
	Easements and Surveys and Acquisition Costs	LF	20,200	$ 2.00	$ 40,400.00
	Environmental Investigation	LF	20,200	$ 1.50	$ 30,300.00
	Total Easement Costs				**$ 171,700.00**
	Basic Engineering	10%			$ 282,799.00
	Survey	LF	20,200	$ 2.00	$ 40,400.00
	Construction Phase Services	2%			$ 56,559.80
	Total Engineering Costs				**$ 379,758.80**
	Total Project Costs				**$ 3,379,448.80**

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Green Valley Special Utility District
Drainage Basin B - 3 EDU/acre
Engineer's Opinion of Probable Costs

B

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 70.00	$ 182,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 80.00	$ 224,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 90.00	$ 252,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 100.00	$ 260,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	9,400	$ 110.00	$ 1,034,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**20,200**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	40	$ 5,000.00	$ 202,000.00
17	Bore and Case Roadways	LF	1010	$ 130.00	$ 131,300.00
18	Bore and Case Creek Crossings	LF	808	$ 100.00	$ 80,800.00
19	Trench Safety	LF	20,200	$ 2.00	$ 40,400.00
20	Sewer Main Television Inspection	LF	20,200	$ 26.00	$ 525,200.00
21	Erosion Control Devices	LF	20,200	$ 1.00	$ 20,200.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 2,951,900.00**
	Contingencies	10%			$ 295,190.00
	Total				**$ 3,247,090.00**
	Easements	LF	20,200	$ 5.00	$ 101,000.00
	Easements and Surveys and Acquisition Costs	LF	20,200	$ 2.00	$ 40,400.00
	Environmental Investigation	LF	20,200	$ 1.50	$ 30,300.00
	Total Easement Costs				**$ 171,700.00**
	Basic Engineering	10%			$ 324,709.00
	Survey	LF	20,200	$ 2.00	$ 40,400.00
	Construction Phase Services	2%			$ 64,941.80
	Total Engineering Costs				**$ 430,050.80**
	Total Project Costs				**$ 3,848,840.80**

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Green Valley Special Utility District
Summary Drainage Basin C
Engineer's Opinion of Probable Costs

C

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ 169,000.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ 392,000.00	$ 182,000.00
4	21" SDR 35, PVC (0'-6' cut)	$ 448,000.00	$ 224,000.00
5	24" SDR 35, PVC (0'-6' cut)	$ 468,000.00	$ 252,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ 500,000.00	$ 280,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ -	$ 594,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ -	$ 950,000.00
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ -
10	42", PVC (0'-6' cut)	$ -	$ -
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 240,000.00	$ 240,000.00
17	Bore and Case Roadways	$ 156,000.00	$ 156,000.00
18	Bore and Case Creek Crossings	$ 96,000.00	$ 96,000.00
19	Trench Safety	$ 48,000.00	$ 48,000.00
20	Sewer Main Television Inspection	$ 624,000.00	$ 624,000.00
21	Erosion Control Devices	$ 24,000.00	$ 24,000.00
22	Sewer Junction Structure	$ -	$ -
23	Lift Station	$ -	$ -
	Total Construction	**$ 3,165,000.00**	**$ 3,670,000.00**
	Contingencies	$ 316,500.00	$ 367,000.00
	Total	**$ 3,481,500.00**	**$ 4,037,000.00**
	Easements	$ 120,000.00	$ 120,000.00
	Easements and Surveys and Acquisition Costs	$ 48,000.00	$ 48,000.00
	Environmental Investigation	$ 36,000.00	$ 36,000.00
	Total Easement Costs	**$ 204,000.00**	**$ 204,000.00**
	Basic Engineering	$ 348,150.00	$ 403,700.00
	Survey	$ 48,000.00	$ 48,000.00
	Construction Phase Services	$ 69,630.00	$ 80,740.00
	Total Engineering Costs	**$ 465,780.00**	**$ 532,440.00**
	Total Project Costs	**$ 4,151,280.00**	**$ 4,773,440.00**

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Green Valley Special Utility District
Drainage Basin C - 1 EDU/acre
Engineer's Opinion of Probable Costs

C

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 65.00	$ 169,000.00
3	18" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 70.00	$ 392,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 80.00	$ 448,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	5,200	$ 90.00	$ 468,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 100.00	$ 500,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	0	$ 110.00	$ -
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**24,000**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	48	$ 5,000.00	$ 240,000.00
17	Bore and Case Roadways	LF	1200	$ 130.00	$ 156,000.00
18	Bore and Case Creek Crossings	LF	960	$ 100.00	$ 96,000.00
19	Trench Safety	LF	24,000	$ 2.00	$ 48,000.00
20	Sewer Main Television Inspection	LF	24,000	$ 26.00	$ 624,000.00
21	Erosion Control Devices	LF	24,000	$ 1.00	$ 24,000.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 3,165,000.00**
	Contingencies	10%			$ 316,500.00
	Total				**$ 3,481,500.00**
	Easements	LF	24,000	$ 5.00	$ 120,000.00
	Easements and Surveys and Acquisition Costs	LF	24,000	$ 2.00	$ 48,000.00
	Environmental Investigation	LF	24,000	$ 1.50	$ 36,000.00
	Total Easement Costs				**$ 204,000.00**
	Basic Engineering	10%			$ 348,150.00
	Survey	LF	24,000	$ 2.00	$ 48,000.00
	Construction Phase Services	2%			$ 69,630.00
	Total Engineering Costs				**$ 465,780.00**
	Total Project Costs				**$ 4,151,280.00**

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Green Valley Special Utility District
Drainage Basin C - 3 EDU/acre
Engineer's Opinion of Probable Costs

C

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	2,600	$ 70.00	$ 182,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 80.00	$ 224,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 90.00	$ 252,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 100.00	$ 280,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	5,400	$ 110.00	$ 594,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	7,600	$ 125.00	$ 950,000.00
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**24,000**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	48	$ 5,000.00	$ 240,000.00
17	Bore and Case Roadways	LF	1200	$ 130.00	$ 156,000.00
18	Bore and Case Creek Crossings	LF	960	$ 100.00	$ 96,000.00
19	Trench Safety	LF	24,000	$ 2.00	$ 48,000.00
20	Sewer Main Television Inspection	LF	24,000	$ 26.00	$ 624,000.00
21	Erosion Control Devices	LF	24,000	$ 1.00	$ 24,000.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 3,670,000.00**
	Contingencies	10%			$ 367,000.00
	Total				**$ 4,037,000.00**
	Easements	LF	24,000	$ 5.00	$ 120,000.00
	Easements and Surveys and Acquisition Costs	LF	24,000	$ 2.00	$ 48,000.00
	Environmental Investigation	LF	24,000	$ 1.50	$ 36,000.00
	Total Easement Costs				**$ 204,000.00**
	Basic Engineering	10%			$ 403,700.00
	Survey	LF	24,000	$ 2.00	$ 48,000.00
	Construction Phase Services	2%			$ 80,740.00
	Total Engineering Costs				**$ 532,440.00**
	Total Project Costs				**$ 4,773,440.00**

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Green Valley Special Utility District
Summary Drainage Basin D
Engineer's Opinion of Probable Costs

D

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ -	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ -	$ -
4	21" SDR 35, PVC (0'-6' cut)	$ 200,000.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	$ 225,000.00	$ -
6	27" SDR 35, PVC (0'-6' cut)	$ 530,000.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ 616,000.00	$ -
8	33" SDR 35, PVC (0'-6' cut)	$ -	$ 312,500.00
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ 795,000.00
10	42", PVC (0'-6' cut)	$ -	$ 1,120,000.00
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 159,000.00	$ 159,000.00
17	Bore and Case Roadways	$ 103,350.00	$ 103,350.00
18	Bore and Case Creek Crossings	$ 63,600.00	$ 63,600.00
19	Trench Safety	$ 31,800.00	$ 31,800.00
20	Sewer Main Television Inspection	$ 413,400.00	$ 413,400.00
21	Erosion Control Devices	$ 15,900.00	$ 15,900.00
22	Sewer Junction Structure	$ -	$ -
23	Lift Station	$ -	$ -
	Total Construction	**$ 2,358,050.00**	**$ 3,264,550.00**
	Contingencies	$ 235,805.00	$ 326,455.00
	Total	**$ 2,593,855.00**	**$ 3,591,005.00**
	Easements	$ 79,500.00	$ 79,500.00
	Easements and Surveys and Acquisition Costs	$ 31,800.00	$ 31,800.00
	Environmental Investigation	$ 23,850.00	$ 23,850.00
	Total Easement Costs	**$ 135,150.00**	**$ 135,150.00**
	Basic Engineering	$ 259,385.50	$ 359,100.50
	Survey	$ 31,800.00	$ 31,800.00
	Construction Phase Services	$ 51,877.10	$ 71,820.10
	Total Engineering Costs	**$ 343,062.60**	**$ 462,720.60**
	Total Project Costs	**$ 3,072,067.60**	**$ 4,188,875.60**

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Green Valley Special Utility District
Drainage Basin D - 1 EDU/acre
Engineer's Opinion of Probable Costs

D

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	0	$ 70.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 80.00	$ 200,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 90.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	5,300	$ 100.00	$ 530,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 110.00	$ 616,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**15,900**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	32	$ 5,000.00	$ 159,000.00
17	Bore and Case Roadways	LF	795	$ 130.00	$ 103,350.00
18	Bore and Case Creek Crossings	LF	636	$ 100.00	$ 63,600.00
19	Trench Safety	LF	15,900	$ 2.00	$ 31,800.00
20	Sewer Main Television Inspection	LF	15,900	$ 26.00	$ 413,400.00
21	Erosion Control Devices	LF	15,900	$ 1.00	$ 15,900.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 2,358,050.00**
	Contingencies	10%			$ 235,805.00
	Total				**$ 2,593,855.00**
	Easements	LF	15,900	$ 5.00	$ 79,500.00
	Easements and Surveys and Acquisition Costs	LF	15,900	$ 2.00	$ 31,800.00
	Environmental Investigation	LF	15,900	$ 1.50	$ 23,850.00
	Total Easement Costs				**$ 135,150.00**
	Basic Engineering	10%			$ 259,385.50
	Survey	LF	15,900	$ 2.00	$ 31,800.00
	Construction Phase Services	2%			$ 51,877.10
	Total Engineering Costs				**$ 343,062.60**
	Total Project Costs				**$ 3,072,067.60**

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Green Valley Special Utility District
Drainage Basin D - 3 EDU/acre
Engineer's Opinion of Probable Costs

D

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	0	$ 70.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	LF	0	$ 80.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	LF	0	$ 90.00	$ -
6	27" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 100.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	0	$ 110.00	$ -
8	33" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 125.00	$ 312,500.00
9	36" SDR 35, PVC (0'-6' cut)	LF	5,300	$ 150.00	$ 795,000.00
10	42" SDR 35, PVC (0'-6' cut)	LF	5,600	$ 200.00	$ 1,120,000.00
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**15,900**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	32	$ 5,000.00	$ 159,000.00
17	Bore and Case Roadways	LF	795	$ 130.00	$ 103,350.00
18	Bore and Case Creek Crossings	LF	636	$ 100.00	$ 63,600.00
19	Trench Safety	LF	15,900	$ 2.00	$ 31,800.00
20	Sewer Main Television Inspection	LF	15,900	$ 26.00	$ 413,400.00
21	Erosion Control Devices	LF	15,900	$ 1.00	$ 15,900.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 3,264,550.00**
	Contingencies	10%			$ 326,455.00
	Total				**$ 3,591,005.00**
	Easements	LF	15,900	$ 5.00	$ 79,500.00
	Easements and Surveys and Acquisition Costs	LF	15,900	$ 2.00	$ 31,800.00
	Environmental Investigation	LF	15,900	$ 1.50	$ 23,850.00
	Total Easement Costs				**$ 135,150.00**
	Basic Engineering	10%			$ 359,100.50
	Survey	LF	15,900	$ 2.00	$ 31,800.00
	Construction Phase Services	2%			$ 71,820.10
	Total Engineering Costs				**$ 462,720.60**
	Total Project Costs				**$ 4,188,875.60**

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Green Valley Special Utility District
Summary Drainage Basin E
Engineer's Opinion of Probable Costs

E

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ -	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ -	$ -
4	21" SDR 35, PVC (0'-6' cut)	$ 588,000.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	$ 1,548,000.00	$ 414,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ 2,230,000.00	$ 735,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ 1,699,500.00	$ 1,386,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ 2,706,250.00	$ 1,625,000.00
9	36" SDR 35, PVC (0'-6' cut)	$ 870,000.00	$ 2,167,500.00
10	42", PVC (0'-6' cut)	$ -	$ 6,390,000.00
11	48", PVC (0'-6' cut)	$ 1,750,000.00	$ 1,450,000.00
12	54", PVC (0'-6' cut)	$ 5,550,000.00	$ -
13	60", PVC (0'-6' cut)	$ 3,360,000.00	$ 2,450,000.00
14	66", PVC (0'-6' cut)	$ -	$ 2,000,000.00
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 1,248,500.00	$ 1,017,500.00
17	Bore and Case Roadways	$ 811,525.00	$ 661,375.00
18	Bore and Case Creek Crossings	$ 499,400.00	$ 407,000.00
19	Trench Safety	$ 249,700.00	$ 203,500.00
20	Sewer Main Television Inspection	$ 3,246,100.00	$ 2,645,500.00
21	Erosion Control Devices	$ 124,850.00	$ 101,750.00
22	Sewer Junction Structure	$ 140,000.00	$ 140,000.00
23	Lift Station	$ 400,000.00	$ 400,000.00
	Total Construction	**$ 27,021,825.00**	**$ 34,589,125.00**
	Contingencies	$ 2,702,182.50	$ 3,458,912.50
	Total	**$ 29,724,007.50**	**$ 38,048,037.50**
	Easements	$ 624,250.00	$ 508,750.00
	Easements and Surveys and Acquisition Costs	$ 249,700.00	$ 203,500.00
	Environmental Investigation	$ 187,275.00	$ 152,625.00
	Total Easement Costs	**$ 1,061,225.00**	**$ 864,875.00**
	Basic Engineering	$ 2,972,400.75	$ 3,804,803.75
	Survey	$ 249,700.00	$ 203,500.00
	Construction Phase Services	$ 594,480.15	$ 760,960.75
	Total Engineering Costs	**$ 3,816,580.90**	**$ 4,769,264.50**
	Total Project Costs	**$ 34,601,813.40**	**$ 43,682,177.00**

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Green Valley Special Utility District
Drainage Basin E - 1 EDU/acre
Engineer's Opinion of Probable Costs

E

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	0	$ 70.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	LF	7,350	$ 80.00	$ 588,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	17,200	$ 90.00	$ 1,548,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	22,300	$ 100.00	$ 2,230,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	15,450	$ 110.00	$ 1,699,500.00
8	33" SDR 35, PVC (0'-6' cut)	LF	21,650	$ 125.00	$ 2,706,250.00
9	36" SDR 35, PVC (0'-6' cut)	LF	5,800	$ 150.00	$ 870,000.00
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	7,000	$ 250.00	$ 1,750,000.00
12	54" SDR 35, PVC (0'-6' cut)	LF	18,500	$ 300.00	$ 5,550,000.00
13	60" SDR 35, PVC (0'-6' cut)	LF	9,600	$ 350.00	$ 3,360,000.00
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**124,850**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	250	$ 5,000.00	$ 1,248,500.00
17	Bore and Case Roadways	LF	6242.5	$ 130.00	$ 811,525.00
18	Bore and Case Creek Crossings	LF	4,994	$ 100.00	$ 499,400.00
19	Trench Safety	LF	124,850	$ 2.00	$ 249,700.00
20	Sewer Main Television Inspection	LF	124,850	$ 26.00	$ 3,246,100.00
21	Erosion Control Devices	LF	124,850	$ 1.00	$ 124,850.00
22	Sewer Junction Structure	EA	4	$ 35,000.00	$ 140,000.00
23	Lift Station	EA	2	$ 200,000.00	$ 400,000.00
	Total Construction				**$ 27,021,825.00**
	Contingencies	10%			$ 2,702,182.50
	Total				**$ 29,724,007.50**
	Easements	LF	124,850	$ 5.00	$ 624,250.00
	Easements and Surveys and Acquisition Costs	LF	124,850	$ 2.00	$ 249,700.00
	Environmental Investigation	LF	124,850	$ 1.50	$ 187,275.00
	Total Easement Costs				**$ 1,061,225.00**
	Basic Engineering	10%			$ 2,972,400.75
	Survey	LF	124,850	$ 2.00	$ 249,700.00
	Construction Phase Services	2%			$ 594,480.15
	Total Engineering Costs				**$ 3,816,580.90**
	Total Project Costs				**$ 34,601,813.40**

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Green Valley Special Utility District
Drainage Basin E - 3 EDU/acre
Engineer's Opinion of Probable Costs

E

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	0	$ 70.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	LF	0	$ 80.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	LF	4,600	$ 90.00	$ 414,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	7,350	$ 100.00	$ 735,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	12,600	$ 110.00	$ 1,386,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	13,000	$ 125.00	$ 1,625,000.00
9	36" SDR 35, PVC (0'-6' cut)	LF	14,450	$ 150.00	$ 2,167,500.00
10	42" SDR 35, PVC (0'-6' cut)	LF	31,950	$ 200.00	$ 6,390,000.00
11	48" SDR 35, PVC (0'-6' cut)	LF	5,800	$ 250.00	$ 1,450,000.00
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	7,000	$ 350.00	$ 2,450,000.00
14	66" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 400.00	$ 2,000,000.00
15	72" SDR 35, PVC (0'-6' cut)	LF	23,100	$ 450.00	$ 10,395,000.00
	Total Length	**LF**	**101,750**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	204	$ 5,000.00	$ 1,017,500.00
17	Bore and Case Roadways	LF	5087.5	$ 130.00	$ 661,375.00
18	Bore and Case Creek Crossings	LF	4,070	$ 100.00	$ 407,000.00
19	Trench Safety	LF	101,750	$ 2.00	$ 203,500.00
20	Sewer Main Television Inspection	LF	101,750	$ 26.00	$ 2,645,500.00
21	Erosion Control Devices	LF	101,750	$ 1.00	$ 101,750.00
22	Sewer Junction Structure	EA	4	$ 35,000.00	$ 140,000.00
23	Lift Station	EA	2	$ 200,000.00	$ 400,000.00
	Total Construction				**$ 34,589,125.00**
	Contingencies	10%			$ 3,458,912.50
	Total				**$ 38,048,037.50**
	Easements	LF	101,750	$ 5.00	$ 508,750.00
	Easements and Surveys and Acquisition Costs	LF	101,750	$ 2.00	$ 203,500.00
	Environmental Investigation	LF	101,750	$ 1.50	$ 152,625.00
	Total Easement Costs				**$ 864,875.00**
	Basic Engineering	10%			$ 3,804,803.75
	Survey	LF	101,750	$ 2.00	$ 203,500.00
	Construction Phase Services	2%			$ 760,960.75
	Total Engineering Costs				**$ 4,769,264.50**
	Total Project Costs				**$ 43,682,177.00**

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Green Valley Special Utility District
Summary Drainage Basin F
Engineer's Opinion of Probable Costs

F

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ -	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ 175,000.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	$ 200,000.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	$ 450,000.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ 500,000.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ 1,342,000.00	$ 550,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ -	$ 312,500.00
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ 1,155,000.00
10	42", PVC (0'-6' cut)	$ -	$ 1,400,000.00
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 272,000.00	$ 272,000.00
17	Bore and Case Roadways	$ 176,800.00	$ 176,800.00
18	Bore and Case Creek Crossings	$ 108,800.00	$ 108,800.00
19	Trench Safety	$ 54,400.00	$ 54,400.00
20	Sewer Main Television Inspection	$ 707,200.00	$ 707,200.00
21	Erosion Control Devices	$ 27,200.00	$ 27,200.00
22	Sewer Junction Structure	$ -	$ -
23	Lift Station	$ -	$ -
	Total Construction	**$ 4,013,400.00**	**$ 5,238,900.00**
	Contingencies	$ 401,340.00	$ 523,890.00
	Total	**$ 4,414,740.00**	**$ 5,762,790.00**
	Easements	$ 136,000.00	$ 136,000.00
	Easements and Surveys and Acquisition Costs	$ 54,400.00	$ 54,400.00
	Environmental Investigation	$ 40,800.00	$ 40,800.00
	Total Easement Costs	**$ 231,200.00**	**$ 231,200.00**
	Basic Engineering	$ 441,474.00	$ 576,279.00
	Survey	$ 54,400.00	$ 54,400.00
	Construction Phase Services	$ 88,294.80	$ 115,255.80
	Total Engineering Costs	**$ 584,168.80**	**$ 745,934.80**
	Total Project Costs	**$ 5,230,108.80**	**$ 6,739,924.80**

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Green Valley Special Utility District
Drainage Basin F - 1 EDU/acre
Engineer's Opinion of Probable Costs

F

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 70.00	$ 175,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 80.00	$ 200,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 90.00	$ 450,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 100.00	$ 500,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	12,200	$ 110.00	$ 1,342,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	0	$ 125.00	$ -
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**27,200**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	54	$ 5,000.00	$ 272,000.00
17	Bore and Case Roadways	LF	1360	$ 130.00	$ 176,800.00
18	Bore and Case Creek Crossings	LF	1,088	$ 100.00	$ 108,800.00
19	Trench Safety	LF	27,200	$ 2.00	$ 54,400.00
20	Sewer Main Television Inspection	LF	27,200	$ 26.00	$ 707,200.00
21	Erosion Control Devices	LF	27,200	$ 1.00	$ 27,200.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$200,000.00	$ -
	Total Construction				**$ 4,013,400.00**
	Contingencies	10%			$ 401,340.00
	Total				**$ 4,414,740.00**
	Easements	LF	27,200	$ 5.00	$ 136,000.00
	Easements and Surveys and Acquisition Costs	LF	27,200	$ 2.00	$ 54,400.00
	Environmental Investigation	LF	27,200	$ 1.50	$ 40,800.00
	Total Easement Costs				**$ 231,200.00**
	Basic Engineering	10%			$ 441,474.00
	Survey	LF	27,200	$ 2.00	$ 54,400.00
	Construction Phase Services	2%			$ 88,294.80
	Total Engineering Costs				**$ 584,168.80**
	Total Project Costs				**$ 5,230,108.80**

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Green Valley Special Utility District
Drainage Basin F - 3 EDU/acre
Engineer's Opinion of Probable Costs

