

Reference reach data		
Reach	RR-South of Pineflat	Downstream Proj.
Valley length (ft)	960.73	390.63
TW length (ft)	1014.01	395.26
Sinuosity	1.055457829	1.011852648
Elevation change	14.57	5.5856
Slope	1.437%	1.413%

Reference Reach South of Pine Flat							
Cross sections	Width	Depth	W/D	Wetted perimeter	Cross sectional area	Width 2x Bankfull	Entranchment ratio
1	54.3	3.26	16.65644172	61.93	136.99	83.23	1.343936703
2	66.78	5.3	12.6	68.26	234.86	106.16	1.555230003
3	66.57	3.98	16.72613065	66.91	85.17	80	1.195635929
4	65.6	4.95	13.25252525	67.91	213.55	86.87	1.27919305
5	50.1	4.07	12.30958231	50.28	146.73	100.22	1.993237868
6	60.01	4.35	13.7954023	63.92	190.51	83.01	1.298654568
7	50.56	4.89	10.3394683	61.01	182.53	88.14	1.4446812
8	55.18	3.51	15.72079772	55.52	72.44	70.3	1.266210375
9	52.72	4.04	13.04950495	58.13	135.96	66.61	1.145879924
10	52.11	4.25	12.26117647	53.2	159.56	75.15	1.412593985
	Shear Stress ($\tau = \gamma R S$) (lb/sq ft)	Entrainment diameter ($D = 152.02 \tau_c^{-0.7355}$) (mm) Colorado	Entrainment diameter ($D = 77.966 \tau_c^{-1.042}$) (mm) Leopold et al.	Mean velocity (ft/sec)	Stream power ((lb*s)/ft)	Bankfull width ($W = ((W/D)A)(1/2)$)	Depth of Channel
1	55.52684317	2917.310617	5124.805205	6.064338639	336.7335805	47.76783385	2.867829436
2	61.20236258	3133.781627	5671.758164	8.141168984	498.258776	54.39886028	4.317369864
3	59.99194375	3088.076715	5554.923599	4.195547728	251.6990633	37.74340403	2.25653223
4	60.88855029	3121.955346	5641.458324	7.667176916	466.8432873	53.19846584	4.014213505
5	45.08137695	2502.739503	4124.490497	7.294698613	328.8550579	42.49923543	3.452532699
6	57.31109019	2985.96883	5296.511841	7.397964815	423.9854287	51.2656034	3.71613689
7	54.70196515	2885.372459	5045.501098	7.416751706	405.7108933	43.44264206	4.201632114
8	49.77959523	2692.043072	4573.332438	4.265247566	212.3222974	33.74632701	2.146603984
9	52.11973831	2784.555419	4797.572799	6.294078323	328.0457151	42.12138047	3.227814437
10	47.69946805	2608.839935	4374.378495	7.429048345	354.3616542	44.23113516	3.607413633

Reference Reach South of Cave Springs							
Cross sections	Width	Depth	W/D	Wetted perimeter	Cross sectional area	Width 2x Bankfull (1)	Entranchment ratio
1	47.03	3.79	12.40897098	46.18	121	100	2.165439584
2	65.86	4.24	15.53301887	65.05	181.42	100	1.537279016
3	56.7	5.5	10.30909091	58.33	149.03	100	1.714383679
4	57.44	6.42	8.947040498	62.41	244.47	100	1.602307323
5	54.5	4.01	13.59102244	52.53	127.05	100	1.903674091
6	53.69	6.56	8.18445122	56.48	194.78	100	1.770538244
7	53.02	7.07	7.499292786	57.18	217.44	100	1.748863239
8	52.28	6.02	8.684385382	54.79	240.27	73.06	1.33345501
9	53.97	5.36	10.06902985	56.41	173	71.44	1.26644212
10	46.46	5.74	8.094076655	52.7	162.2	73.95	1.403225806
	Shear Stress ($\tau = \gamma R S$) (lb/sq ft)	Entrainment diameter ($D = 152.02 \tau_c^{-0.7355}$) (mm) Colorado	Entrainment diameter ($D = 77.966 \tau_c^{-1.042}$) (mm) Leopold et al.	Mean velocity (ft/sec)	Stream power ((lb*s)/ft)	Bankfull width ($W = ((W/D)A)(1/2)$)	Depth of Channel
1	41.40529013	2350.960285	3774.656451	6.732825745	278.7746033	38.74900629	3.122660723
2	58.32425558	3024.703564	5394.114048	7.01888814	409.3714258	53.08484043	3.417548184
3	52.29905961	2791.598632	4814.773665	6.620603257	346.2513244	39.19647711	3.80212741
4	55.95721431	2933.924133	5166.200954	8.802864291	492.5837636	46.76839735	5.227247754
5	47.09874167	2584.63411	4316.989066	6.382947304	300.6287862	41.55405397	3.057463421
6	50.64033751	2726.201618	4655.761256	8.086169903	409.4863731	39.92702604	4.878399904
7	51.26796209	2751.012104	4715.902769	8.630579133	442.4722038	40.3812608	5.384675855
8	49.12507245	2665.963718	4510.692193	9.490925811	466.2424182	45.67928716	5.25993322
9	50.57757505	2723.71611	4649.74882	7.477729466	378.2054233	41.73658065	4.145044882
10	47.25116478	2590.783579	4331.547668	7.495545356	354.1732487	36.23339942	4.476532774

Reference reach averages							
Manning's Q RR-PF	Manning's Q RR-CS	Average width RR-PF	Average Depth RR-PF	W/D RR-PF	Average Wetted perimeter RR-PF	Average Cross sectional area RR-PF	Average 2x Banfull width RR-PF
830.7537502	814.6719152	57.393	4.26	13.47253521	60.707	155.83	83.969
1912.034948	1273.366686	Average	Design (E/R) RR-PF	Average Q RR-PF	Average V Calculated RR-PF	Average V of mean V RR-PF	Average Wetted Perimeter RR-PF
357.3348	986.6685034	entrenchment ratio					
1637.325631	2152.036233	1.39352536	1.383184806	1092.10626	7.008318423	6.616602164	60.707
1070.351127	810.953455	Average width RR-CS	Average Depth RR-CS	W/D RR-CS	Average Wetted perimeter RR-CS	Average Cross sectional area RR-CS	Average 2x Banfull width RR-CS
1409.386277	1575.024174	54.095	5.471	9.887589106	56.206	181.066	91.845
1353.779689	1876.633127	Average	Design (E/R) RR-CS	Average Q RR-CS	Average V Calculated RR-CS	Average V of mean V RR-CS	Average Wetted Perimeter RR-CS
308.9745337	2280.384745	entrenchment ratio					
855.7428888	1293.647198	1.644560811	1.634078212	1427.916349	7.886164985	7.673907841	56.206
1185.378954	1215.777457						

1. 2x Bankfull width at some locations are greater than the surveyed topography and will be assumed to be 100 ft.

New Channel dimensions							
Higher calculated Q	Average Width	Average W/D	Average Wetted Perimeter	Average E/R	Actual 2x Bankfull width	Actual depth	
1427.916349	55.744	11.68006216	58.4565	1.508631509	88.18931781	4.772577341	