

McCulloch Reservoir Water Supply and Hydrology Study

Prepared for the South East Kelowna Irrigation District

(Year 3 - 2005 Report)

Summary:

The hydrometric stations at Pooley, Stirling, Canyon and Hydraulic Creeks operated from May through October 2005. The water yields for the May through October period are as follows: Pooley Creek – 3,766 AF, Stirling Creek – 2,145 AF, Canyon Creek – 2,160 AF and Hydraulic Creek – 5,761 AF. The Hydraulic and Stirling Creeks combined yield=7,906 AF. From May 1 to May 24, SEKID staff closed the diversions from Pooley Creek and Canyon Creek as the Hydraulic Reservoir was near full pool. For this reason, discharge from Pooley and Canyon Creeks was not diverted into the McCulloch reservoir during this period and therefore was not measured at the Hydraulic station.

1. Introduction:

This is the 2005 update report for the water SEKID water supply study. The 2003-2005 data summary tables are in Appendix A. The annual period of record for the four stations varies from year to year depending on field conditions (ice conditions), however data is typically collected from May 1st through October 31st.

2. Project Activities:

The completion dates for the various project activities completed in 2005 are outlined in Table 1.

Table 1 – 2005 Project Activities

Dates	Activity
March 30, 2005	Attempt to de-ice wells at all four stations
April 19, 2005	De-ice wells at Canyon and Hydraulic stations
May 2, 2005	Calculate flow at Stirling, Canyon and Hydraulic Creeks
*May 3, 2005	De-ice Pooley station again and re-installed damaged staff gauges at both Pooley and Stirling Creeks
May 19, 2005	Download data at all four sites and calculate flow at Pooley, Canyon and Hydraulic Creeks
June 2, 2005	Calculate flow and download data at all four sites
June 29, 2005	Calculate flow and download data at all four sites

Table 1 – 2005 Project Activities - Continued

Dates	Activity
July 29, 2005	Calculate flow and download data at all four sites
Oct. 13, 2005	Calculate flow and download data at all four sites
Oct. 20, 2005	Calculate flow at all four sites
Oct. 26, 2005	Survey benchmarks at all four sites
Nov. 20, 2005	Download dataloggers and closed all four stations for the year

*The configuration of the stilling well intake at the Stirling Creek station was adjusted to reduce interference (errant water level readings) and therefore the stage discharge curve for Stirling Creek changed in 2005. In addition, ice movement affected the reference staff gauge so it was relocated to a more stable position in the stream. The reference staff gauge at Pooley Creek toppled during the ice break up and was replaced in a more stable location. The 2005 water level data was corrected to the new reference and the stage discharge curve did not change for Pooley Creek.

3. Data Summary:

The Continuous water level data (hourly data) was collected from May 1 to November 20, 2005 at Pooley Creek and from April 11 to November 20, 2005 at Stirling, Canyon and Hydraulic Creeks (refer to Appendix A).

Environment Canada data indicates that in 2005, the Southern BC Mountains Region experienced the 2nd warmest and 45th wettest spring on record since 1948 (58 years of record). The summer was the 27th warmest and 8th wettest on record and the autumn was the 25th warmest and 20th wettest on record.

The mean monthly discharges were calculated using the hourly field data (stage/water level) and the corresponding discharge values derived from the stage discharge curves. The total discharge from each hour was calculated and then summed for each month. This value was then divided by the total number of seconds in that month to arrive at the mean monthly discharges (refer to Appendix A).

The total monthly yield was calculated in cubic meters and converted to acre-feet by multiplying the cubic meter value by 0.0008107 (1 m³ = 0.0008107 acre feet). The metric data was converted to acre-feet so that it is consistent with other water supply data used by SEKID staff.

In 2005, the maximum yields occurred in May during the snowmelt period. Because the Pooley Creek and Canyon Creek diversions were turned off from May 1 to May 24, 2005 the total yield was not detected at the Hydraulic station. The minimum yields occurred during September 2005. The combined yield recorded at the Hydraulic Creek station and the Stirling Creek station for the period May 1, 2005 to October 31, 2005 is 7,906 AF.