F

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	0	$ 70.00	$ -
4	21" SDR 35, PVC (0'-6' cut)	LF	0	$ 80.00	$ -
5	24" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 90.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 100.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 110.00	$ 550,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 125.00	$ 312,500.00
9	36" SDR 35, PVC (0'-6' cut)	LF	7,700	$ 150.00	$ 1,155,000.00
10	42" SDR 35, PVC (0'-6' cut)	LF	7,000	$ 200.00	$ 1,400,000.00
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**27,200**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	54	$ 5,000.00	$ 272,000.00
17	Bore and Case Roadways	LF	1360	$ 130.00	$ 176,800.00
18	Bore and Case Creek Crossings	LF	1,088	$ 100.00	$ 108,800.00
19	Trench Safety	LF	27,200	$ 2.00	$ 54,400.00
20	Sewer Main Television Inspection	LF	27,200	$ 26.00	$ 707,200.00
21	Erosion Control Devices	LF	27,200	$ 1.00	$ 27,200.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$200,000.00	$ -
	Total Construction				**$ 5,238,900.00**
	Contingencies	10%			$ 523,890.00
	Total				**$ 5,762,790.00**
	Easements	LF	27,200	$ 5.00	$ 136,000.00
	Easements and Surveys and Acquisition Costs	LF	27,200	$ 2.00	$ 54,400.00
	Environmental Investigation	LF	27,200	$ 1.50	$ 40,800.00
	Total Easement Costs				**$ 231,200.00**
	Basic Engineering	10%			$ 576,279.00
	Survey	LF	27,200	$ 2.00	$ 54,400.00
	Construction Phase Services	2%			$ 115,255.80
	Total Engineering Costs				**$ 745,934.80**
	Total Project Costs				**$ 6,739,924.80**

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Green Valley Special Utility District
Summary Drainage Basin G
Engineer's Opinion of Probable Costs

G

Item	Description	Total Costs 1 (EDU/acre)	Total Costs 3 (EDU/acre)
1	12" SDR 35, PVC (0'-6' cut)	$ -	$ -
2	15" SDR 35, PVC (0'-6' cut)	$ 175,500.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	$ 189,000.00	$ 189,000.00
4	21" SDR 35, PVC (0'-6' cut)	$ 400,000.00	$ 216,000.00
5	24" SDR 35, PVC (0'-6' cut)	$ 225,000.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	$ 280,000.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	$ 319,000.00	$ 275,000.00
8	33" SDR 35, PVC (0'-6' cut)	$ 375,000.00	$ 350,000.00
9	36" SDR 35, PVC (0'-6' cut)	$ -	$ 435,000.00
10	42", PVC (0'-6' cut)	$ -	$ 600,000.00
11	48", PVC (0'-6' cut)	$ -	$ -
12	54", PVC (0'-6' cut)	$ -	$ -
13	60", PVC (0'-6' cut)	$ -	$ -
14	66", PVC (0'-6' cut)	$ -	$ -
15	72", PVC (0'-6' cut)	$ -	$ -
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	$ 216,000.00	$ 216,000.00
17	Bore and Case Roadways	$ 140,400.00	$ 140,400.00
18	Bore and Case Creek Crossings	$ 86,400.00	$ 86,400.00
19	Trench Safety	$ 43,200.00	$ 43,200.00
20	Sewer Main Television Inspection	$ 561,600.00	$ 561,600.00
21	Erosion Control Devices	$ 21,600.00	$ 21,600.00
22	Sewer Junction Structure	$ -	$ -
23	Lift Station	$ -	$ -
	Total Construction	**$ 3,032,700.00**	**$ 3,609,200.00**
	Contingencies	$ 303,270.00	$ 360,920.00
	Total	**$ 3,335,970.00**	**$ 3,970,120.00**
	Easements	$ 108,000.00	$ 108,000.00
	Easements and Surveys and Acquisition Costs	$ 43,200.00	$ 43,200.00
	Environmental Investigation	$ 32,400.00	$ 32,400.00
	Total Easement Costs	**$ 183,600.00**	**$ 183,600.00**
	Basic Engineering	$ 333,597.00	$ 397,012.00
	Survey	$ 43,200.00	$ 43,200.00
	Construction Phase Services	$ 66,719.40	$ 79,402.40
	Total Engineering Costs	**$ 443,516.40**	**$ 519,614.40**
	Total Project Costs	**$ 3,963,086.40**	**$ 4,673,334.40**

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Green Valley Special Utility District
Drainage Basin G - 1 EDU/acre
Engineer's Opinion of Probable Costs

G

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	2,700	$ 65.00	$ 175,500.00
3	18" SDR 35, PVC (0'-6' cut)	LF	2,700	$ 70.00	$ 189,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	5,000	$ 80.00	$ 400,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 90.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 100.00	$ 280,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	2,900	$ 110.00	$ 319,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	3,000	$ 125.00	$ 375,000.00
9	36" SDR 35, PVC (0'-6' cut)	LF	0	$ 150.00	$ -
10	42" SDR 35, PVC (0'-6' cut)	LF	0	$ 200.00	$ -
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**21,600**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	43	$ 5,000.00	$ 216,000.00
17	Bore and Case Roadways	LF	1080	$ 130.00	$ 140,400.00
18	Bore and Case Creek Crossings	LF	864	$ 100.00	$ 86,400.00
19	Trench Safety	LF	21,600	$ 2.00	$ 43,200.00
20	Sewer Main Television Inspection	LF	21,600	$ 26.00	$ 561,600.00
21	Erosion Control Devices	LF	21,600	$ 1.00	$ 21,600.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 3,032,700.00**
	Contingencies	10%			$ 303,270.00
	Total				**$ 3,335,970.00**
	Easements	LF	21,600	$ 5.00	$ 108,000.00
	Easements and Surveys and Acquisition Costs	LF	21,600	$ 2.00	$ 43,200.00
	Environmental Investigation	LF	21,600	$ 1.50	$ 32,400.00
	Total Easement Costs				**$ 183,600.00**
	Basic Engineering	10%			$ 333,597.00
	Survey	LF	21,600	$ 2.00	$ 43,200.00
	Construction Phase Services	2%			$ 66,719.40
	Total Engineering Costs				**$ 443,516.40**
	Total Project Costs				**$ 3,963,086.40**

This cost estimate is based on River City Engineering's experience and qualifications, and represents River City Engineering's best judgment. This cost estimate was prepared for feasibility analysis purposes only. River City Engineering does not guarantee that the actual construction cost will not vary from this estimate. Unit prices were used from SAWS average unit price list revised October 2005. Units prices will not remain constraint and will vary due to market variations such as inflation.

Green Valley Special Utility District
Drainage Basin G - 3 EDU/acre
Engineer's Opinion of Probable Costs

G

Item	Description	Unit	Quantity	Unit Price	Total Costs
1	12" SDR 35, PVC (0'-6' cut)	LF	0	$ 60.00	$ -
2	15" SDR 35, PVC (0'-6' cut)	LF	0	$ 65.00	$ -
3	18" SDR 35, PVC (0'-6' cut)	LF	2,700	$ 70.00	$ 189,000.00
4	21" SDR 35, PVC (0'-6' cut)	LF	2,700	$ 80.00	$ 216,000.00
5	24" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 90.00	$ 225,000.00
6	27" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 100.00	$ 250,000.00
7	30" SDR 35, PVC (0'-6' cut)	LF	2,500	$ 110.00	$ 275,000.00
8	33" SDR 35, PVC (0'-6' cut)	LF	2,800	$ 125.00	$ 350,000.00
9	36" SDR 35, PVC (0'-6' cut)	LF	2,900	$ 150.00	$ 435,000.00
10	42" SDR 35, PVC (0'-6' cut)	LF	3,000	$ 200.00	$ 600,000.00
11	48" SDR 35, PVC (0'-6' cut)	LF	0	$ 250.00	$ -
12	54" SDR 35, PVC (0'-6' cut)	LF	0	$ 300.00	$ -
13	60" SDR 35, PVC (0'-6' cut)	LF	0	$ 350.00	$ -
14	66" SDR 35, PVC (0'-6' cut)	LF	0	$ 400.00	$ -
15	72" SDR 35, PVC (0'-6' cut)	LF	0	$ 450.00	$ -
	Total Length	**LF**	**21,600**		
16	48" dia. M.H. W.T. & Bolted (0'-6' cut)	EA	43	$ 5,000.00	$ 216,000.00
17	Bore and Case Roadways	LF	1080	$ 130.00	$ 140,400.00
18	Bore and Case Creek Crossings	LF	864	$ 100.00	$ 86,400.00
19	Trench Safety	LF	21,600	$ 2.00	$ 43,200.00
20	Sewer Main Television Inspection	LF	21,600	$ 26.00	$ 561,600.00
21	Erosion Control Devices	LF	21,600	$ 1.00	$ 21,600.00
22	Sewer Junction Structure	EA	0	$ 35,000.00	$ -
23	Lift Station	EA	0	$ 200,000.00	$ -
	Total Construction				**$ 3,609,200.00**
	Contingencies	10%			$ 360,920.00
	Total				**$ 3,970,120.00**
	Easements	LF	21,600	$ 5.00	$ 108,000.00
	Easements and Surveys and Acquisition Costs	LF	21,600	$ 2.00	$ 43,200.00
	Environmental Investigation	LF	21,600	$ 1.50	$ 32,400.00
	Total Easement Costs				**$ 183,600.00**
	Basic Engineering	10%			$ 397,012.00
	Survey	LF	21,600	$ 2.00	$ 43,200.00
	Construction Phase Services	2%			$ 79,402.40
	Total Engineering Costs				**$ 519,614.40**
	Total Project Costs				**$ 4,673,334.40**

This cost estimate is based on River City Engineering's experience and qualifications, and represents River City Engineering's best judgment. This cost estimate was prepared for feasibility analysis purposes only. River City Engineering does not guarantee that the actual construction cost will not vary from this estimate. Unit prices were used from SAWS average unit price list revised October 2005. Units prices will not remain constraint and will vary due to market variations such as inflation.

Green Valley Special Utility District
Wastewater impact Fees and Rates
Neighboring Utilities

Neighboring Utility	Wastewater Impact Fee	Wastewater Connection Fee	Cost of Treatment ($/1000 gal)	Monthly Service Fee
New Braunfels Utilities	$1,160	$655		
City of Seguin	$500	$470		
CCMA	$985		$1.60	
GBRA		$1,000		$32

Green Valley Special Utility District
Wastewater Impact Fees
Main Wastewater Collection System (Trunk Lines)

Drainage Basin	Total EDU 1 (EDU/acre)	Total EDU 3 (EDU/acre)	Dev Density of 1 EDU/acre		Dev Density of 3 EDU/acre	
			Total Costs	Potential Impact Fee	Total Costs	Potential Impact Fee
Drainage Basin A	9,211	27,633	$11,212,950	$1,217	$13,229,734	$479
Drainage Basin B	4,690	14,070	$3,379,449	$721	$3,848,841	$274
Drainage Basin C	5,636	16,908	$4,151,280	$737	$4,773,440	$282
Drainage Basin D	6,688	20,064	$3,072,068	$459	$4,188,876	$209
Drainage Basin E	35,618	106,854	$34,601,813	$971	$43,682,177	$409
Drainage Basin F	6,515	19,545	$5,230,109	$803	$6,739,925	$345
Drainage Basin G	7,511	22,533	$3,963,086	$528	$4,673,334	$207
Total	**75,869**	**227,607**	**$65,610,755**	**$865**	**$81,136,327**	**$356**

Green Valley Special Utility District
Wastewater Impact Fees
Wastewater Treatment Facility

Drainage Basin	Total EDU 1 (EDU/acre)	Total EDU 3 (EDU/acre)	Dev Density of 1 EDU/acre		Dev Density of 3 EDU/acre	
			Total Costs	Potential Impact Fee	Total Costs	Potential Impact Fee
Drainage Basin A	9,211	27,633	$7,898,433	$858	$20,310,255	$735
Drainage Basin B	4,690	14,070	$4,021,675	$858	$12,065,025	$858
Drainage Basin C	5,636	16,908	$4,832,870	$858	$14,498,610	$858
Drainage Basin D	6,688	20,064	$5,734,103	$857	$17,202,308	$857
Drainage Basin E	35,618	106,854	$26,179,965	$735	$39,269,948	$368
Drainage Basin F	6,515	19,545	$5,586,613	$858	$16,759,838	$858
Drainage Basin G	7,511	22,533	$6,440,683	$858	$16,561,755	$735
Total	**75,869**	**227,607**	**$60,694,342**	**$800**	**$136,667,739**	**$600**

Green Valley Special Utility District
Wastewater Impact Fees
Wastewater Treatment Facility

Drainage Basin	Dev Density of 1 EDU/acre			Dev Density of 3 EDU/acre		
	Wastewater Collection Impact fee	Wastewater Treatmrnt Impact fee	Total Impact Fee	Wastewater Collection Impact fee	Wastewater Treatmrnt Impact fee	Total Impact Fee
Drainage Basin A	$1,217	$858	**$ 2,075**	$479	$735	**$1,214**
Drainage Basin B	$721	$858	**$ 1,578**	$274	$858	**$1,131**
Drainage Basin C	$737	$858	**$ 1,594**	$282	$858	**$1,140**
Drainage Basin D	$459	$857	**$ 1,317**	$209	$857	**$1,066**
Drainage Basin E	$971	$735	**$ 1,706**	$409	$368	**$776**
Drainage Basin F	$803	$858	**$ 1,660**	$345	$858	**$1,202**
Drainage Basin G	$528	$858	**$ 1,385**	$207	$735	**$942**

Green Valley Special Utility District
Wastewater Treatment Capacity Summary
Most Downstream Drainage Basin Location

Design Flow	1 EDU/Acre	3 EDU/Acre
	Capacity (MGD)	Capacity (MGD)
Drainage Basin A	2.3	6.8
Drainage Basin B	1.1	3.4
Drainage Basin C	1.4	4.1
Drainage Basin D	1.6	4.9
Drainage Basin E	8.7	26.2
Drainage Basin F	1.6	4.8
Drainage Basin G	1.8	5.5

Green Valley Special Utility District
Wastewater Treatment Costs Summary
Most Downstream Drainage Basin Location

Design Flow	1 EDU/Acre	3 EDU/Acre
	Costs ($)	Costs ($)
Drainage Basin A	$ 7,898,433	$ 20,310,255
Drainage Basin B	$ 4,021,675	$ 12,065,025
Drainage Basin C	$ 4,832,870	$ 14,498,610
Drainage Basin D	$ 5,734,103	$ 17,202,308
Drainage Basin E	$ 26,179,965	$ 39,269,948
Drainage Basin F	$ 5,586,613	$ 16,759,838
Drainage Basin G	$ 6,440,683	$ 16,561,755

Development Density 3 EDU/acre

Green Valley Special Utility District
Drainage Area A
Wastewater Treatment Plant Costs Study

A

Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP AA1-1	570,360	0.6	$4.00	$2,281,440
CP AA2-1	736,470	0.7	$4.00	$2,945,880
CP AA1-5	3,518,445	3.5	$3.50	$12,314,558
CP AA5-2	4,959,045	5.0	$3.50	$17,356,658
CP AA6-1	6,352,605	6.4	$3.00	$19,057,815
CP AA8-1	6,770,085	6.8	$3.00	$20,310,255

Development Density 1 EDU/acre

Green Valley Special Utility District
Drainage Area A
Wastewater Treatment Plant Costs Study

A

Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP AA1-1	190,120	0.2	$4.00	$760,480
CP AA2-1	245,490	0.2	$4.00	$981,960
CP AA1-5	1,172,815	1.2	$3.50	$4,104,853
CP AA5-2	1,653,015	1.7	$3.50	$5,785,553
CP AA6-1	2,117,535	2.1	$3.50	$7,411,373
CP AA8-1	2,256,695	2.3	$3.50	$7,898,433

Green Valley Special Utility District
Drainage Area A
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU **A**

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe AA1	Upstream	**CP AA1-1**	256	520	776	3.0	2328	570,360	**570,360**	2,293,080	2,293,080	$4.00	**$2,281,440**
Pipe AA1	CP AA1-1	CP AA1-2	177	144	321	3.0	963	235,935	806,295	948,555	3,241,635	$4.00	$3,225,180
Pipe AA1	CP AA1-2	CP AA1-3	169	129	298	3.0	894	219,030	1,025,325	880,590	4,122,225	$3.50	$3,588,638
Pipe AA1	CP AA1-3	CP AA1-4	175	114	289	3.0	867	212,415	1,237,740	853,995	4,976,220	$3.50	$4,332,090
Pipe AA1	CP AA1-4	CP AA1-5	210	73	283	3.0	849	208,005	1,445,745	836,265	5,812,485	$3.50	$5,060,108
1	Total		987	980	1967		5901	1,445,745		5,812,485			
Pipe AA2	Upstream	**CP AA2-1**	931	71	1002	3.0	3006	736,470	**736,470**	2,960,910	2,960,910	$4.00	**$2,945,880**
Pipe AA2	CP AA2-1	CP AA2-2	486	287	773	3.0	2319	568,155	1,304,625	2,284,215	5,245,125	$3.50	$4,566,188
Pipe AA2	CP AA2-2	CP AA2-3	234	394	628	3.0	1884	461,580	1,766,205	1,855,740	7,100,865	$3.50	$6,181,718
Pipe AA2	CP AA2-3	CP AA2-4	131	119	250	3.0	750	183,750	1,949,955	738,750	7,839,615	$3.50	$6,824,843
Pipe AA2	CP AA2-4	CP AA1-5	34	133	167	3.0	501	122,745	2,072,700	493,485	8,333,100	$3.50	$7,254,450
2	Total		1816	1004	2820		8460	2,072,700		8,333,100			
Pipe AA3	Upstream	CP AA3-1	93	246	339	3.0	1017	249,165	249,165	1,001,745	1,001,745	$4.00	$996,660
Pipe AA3	CP AA3-1	CP AA3-2	127	195	322	3.0	966	236,670	485,835	951,510	1,953,255	$4.00	$1,943,340
Pipe AA3	CP AA3-2	CP AA3-3	93	262	355	3.0	1065	260,925	746,760	1,049,025	3,002,280	$4.00	$2,987,040
Pipe AA3	CP AA3-3	CP AA3-4	127	220	347	3.0	1041	255,045	1,001,805	1,025,385	4,027,665	$3.50	$3,506,318
Pipe AA3	CP AA3-4	CP AA6-1	50	240	290	3.0	870	213,150	1,214,955	856,950	4,884,615	$3.50	$4,252,343
3	Total		490	1163	1653		4959	1,214,955		4,884,615			
Pipe AA4	Upstream	CP AA4-1	211	17	228	3.0	684	167,580	167,580	673,740	673,740	$4.00	$670,320
Pipe AA4	CP AA4-1	CP AA4-2	314	69	383	3.0	1149	281,505	449,085	1,131,765	1,805,505	$4.00	$1,796,340
Pipe AA4	CP AA4-2	CP AA4-3	252	36	288	3.0	864	211,680	660,765	851,040	2,656,545	$4.00	$2,643,060
Pipe AA4	CP AA4-3	CP AA5-2	269	72	341	3.0	1023	250,635	911,400	1,007,655	3,664,200	$4.00	$3,645,600
4	Total		1046	194	1240		3720	911,400		3,664,200			
Pipe AA1	Upstream	CP AA1-5	987	980	1967	3.0	5901	1,445,745	1,445,745	5,812,485	5,812,485	$3.50	$5,060,108
Pipe AA2	Upstream	**CP AA1-5**	1816	1004	2820	3.0	8460	2,072,700	**3,518,445**	8,333,100	14,145,585	$3.50	**$12,314,558**
Pipe AA5	CP AA1-5	CP AA5-1	233	103	336	3.0	1008	246,960	3,765,405	992,880	15,138,465	$3.50	$13,178,918
Pipe AA5	CP AA5-1	CP AA5-2	266	118	384	3.0	1152	282,240	4,047,645	1,134,720	16,273,185	$3.50	$14,166,758
5	Total		3302	2205	5507		16521	4,047,645		16,273,185			
Pipe AA4	Upstream	CP AA5-2	1046	194	1240	3.0	3720	911,400	911,400	3,664,200	3,664,200	$4.00	$3,645,600
Pipe AA5	CP AA1-5	**CP AA5-2**	3302	2205	5507	3.0	16521	4,047,645	**4,959,045**	16,273,185	19,937,385	$3.50	**$17,356,658**
Pipe AA6	CP AA5-2	CP AA6-1	181	62	243	3.0	729	178,605	5,137,650	718,065	20,655,450	$3.00	$15,412,950
6	Total		4529	2461	6990		20970	5,137,650		20,655,450			
Pipe AA3	Upstream	CP AA6-1	490	1163	1653	3.0	4959	1,214,955	1,214,955	4,884,615	4,884,615	$3.50	$4,252,343
Pipe AA6	CP AA5-2	**CP AA6-1**	4529	2461	6990	3.0	20970	5,137,650	**6,352,605**	20,655,450	25,540,065	$3.00	**$19,057,815**
Pipe AA7	CP AA6-1	CP AA7-1	208	92	300	3.0	900	220,500	6,573,105	886,500	26,426,565	$3.00	$19,719,315
7	Total		5227	3716	8943		26829	6,573,105		26,426,565			
Pipe AA7	CP AA6-1	CP AA7-1	5227	3716	8943	3.0	26829	6,573,105	6,573,105	26,426,565	26,426,565	$3.00	$19,719,315
Pipe AA8	CP AA7-1	**CP AA8-1**	253	15	268	3.0	804	196,980	**6,770,085**	791,940	27,218,505	$3.00	**$20,310,255**
8	Total		5480	3731	9211		27633	6,770,085		27,218,505			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Green Valley Special Utility District
Drainage Area A
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU **A**