Pooley Creek

The maximum daily discharge occurred on May 15, 2005 and was 2.11 m³/s. The minimum daily discharge (0.002 m³/s) occurred on August 28, 2005. The yield from Pooley Creek (May 1 through October 31, 2005) was approximately 3,766 AF, which is 70 AF (2%) more volume than May 1 through October 31, 2004. Additional years of data are required to determine current run-off trends. Flow from the Pooley Creek diversion was turned off and did not reach the McCulloch reservoir from May 1 – 24, 2005. Refer to Appendix A for additional details.

Stirling Creek

The maximum daily discharge occurred on May 16, 2005 and was 1.52 m³/s. The minimum daily discharge (0.002 m³/s) occurred on August 16, 2005. Because the 2005 freshet/snowmelt occurred later than the 2004 freshet, the April to October 2004 data is compared with the May to October 2005 data. The yield from Stirling Creek (May 1 through October 31, 2005) was approximately 2,145 AF, which is 227 AF (12%) more volume than April 1 through October 31, 2004. Additional years of data are required to determine current run-off trends.

Canyon Creek

This is a new hydrometric station so no comparative WSC data exists for this site. The maximum daily discharge occurred on May 16, 2005 and was 2.17 m³/s. The minimum daily discharge (0.001 m³/s) occurred on August 28, 2005. The yield from Canyon Creek (May 1 through October 31, 2005) was approximately 2,160 AF, which is 61 AF (3%) less volume than April 1 through October 31, 2004. Flow from the Canyon Creek diversion was turned off and did not reach the McCulloch reservoir from May 1 – 24, 2005. Refer to Appendix A for additional details.

Hydraulic Creek

This station records the run-off from the Pooley Creek and Canyon Creek diversions as well as the run-off from the residual catchment area upstream from this station location. The Stirling Creek diversion enters Hydraulic Creek downstream from the Hydraulic Creek hydrometric station.

Because the Pooley and Canyon Creek diversions were turned off from May 1 – 24, the maximum daily discharge for Hydraulic Creek was estimated by adding the discharges from the 3 stations (Pooley, Canyon and Hydraulic). The maximum daily discharges on May 16 were; Pooley – 1.85 m³/s, Canyon – 2.17 m³/s and Hydraulic – 0.836 m³/s, which equals 4.86 m³/s. The minimum daily discharge (0.015 m³/s) occurred on August 22, 2005. The yield from Hydraulic Creek (May 1 through October 31, 2005) was approximately 5,761 AF, which is 2442 AF (30%) less volume than April 1 through October 31, 2004. This reduction is due to the Pooley and Canyon Creek diversions which were turned off from May 1 – 24.

4. Conclusions:

Because the McCulloch reservoir approached full pool in late April, SEKID staff turned off the Pooley and Canyon Creek diversions from May 1 to May 24, 2005.

Based on data collected from May 1 through October 31 of 2005, the yield at the Hydraulic Creek station was 5,761 AF. The yield at the Stirling Creek station was 2,145 AF for a total supply of 7,906 AF of run-off to the McCulloch Reservoir from the upper catchment areas.

Environment Canada data indicates that in 2005, the Southern BC Mountains Region experienced the 2nd warmest and 45th wettest spring on record since 1948 (58 years of record). The summer was the 27th warmest and 8th wettest on record and the autumn was the 25th warmest and 20th wettest on record.

5. Recommendations:

Continue to collect and analyze hydrometric data at the four stations to develop a database that can be used to define the run-off trends for these catchments

Continue to measure stage and discharge during the 2006 open water season to better define the stage discharge relationship at all four stations

Continue with routine site inspections at the hydrometric stations to confirm proper operation. The inspections can, for the most part, be completed during times when flow measurements are made, and at a minimum should be conducted biweekly during freshet and monthly thereafter

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Appendix A

Data

The following 3 tables summarize the annual data collected. The pages beyond these three tables provide the site specific details.

2005 Stage and Discharge Measurements

Dates	Pooley Creek		Stirling Creek		Canyon Creek		Hydraulic Creek	
	Stage (m)	Q (m ³ /s)	Stage (m)	Q (m ³ /s)	Stage (m)	Q (m ³ /s)	Stage (m)	Q (m ³ /s)
May 2, 2005	-	-	0.315	0.440	0.544	0.474	0.441	0.392
May 19, 2005	0.324	0.875	-	-	0.656	0.650	0.434	0.380
June 2, 2005	0.260	0.479	0.218	0.108	0.440	0.238	0.539	0.946
June 29, 2005	0.312	0.731	0.235	0.166	0.454	0.240	0.621	1.660
July 29, 2005	0.028	0.018	0.132	0.009	0.274	0.025	0.325	0.062
Oct. 13, 2005	0.014	0.009	0.121	0.003	0.227	0.003	0.276	0.015
Oct. 20, 2005	0.074	0.052	0.150	0.018	0.303	0.027	0.349	0.109

The data in this table was used to develop/confirm the stage discharge curves for each site.