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe AA1	Upstream	**CP AA1-1**	256	520	776	1.0	776	190,120	**190,120**	1,152,360	1,152,360	$4.00	**$760,480**
Pipe AA1	CP AA1-1	CP AA1-2	177	144	321	1.0	321	78,645	268,765	476,685	1,629,045	$4.00	$1,075,060
Pipe AA1	CP AA1-2	CP AA1-3	169	129	298	1.0	298	73,010	341,775	442,530	2,071,575	$4.00	$1,367,100
Pipe AA1	CP AA1-3	CP AA1-4	175	114	289	1.0	289	70,805	412,580	429,165	2,500,740	$4.00	$1,650,320
Pipe AA1	CP AA1-4	CP AA1-5	210	73	283	1.0	283	69,335	481,915	420,255	2,920,995	$4.00	$1,927,660
	Total		987	980	1967		1967	481,915		2,920,995			
Pipe AA2	Upstream	**CP AA2-1**	931	71	1002	1.0	1002	245,490	**245,490**	1,487,970	1,487,970	$4.00	**$981,960**
Pipe AA2	CP AA2-1	CP AA2-2	486	287	773	1.0	773	189,385	434,875	1,147,905	2,635,875	$4.00	$1,739,500
Pipe AA2	CP AA2-2	CP AA2-3	234	394	628	1.0	628	153,860	588,735	932,580	3,568,455	$4.00	$2,354,940
Pipe AA2	CP AA2-3	CP AA2-4	131	119	250	1.0	250	61,250	649,985	371,250	3,939,705	$4.00	$2,599,940
Pipe AA2	CP AA2-4	CP AA1-5	34	133	167	1.0	167	40,915	690,900	247,995	4,187,700	$4.00	$2,763,600
	Total		1816	1004	2820		2820	690,900		4,187,700			
Pipe AA3	Upstream	CP AA3-1	93	246	339	1.0	339	83,055	83,055	503,415	503,415	$4.00	$332,220
Pipe AA3	CP AA3-1	CP AA3-2	127	195	322	1.0	322	78,890	161,945	478,170	981,585	$4.00	$647,780
Pipe AA3	CP AA3-2	CP AA3-3	93	262	355	1.0	355	86,975	248,920	527,175	1,508,760	$4.00	$995,680
Pipe AA3	CP AA3-3	CP AA3-4	127	220	347	1.0	347	85,015	333,935	515,295	2,024,055	$4.00	$1,335,740
Pipe AA3	CP AA3-4	CP AA6-1	50	240	290	1.0	290	71,050	404,985	430,650	2,454,705	$4.00	$1,619,940
	Total		490	1163	1653		1653	404,985		2,454,705			
Pipe AA4	Upstream	CP AA4-1	211	17	228	1.0	228	55,860	55,860	338,580	338,580	$4.00	$223,440
Pipe AA4	CP AA4-1	CP AA4-2	314	69	383	1.0	383	93,835	149,695	568,755	907,335	$4.00	$598,780
Pipe AA4	CP AA4-2	CP AA4-3	252	36	288	1.0	288	70,560	220,255	427,680	1,335,015	$4.00	$881,020
Pipe AA4	CP AA4-3	CP AA5-2	269	72	341	1.0	341	83,545	303,800	506,385	1,841,400	$4.00	$1,215,200
	Total		1046	194	1240		1240	303,800		1,841,400			
Pipe AA1	Upstream	CP AA1-5	987	980	1967	1.0	1967	481,915	481,915	2,920,995	2,920,995	$4.00	$1,927,660
Pipe AA2	Upstream	**CP AA1-5**	1816	1004	2820	1.0	2820	690,900	**1,172,815**	4,187,700	7,108,695	$3.50	**$4,104,853**
Pipe AA5	CP AA1-5	CP AA5-1	233	103	336	1.0	336	82,320	1,255,135	498,960	7,607,655	$3.50	$4,392,973
Pipe AA5	CP AA5-1	CP AA5-2	266	118	384	1.0	384	94,080	1,349,215	570,240	8,177,895	$3.50	$4,722,253
	Total		3302	2205	5507		5507	1,349,215		8,177,895			
Pipe AA4	Upstream	CP AA5-2	1046	194	1240	1.0	1240	303,800	303,800	1,841,400	1,841,400	$4.00	$1,215,200
Pipe AA5	CP AA1-5	**CP AA5-2**	3302	2205	5507	1.0	5507	1,349,215	**1,653,015**	8,177,895	10,019,295	$3.50	**$5,785,553**
Pipe AA6	CP AA5-2	CP AA6-1	181	62	243	1.0	243	59,535	1,712,550	360,855	10,380,150	$3.50	$5,993,925
	Total		4529	2461	6990		6990	1,712,550		10,380,150			
Pipe AA3	Upstream	CP AA6-1	490	1163	1653	1.0	1653	404,985	404,985	2,454,705	2,454,705	$4.00	$1,619,940
Pipe AA6	CP AA5-2	**CP AA6-1**	4529	2461	6990	1.0	6990	1,712,550	**2,117,535**	10,380,150	12,834,855	**$3.50**	**$7,411,373**
Pipe AA7	CP AA6-1	CP AA7-1	208	92	300	1.0	300	73,500	2,191,035	445,500	13,280,355	$3.50	$7,668,623
	Total		5227	3716	8943		8943	2,191,035		13,280,355			
Pipe AA7	CP AA6-1	CP AA7-1	5227	3716	8943	1.0	8943	2,191,035	2,191,035	13,280,355	13,280,355	$3.50	$7,668,623
Pipe AA8	CP AA7-1	**CP AA8-1**	253	15	268	1.0	268	65,660	**2,256,695**	397,980	13,678,335	**$3.50**	**$7,898,433**
	Total		5480	3731	9211		9211	2,256,695		13,678,335			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area B Wastewater Treatment Plant Costs Study				B
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP BB-1	465,990	0.5	$4.00	$1,863,960
CP BB-4	1,609,650	1.6	$3.50	$5,633,775
CP BB-8	3,447,150	3.4	$3.50	$12,065,025

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area B Wastewater Treatment Plant Costs Study				B
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP BB-1	155,330	0.2	$4.00	$621,320
CP BB-4	536,550	0.5	$4.00	$2,146,200
CP BB-8	1,149,050	1.1	$3.50	$4,021,675

Green Valley Special Utility District
Drainage Area B
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU B

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe BB	Upstream	**CP BB-1**	267	367	634	3.0	1902	465,990	**465,990**	1,873,470	1,873,470	$4.00	**$1,863,960**
Pipe BB	CP BB-1	CP BB-2	207	287	494	3.0	1482	363,090	829,080	1,459,770	3,333,240	$4.00	$3,316,320
Pipe BB	CP BB-2	CP BB-3	251	229	480	3.0	1440	352,800	1,181,880	1,418,400	4,751,640	$3.50	$4,136,580
Pipe BB	CP BB-3	**CP BB-4**	366	216	582	3.0	1746	427,770	**1,609,650**	1,719,810	6,471,450	$3.50	**$5,633,775**
Pipe BB	CP BB-4	CP BB-5	384	190	574	3.0	1722	421,890	2,031,540	1,696,170	8,167,620	$3.50	$7,110,390
Pipe BB	CP BB-5	CP BB-6	206	285	491	3.0	1473	360,885	2,392,425	1,450,905	9,618,525	$3.50	$8,373,488
Pipe BB	CP BB-6	CP BB-7	209	306	515	3.0	1545	378,525	2,770,950	1,521,825	11,140,350	$3.50	$9,698,325
Pipe BB	CP BB-7	**CP BB-8**	704	216	920	3.0	2760	676,200	**3,447,150**	2,718,600	13,858,950	$3.50	**$12,065,025**
	Total		2594	2096	4690		14070	3,447,150		13,858,950			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Green Valley Special Utility District
Drainage Area B
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU B

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe BB	Upstream	**CP BB-1**	267	367	634	1.0	634	155,330	**155,330**	941,490	941,490	$4.00	**$621,320**
Pipe BB	CP BB-1	CP BB-2	207	287	494	1.0	494	121,030	276,360	733,590	1,675,080	$4.00	$1,105,440
Pipe BB	CP BB-2	CP BB-3	251	229	480	1.0	480	117,600	393,960	712,800	2,387,880	$4.00	$1,575,840
Pipe BB	CP BB-3	**CP BB-4**	366	216	582	1.0	582	142,590	**536,550**	864,270	3,252,150	$4.00	**$2,146,200**
Pipe BB	CP BB-4	CP BB-5	384	190	574	1.0	574	140,630	677,180	852,390	4,104,540	$4.00	$2,708,720
Pipe BB	CP BB-5	CP BB-6	206	285	491	1.0	491	120,295	797,475	729,135	4,833,675	$4.00	$3,189,900
Pipe BB	CP BB-6	CP BB-7	209	306	515	1.0	515	126,175	923,650	764,775	5,598,450	$4.00	$3,694,600
Pipe BB	CP BB-7	**CP BB-8**	704	216	920	1.0	920	225,400	**1,149,050**	1,366,200	6,964,650	$3.50	**$4,021,675**
	Total		2594	2096	4690		4690	1,149,050		6,964,650			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area C Wastewater Treatment Plant Costs Study				C
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP CC-1	341,040	0.3	$4.00	$1,364,160
CP CC-5	2,009,490	2.0	$3.50	$7,033,215
CP CC-10	4,142,460	4.1	$3.50	$14,498,610

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area C Wastewater Treatment Plant Costs Study				C
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP CC-1	113,680	0.1	$4.00	$454,720
CP CC-5	669,830	0.7	$4.00	$2,679,320
CP CC-10	1,380,820	1.4	$3.50	$4,832,870

Green Valley Special Utility District
Drainage Area C
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU C

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe CC	Upstream	**CP CC-1**	150	314	**464**	3.0	**1392**	341,040	**341,040**	1,371,120	1,371,120	$4.00	**$1,364,160**
Pipe CC	CP CC-1	CP CC-2	173	365	538	3.0	1614	395,430	736,470	1,589,790	2,960,910	$4.00	$2,945,880
Pipe CC	CP CC-2	CP CC-3	192	373	565	3.0	1695	415,275	1,151,745	1,669,575	4,630,485	$3.50	$4,031,108
Pipe CC	CP CC-3	CP CC-4	271	331	602	3.0	1806	442,470	1,594,215	1,778,910	6,409,395	$3.50	$5,579,753
Pipe CC	CP CC-4	**CP CC-5**	332	233	**565**	3.0	**1695**	415,275	**2,009,490**	1,669,575	8,078,970	$3.50	**$7,033,215**
Pipe CC	CP CC-5	CP CC-6	457	259	716	3.0	2148	526,260	2,535,750	2,115,780	10,194,750	$3.50	$8,875,125
Pipe CC	CP CC-6	CP CC-7	584	203	787	3.0	2361	578,445	3,114,195	2,325,585	12,520,335	$3.50	$10,899,683
Pipe CC	CP CC-7	CP CC-8	520	119	639	3.0	1917	469,665	3,583,860	1,888,245	14,408,580	$3.50	$12,543,510
Pipe CC	CP CC-8	CP CC-9	405	152	557	3.0	1671	409,395	3,993,255	1,645,935	16,054,515	$3.50	$13,976,393
Pipe CC	CP CC-9	**CP CC-10**	194	9	**203**	3.0	**609**	149,205	**4,142,460**	599,865	16,654,380	$3.50	**$14,498,610**
	Total		3278	2358	5636		16908	4,142,460		16,654,380			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Green Valley Special Utility District
Drainage Area C
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU C

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe CC	Upstream	**CP CC-1**	150	314	**464**	1.0	**464**	113,680	**113,680**	689,040	689,040	$4.00	**$454,720**
Pipe CC	CP CC-1	CP CC-2	173	365	538	1.0	538	131,810	245,490	798,930	1,487,970	$4.00	$981,960
Pipe CC	CP CC-2	CP CC-3	192	373	565	1.0	565	138,425	383,915	839,025	2,326,995	$4.00	$1,535,660
Pipe CC	CP CC-3	CP CC-4	271	331	602	1.0	602	147,490	531,405	893,970	3,220,965	$4.00	$2,125,620
Pipe CC	CP CC-4	**CP CC-5**	332	233	**565**	1.0	**565**	138,425	**669,830**	839,025	4,059,990	$4.00	**$2,679,320**
Pipe CC	CP CC-5	CP CC-6	457	259	716	1.0	716	175,420	845,250	1,063,260	5,123,250	$4.00	$3,381,000
Pipe CC	CP CC-6	CP CC-7	584	203	787	1.0	787	192,815	1,038,065	1,168,695	6,291,945	$3.50	$3,633,228
Pipe CC	CP CC-7	CP CC-8	520	119	639	1.0	639	156,555	1,194,620	948,915	7,240,860	$3.50	$4,181,170
Pipe CC	CP CC-8	CP CC-9	405	152	557	1.0	557	136,465	1,331,085	827,145	8,068,005	$3.50	$4,658,798
Pipe CC	CP CC-9	**CP CC-10**	194	9	**203**	1.0	**203**	49,735	**1,380,820**	301,455	8,369,460	$3.50	**$4,832,870**
	Total		3278	2358	5636		5636	1,380,820		8,369,460			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area D Wastewater Treatment Plant Costs Study				D
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP DD-1	1,079,715	1.1	$3.50	$3,779,003
CP DD-4	3,476,550	3.5	$3.50	$12,167,925
CP DD-7	4,914,945	4.9	$3.50	$17,202,308

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area D Wastewater Treatment Plant Costs Study				D
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP DD-1	359,905	0.4	$4.00	$1,439,620
CP DD-4	1,158,850	1.2	$3.50	$4,055,975
CP DD-7	1,638,315	1.6	$3.50	$5,734,103

Green Valley Special Utility District
Drainage Area D
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU D

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe DD	Upstream	**CP DD-1**	401	1068	**1469**	3.0	**4407**	1,079,715	**1,079,715**	4,340,895	4,340,895	$3.50	**$3,779,003**
Pipe DD	CP DD-1	CP DD-2	374	815	1189	3.0	3567	873,915	1,953,630	3,513,495	7,854,390	$3.50	$6,837,705
Pipe DD	CP DD-2	CP DD-3	411	725	1136	3.0	3408	834,960	2,788,590	3,356,880	11,211,270	$3.50	$9,760,065
Pipe DD	CP DD-3	**CP DD-4**	326	610	**936**	3.0	**2808**	687,960	**3,476,550**	2,765,880	13,977,150	$3.50	**$12,167,925**
Pipe DD	CP DD-4	CP DD-5	376	466	842	3.0	2526	618,870	4,095,420	2,488,110	16,465,260	$3.50	$14,333,970
Pipe DD	CP DD-5	CP DD-6	407	283	690	3.0	2070	507,150	4,602,570	2,038,950	18,504,210	$3.50	$16,108,995
Pipe DD	CP DD-6	**CP DD-7**	297	128	**425**	3.0	**1275**	312,375	**4,914,945**	1,255,875	19,760,085	$3.50	**$17,202,308**
	Total		2592	4095	6687		20061	4,914,945		19,760,085			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Green Valley Special Utility District
Drainage Area D
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU D

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe DD	Upstream	**CP DD-1**	401	1068	**1469**	1.0	**1469**	359,905	**359,905**	2,181,465	2,181,465	$4.00	**$1,439,620**
Pipe DD	CP DD-1	CP DD-2	374	815	1189	1.0	1189	291,305	651,210	1,765,665	3,947,130	$4.00	$2,604,840
Pipe DD	CP DD-2	CP DD-3	411	725	1136	1.0	1136	278,320	929,530	1,686,960	5,634,090	$4.00	$3,718,120
Pipe DD	CP DD-3	**CP DD-4**	326	610	**936**	1.0	**936**	229,320	**1,158,850**	1,389,960	7,024,050	$3.50	**$4,055,975**
Pipe DD	CP DD-4	CP DD-5	376	466	842	1.0	842	206,290	1,365,140	1,250,370	8,274,420	$3.50	$4,777,990
Pipe DD	CP DD-5	CP DD-6	407	283	690	1.0	690	169,050	1,534,190	1,024,650	9,299,070	$3.50	$5,369,665
Pipe DD	CP DD-6	**CP DD-7**	297	128	**425**	1.0	**425**	104,125	**1,638,315**	631,125	9,930,195	$3.50	**$5,734,103**
	Total		2592	4095	6687		6687	1,638,315		9,930,195			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area E Wastewater Treatment Plant Costs Study				E
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP EE1-1	1,394,295	1.4	$3.50	$4,880,033
CP EE1-7	4,694,445	4.7	$3.50	$16,430,558
CP EE2-1	2,110,185	2.1	$3.50	$7,385,648
CP EE2-7	5,247,165	5.2	$3.00	$15,741,495
CP EE3-1	895,230	0.9	$4.00	$3,580,920
CP EE3-3	1,855,875	1.9	$3.50	$6,495,563
CP EE1-13	14,318,535	14.3	$2.50	$35,796,338
CP EE4-3	19,331,235	19.3	$2.00	$38,662,470
CP EE5-4	23,497,215	23.5	$1.75	$41,120,126
CP EE5-9	26,179,965	26.2	$1.50	$39,269,948

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area E Wastewater Treatment Plant Costs Study				E
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP EE1-1	464,765	0.5	$4.00	$1,859,060
CP EE1-7	1,564,815	1.6	$3.50	$5,476,853
CP EE2-1	703,395	0.7	$4.00	$2,813,580
CP EE2-7	1,749,055	1.7	$3.50	$6,121,693
CP EE3-1	298,410	0.3	$4.00	$1,193,640
CP EE3-3	618,625	0.6	$4.00	$2,474,500
CP EE1-13	4,772,845	4.8	$3.50	$16,704,958
CP EE4-3	6,443,745	6.4	$3.00	$19,331,235
CP EE5-4	7,832,405	7.8	$3.00	$23,497,215
CP EE5-9	8,726,655	8.7	$3.00	$26,179,965

Green Valley Special Utility District
Drainage Area E
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU **E**

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe EE1	Upstream	**CP EE1-1**	442	1455	**1897**	3.0	**5691**	1,394,295	**1,394,295**	5,605,635	5,605,635	$3.50	**$4,880,033**
Pipe EE1	CP EE1-1	CP EE1-2	311	476	787	3.0	2361	578,445	1,972,740	2,325,585	7,931,220	$3.50	$6,904,590
Pipe EE1	CP EE1-2	CP EE1-3	365	424	789	3.0	2367	579,915	2,552,655	2,331,495	10,262,715	$3.50	$8,934,293
Pipe EE1	CP EE1-3	CP EE1-4	419	383	802	3.0	2406	589,470	3,142,125	2,369,910	12,632,625	$3.50	$10,997,438
Pipe EE1	CP EE1-4	CP EE1-5	517	343	860	3.0	2580	632,100	3,774,225	2,541,300	15,173,925	$3.50	$13,209,788
Pipe EE1	CP EE1-5	CP EE1-6	58	302	360	3.0	1080	264,600	4,038,825	1,063,800	16,237,725	$3.50	$14,135,888
Pipe EE1	CP EE1-6	**CP EE1-7**	625	267	**892**	3.0	**2676**	655,620	**4,694,445**	2,635,860	18,873,585	$3.50	**$16,430,558**
Pipe EE1	CP EE1-7	CP EE1-8	646	259	905	3.0	2715	665,175	5,359,620	2,674,275	21,547,860	$3.00	$16,078,860
Pipe EE1	CP EE1-8	CP EE1-9	471	255	726	3.0	2178	533,610	5,893,230	2,145,330	23,693,190	$3.00	$17,679,690
Pipe EE1	CP EE1-9	CP EE1-10	416	248	664	3.0	1992	488,040	6,381,270	1,962,120	25,655,310	$3.00	$19,143,810
Pipe EE1	CP EE1-10	CP EE1-11	381	224	605	3.0	1815	444,675	6,825,945	1,787,775	27,443,085	$3.00	$20,477,835
Pipe EE1	CP EE1-11	CP EE1-12	312	167	479	3.0	1437	352,065	7,178,010	1,415,445	28,858,530	$3.00	$21,534,030
Pipe EE1	CP EE1-12	CP EE1-13	250	130	380	3.0	1140	279,300	7,457,310	1,122,900	29,981,430	$3.00	$22,371,930
	Total		5213	4933	10146		30438	7,457,310		29,981,430			
Pipe EE2	Upstream	**CP EE2-1**	574	2297	**2871**	3.0	**8613**	2,110,185	**2,110,185**	8,483,805	8,483,805	$3.50	**$7,385,648**
Pipe EE2	CP EE2-1	CP EE2-2	347	519	866	3.0	2598	636,510	2,746,695	2,559,030	11,042,835	$3.50	$9,613,433
Pipe EE2	CP EE2-2	CP EE2-3	322	484	806	3.0	2418	592,410	**3,339,105**	2,381,730	13,424,565	$3.50	$11,686,868
Pipe EE2	CP EE2-3	CP EE2-4	279	464	743	3.0	2229	546,105	3,885,210	2,195,565	15,620,130	$3.50	$13,598,235
Pipe EE2	CP EE2-4	CP EE2-5	273	419	692	3.0	2076	508,620	4,393,830	2,044,860	17,664,990	$3.50	$15,378,405
Pipe EE2	CP EE2-5	CP EE2-6	266	406	672	3.0	2016	493,920	4,887,750	1,985,760	19,650,750	$3.50	$17,107,125
Pipe EE2	CP EE2-6	**CP EE2-7**	260	229	**489**	3.0	**1467**	359,415	**5,247,165**	1,444,995	21,095,745	$3.00	**$15,741,495**
Pipe EE2	CP EE2-7	CP EE2-8	253	151	404	3.0	1212	296,940	5,544,105	1,193,820	22,289,565	$3.00	$16,632,315
Pipe EE2	CP EE2-8	CP EE2-9	247	135	382	3.0	1146	280,770	5,824,875	1,128,810	23,418,375	$3.00	$17,474,625
Pipe EE2	CP EE2-9	CP EE2-10	232	142	374	3.0	1122	274,890	6,099,765	1,105,170	24,523,545	$3.00	$18,299,295
Pipe EE2	CP EE2-10	CP EE2-11	183	161	344	3.0	1032	252,840	6,352,605	1,016,520	25,540,065	$3.00	$19,057,815
Pipe EE2	CP EE2-11	CP EE2-12	140	151	291	3.0	873	213,885	6,566,490	859,905	26,399,970	$3.00	$19,699,470
Pipe EE2	CP EE2-12	CP EE2-13	110	291	401	3.0	1203	294,735	6,861,225	1,184,955	27,584,925	$3.00	$20,583,675
Pipe EE2	CP EE2-13	CP EE1-13	0	0	0	3.0	0	0	6,861,225	0	27,584,925	$3.00	$20,583,675
	Total		3486	5849	9335		28005	6,861,225		27,584,925			
Pipe EE3	Upstream	**CP EE3-1**	1168	50	**1218**	3.0	**3654**	895,230	**895,230**	3,599,190	3,599,190	$4.00	**$3,580,920**
Pipe EE3	CP EE3-1	CP EE3-2	619	179	798	3.0	2394	586,530	1,481,760	2,358,090	5,957,280	$3.50	$5,186,160
Pipe EE3	CP EE3-2	**CP EE3-3**	477	32	**509**	3.0	**1527**	374,115	**1,855,875**	1,504,095	7,461,375	$3.50	**$6,495,563**
Pipe EE3	CP EE3-3	CP EE3-4	334	509	843	3.0	2529	619,605	2,475,480	2,491,065	9,952,440	$3.50	$8,664,180
Pipe EE3	CP EE3-4	CP EE3-5	192	628	820	3.0	2460	602,700	3,078,180	2,423,100	12,375,540	$3.50	$10,773,630
Pipe EE3	CP EE3-5	CP EE4-3	51	805	856	3.0	2568	629,160	3,707,340	2,529,480	14,905,020	$3.50	$12,975,690
	Total		2841	2203	5044		15132	3,707,340		14,905,020			
Pipe EE1	Upstream	CP EE1-13	5213	4933	10146	3.0	30438	7,457,310	7,457,310	29,981,430	29,981,430	$3.00	$22,371,930
Pipe EE2	Upstream	**CP EE1-13**	3486	5849	**9335**	3.0	**28005**	6,861,225	**14,318,535**	27,584,925	57,566,355	$2.50	**$35,796,338**
Pipe EE4	CP EE1-13	CP EE4-1	184	466	650	3.0	1950	477,750	14,796,285	1,920,750	59,487,105	$2.50	$36,990,713
Pipe EE4	CP EE4-1	CP EE4-2	106	414	520	3.0	1560	382,200	15,178,485	1,536,600	61,023,705	$2.00	$30,356,970
Pipe EE4	CP EE4-2	CP EE4-3	28	578	606	3.0	1818	445,410	15,623,895	1,790,730	62,814,435	$2.00	$31,247,790
	Total		9017	12240	21257		63771	15,623,895		62,814,435			
Pipe EE3	Upstream	CP EE4-3	2841	2203	5044	3.0	15132	3,707,340	3,707,340	14,905,020	14,905,020	$3.50	$12,975,690
Pipe EE4	CP EE1-13	**CP EE4-3**	9017	12240	**21257**	3.0	**63771**	15,623,895	**19,331,235**	62,814,435	77,719,455	$2.00	**$38,662,470**
Pipe EE5	CP EE4-3	CP EE5-1	925	607	1532	3.0	4596	1,126,020	20,457,255	4,527,060	82,246,515	$1.75	$35,800,196
Pipe EE5	CP EE5-1	CP EE5-2	1036	644	1680	3.0	5040	1,234,800	21,692,055	4,964,400	87,210,915	$1.75	$37,961,096
Pipe EE5	CP EE5-2	CP EE5-3	1003	585	1588	3.0	4764	1,167,180	22,859,235	4,692,540	91,903,455	$1.75	$40,003,661
Pipe EE5	CP EE5-3	**CP EE5-4**	801	67	**868**	3.0	**2604**	637,980	**23,497,215**	2,564,940	94,468,395	$1.75	**$41,120,126**
Pipe EE5	CP EE5-4	CP EE5-5	650	621	1271	3.0	3813	934,185	24,431,400	3,755,805	98,224,200	$1.75	$42,754,950
Pipe EE5	CP EE5-5	CP EE5-6	375	567	942	3.0	2826	692,370	25,123,770	2,783,610	101,007,810	$1.50	$37,685,655
Pipe EE5	CP EE5-6	CP EE5-7	17	665	682	3.0	2046	501,270	25,625,040	2,015,310	103,023,120	$1.50	$38,437,560
Pipe EE5	CP EE5-7	CP EE5-8	0	564	564	3.0	1692	414,540	26,039,580	1,666,620	104,689,740	$1.50	$39,059,370
Pipe EE5	CP EE5-8	**CP EE5-9**	0	191	**191**	3.0	**573**	140,385	**26,179,965**	564,405	105,254,145	$1.50	**$39,269,948**
	Total		16665	18954	35619		106857	26,179,965		105,254,145			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245 GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735 GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985 GPD/EDU
Wastewater Demand =	70	GPD/capita		
Maximum Flow Peak Factor =	3			
Inflow/Infiltration =	750	gallon/acres served		