Mean Monthly Discharge (WSC Data vs 2003-2005 Data)

Data	Mean Monthly Discharge (m ³ /s)						
	Apr.	May	June	July	Aug.	Sept.	Oct.
Pooley 2003	-	-	-	-	-	-	0.025
Pooley 2004	0.294	1.020	0.454	0.036	0.013	0.136	0.067
Pooley 2005	-	0.996	0.574	0.156	0.006	0.006	0.015
WSC Pooley	-	0.957	0.868	0.123	0.016	0.063	0.018
Stirling 2003	-	-	-	-	-	-	*0.021
Stirling 2004	0.349	0.334	0.121	0.018	0.007	0.037	0.036
Stirling 2005	-	0.701	0.202	0.064	0.005	0.005	0.017
WSC Stirling	0.041	0.356	0.148	0.012	0.003	0	0
Canyon 2004	0.329	0.722	0.206	0.028	0.005	0.036	0.034
Canyon 2005	0.431	0.713	0.194	0.072	0.005	0.002	0.015
Hydraulic 2004	-	2.349	0.868	**0.072	0.039	0.286	0.162
Hydraulic 2005	-	0.739	1.479	0.389	0.025	0.024	0.046

*This value is estimated based on hourly data collected from Oct 14, 2003 08:45 PST to Oct 31, 2003 23:45 PST.

**Power lost/data missing from July 4, 2004 08:00 PST to July 13, 2004 09:00 PST (8 days of data missing, 0.072 is the 23 day mean).

WSC Pooley values based on data collected from 1973 - 1979, WSC Stirling values based on data collected from 1977 - 1984.

Table 4 –Monthly Yields (WSC Data vs 2003-2005 Data)