Green Valley Special Utility District
Drainage Area E
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU **E**

	Sewer Main Location		Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe EE1	Upstream	**CP EE1-1**	442	1455	**1897**	1.0	**1897**	464,765	**464,765**	2,817,045	2,817,045	$4.00	**$1,859,060**
Pipe EE1	CP EE1-1	CP EE1-2	311	476	787	1.0	787	192,815	657,580	1,168,695	3,985,740	$4.00	$2,630,320
Pipe EE1	CP EE1-2	CP EE1-3	365	424	789	1.0	789	193,305	850,885	1,171,665	5,157,405	$4.00	$3,403,540
Pipe EE1	CP EE1-3	CP EE1-4	419	383	802	1.0	802	196,490	1,047,375	1,190,970	6,348,375	$3.50	$3,665,813
Pipe EE1	CP EE1-4	CP EE1-5	517	343	860	1.0	860	210,700	1,258,075	1,277,100	7,625,475	$3.50	$4,403,263
Pipe EE1	CP EE1-5	CP EE1-6	58	302	360	1.0	360	88,200	1,346,275	534,600	8,160,075	$3.50	$4,711,963
Pipe EE1	CP EE1-6	**CP EE1-7**	625	267	**892**	1.0	**892**	218,540	**1,564,815**	1,324,620	9,484,695	$3.50	**$5,476,853**
Pipe EE1	CP EE1-7	CP EE1-8	646	259	905	1.0	905	221,725	1,786,540	1,343,925	10,828,620	$3.50	$6,252,890
Pipe EE1	CP EE1-8	CP EE1-9	471	255	726	1.0	726	177,870	1,964,410	1,078,110	11,906,730	$3.50	$6,875,435
Pipe EE1	CP EE1-9	CP EE1-10	416	248	664	1.0	**664**	162,680	2,127,090	986,040	12,892,770	$3.50	$7,444,815
Pipe EE1	CP EE1-10	CP EE1-11	381	224	605	1.0	605	148,225	2,275,315	898,425	13,791,195	$3.50	$7,963,603
Pipe EE1	CP EE1-11	CP EE1-12	312	167	479	1.0	479	117,355	2,392,670	711,315	14,502,510	$3.50	$8,374,345
Pipe EE1	CP EE1-12	CP EE1-13	250	130	380	1.0	380	93,100	2,485,770	564,300	15,066,810	$3.50	$8,700,195
	Total		5213	4933	10146		10146	2,485,770		15,066,810			
Pipe EE2	Upstream	**CP EE2-1**	574	2297	**2871**	1.0	**2871**	703,395	**703,395**	4,263,435	4,263,435	$4.00	**$2,813,580**
Pipe EE2	CP EE2-1	CP EE2-2	347	519	866	1.0	866	212,170	915,565	1,286,010	5,549,445	$4.00	$3,662,260
Pipe EE2	CP EE2-2	CP EE2-3	322	484	806	1.0	806	197,470	1,113,035	1,196,910	6,746,355	$3.50	$3,895,623
Pipe EE2	CP EE2-3	CP EE2-4	279	464	743	1.0	743	182,035	1,295,070	1,103,355	7,849,710	$3.50	$4,532,745
Pipe EE2	CP EE2-4	CP EE2-5	273	419	692	1.0	692	169,540	1,464,610	1,027,620	8,877,330	$3.50	$5,126,135
Pipe EE2	CP EE2-5	CP EE2-6	266	406	672	1.0	672	164,640	1,629,250	997,920	9,875,250	$3.50	$5,702,375
Pipe EE2	CP EE2-6	**CP EE2-7**	260	229	**489**	1.0	**489**	119,805	**1,749,055**	726,165	10,601,415	$3.50	**$6,121,693**
Pipe EE2	CP EE2-7	CP EE2-8	253	151	404	1.0	404	98,980	1,848,035	599,940	11,201,355	$3.50	$6,468,123
Pipe EE2	CP EE2-8	CP EE2-9	247	135	382	1.0	382	93,590	1,941,625	567,270	11,768,625	$3.50	$6,795,688
Pipe EE2	CP EE2-9	CP EE2-10	232	142	374	1.0	374	91,630	2,033,255	555,390	12,324,015	$3.50	$7,116,393
Pipe EE2	CP EE2-10	CP EE2-11	183	161	344	1.0	344	84,280	2,117,535	510,840	12,834,855	$3.50	$7,411,373
Pipe EE2	CP EE2-11	CP EE2-12	140	151	291	1.0	291	71,295	2,188,830	432,135	13,266,990	$3.50	$7,660,905
Pipe EE2	CP EE2-12	CP EE2-13	110	291	401	1.0	401	98,245	2,287,075	595,485	13,862,475	$3.50	$8,004,763
Pipe EE2	CP EE2-13	CP EE1-13	0	0	0	1.0	0	0	2,287,075	0	13,862,475	$3.50	$8,004,763
	Total		3486	5849	9335		9335	2,287,075		13,862,475			
Pipe EE3	Upstream	**CP EE3-1**	1168	50	**1218**	1.0	**1218**	298,410	**298,410**	1,808,730	1,808,730	$4.00	**$1,193,640**
Pipe EE3	CP EE3-1	CP EE3-2	619	179	798	1.0	798	195,510	493,920	1,185,030	2,993,760	$4.00	$1,975,680
Pipe EE3	CP EE3-2	**CP EE3-3**	477	32	**509**	1.0	**509**	124,705	**618,625**	755,865	3,749,625	$4.00	**$2,474,500**
Pipe EE3	CP EE3-3	CP EE3-4	334	509	843	1.0	843	206,535	825,160	1,251,855	5,001,480	$4.00	$3,300,640
Pipe EE3	CP EE3-4	CP EE3-5	192	628	820	1.0	820	200,900	1,026,060	1,217,700	6,219,180	$3.50	$3,591,210
Pipe EE3	CP EE3-5	CP EE4-3	51	805	856	1.0	856	209,720	1,235,780	1,271,160	7,490,340	$3.50	$4,325,230
	Total		2841	2203	5044		5044	1,235,780		7,490,340			
Pipe EE1	Upstream	CP EE1-13	5213	4933	10146	1.0	10146	2,485,770	2,485,770	15,066,810	15,066,810	$3.50	$8,700,195
Pipe EE2	Upstream	**CP EE1-13**	3486	5849	**9335**	1.0	**9335**	2,287,075	**4,772,845**	13,862,475	28,929,285	$3.50	**$16,704,958**
Pipe EE4	CP EE1-13	CP EE4-1	184	466	650	1.0	650	159,250	4,932,095	965,250	29,894,535	$3.50	$17,262,333
Pipe EE4	CP EE4-1	CP EE4-2	106	414	520	1.0	520	127,400	5,059,495	772,200	30,666,735	$3.00	$15,178,485
Pipe EE4	CP EE4-2	CP EE4-3	28	578	606	1.0	606	148,470	5,207,965	899,910	31,566,645	$3.00	$15,623,895
	Total		9017	12240	21257		21257	5,207,965		31,566,645			
Pipe EE3	Upstream	CP EE4-3	2841	2203	5044	1.0	5044	1,235,780	1,235,780	7,490,340	7,490,340	$3.50	$4,325,230
Pipe EE4	CP EE1-13	**CP EE4-3**	9017	12240	**21257**	1.0	**21257**	5,207,965	**6,443,745**	31,566,645	39,056,985	$3.00	**$19,331,235**
Pipe EE5	CP EE4-3	CP EE5-1	925	607	1532	1.0	1532	375,340	6,819,085	2,275,020	41,332,005	$3.00	$20,457,255
Pipe EE5	CP EE5-1	CP EE5-2	1036	644	1680	1.0	1680	411,600	7,230,685	2,494,800	43,826,805	$3.00	$21,692,055
Pipe EE5	CP EE5-2	CP EE5-3	1003	585	1588	1.0	1588	389,060	7,619,745	2,358,180	46,184,985	$3.00	$22,859,235
Pipe EE5	CP EE5-3	**CP EE5-4**	801	67	**868**	1.0	**868**	212,660	**7,832,405**	1,288,980	47,473,965	$3.00	**$23,497,215**
Pipe EE5	CP EE5-4	CP EE5-5	650	621	1271	1.0	1271	311,395	8,143,800	1,887,435	49,361,400	$3.00	$24,431,400
Pipe EE5	CP EE5-5	CP EE5-6	375	567	942	1.0	942	230,790	8,374,590	1,398,870	50,760,270	$3.00	$25,123,770
Pipe EE5	CP EE5-6	CP EE5-7	17	665	682	1.0	682	167,090	8,541,680	1,012,770	51,773,040	$3.00	$25,625,040
Pipe EE5	CP EE5-7	CP EE5-8	0	564	564	1.0	564	138,180	8,679,860	837,540	52,610,580	$3.00	$26,039,580
Pipe EE5	CP EE5-8	**CP EE5-9**	0	191	**191**	1.0	**191**	46,795	**8,726,655**	283,635	52,894,215	$3.00	**$26,179,965**
	Total		16665	18954	35619		35619	8,726,655		52,894,215			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area F Wastewater Treatment Plant Costs Study				F
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP FF 1	622,545	0.6	$4.00	$2,490,180
CP FF 6	3,196,515	3.2	$3.50	$11,187,803
CP FF 11	4,788,525	4.8	$3.50	$16,759,838

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area F Wastewater Treatment Plant Costs Study				F
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP FF 1	207,515	0.2	$4.00	$830,060
CP FF 6	1,065,505	1.1	$3.50	$3,729,268
CP FF 11	1,596,175	1.6	$3.50	$5,586,613

Green Valley Special Utility District
Drainage Area F
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU F

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe FF	Upstream	**CP FF 1**	233	614	**847**	3.0	**2541**	622,545	**622,545**	2,502,885	2,502,885	$4.00	**$2,490,180**
Pipe FF	CP FF 1	CP FF 2	343	379	722	3.0	2166	530,670	1,153,215	2,133,510	4,636,395	$3.50	$4,036,253
Pipe FF	CP FF 2	CP FF 3	291	389	680	3.0	2040	499,800	1,653,015	2,009,400	6,645,795	$3.50	$5,785,553
Pipe FF	CP FF 3	CP FF 4	229	451	680	3.0	2040	499,800	2,152,815	2,009,400	8,655,195	$3.50	$7,534,853
Pipe FF	CP FF 4	CP FF 5	239	500	739	3.0	2217	543,165	2,695,980	2,183,745	10,838,940	$3.50	$9,435,930
Pipe FF	CP FF 5	**CP FF 6**	229	452	**681**	3.0	**2043**	500,535	**3,196,515**	2,012,355	12,851,295	$3.50	**$11,187,803**
Pipe FF	CP FF 6	CP FF 7	284	313	597	3.0	1791	438,795	3,635,310	1,764,135	14,615,430	$3.50	$12,723,585
Pipe FF	CP FF 7	CP FF 8	233	295	528	3.0	1584	388,080	4,023,390	1,560,240	16,175,670	$3.50	$14,081,865
Pipe FF	CP FF 8	CP FF 9	89	363	452	3.0	1356	332,220	4,355,610	1,335,660	17,511,330	$3.50	$15,244,635
Pipe FF	CP FF 9	CP FF 10	86	250	336	3.0	1008	246,960	4,602,570	992,880	18,504,210	$3.50	$16,108,995
Pipe FF	CP FF 10	**CP FF 11**	171	82	**253**	3.0	**759**	185,955	**4,788,525**	747,615	19,251,825	$3.50	**$16,759,838**
	Total		2427	4088	6515		19545	4,788,525		19,251,825			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Green Valley Special Utility District
Drainage Area F
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU F

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe FF	Upstream	**CP FF 1**	233	614	**847**	1.0	**847**	207,515	**207,515**	1,257,795	1,257,795	$4.00	**$830,060**
Pipe FF	CP FF 1	CP FF 2	343	379	722	1.0	722	176,890	384,405	1,072,170	2,329,965	$4.00	$1,537,620
Pipe FF	CP FF 2	CP FF 3	291	389	680	1.0	680	166,600	551,005	1,009,800	3,339,765	$4.00	$2,204,020
Pipe FF	CP FF 3	CP FF 4	229	451	680	1.0	680	166,600	717,605	1,009,800	4,349,565	$4.00	$2,870,420
Pipe FF	CP FF 4	CP FF 5	239	500	739	1.0	739	181,055	898,660	1,097,415	5,446,980	$4.00	$3,594,640
Pipe FF	CP FF 5	**CP FF 6**	229	452	**681**	1.0	**681**	166,845	**1,065,505**	1,011,285	6,458,265	$3.50	**$3,729,268**
Pipe FF	CP FF 6	CP FF 7	284	313	597	1.0	597	146,265	1,211,770	886,545	7,344,810	$3.50	$4,241,195
Pipe FF	CP FF 7	CP FF 8	233	295	528	1.0	528	129,360	1,341,130	784,080	8,128,890	$3.50	$4,693,955
Pipe FF	CP FF 8	CP FF 9	89	363	452	1.0	452	110,740	1,451,870	671,220	8,800,110	$3.50	$5,081,545
Pipe FF	CP FF 9	CP FF 10	86	250	336	1.0	336	82,320	1,534,190	498,960	9,299,070	$3.50	$5,369,665
Pipe FF	CP FF 10	**CP FF 11**	171	82	**253**	1.0	**253**	61,985	**1,596,175**	375,705	9,674,775	$3.50	**$5,586,613**
	Total		2427	4088	6515		6515	1,596,175		9,674,775			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Development Density 3 EDU/acre

Green Valley Special Utility District Drainage Area G Wastewater Treatment Plant Costs Study				G
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP GG-1	266,805	0.3	$4.00	$1,067,220
CP GG-5	2,042,565	2.0	$3.50	$7,148,978
CP GG-9	5,520,585	5.5	$3.00	$16,561,755

Development Density 1 EDU/acre

Green Valley Special Utility District Drainage Area G Wastewater Treatment Plant Costs Study				G
1	2	3	4	5
Collection Point ID	Average Dry Weather Flow (GPD)	Treatment Plant Capacity (MGD)	Unit Costs (dollars/GPD)	Total Costs (dollars)
CP GG-1	88,935	0.1	$4.00	$355,740
CP GG-5	680,855	0.7	$4.00	$2,723,420
CP GG-9	1,840,195	1.8	$3.50	$6,440,683

Green Valley Special Utility District
Drainage Area G
Wastewater Treatment Plant Capacity and Costs Calculations

3 EDU G

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (3 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe GG	Upstream	**CP GG-1**	96	267	**363**	3.0	**1089**	266,805	**266,805**	1,072,665	1,072,665	$4.00	**$1,067,220**
Pipe GG	CP GG-1	CP GG-2	268	187	455	3.0	1365	334,425	601,230	1,344,525	2,417,190	$4.00	$2,404,920
Pipe GG	CP GG-2	CP GG-3	452	144	596	3.0	1788	438,060	1,039,290	1,761,180	4,178,370	$3.50	$3,637,515
Pipe GG	CP GG-3	CP GG-4	552	129	681	3.0	2043	500,535	1,539,825	2,012,355	6,190,725	$3.50	$5,389,388
Pipe GG	CP GG-4	**CP GG-5**	594	90	**684**	3.0	**2052**	502,740	**2,042,565**	2,021,220	8,211,945	$3.50	**$7,148,978**
Pipe GG	CP GG-5	CP GG-6	661	160	821	3.0	2463	603,435	2,646,000	2,426,055	10,638,000	$3.50	$9,261,000
Pipe GG	CP GG-6	CP GG-7	838	387	1225	3.0	3675	900,375	3,546,375	3,619,875	14,257,875	$3.50	$12,412,313
Pipe GG	CP GG-7	CP GG-8	600	563	1163	3.0	3489	854,805	4,401,180	3,436,665	17,694,540	$3.50	$15,404,130
Pipe GG	CP GG-8	**CP GG-9**	113	1410	**1523**	3.0	**4569**	1,119,405	**5,520,585**	4,500,465	22,195,005	$3.00	**$16,561,755**
	Total		4174	3337	7511		22533	5,520,585		22,195,005			

Design Parameters:

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	3	EDU/acre	Maximum Wet Weather Flow =	985	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

Green Valley Special Utility District
Drainage Area G
Wastewater Treatment Plant Capacity and Costs Calculations

1 EDU G

Sewer Main Location			Contributing Area			Population		Average Dry Weather Flow		Maximum Wet Weather		Wastewater Treatment Plant Costs	
1	2	3	4	5	6	7	8	9	10	11	14	15	16
Pipe ID	Up Stream Collection Point	Down Stream Collection Point	Left Side Area (acres)	Right Side Area (acres)	Total Area (acres)	Development Density (1 EDU/acre)	Total EDU (EDU)	Dry Weather Flow (GPD)	Cumulative Dry Weather Flow (GPD)	Wet Weather Flow (GPD)	Cumulative Wet Weather Flow (GPD)	Unit Costs ($/GPD)	Total Costs ($)
Pipe GG	Upstream	**CP GG-1**	96	267	**363**	1.0	**363**	88,935	**88,935**	539,055	539,055	$4.00	**$355,740**
Pipe GG	CP GG-1	CP GG-2	268	187	455	1.0	455	111,475	200,410	675,675	1,214,730	$4.00	$801,640
Pipe GG	CP GG-2	CP GG-3	452	144	596	1.0	596	146,020	346,430	885,060	2,099,790	$4.00	$1,385,720
Pipe GG	CP GG-3	CP GG-4	552	129	681	1.0	681	166,845	513,275	1,011,285	3,111,075	$4.00	$2,053,100
Pipe GG	CP GG-4	**CP GG-5**	594	90	**684**	1.0	**684**	167,580	**680,855**	1,015,740	4,126,815	$4.00	**$2,723,420**
Pipe GG	CP GG-5	CP GG-6	661	160	821	1.0	821	201,145	882,000	1,219,185	5,346,000	$4.00	$3,528,000
Pipe GG	CP GG-6	CP GG-7	838	387	1225	1.0	1225	300,125	1,182,125	1,819,125	7,165,125	$3.50	$4,137,438
Pipe GG	CP GG-7	CP GG-8	600	563	1163	1.0	1163	284,935	1,467,060	1,727,055	8,892,180	$3.50	$5,134,710
Pipe GG	CP GG-8	**CP GG-9**	113	1410	**1523**	1.0	**1523**	373,135	**1,840,195**	2,261,655	11,153,835	$3.50	**$6,440,683**
	Total		4174	3337	7511		7511	1,840,195		11,153,835			

Residential Single Family Units (EDU) =	245	GPD	Average Dry Weather Flow =	245	GPD/EDU
Population per EDU =	3.5	capita/EDU	Maximum Dry Weather Flow =	735	GPD/EDU
Development Average Density =	1	EDU/acre	Maximum Wet Weather Flow =	1485	GPD/EDU
Wastewater Demand =	70	GPD/capita			
Maximum Flow Peak Factor =	3				
Inflow/Infiltration =	750	gallon/acres served			

2014 WATER MASTER PLAN

Green Valley Special Utility District

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11/19/2014
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TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND

Since the inception of the Green Valley Water Service Company and its conversion to Green Valley Special Utility District (GVSUD), GVSUD has earned a respected reputation for excellent water quality and friendly customer service. GVSUD started as a rural water supply corporation back in 1963. Over the past 50-years, GVSUD service area has experienced a steady increase of residential growth. Through the years, GVSUD has gained significant experience managing and servicing this extensive growth. In an effort to continue serving its customers with superior water service, GVSUD has authorized River City Engineering (RCE) to update this Water Master Plan and to prioritize proposed future Capital Improvement Projects (CIPs). This strategic plan will ensure adequate water supplies and infrastructure to meet the continued rapid growth of the area.