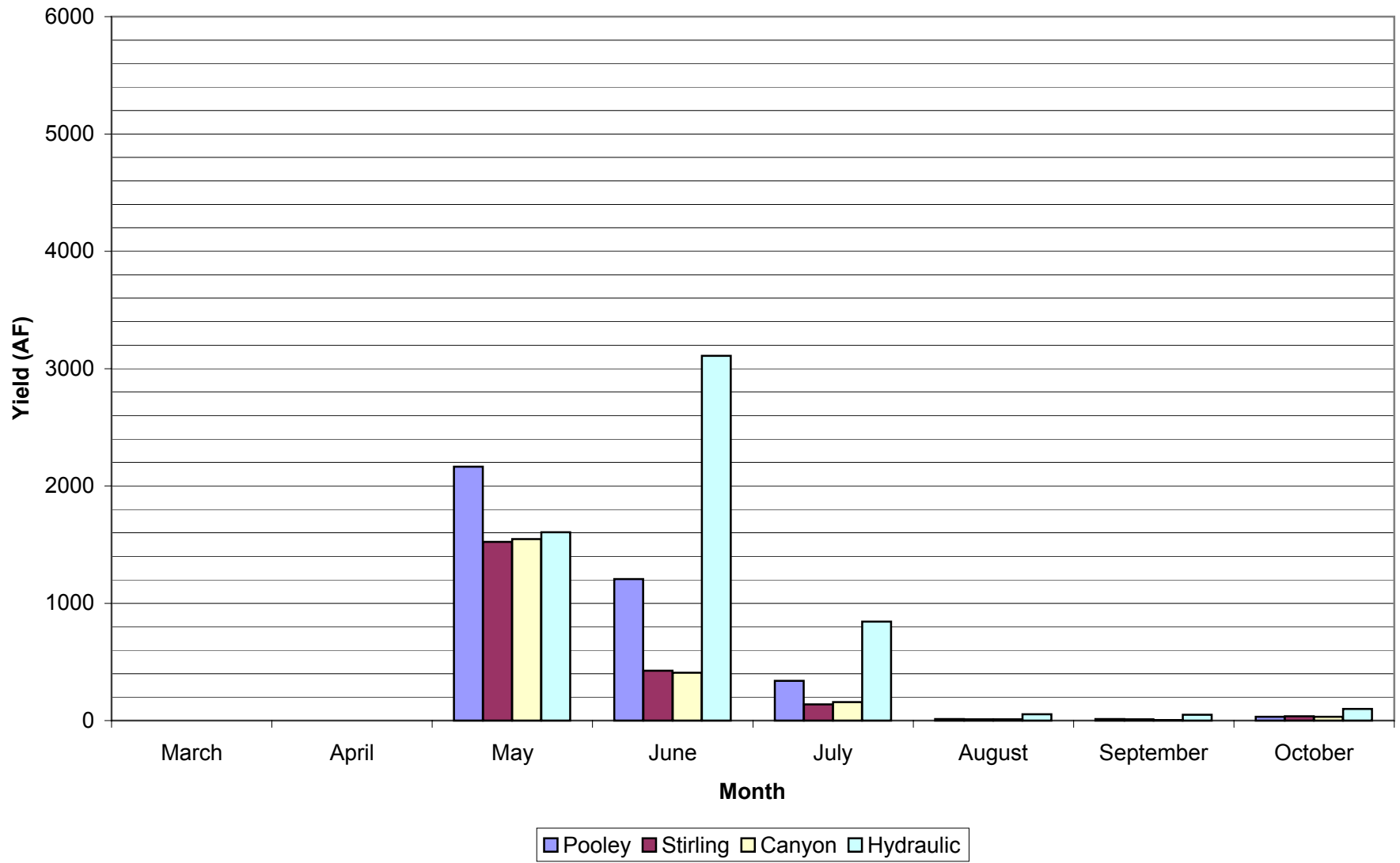
Data	Monthly Yields (AF)							
	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
Pooley 2003	-	-	-	-	-	-	54.3	-
Pooley 2004	617	2216	953	77.5	27.8	286	136	4313
Pooley 2005	-	2163	1206	338	13.3	12.6	32.7	3766
WSC Pooley	-	2078	1824	267	35	132	39	4375
Stirling 2003	-	-	-	-	-	-	45.6	-
Stirling 2004	*733	725	254	38	16	78.7	73.3	1918
Stirling 2005	-	1523	425	139	10.7	10.2	36.6	2145
WSC Stirling	86	773	311	26	6.5	0	0	1203
Canyon 2004	*694	1568	433	60	11.2	74.9	73.7	2915
Canyon 2005	906	1548	408	157	10.2	3.4	33.3	3066
Hydraulic 2004	-	5103	1885	**156	86.1	622	351	8203
Hydraulic 2005	-	1604	3109	844	54.1	50.0	99.7	5761

*Incomplete monthly data, yields estimated using mean monthly discharge (m³/s) multiplied by the number of seconds in that month and converted to Acre Feet.