This master plans purpose is to analyze GVSUD's existing conditions, estimate future water demands, determine the necessary capital improvement projects to meet those demands, estimate proposed project costs and schedules, and recognize long-term water opportunities and provide the utility the operation options to move different water sources around the CCN service area and efficiently utilize all water sources where necessary. This document shall serve as a long-term adaptable guide to be used as needed to manage future service area development and projected water needs.

2.0 WATER CONNECTIONS

A water connection is defined as the average demand used by a single-family residence. GVSUD historically has not provided for many commercial meters and has not experienced a great deal of commercial growth since the 2008 study was completed. Therefore, for the convenience of this report, all of GVSUD's existing and proposed water connections are considered equal to a single-family residential meter. This assumption will need to be re-evaluated if GVSUD sees an increase in commercial development in the future. We are starting to see signs of industrial and commercial growth along the IH 10 Corridor, however the developments that have made application for service most recently align well with residential type demands.

3.0 HISTORICAL WATER CONNECTIONS AND WATER USE

Many different factors affect growth and development within an area. These include but are not limited to, the local and regional economy, development restrictions, environmental constraints, the current housing inventory, and existing and proposed roadways. GVSUD does not control any of these factors, and therefore, projecting the impact of these factors into the future is difficult.

Table 3.0 shows the total quantity of connections for each of the years from 2003 to 2013.

TABLE 3.0

Green Valley Special Utility District Historical Connection Growth				
1	2	3	4	5
Year	Historical Water Connections	Historical Annual Water Pumped (acre-feet)	Historical Annual Growth (%)	Historical Annual Water Pumped (acre-feet/Connection)
2003	6,500	2310		0.36
2004	6,800	2334	4.62%	0.34
2005	7,500	2776	10.29%	0.37
2006	8,000	3091	6.67%	0.39
2007	8,302	2577	3.78%	0.31
2008	8,453	3235	1.82%	0.38
2009	8,650	3042	2.33%	0.35
2010	8,829	2742	2.07%	0.31
2011	8,995	3289	1.88%	0.37
2012	9,274	2737	3.10%	0.30
2013	9,621	2739	3.74%	0.28

Historical Average Annual Water Connections Percent Growth (%) =	**4.45%**
Historical Average Annual Water Usage (acre-feet/EDU) =	**0.34**

Note:
1. All historical data was provided by GVSUD.

The district has experienced an annual growth rate average of 4.45% and average water usage of 0.34 acre-feet/connection. Pockets of higher growth may exist within certain areas of the District's CCN, requiring a detailed study of each pressure plane. As shown in the table above, the variance in annual growth in 2005 and 2008 could be contributed to the completion of several residential developments in 2005. From the historical data provided, it is safe to assume an average connection growth rate of 5% to predict connection quantity in the future. GVSUD historically uses 0.34 acre-feet/connection/year which will suffice to predict future water usage due to the conservative connection growth value.

As shown in Table 3.1 on the following page, Guadalupe County and the City of New Braunfels are experiencing similar growth to GVSUD.

TABLE 3.1

Surrounding Area Historical Growth				
1	2	3	4	5
Year	Guadalupe County Population	Guadalupe County Growth (%)	New Braunfels Population	New Braunfels Growth (%)
2003	96,445		42,489	
2004	99,038	2.69%	44,596	4.96%
2005	102,313	3.31%	46,577	4.44%
2006	107,670	5.24%	49,514	6.31%
2007	112,581	4.56%	52,056	5.13%
2008	117,341	4.23%	53,975	3.69%
2009	121,432	3.49%	55,867	3.51%
2010	132,409	9.04%	58,226	4.22%
2011	135,757	2.53%	59,590	2.34%
2012	139,841	3.01%	60,761	1.97%
Average		**4.23%**		**4.06%**

- Connection Growth Rate = 4.45%
- Water Demand per Connection = 0.34 Acre-feet/Connection/Year

CHART 3.2

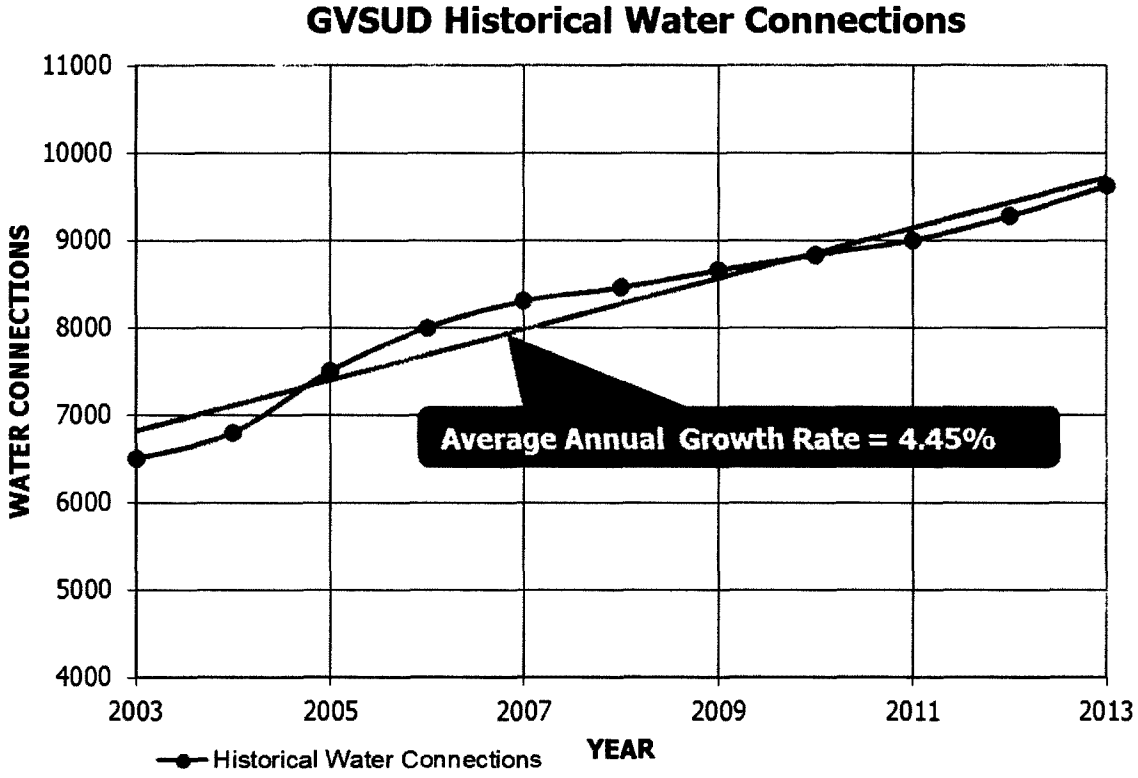


Chart 3.2 above displays the historical water connections for the years 2003 to 2013. An average historical growth rate of 4.45% was experienced in the past ten years. It is assumed that the growth rate will remain steady into the future and a growth rate of 5% will be used for projected connection quantity into the future.

CHART 3.3

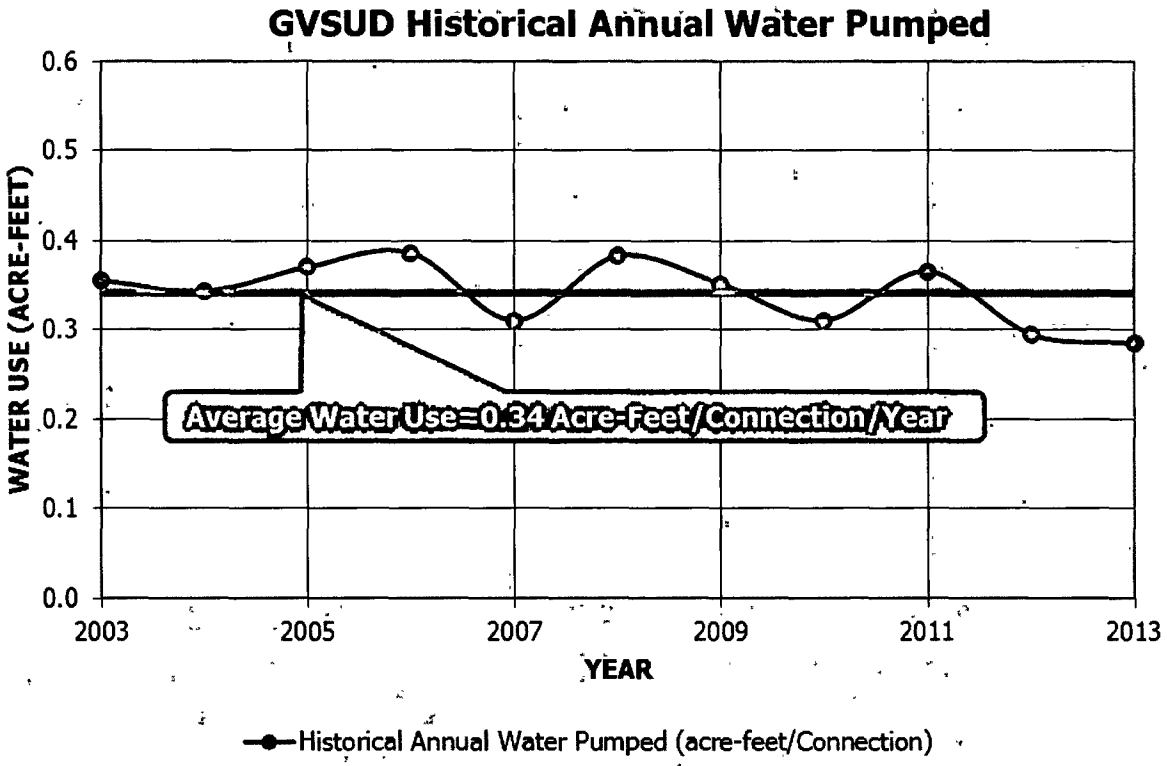


Chart 3.3 above displays the historical water usage for the years 2003 to 2013. The average water use rate for GVSUD was 0.34 acre-feet/connection/year.

4.0 PROJECTED WATER CONNECTIONS AND WATER USE

The 5% average annual growth rate was used to determine quantity of future connections. An 8% and 10% average annual growth rate is also shown in the table to represent a hurried growth of the GVSUD service area. The future connection count along with 0.34 acre-feet/year average water use was used to determine the future estimated water demand.

Table 4.1, shows the projected connection growth based on a 5%, 8% and 10% growth trend and a 0.34 acre-feet/connection/year water use.

TABLE 4.1

Green Valley Special Utility District Projected Growth						
Year	Projected Water Connections			Projected Water Demand (acre-feet/year)		
	5%	8%	10%	5%	8%	10%
2013	9,621	9,621	9,621	3,271	3,271	3,271
2014	10,102	10,391	10,583	3,435	3,533	3,598
2015	10,607	11,222	11,641	3,606	3,815	3,958
2016	11,138	12,120	12,806	3,787	4,121	4,354
2017	11,694	13,089	14,086	3,976	4,450	4,789
2018	12,279	14,136	15,495	4,175	4,806	5,268
2019	12,893	15,267	17,044	4,384	5,191	5,795
2020	13,538	16,489	18,749	4,603	5,606	6,375
2021	14,215	17,808	20,623	4,833	6,055	7,012
2022	14,925	19,232	22,686	5,075	6,539	7,713
2023	15,672	20,771	24,954	5,328	7,062	8,484
2024	16,455	22,433	27,450	5,595	7,627	9,333
2025	17,278	24,227	30,195	5,874	8,237	10,266
2026	18,142	26,165	33,214	6,168	8,896	11,293
2027	19,049	28,259	36,536	6,477	9,608	12,422
2028	20,001	30,519	40,189	6,800	10,377	13,664
2029	21,001	32,961	44,208	7,140	11,207	15,031
2030	22,052	35,598	48,629	7,498	12,103	16,534
2031	23,154	38,446	53,492	7,872	13,072	18,187
2032	24,312	41,521	58,841	8,266	14,117	20,006
2033	25,527	44,843	64,725	8,679	15,247	22,007
2034	26,804	48,431	71,198	9,113	16,466	24,207

Note: Water Usage assumption of 0.34 acre-feet per Connection/Year.

This data indicates a projected water demand for the year 2034 of 9,113 acre-feet, 16,466 acre-feet and 24,207 acre-feet for the associated growth rates of 5%, 8% and 10%, respectively.

5.0 SUMMARY OF EXISTING WATER SYSTEM

GVSUD was divided into individual pressure planes based on Hydraulic Grade Lines in order to quantify the existing and projected number of connections in the study area. These areas are shown on Attachment 'A', Existing Pressure Planes Map. Shown below, in Table 5.0, is a summary of the existing connections per individual pressure planes.

TABLE 5.0

Existing Connections Per Pressure Plane			
1	**2**	**3**	**4**
Service Level No.	**Pressure Plane**	**Existing Connections**	**Percentage of Connections Per Pressure Plane**
1	Plant 1	1,877	19.51%
2	Plant 2	-	0.00%
3	Plant 3	318	3.31%
4	Plant 4	2,688	27.94%
5	Plant 5	476	4.95%
6	Wells	2,030	21.10%
7	Plant 10	-	0.00%
8	Leissner	927	9.64%
9	Haeckerville	528	5.49%
10	Wagner	489	5.08%
11	East Central	234	2.43%
12	1518 EST	54	0.56%
TOTAL		**9,621**	**100%**

As shown in the above table, there are 9,621 existing connections in the system, as of January 2013.

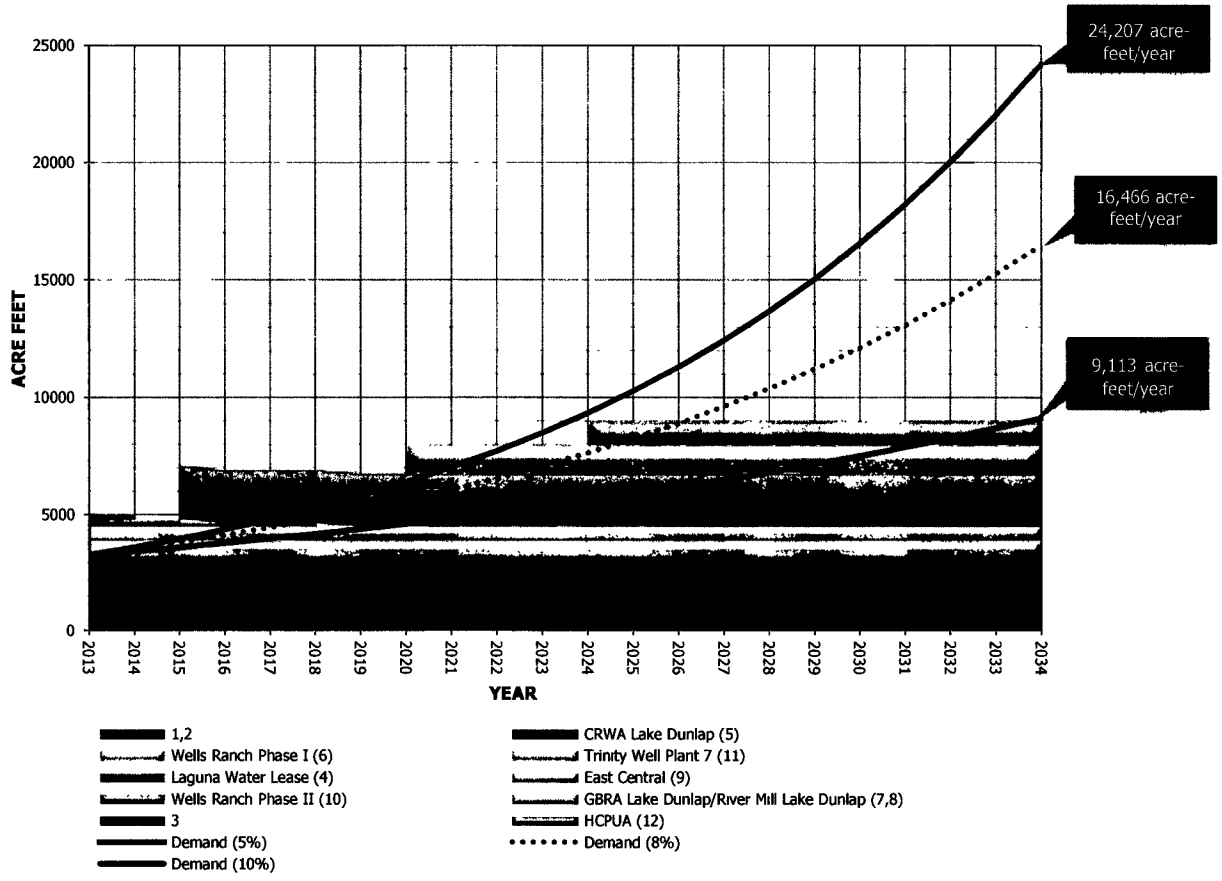
5.1 EXISTING WATER SUPPLY CAPACITY AND WATER RIGHTS

GVSUD currently has contracted water rights with several sources. These water rights include Edwards Wells, a Trinity Well, Canyon Regional Water Authority, East Central Special Utility District and Hays Caldwell Public Utility Agency. GVSUD currently has 5,004 acre-feet/year in water rights with some of these water rights in the form of short-term leases due to expire soon. These leases are not guaranteed to renew. This puts GVSUD at risk of losing these water rights.

Chart 5.1 below gives a summary of the current water rights in relation to the projected demand. The water rights' numbers correspond to Table 5.1 on the following page.

CHART 5.1

GVSUD Existing Water Inventory vs Future Demand



GVSUD currently has approximately 1,704 acre-feet of Edwards Aquifer well water and 600 acre-feet of Trinity Aquifer well water. By 2015, the amount of Edwards well water will decrease by nearly 172 acre-feet and by 2018 another 132 acre-feet due to leases expiring. The remaining 1,400.8 acre-feet of Edwards Aquifer water rights are owned. In 2012, GVSUD signed a lease with East Central to buy 200 acre-feet of water. This lease is a 3-year lease and is due to expire in 2015. There is no guarantee that this lease will be renewed at that time. These short-term leases pose a serious risk for GVSUD as it impairs GVSUD from being able to use these water sources for future planning. As of 2014, there is approximately 5,004 acre-feet of water available to GVSUD.

TABLE 5.1

GVSUD AVAILABLE WATER INVENTORY						
No.	**PERMIT #**	**OLD #**	**COUNTY**	**ACRE FT.**	**SOURCE**	**EXPIRES**
1	P100-199	BE00081AD	COMAL	309	Edwards	Owned
2	P100-776	CO00146	COMAL	1091.812	Edwards	Owned
3	P103-289		COMAL	171.56	Edwards	Leased
		TOTAL ACRE FT.		**1572.372**		
4	LAGUNA WATER LEASE		COMAL	132	Edwards	2018
		TOTAL ACRE FT.		**1704.372**		
5	CRWA LAKE DUNLAP			1800	CRWA	Owned
6	WELLS RANCH PH 1			700	CRWA	Owned
7	GBRA LAKE DUNLAP			1000	CRWA	40 Year term/not available
8	RIVER MILL LAKE DUNLAP			190	CRWA	Owned but not available
		TOTAL ACRE FT.		**3690**		
9	EAST CENTRAL			200	East Central	12/31/2015
10	WELLS RANCH PH 2			2300	CRWA	Negotiation Pending
11	TRINITY WELL PLANT 7			600	Trinity	Owned
12	HCPUA			1000	HCPUA	Owned (Assumed 2024)
		GRAND TOTAL ACRE FT.		**9494.372**		

5.2 EXISTING PRESSURE PLANES

The boundary of each existing pressure plane was determined from USGS topography. The topography was used to establish the different water pressure planes based on desired minimum and maximum water pressures. These pressure plane boundaries were delineated with help from GVSUD staff. The boundaries of these twelve (12) Pressure Planes are shown on Attachment 'A, GVSUD Existing Pressure Planes. A summary and outline of the equipment for each Pressure Plane is located below in Table 5.3:

5.3 DESCRIPTION OF EXISTING PLANT 1 PRESSURE PLANE

Plant 1 Pressure Plane serves the area in the northwestern part of GVSUD, this pressure plane is shown on Attachment 'A'. This service area also includes the CRWA Damerau elevated storage tank. This Pressure Plane has a hydraulic grade line of 1008 feet mean sea level (MSL). A pneumatic pressure tank and pump combination is used in order to provide this pressure plane with pressure. The water supply for this pressure plane is currently provided by Edwards Aquifer and Trinity Aquifer water. In 2015 the

Weil Road Booster Pump Station will be completed and will deliver CRWA water to this service area. This will bring an additional source of water, more storage, and less restricted water. As shown on Table 5.0, Plant 1 Pressure Plane currently serves 1,877 connections. A summary of existing Plant 1 infrastructure is listed below and shown in Table 5.3:

- 200,000-gallon Ground Storage
- 1,000,000-gallon Elevated Storage
- 5,000-gallon Pneumatic Pressure Tank
- 3 Booster Pumps @ 450 gpm = 1,350 gpm
- Weil Road Booster Pump Station (Construction Completion in 2015)
    - 500,000-gallon Ground Storage
    - 2 Booster Pumps @ 1,440 gpm = 2,800 gpm

5.4 DESCRIPTION OF EXISTING PLANT 2 PRESSURE PLANE

Plant 2 Pressure Plane serves the area in the northeastern part of GVSUD and northeastern of Plant 3 Pressure Plane, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 897 feet MSL. Plant 1 is currently serving the water supply for this pressure plane. As shown on Table 5.0, Plant 2 Pressure Plane is currently within the Plant 1 Pressure Plane. A summary of Plant 2 is listed below and shown in Table 5.3:

- 127,000-gallon Ground Storage
- 80,000-gallon Ground Storage
- 100,000-gallon Elevated Storage
- 4 Booster Pumps @ 450 gpm = 1,800 gpm

5.5 DESCRIPTION OF EXISTING PLANT 3 PRESSURE PLANE

Plant 3 Pressure Plane serves the area west of Wagner and north of East Central Special Utility District service area, this pressure plane is shown on Attachment 'A'. The Water supply for this pressure plane is provided by Edwards Aquifer water and water from Canyon Regional Water Authority. This Pressure Plane has a hydraulic grade line of 830 feet MSL. As shown on Table 5.0, Plant 3 Pressure Plane currently serves 318 connections. A summary of Plant 3 is listed below and shown in Table 5.3:

- 127,000-gallon Ground Storage
- 80,000-gallon Ground Storage
- 100,000-gallon Elevated Storage
- 4 Booster Pumps @ 450 gpm = 1,800 gpm

5.6 DESCRIPTION OF EXISTING PLANT 4 PRESSURE PLANE

Plant 4 Pressure Plane serves the northeast corner of the GVSUD area and is east of Plant 1 Pressure Plane, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 830 feet MSL. The water supply for this pressure plane is provided by Canyon Regional Water Authority's Lake Dunlap plant. This pressure plane is using existing CRWA-Lake Dunlap storage tanks and high service pumps to feed the meters in this pressure plane and to fill the Plant 4 elevated tower near Zipp Road. Table 5.0 shows a summary of the existing pressure plane. The total number of existing connections served by Plane 4 Pressure Plane is 2,688 connections. A summary of Plant 4 is listed below and shown in Table 5.3:

- 100,000-gallon Elevated Storage – currently not in service
- 500,000-gallon Elevated Storage
- CRWA-Lake Dunlap existing equipment (tanks & high service pumps)

5.7 DESCRIPTION OF EXISTING PLANT 5 PRESSURE PLANE

Plant 5 Pressure Plane serves the area southwest of GVSUD service area and east of East Central SUD service area, this pressure plane is shown on Attachment 'A'. The water for this pressure plane is provided by the Edwards Aquifer. This Edwards water is piped from the Plant 7, 8 & 9 Pressure Plane (Wells Pressure Plane), across IH-35 and sent through the system to Plant 5. As shown on Table 5.0, Plant 5 Pressure Plane currently serves 476 connections. A summary of Plant 5 is listed below and shown in Table 5.3:

- 60,000-gallon Ground Storage
- 3,000-gallon Pneumatic Pressure Tank
- 2 Booster Pumps @ 225 gpm = 450 gpm

5.8 DESCRIPTION OF EXISTING WELLS PRESSURE PLANE (PLANT 7, 8 & 9)

The Wells Pressure Plane serves the area in the northwestern portion of GVSUD service area, this pressure plane is shown on Attachment 'A'. The water supply for this pressure plane is provided by two Edwards Aquifer wells and one Trinity well that are owned by GVSUD. This Pressure Plane has a hydraulic grade line of 1008 feet mean sea level (MSL). As shown on Table 5.0, the Wells Pressure Plane currently serves 2,030 connections. A summary of Plants 7, 8 & 9 are listed below and shown in Table 5.3:

- Plant 7
  - 200,000-gallon Ground Storage
  - 5,000-gallon Pneumatic Pressure Tank
  - 2 Booster Pumps @ 800 gpm = 1,600 gpm
  - 2 Booster Pumps @ 450 gpm = 900 gpm

    - Well #2
        - 1 Well pump @ 800 gpm
    - Well #3
        - 1 Well pump @ 1,600 gpm
    - Well #4
        - 1 Well pump @ 600 gpm
- Plant 8
    - 200,000-gallon Ground Storage
    - 5,000-gallon Pneumatic Pressure Tank
    - Well #1
    - 1 Well pump @ 1,200 gpm
    - 1 Booster Pump @ 800 gpm
    - 1 Booster Pump @ 450 gpm

- Plant 9
    - 200,000-gallon Ground Storage
    - 80,000-gallon Ground Storage
    - 300,000-gallon Elevated Storage
    - 2 Booster Pumps @ 500 gpm = 1,000 gpm
    - 2 Booster Pumps @ 1,000 gpm = 2,000 gpm

5.10 DESCRIPTION OF EXISTING PLANT 10 PRESSURE PLANE

Plant 10 Pressure Plane serves the area in the southeastern most portion of GVSUD, this pressure plane is shown on Attachment 'A'. Canyon Regional Water Authority provides the water supply for this pressure plane through a take point at Leissner Booster Pump Station. As shown on Table 5.0, Plant 10 is being bypassed and is not currently serving any connections, but is being maintained for future use if needed. A summary of Plant 10 is listed below and shown in Table 5.3:

- 2 ea. @ 250,000-gallon Ground Storage
- 13,000-gallon Pneumatic Pressure Tank
- 3 Booster Pumps @ 500 gpm = 1,500 gpm

5.11 DESCRIPTION OF EXISTING 1518 PRESSURE PLANE

1518 Pressure Plane serves the area in the southwestern most portion of GVSUD, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 880 feet mean sea level (MSL). The water supply for this pressure plane is provided by Canyon Regional Water Authority FM 1518 elevated storage tank. As shown on Table 5.3, 1518 Pressure Plane currently serves 54 connections.

5.12 DESCRIPTION OF EXISTING LEISSNER PRESSURE PLANE

Leissner Pressure Plane serves the area southeast of GVSUD service area and west of East Central SUD and Plant 3 service areas, this pressure plane is shown on Attachment 'A'. The water for this pressure plane is provided by CRWA Leissner Booster Pump Station, which transports Wells Ranch water. As shown on Table 5.3, Leissner Pressure Plane currently serves 927 connections.

5.13 DESCRIPTION OF EXISTING HAECKERVILLE PRESSURE PLANE

Haeckerville Pressure Plane serves the area southwest of the Wagner service area as shown on Attachment 'A'. The water supply for this pressure plane is currently served by CRWA. As shown on Table 5.3, the Haeckerville Pressure Plane currently serves 528 connections.

5.14 DESCRIPTION OF EXISTING WAGNER PRESSURE PLANE

Wagner Pressure Plane serves the area southwest of the City of Marion located in the center of GVSUD, this pressure plane is shown on Attachment 'A'. This pressure plane has a hydraulic grade line of 880 feet mean sea level. This area is currently using the CRWA Wagner Booster Pump Station to serve this pressure plane. As shown on Table 5.3, Wagner Pressure Plane currently serves 489 connections.

5.15 DESCRIPTION OF EXISTING EAST CENTRAL PRESSURE PLANE

East Central Pressure Plane serves the area of the south central most portion of GVSUD, this pressure plane is shown on Attachment 'A'. The water supply for this pressure plane is East Central Special Utility District. This area currently experiences a pressure of approximately 90 psi from ECSUD pressure tank and is provided by a nearby ECSUD booster pump station. This contract may not be renewed with East Central SUD when it expires in 2015. As shown on Table 5.3, East Central Pressure Plane currently serves 234 connections.

Table 5.3 on the following page gives an overall summary of the current plants in the GVSUD system.

TABLE 5.3 SUMMARY OF EXISTING PRESSURE PLANES

GREEN VALLEY SPECIAL UTILITY DISTRICT EXISTING EQUIPMENT							
Plane Name		**Connections**	**GST Capacity (gallons)**	**EST Capacity (gallons)**	**Pneumatic Tank (gallons)**	**Booster Pumps**	**Well Pumps**
Plant 1 Pressure Plane		1877	200,000	1,000,000	5,000	3 @ 450 gpm	
Plant 2 Pressure Plane		-	127,000 80,000	100,000		4 @ 450 gpm	
Plant 3 Pressure Plane		318	127,000 80,000	100,000		4 @ 450 gpm	
Plant 4 Pressure Plane		2,688		500,000			
Plant 5 Pressure Plane		476	60,000		3,000	2 @ 225 gpm	
Wells Pressure Plane	Plant 7	2,030	200,000		5,000	2 @ 800 gpm 2 @ 50 gpm 1 @ 800 gpm 1 @ 600 gpm	
	Plant 7, Well #2						1 @ 800 gpm
	Plant 7, Well #3						1 @ 1,600 gpm
	Plant 7, Well #4						1 @ 600 gpm
	Plant 8		200,000		5,000	1 @ 800 gpm 2 @ 450 gpm	
	Plant 8, Well #1						1 @ 1,200 gpm
	Plant 9		200,000 80,000	300,000		2 @ 500 gpm 2 @ 1,000 gpm	
Plant 10 Pressure Plane		-	250,000 250,000		13,000	3 @ 500 gpm	
1518 Pressure Plane		54					
Leissner Pressure Plane		927					
Haeckerville Pressure Plane		528					
Wagner Pressure Plane		489					
East Central Pressure Plane		234					
TOTAL		9,621	1,854,000	2,000,000	31,000	14,700 gpm	4,200
Capacity per Connection			**394.38**	**289.31**		**3.13**	**2.07**

GVSUD is currently able to supply water to all connections using their current infrastructure. However, as they grow they will need to implement additional infrastructure in order to be able to supply water to the existing and additional connections.

The GVSUD water system as a whole has enough capacity to meet current demands. A summary of their capacity per connection is listed below:

- Ground Storage - 394 gallons/connection
- Elevated Storage – 289 gallons/connection
- Booster Pumps – 3.13 gpm/connection
- Well Pumps – 2.07 gpm/connection

6.0 TCEQ DESIGN STANDARDS

The Texas Commission on Environmental Quality (30 TAC §290.45) has set minimum design standards that ensure a water system is capable of meeting the demands of its customers, these standards are in Attachment 5. TCEQ does not included consideration for additional fire flows that maybe necessary for future development in their minimum requirements. These standards must be met in order to be compliant with the state.

Water Treatment Plant:

- Treatment Capacity: 0.6 gpm/connection (must be greater than the anticipated maximum daily demand)

Storage:

- Total Storage: 200 gallons/connection
- Elevated Storage: 100 gallons/connection
- Pressure Tank: 20 gallons/connection (in lieu of elevated storage up to 2,500 connections)

Pumping:

- If less than 200 gallons per connection of elevated storage is provided, two or more pumps with a total capacity of 2.0 gpm/connection, or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less.

- If at least 200 gallons/connection of elevated storage is provided: two or more pumps with a minimum capacity of 0.6 gpm/connection.

7.0 GVSUD DESIGN REQUIREMENTS

RCE used historical water usage records to establish design requirements in order to ensure that minimum service equals or exceeds the minimum requirements expected by the TCEQ and meets or exceeds GVSUD future water demands.

As a whole, GVSUD design requirements exceed the minimum criteria established by TCEQ. GVSUD current water system is in full compliance with TCEQ and is able to meet current demands in the system. In Table 7.1, are GVSUD's historical water usage records.

TABLE 7.1

Green Valley Special Utility District Historic Water Use					
1	2	3	4	5	6
Year	Historical Water Connections	Daily Avg. Pumped (gpd)	Daily Avg. Pumped per Conn. (gpd/Conn.)	Average Daily Water Usage per Conn. (gpm/Conn.)	Peak Hour Water Usage per Conn. (gpm/Conn.)*
2003	6,500	2,062,238	317.3	0.22	0.9
2004	6,800	2,083,664	306.4	0.21	0.9
2005	7,500	2,478,256	330.4	0.23	0.9
2006	8,000	2,759,471	344.9	0.24	1.0
2007	8,302	2,300,600	277.1	0.19	0.8
2008	8,453	2,888,026	341.7	0.24	0.9
2009	8,650	2,715,726	314.0	0.22	0.9
2010	8,829	2,447,903	277.3	0.19	0.8
2011	8,995	2,936,234	326.4	0.23	0.9
2012	9,274	2,443,439	263.5	0.18	0.7
2013	9,621	2,445,225	254.2	0.18	0.7
		Average	304.8	**0.21**	**0.8**

*Based on a Peak Factor of 4

The preceding table shows the average daily and peak hour water usage. The average number of connections used for each year was provided by GVSUD staff. We used the last 11 years of data to represent modern operating conditions. The average water usage for the past 11 years is 0.21 gpm/connection. This average use value is less than the 0.31 gpm/connection as suggested by the Texas Water Development Board and Edwards Aquifer Authority. The table above shows that the Average Daily Demand is 304.8 gpd/connection, and the Peak Hour Demand, is 0.8 gpm/connection. These values were used in determining GVSUD's design requirements. The color of the text corresponds to the location of the value in Table 7.1 above.

However, when the system is broken down into pressure planes, some individual pressure planes fail to meet the TCEQ minimums using only GVSUD infrastructure, however the Districts wholesale connections provide additional storage, pump capacity and pressure. Water production capacity is designed to meet historical peak daily demand. System storage is designed and based on average daily demand. Annual evaluations of the average daily demand and peak daily demand of water flows should be conducted based on daily records of pumping for the calendar year. This will enable the design requirements to be revised and adjusted accordingly. GVSUD design requirements for average and peak flows are as follows:

- Average Daily Demand: 351 gpd/connection
- Peak Daily Demand: 702 gpd/connection
- Peak Hour Demand: 0.8 gpm/connection + Fire Flow

TCEQ minimum requirements do not consider fire flow. Additional size for water main projects may be required to not only meet the minimum requirements of the TCEQ, but to confidently provide fire flow protection. This additional fire flow consideration will be on a project-by-project basis.

The average daily demand of 351 gpd/connection is based on the 10-year historic average of 304.8 gpd/connection with an added 15-percent safety factor. Below is an explanation of how this value was calculated.

$$304.8 \times .15 = 45.72 + 305 = 351 \text{ gpd/connection}$$

The peak daily demand is based on the average maximum with a peak factor of 2 (two). We used a peak factor of 2 because we were not able to obtain peak usage data from GVSUD, therefore used an industry standard of 2. A peak factor of 2 represents an average water system. The maximum peak daily demand is 702 gpd/connection. The calculation is shown below.

$$351 \times 2 = 702 \text{ gpd/connection}$$

GVSUD historical water use is at 0.21 gpm/connection. This value is the average daily demand and is used to calculate storage volumes. This calculation is based on the 0.34 acre-feet/year historical average annual water usage per connection. Below is the calculation that shows how this number was achieved.

$$\frac{.34\text{acre-ft}}{\text{year}} \text{x} \frac{1\text{year}}{365\text{days}} \text{x} \frac{1\text{day}}{24\text{hrs}} \text{x} \frac{1\text{hr}}{60\text{min}} \text{x} \frac{43{,}560\text{ft}^2}{1\text{acre}} \text{x} \frac{7.48\text{gal}}{1\text{ft}^3} = 0.21\text{gpm/connection}$$

GVSUD is currently in compliance with TCEQ minimums, however TCEQ does not account for future growth in these requirements. Due to rapid growth in this area, GVSUD will need to perform several water system improvements in order to meet this ever-growing demand and to remain compliant with TCEQ. The following is a summary of GVSUD's design requirements for water treatment, storage, and pumping based on these average and peak flow design requirements:

Historical Water Supply Capacity:
0.25 gpm/connection (Peak Day Demand)
(.21x15%) = 0.242 = 0.25 gpm/Connection~0.40 acre-feet/connection

Water Plant:

$$\frac{1{,}704\text{ ac} - \text{ft (Edwards Rights)} + 600\text{ ac-ft(Trinity Rights)}}{0.4\text{ acre} - \text{feet/connection}} = 5{,}760\text{ connections}$$

5,760 connections*0.6 gpm/connection (TCEQ min) = 3,456 gpm

Well 1 – 800 gpm
Well 2 – 1,600 gpm
Well 3 – 1,200 gpm
Well 4 – 600 gpm
TOTAL – 4,200 gpm*

**Does not include CRWA Wells Ranch or Lake Dunlap*

Existing capacity = 4,200 gpm > TCEQ minimum Capacity =3,456 gpm

Storage:
- Total Storage: 176 gallons/connection (Average Daily Demand)
- Ground Storage: 88 gallons/connection
- Elevated Storage: 88 gallons/connection

Pumping:
- High Service Pumps: 0.8 gpm/connection (Peak Hour Demand) (Firm)

The water supply capacity was determined by taking the highest peak daily demand and adding 15% giving us a value of 0.25 gpm/connection after rounding up to the nearest hundredth.

The values above were calculated by taking the daily average pumped for each year and averaging these values equals 351 gpd/connection. This value was then halved in order to allow for 12 hours of storage capacity. The 351 gpd/connection represents a full 24 hours of storage capacity. The ground and elevated storage requirements were calculated by taking the total amount of storage and dividing by 2 (two) to distribute evenly between elevated and ground storage. The same ratio that TCEQ established in their design criteria was applied to GVSUD's design criteria. The elevated requirement from TCEQ was half as much as the total storage amount, therefore, we are establishing a total storage criteria of 176 gallons/connection and 88 gallons/connection for elevated storage. This calculation is shown below.

- 24 hours = 176 gallons/connection

$$\frac{\frac{176\,\text{gallon}}{\text{day}}}{\text{connection}} \text{x.5 day} = 88\,\text{gallons/connection}$$

- 12 hours = 88 gallons/connection

The high service pump usage was determined to be 0.8 gpm/connection and per TCEQ requirements, 2.0 gpm/connection was used.
Below is a summary of TCEQ requirements vs. GVSUD demand. The more stringent value will be used for future capacity design criteria.

TCEQ vs. GVSUD			
1	2	3	4
Description	**TCEQ (minimum)**	**Green Valley SUD (existing)**	**Green Valley SUD (demand)**
Water Rights (acre-feet/connection/year)	0.50	0.52	0.34
Water Plant Supply (gpm/connection)	0.60	2.07	0.25
Total Storage (gallons/connection)	200	400.6	176
Ground Storage (gallons/connection)	-	192.7	88
Elevated Storage (gallons/connection)	100	207.88	88
Pumping (gpm/connection)	2.0	3.13	0.8

Note: Bold value indicates GVSUD design criteria used for future development

Clarification: The 0.44 gpm/connection Water Plant Supply calculation includes the infrastructure owned by GVSUD and does not include any CRWA infrastructure that provides pressure, storage, treatment and pumping capacity to the system. If the calculation is completed using the number of connections for the service area being serviced (Wells, Plant 1 and Plant 5 Pressure Planes) the results are as follows:

Water Plant Supply =
4200 gpm Well Capacity / 4383 connections = 0.96 gpm/connection > TCEQ minimum

Similarly, we could add the CRWA infrastructure (Treatment, pumping and storage) to provide a more accurate picture of the robust system in place to serve the District. At this time all calculations will only include infrastructure and capacity owned and operated by GVSUD directly.

8.0 PROPOSED WATER SYSTEM

The GVSUD water system is currently very complex and requires extensive maintenance in order to maintain the 12 existing pressure planes. It is proposed that GVSUD move to a simpler, more efficient, self-maintained, water system that will meet the rapidly growing demands of its customers. The system is currently complicated due to 12 pressure planes and containing many mechanical devices such as pneumatic tanks and PRVs that require extensive maintenance, limit redundancy, and are prone to failure. This proposed water system will allow for the movement of water to all parts of the system and give the system redundant water sources.

RCE has identified capital improvement projects (CIPs) in order to meet future storage, pump and water demands through the year 2034 and replace aging infrastructure. The strategy of these CIP's will be to combine the existing 12 pressure planes into four pressure planes in an effort to allow the GVSUD water system the opportunity to run effectively and efficiently in the future as demands for water increases. The proposed CIPs will provide redundancy in each pressure plane. These areas are shown on Attachment 'B', Proposed Pressure Planes Map.

8.1 PROPOSED WATER SUPPLY

The water supply for GVSUD is obtained from many different sources and is composed of several leases. A list of the current and expired water leases was compiled in order to analyze the amount of water that will be needed in the future. This list is shown in Table 5.2.

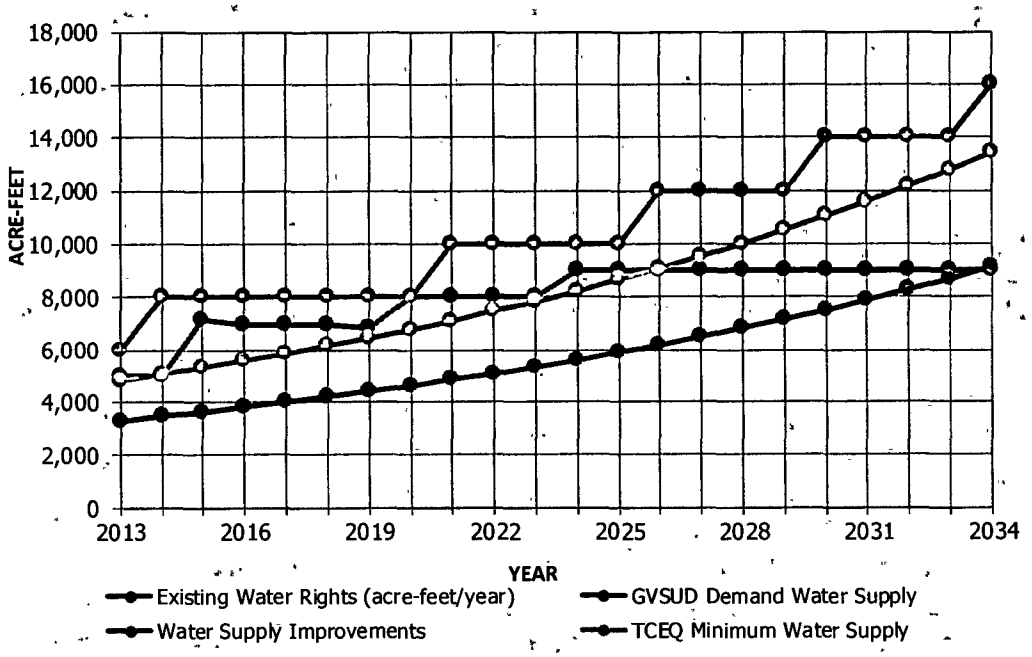
It is recommended that GVSUD continue to pursue supplemental sources of water supply. GVSUD's current water rights with East Central are due to expire in 2015 and the Laguna Water Lease is set to expire in 2018. According to Chart 5.1, by 2020 GVSUD will have exhausted its 4,500 acre-feet of owned water inventory assuming a 5% projected water demand growth. Therefore, the water opportunities CRWA Wells Ranch Phase 2 and GBRA Lake Dunlap/River Mill Lake Dunlap projects shown in Chart 5.1 will need to be negotiated and ready for distribution. GVSUD projected water demand is 9,113 acre-feet/year by 2034. A couple of providers to further explore for water opportunities in Edwards Wells, East Central Special Utility District, Schertz Sequin, Trinity wells, Carrizo-Wilcox wells, GBRA, HCPUA, CRWA water swap with SAWS and Springs Hill Water Supply Company. Another option is to explore more opportunities with brackish water. In addition to finding addition sources of water, GVSUD should implement a water conservation plan that would reduce the amount of water required throughout the system each year.

Water Supply

Year	Projected Connections	Existing Water Rights (acre-feet/year)	GVSUD Demand Water Supply (acre-feet/year)	TCEQ Minimum Water Supply (acre-feet/year)	Water Supply Improvements (acre-feet/year)
2013	9,621	5,004	3,271	4,811	6,000
2014	10,102	5,004	3,435	5,051	8,000
2015	10,607	7,133	3,606	5,304	8,000
2016	11,138	6,933	3,787	5,569	8,000
2017	11,694	6,933	3,976	5,847	8,000
2018	12,279	6,933	4,175	6,140	8,000
2019	12,893	6,801	4,384	6,447	8,000
2020	13,538	7,991	4,603	6,769	8,000
2021	14,215	7,991	4,833	7,107	10,000
2022	14,925	7,991	5,075	7,463	10,000
2023	15,672	7,991	5,328	7,836	10,000
2024	16,455	8,991	5,595	8,228	10,000
2025	17,278	8,991	5,874	8,639	10,000
2026	18,142	8,991	6,168	9,071	12,000
2027	19,049	8,991	6,477	9,524	12,000
2028	20,001	8,991	6,800	10,001	12,000
2029	21,001	8,991	7,140	10,501	12,000
2030	22,052	8,991	7,498	11,026	14,000
2031	23,154	8,991	7,872	11,577	14,000
2032	24,312	8,991	8,266	12,156	14,000
2033	25,527	8,991	8,679	12,764	14,000
2034	26,804	8,991	9,113	13,402	16,000

* Note: See Table 5.1 for summary of GVSUD Existing Water Rights.

Minimum Water Rights Supply Criteria =	0.31 gpm/Connection	**0.50**	Acre-Feet/Connection
GVSUD Historical Annual Water Usage =	0.21 gpm/Connection	**0.34**	Acre-Feet/Connection



GVSUD water supply will not require additional water rights until 2034 according to the future demand projection shown on the previous page. The dark blue line in the figure above shows that GVSUD's current water rights. In order to meet the TCEQ minimum water supply the District will need to find additional water rights by 2025.

8.2 PROPOSED 750-FT PRESSURE PLANE

The proposed 750' pressure plane includes the current 1518, Plant 5, Leissner, and East Central service levels. The boundary of this pressure plane serves 1,460 connections. It is projected that by 2024 this plane will have approximately 2,497 connections. In analyzing this proposed pressure plane it is determined that this plane will need additional infrastructure in order to meet TCEQ minimum requirements. A summary of the current infrastructure is listed below:

- 1,950 gpm pumping capacity (1,450 gpm capacity with largest out of commission)
- 560,000 gallons Ground Storage
- 16,000 gallons Pneumatic Pressure Tanks.

This does not account for the existing infrastructure at Plant 15 or East Central pressure plane. CRWA has the Lake Dunlap Water Treatment Plant that also feeds water into this pressure plane. This water treatment plant has storage tanks as well as high service pumps that contribute to this service area.

The table and chart below shows the future required pumping capacity as well as the current pumping capacity. It shows that the current capacity is below the required pumping capacity. This plane will need approximately 7,000 gallons per minute of pumping capacity in order to meet its demand in the future. This chart also gives us an outlook on the additional capacity that will be required in order to meet the demands of this pressure plane.

This proposed pressure plane does not currently have any elevated storage. Fortunately, this pressure plane can temporarily comply with TCEQ minimum design standards and feed off the 830 pressure plane elevated tanks until an elevated storage is added. When this plane is ready for this infrastructure, it will need an additional 500,000 gallon of elevated storage.

This plane has sufficient storage but TCEQ requires that each pressure plane have at least 100 gallons/connection of elevated storage. Therefore, the construction of the 500,000 gallon of elevated storage will meet this requirement and ensure that enough pressure is provided to all the water connections in this plane. This plane will continue to use pumping capacity from adjacent pressure planes until their plant improvements are completed. This pressure plane has excess water and can temporary share water with other pressure planes that are deficient in water capacity while the transition to

the four proposed pressure planes is completed. GVSUD currently obtains water from several CRWA metering stations. These metering stations gives GVSUD the capability to utilize CRWA surface and future groundwater.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 750' pressure plane. Below is a summary of the deficiencies for this pressure plane.

750 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	0	560,000	1,950
Required	500,000	1,060,000	8,950
Deficit	**500,000**	**500,000**	**7,000**

RCE has proposed two elevated storage tanks with booster pumps onsite that will ensure that this proposed pressure plane is able to meet future water demands. The projects will include two pipeline improvements and an elevated tank in the McQueeney area in order to eliminated PRVs. The other elevated tank will be constructed to the south of IH-10 off Gin Road. Together, these two elevated tanks floating together will be able to service the 750-pressure plane. A summary of the projects needed for this pressure plane is shown in the table below.

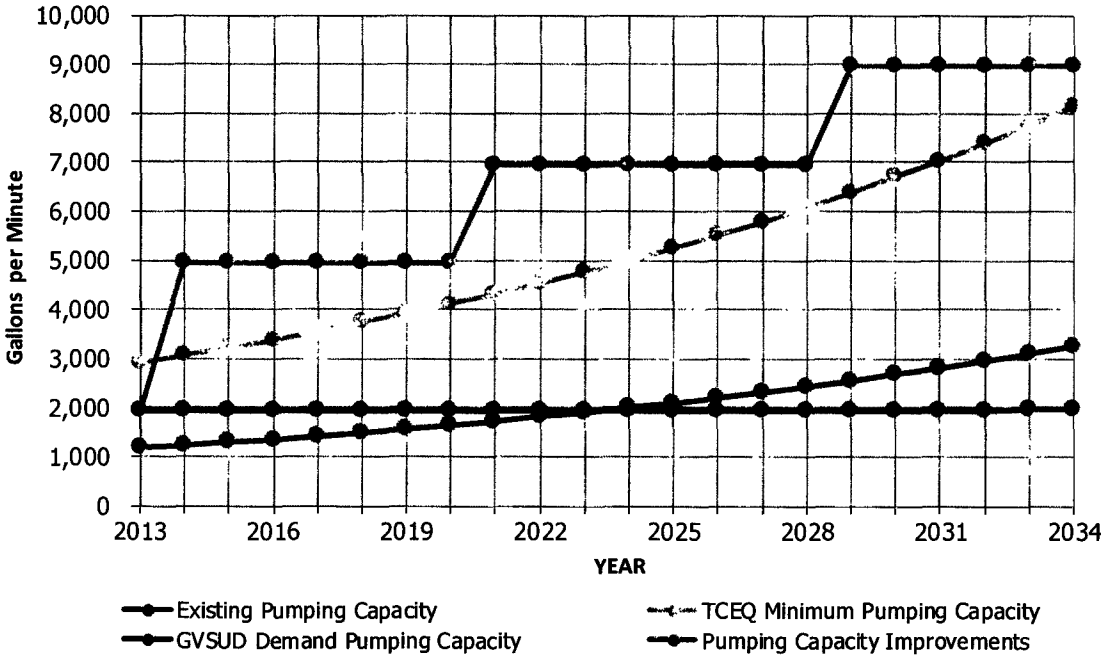
750 Pressure Plane Proposed Improvements	
Project	Year
Pipeline from FM 725 to CRWA Lake Dunlap WTP	2016
16" Pipeline along FM 725 – Union Wine to Altwein	2017
750 Elevated Storage Tank	2018
750' Elevated Storage Tank at Gin Road	2020

750 Pressure Plane

PUMPING CAPACITY

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	1,460	1,950	2,920	1,168	1,950
2014	1,533	1,950	3,066	1,226	4,950
2015	1,610	1,950	3,219	1,288	4,950
2016	1,690	1,950	3,380	1,352	4,950
2017	1,775	1,950	3,549	1,420	4,950
2018	1,863	1,950	3,727	1,491	4,950
2019	1,957	1,950	3,913	1,565	4,950
2020	2,054	1,950	4,109	1,643	4,950
2021	2,157	1,950	4,314	1,726	6,950
2022	2,265	1,950	4,530	1,812	6,950
2023	2,378	1,950	4,756	1,903	6,950
2024	2,497	1,950	4,994	1,998	6,950
2025	2,622	1,950	5,244	2,098	6,950
2026	2,753	1,950	5,506	2,202	6,950
2027	2,891	1,950	5,781	2,313	6,950
2028	3,035	1,950	6,070	2,428	6,950
2029	3,187	1,951	6,374	2,550	8,950
2030	3,346	1,952	6,693	2,677	8,950
2031	3,514	1,953	7,027	2,811	8,950
2032	3,689	1,954	7,379	2,951	8,950
2033	3,874	1,955	7,748	3,099	8,950
2034	4,068	1,956	8,135	3,254	8,950

TCEQ minimum Pumping Capacity Criteria = **2.0** gpm/Connection
GVSUD Pumping Capacity Design Criteria = **0.8** gpm/Connection

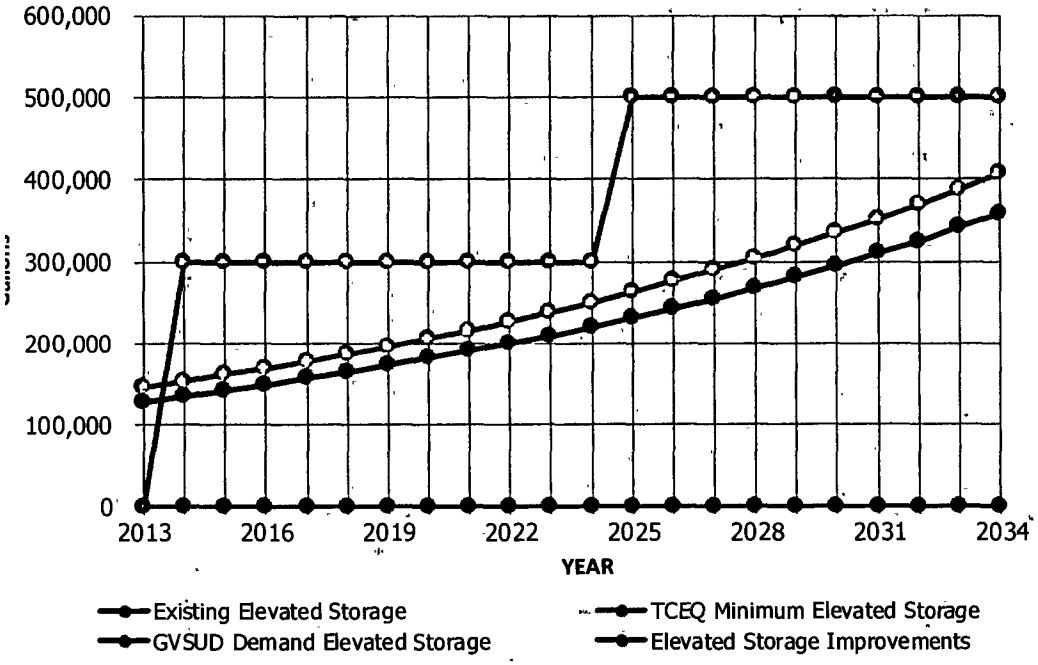


750 Pressure Plane

ELEVATED STORAGE

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	1,460	0	146,000	128,480	0
2014	1,533	0	153,300	134,904	300,000
2015	1,610	0	160,965	141,649	300,000
2016	1,690	0	169,013	148,732	300,000
2017	1,775	0	177,464	156,168	300,000
2018	1,863	0	186,337	163,977	300,000
2019	1,957	0	195,654	172,175	300,000
2020	2,054	0	205,437	180,784	300,000
2021	2,157	0	215,708	189,823	300,000
2022	2,265	0	226,494	199,315	300,000
2023	2,378	0	237,819	209,280	300,000
2024	2,497	0	249,710	219,744	300,000
2025	2,622	0	262,195	230,732	500,000
2026	2,753	0	275,305	242,268	500,000
2027	2,891	0	289,070	254,382	500,000
2028	3,035	0	303,524	267,101	500,000
2029	3,187	0	318,700	280,456	500,000
2030	3,346	0	334,635	294,479	500,000
2031	3,514	0	351,366	309,202	500,000
2032	3,689	0	368,935	324,663	500,000
2033	3,874	0	387,381	340,896	500,000
2034	4,068	0	406,751	357,940	500,000

TCEQ minimum Elevated Storage Criteria = **100** Gallons/Connection
GVSUD Elevated Storage Design Criteria = **88** Gallons/Connection

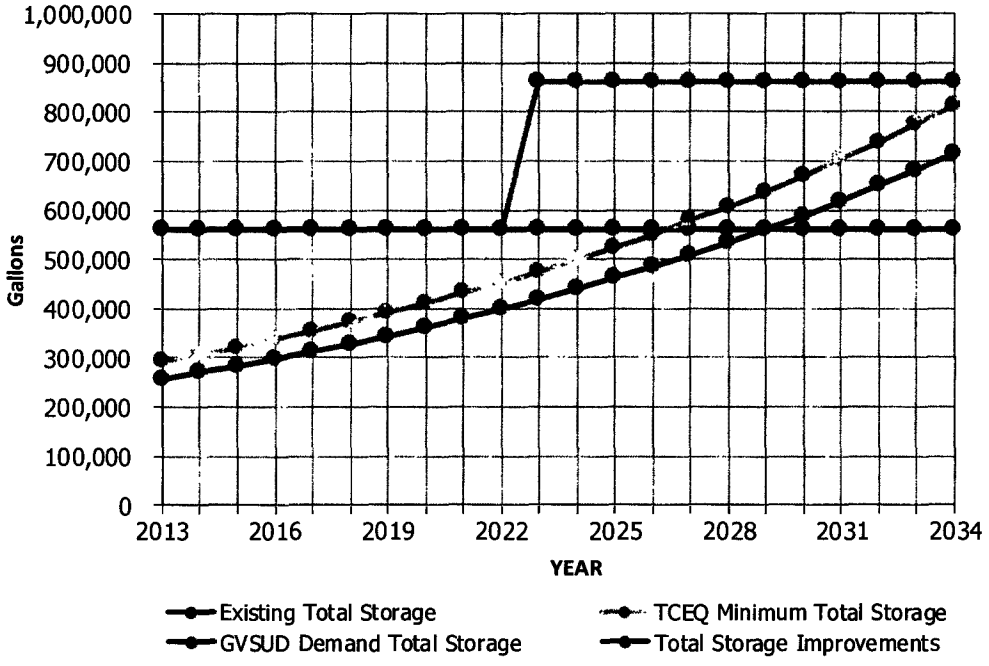


750 Pressure Plane

TOTAL STORAGE

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	1,460	560,000	292,000	256,960	
2014	1,533	560,000	306,600	269,808	
2015	1,610	560,000	321,930	283,298	
2016	1,690	560,000	338,027	297,463	
2017	1,775	560,000	354,928	312,336	
2018	1,863	560,000	372,674	327,953	
2019	1,957	560,000	391,308	344,351	
2020	2,054	560,000	410,873	361,569	
2021	2,157	560,000	431,417	379,647	
2022	2,265	560,000	452,988	398,629	560,000
2023	2,378	560,000	475,637	418,561	860,000
2024	2,497	560,000	499,419	439,489	860,000
2025	2,622	560,000	524,390	461,463	860,000
2026	2,753	560,000	550,610	484,536	860,000
2027	2,891	560,000	578,140	508,763	860,000
2028	3,035	560,000	607,047	534,201	860,000
2029	3,187	560,000	637,399	560,911	860,000
2030	3,346	560,000	669,269	588,957	860,000
2031	3,514	560,000	702,733	618,405	860,000
2032	3,689	560,000	737,869	649,325	860,000
2033	3,874	560,000	774,763	681,791	860,000
2034	4,068	560,000	813,501	715,881	860,000

TCEQ minimum Total Storage Criteria = **200** Gallons/Connection
GVSUD Total Storage Design Criteria = **176** Gallons/Connection



8.3 PROPOSED 1008-FT PRESSURE PLANE

The proposed 1008 pressure plane includes the existing Plant 1 and Plant 9 pressure planes. The boundary for this pressure plane will serve 3,030 connections and is projected to have 5,182 connections by the year 2024. This plane currently has 4,350 gallons per minute of pumping capacity (3,350 gpm with the largest 1,000-gpm pump out of commission), 480,000 gallons of ground capacity, 1,300,000 gallons of elevated storage capacity, and 5,000 gallons of pneumatic pressure tanks.

This plane currently has extensive storage capacity both elevated and ground. The Weil Road Booster Pump Station and ground storage tank currently in progress will add 3,600 gpm to the pumping capacity and 0.5 MG to the storage capacity. GVSUD plans to eliminate pressure tanks due to maintenance issues and high electricity costs associated with their use.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 1008' pressure plane. Below is a summary of this pressure planes deficiency.

1008 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	1,300,000	1,780,000	4,350
Required	0	0	7,150
Deficit	**0**	**0**	**2,800***

*Deficit will be obtained once Weil Road Booster Station is constructed

The proposed 1008 pressure plane will consist of three separate projects that will ensure that future water demands are met. Currently in progress, is a booster pump station on Weil Road that that will move CRWA water into this pressure plane. Another project currently in progress is a large segment of a 24" pipeline to eventually connect Plant 1 and Plant 9 allowing the two elevated storage tanks to float and operate on the same redundant pressures. The first project will be to upgrade Plant 9 with elevated storage and pumping capacity. The second project is to construct a direct fill pipeline from the existing wells north of IH 35 to Plant 1. The final project will be to upgrade the Plant 1 ground storage and pumping facilities. All these projects will ensure that GVSUD will be able to provide fire flow to future developments in this pressure plane. A summary of the projects needed for this pressure plane is shown in the table on the following page.

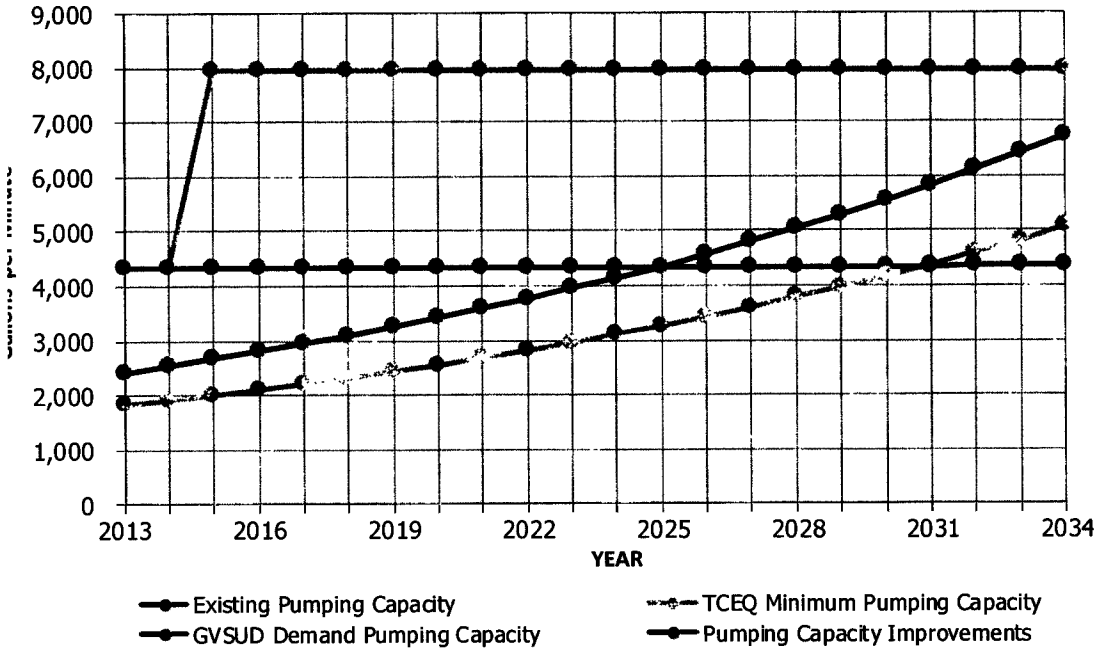
1008 Pressure Plane Proposed Improvements	
Project	Year
Plant 9 Improvements	2017
20" Pipe Line from Wells to Plant 1 Improvements	2019
Plant 1 – Storage & Pump Improvements	2020

1008 Pressure Plane

PUMPING CAPACITY

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	3,030	4,350	1,818	2,424	4,350
2014	3,182	4,350	1,909	2,545	4,350
2015	3,341	4,350	2,004	2,672	7,950
2016	3,508	4,350	2,105	2,806	7,950
2017	3,683	4,350	2,210	2,946	7,950
2018	3,867	4,350	2,320	3,094	7,950
2019	4,060	4,350	2,436	3,248	7,950
2020	4,264	4,350	2,558	3,411	7,950
2021	4,477	4,350	2,686	3,581	7,950
2022	4,701	4,350	2,820	3,760	7,950
2023	4,936	4,350	2,961	3,948	7,950
2024	5,182	4,350	3,109	4,146	7,950
2025	5,441	4,350	3,265	4,353	7,950
2026	5,714	4,350	3,428	4,571	7,950
2027	5,999	4,350	3,600	4,799	7,950
2028	6,299	4,350	3,779	5,039	7,950
2029	6,614	4,351	3,968	5,291	7,950
2030	6,945	4,352	4,167	5,556	7,950
2031	7,292	4,353	4,375	5,834	7,950
2032	7,657	4,354	4,594	6,125	7,950
2033	8,039	4,355	4,824	6,432	7,950
2034	8,441	4,356	5,065	6,753	7,950

TCEQ minimum Pumping Capacity Criteria = **0.6** gpm/Connection
GVSUD Pumping Capacity Design Criteria = **0.8** gpm/Connection



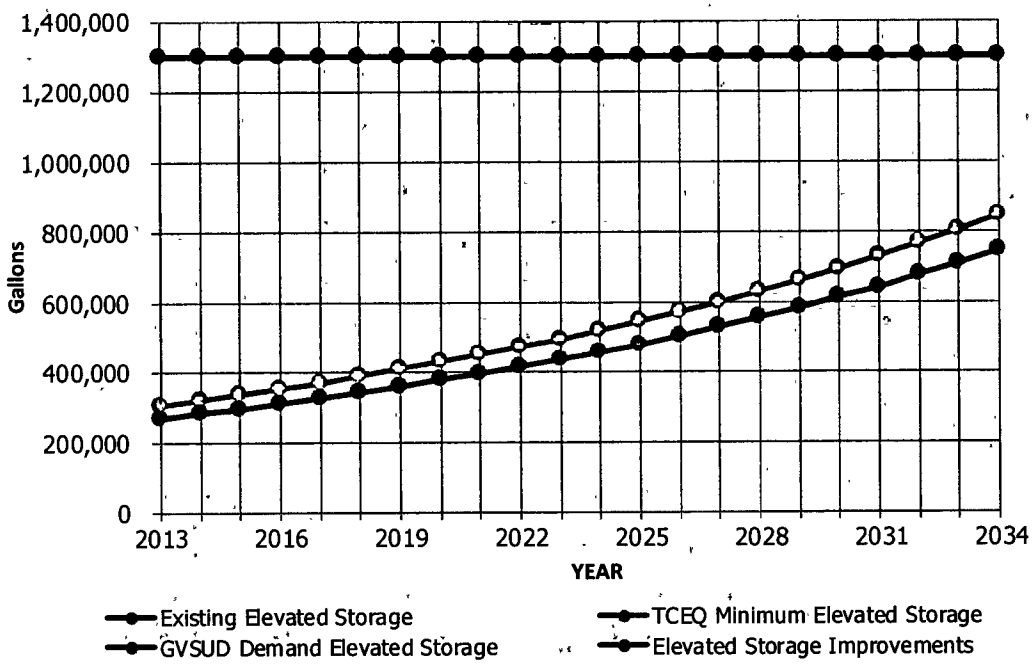
1008 Pressure Plane

ELEVATED STORAGE

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	3,030	1,300,000	303,000	266,640	
2014	3,182	1,300,000	318,150	279,972	
2015	3,341	1,300,000	334,058	293,971	
2016	3,508	1,300,000	350,760	308,669	
2017	3,683	1,300,000	368,298	324,103	
2018	3,867	1,300,000	386,713	340,308	
2019	4,060	1,300,000	406,049	357,323	
2020	4,264	1,300,000	426,351	375,189	
2021	4,477	1,300,000	447,669	393,949	
2022	4,701	1,300,000	470,052	413,646	
2023	4,936	1,300,000	493,555	434,328	
2024	5,182	1,300,000	518,233	456,045	
2025	5,441	1,300,000	544,144	478,847	
2026	5,714	1,300,000	571,352	502,789	
2027	5,999	1,300,000	599,919	527,929	
2028	6,299	1,300,000	629,915	554,325	
2029	6,614	1,300,000	661,411	582,042	
2030	6,945	1,300,000	694,482	611,144	
2031	7,292	1,300,000	729,206	641,701	
2032	7,657	1,300,000	765,666	673,786	
2033	8,039	1,300,000	803,949	707,475	
2034	8,441	1,300,000	844,147	742,849	

TCEQ minimum Elevated Storage Criteria = **100** Gallons/Connection

GVSUD Elevated Storage Design Criteria = **88** Gallons/Connection

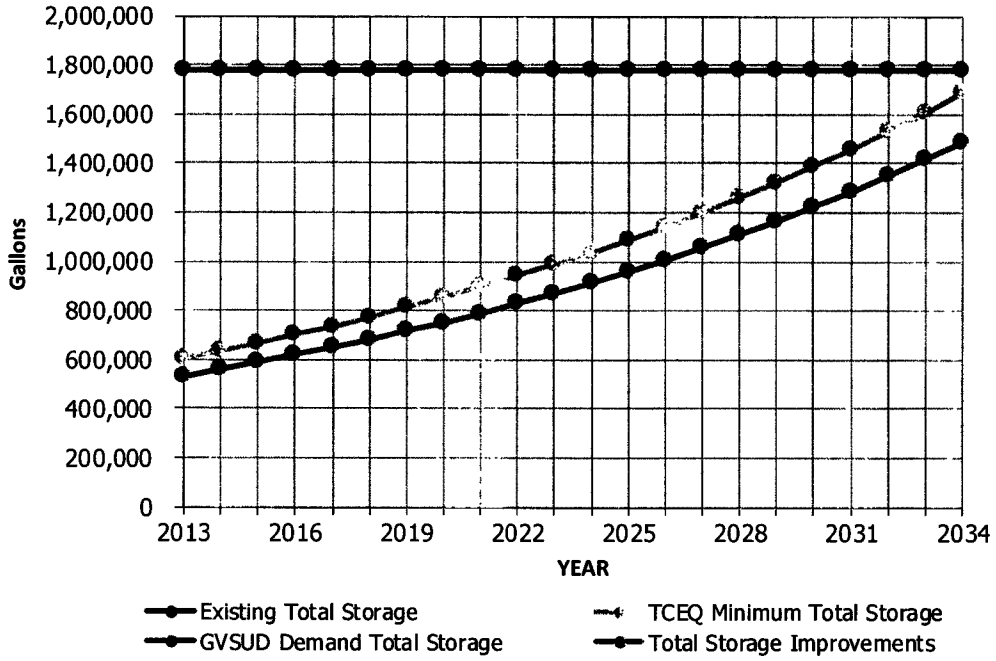


1008 Pressure Plane

TOTAL STORAGE

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	3,030	1,780,000	606,000	533,280	
2014	3,182	1,780,000	636,300	559,944	
2015	3,341	1,780,000	668,115	587,941	
2016	3,508	1,780,000	701,521	617,338	
2017	3,683	1,780,000	736,597	648,205	
2018	3,867	1,780,000	773,427	680,615	
2019	4,060	1,780,000	812,098	714,646	
2020	4,264	1,780,000	852,703	750,379	
2021	4,477	1,780,000	895,338	787,897	
2022	4,701	1,780,000	940,105	827,292	
2023	4,936	1,780,000	987,110	868,657	
2024	5,182	1,780,000	1,036,466	912,090	
2025	5,441	1,780,000	1,088,289	957,694	
2026	5,714	1,780,000	1,142,703	1,005,579	
2027	5,999	1,780,000	1,199,839	1,055,858	
2028	6,299	1,780,000	1,259,830	1,108,651	
2029	6,614	1,780,000	1,322,822	1,164,083	
2030	6,945	1,780,000	1,388,963	1,222,288	
2031	7,292	1,780,000	1,458,411	1,283,402	
2032	7,657	1,780,000	1,531,332	1,347,572	
2033	8,039	1,780,000	1,607,898	1,414,951	
2034	8,441	1,780,000	1,688,293	1,485,698	

TCEQ minimum Total Storage Criteria = **200** Gallons/Connection
GVSUD Total Storage Design Criteria = **176** Gallons/Connection



8.4 PROPOSED 897-FT PRESSURE PLANE

The proposed 897' pressure plane includes the current Plant 2, Plant 7, Plant 8 and the Damerau pressure planes. The boundary for this pressure plane currently serves 881 connections and is projected to grow to 1,507 connections by 2024. This plane currently has 6,600 gallons per minute of pumping capacity (a 5,800 gpm pumping capacity with the largest 800 gpm pump out of commission), 607,000 gallons of storage capacity and 100,000 gallons of elevated storage and 10,000 gallons of pneumatic pressure tanks. This pressure plane will need 150,000 gallons of additional elevated storage in order to meet GVSUD demand by 2034.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 897' pressure plane. Below is a summary of the deficiencies for this pressure plane.

897 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	100,000	707,000	6,600
Required	250,000	0	0
Deficit	**150,000**	**0**	**0**

The proposed 897-pressure plane primary consists of preparing the three Edwards Aquifer wells and one Trinity Aquifer well so that they can boost water into the 1008 pressure plane. The proposed projects include adding a ground storage tank that will allow well water from all 4 wells to be pumped to a common storage tank. This common storage tank will then pump water into the GVSUD system. The Weil Road Booster Pump Station and ground storage tank will also be able to pump to this pressure plane until the common ground storage tank described above is constructed. The fill pipeline from Youngsford to the Weil Road BPS will provide water from an additional source to the service area. The construction of a second Trinity Aquifer well will provide additional water to fill the proposed ground storage tank to supplement the GVSUD system. The modification to the existing pipelines is to connect the wells to Plant 1 & Plant 9 and secure confident easements. This will also ensure that Plant 1 & Plant 9 float together. These projects will ensure that future developments in this area are able to have sufficient domestic drinking water as well as fire flows. A summary of the projects needed for this pressure plane is shown below.

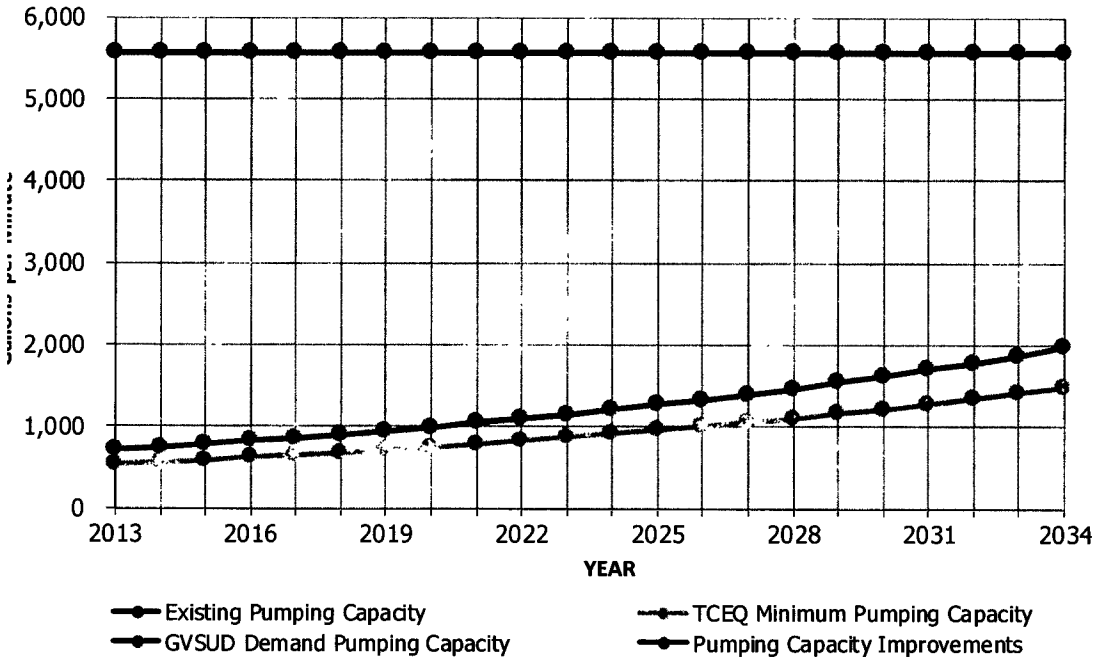
897 Pressure Plane Proposed Improvements	
Project	Year
897' Ground Storage Tank and Booster Pump Station	2017
16" Weil Road BPS Fill Pipeline – Youngsford to Weil Rd BPS	2018
Trinity Well Development	2019
24" Pipe Line that connects existing wells to 897' GST	2021
20" Pipe Line from Wells to Plant 9 Improvements	2022
20" Pipe Line from Wells to Plant 1 Improvements	2023

897 Pressure Plane

PUMPING CAPACITY

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	881	5,550	529	705	
2014	925	5,550	555	740	
2015	971	5,550	583	777	
2016	1,020	5,550	612	816	
2017	1,071	5,550	643	857	
2018	1,124	5,550	675	900	
2019	1,181	5,550	708	944	
2020	1,240	5,550	744	992	
2021	1,302	5,550	781	1,041	
2022	1,367	5,550	820	1,093	
2023	1,435	5,550	861	1,148	
2024	1,507	5,550	904	1,205	
2025	1,582	5,550	949	1,266	
2026	1,661	5,550	997	1,329	
2027	1,744	5,550	1,047	1,395	
2028	1,832	5,550	1,099	1,465	
2029	1,923	5,550	1,154	1,538	
2030	2,019	5,550	1,212	1,615	
2031	2,120	5,550	1,272	1,696	
2032	2,226	5,550	1,336	1,781	
2033	2,338	5,550	1,403	1,870	
2034	2,454	5,550	1,473	1,964	

TCEQ minimum Pumping Capacity Criteria = **0.6** gpm/Connection
GVSUD Pumping Capacity Design Criteria = **0.8** gpm/Connection

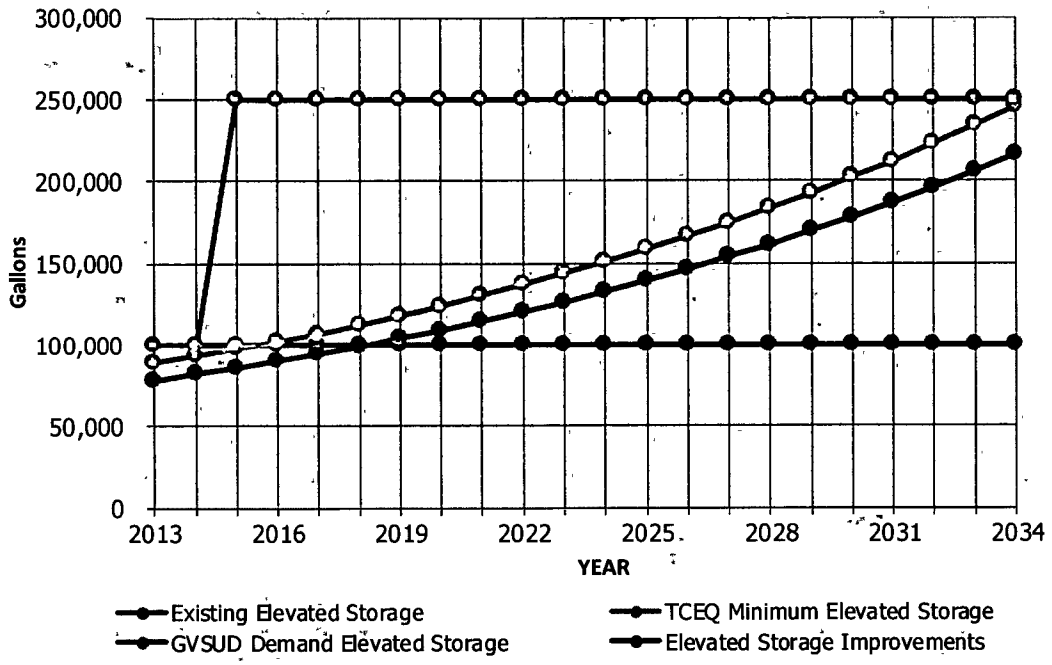


897 Pressure Plane

ELEVATED STORAGE

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	881	100,000	88,100	77,528	100,000
2014	925	100,000	92,505	81,404	100,000
2015	971	100,000	97,130	85,475	250,000
2016	1,020	100,000	101,987	89,748	250,000
2017	1,071	100,000	107,086	94,236	250,000
2018	1,124	100,000	112,440	98,948	250,000
2019	1,181	100,000	118,062	103,895	250,000
2020	1,240	100,000	123,966	109,090	250,000
2021	1,302	100,000	130,164	114,544	250,000
2022	1,367	100,000	136,672	120,271	250,000
2023	1,435	100,000	143,506	126,285	250,000
2024	1,507	100,000	150,681	132,599	250,000
2025	1,582	100,000	158,215	139,229	250,000
2026	1,661	100,000	166,126	146,191	250,000
2027	1,744	100,000	174,432	153,500	250,000
2028	1,832	100,000	183,154	161,175	250,000
2029	1,923	100,000	192,311	169,234	250,000
2030	2,019	100,000	201,927	177,696	250,000
2031	2,120	100,000	212,023	186,580	250,000
2032	2,226	100,000	222,624	195,909	250,000
2033	2,338	100,000	233,756	205,705	250,000
2034	2,454	100,000	245,443	215,990	250,000

TCEQ minimum Elevated Storage Criteria = **100** Gallons/Connection
GVSUD Elevated Storage Design Criteria = **88** Gallons/Connection

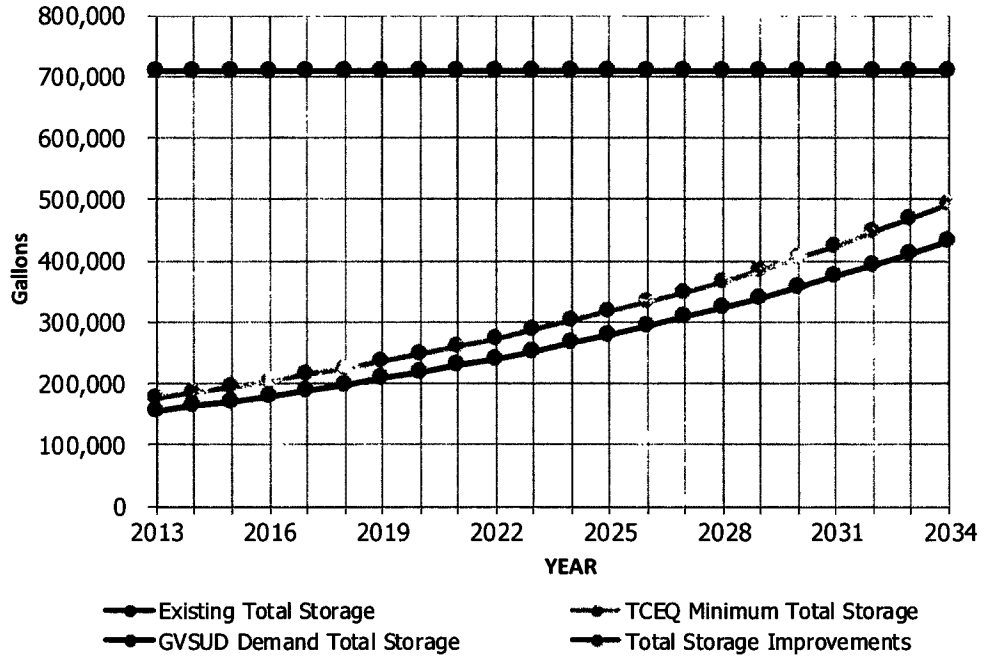


897 Pressure Plane

TOTAL STORAGE

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	881	707,000	176,200	155,056	
2014	925	707,000	185,010	162,809	
2015	971	707,000	194,261	170,949	
2016	1,020	707,000	203,974	179,497	
2017	1,071	707,000	214,172	188,472	
2018	1,124	707,000	224,881	197,895	
2019	1,181	707,000	236,125	207,790	
2020	1,240	707,000	247,931	218,179	
2021	1,302	707,000	260,328	229,088	
2022	1,367	707,000	273,344	240,543	
2023	1,435	707,000	287,011	252,570	
2024	1,507	707,000	301,362	265,198	
2025	1,582	707,000	316,430	278,458	
2026	1,661	707,000	332,251	292,381	
2027	1,744	707,000	348,864	307,000	
2028	1,832	707,000	366,307	322,350	
2029	1,923	707,001	384,623	338,468	
2030	2,019	707,002	403,854	355,391	
2031	2,120	707,003	424,046	373,161	
2032	2,226	707,004	445,249	391,819	
2033	2,338	707,005	467,511	411,410	
2034	2,454	707,006	490,887	431,980	

TCEQ minimum Total Storage Criteria = **200** Gallons/Connection
GVSUD Total Storage Design Criteria = **176** Gallons/Connection



8.5 PROPOSED 830-FT PRESSURE PLANE

The proposed 830' pressure plane includes Plant 3, Plant 4, Haeckerville, and the Wagner pressure planes. This pressure plane currently has 1,800 gallons per minute of pumping capacity (1,350 gpm with one of the four 450 gpm pumps out of commission), 207,000 gallons of ground storage capacity and 700,000 gallons of elevated storage.

This plane will need to add approximately 23,000 gallons per minute of additional pumping capacity by 2034. This plane will use water from the 897-pressure plane since that plane has excess capacities. This pressure plane will be able to meet demands with some assistance from the 897 plane and CRWA existing infrastructure until it can get additional infrastructure built.

This pressure plane will need to add approximately 700,000 gallons of elevated storage by the year 2034. This pressure plane can continue to use water from the 897-pressure plane until infrastructure is in place.

In addition to the 700,000 gallons of elevated storage requirements, this plane will need an additional 750,000 gallons of storage in order to meet the total storage requirement.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 830' pressure plane. Below is a summary of the deficiencies for this pressure plane.

830 Pressure Plane			
	Elevated Storage (Gallons)	Total Storage (Gallons)	Pumping (GPM)
Existing	700,000	907,000	1,800
Required	1,400,000	2,457,000	24,800
Deficit	**700,000**	**1,550,000**	**23,000**

The proposed 830-pressure plane will consists of constructing an elevated storage tank and several pipeline upgrades. This elevated storage tank will also float with the existing Zipp Rd tank and Plant 3 tank. This elevated storage tank site will also need to contain at least 23,000 gallons per minute of additional pumping capacity in order to meet demands in the year 2034. A summary of the projects needed for this pressure plane is shown in the table below.

830 Pressure Plane Proposed Improvements	
Project	Year
Pipeline Along Klein Road – FM 1044 to FM 725	2016
8" Pipeline along Bolton Road (connect)	2017
GVSUD Take Point Meter Station at Santa Clara and IH 10	2018
16" Pipe Line Along Hardy Road	2019
830' EST @ Hardy Road and Union Wine	2020

830 Pressure Plane

PUMPING CAPACITY

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	4,250	1,800	8,500	3,400	11,800
2014	4,463	1,800	8,925	3,570	11,800
2015	4,686	1,800	9,371	3,749	11,800
2016	4,920	1,800	9,840	3,936	11,800
2017	5,166	1,800	10,332	4,133	19,800
2018	5,424	1,800	10,848	4,339	19,800
2019	5,695	1,800	11,391	4,556	19,800
2020	5,980	1,800	11,960	4,784	19,800
2021	6,279	1,800	12,558	5,023	19,800
2022	6,593	1,800	13,186	5,275	19,800
2023	6,923	1,800	13,846	5,538	19,800
2024	7,269	1,800	14,538	5,815	19,800
2025	7,632	1,800	15,265	6,106	19,800
2026	8,014	1,800	16,028	6,411	19,800
2027	8,415	1,800	16,829	6,732	19,800
2028	8,835	1,800	17,671	7,068	24,800
2029	9,277	1,800	18,554	7,422	24,800
2030	9,741	1,800	19,482	7,793	24,800
2031	10,228	1,800	20,456	8,183	24,800
2032	10,740	1,800	21,479	8,592	24,800
2033	11,277	1,800	22,553	9,021	24,800
2034	11,840	1,800	23,681	9,472	24,800

TCEQ minimum Pumping Capacity Criteria = **2.0** gpm/Connection
GVSUD Pumping Capacity Design Criteria = **0.8** gpm/Connection