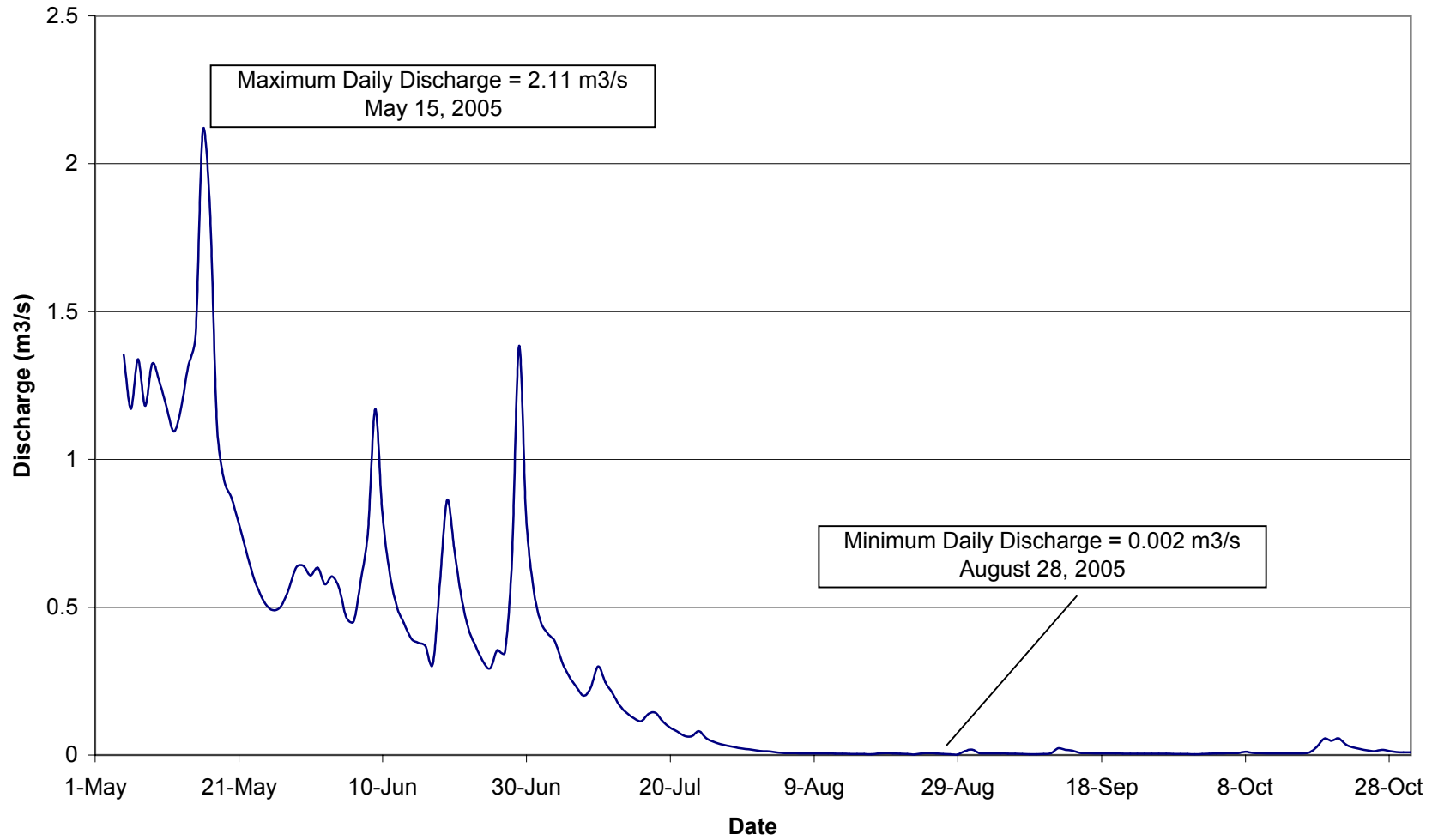
**This value is estimated, because 8 days of hourly data are missing, the 23 day average from Table 4 was used to calculate a 31 day yield.

WSC Pooley values based on mean data collected from 1973 - 1979, WSC Stirling values based on mean data collected from 1977 - 1984.

SEKID Supply Area - 2005 Water Yield (AF)



Pooley Creek Mean Daily Discharge (2005)



**Pooley Creek
Benchmark Survey Notes
10/26/2005 at 9:00 PST**

**HI=BS+Elevation
Elevation=HI-FS**

Station	Backsight	H.I.	Foresight	Elevation	Notes
BM3	0.941	4.863		3.922	
Rock 1		4.863	1.437	3.426	
TP Rock 1	2.24	5.666		3.426	
Rock 2		5.666	0.476	5.19	
TP Rock 2	1.976	7.166		5.19	
Rock 3		7.166	1.185	5.981	
TP Rock 3	1.731	7.712		5.981	
BM1		7.712	0.515	7.197	
BM2		7.712	0.553	7.159	
Rock #4		7.712	2.097	5.615	
TP Rock #4	0.940	6.555		5.615	Instrument Moved
H2O surface		6.555	1.535	5.020	
1m Staff Gauge		6.555	0.935	5.620	
Rock #4		6.555	0.939	5.616	
TP Rock #4	2.037	7.653		5.616	Instrument Moved
BM2		7.653	0.494	7.159	
BM1		7.653	0.455	7.198	
Rock #4		7.653	2.037	5.616	
TP Rock #4	1.145	6.761		5.616	
H2O surface		6.761	1.802	4.959	
Rock #5		6.761	0.960	5.801	
TP #5	1.728	7.529		5.801	Instrument Moved
BM1		7.529	0.33	7.199	
BM2		7.529	0.37	7.159	

Circuit Closure Acceptable

0.000

BM1 = Lag Bolt on Left Bank Spruce Adjacent to Well (Old WSC Tag #1928)

BM2 = Top of Lock Guard on Stilling Well Enclosure

BM3 = Brass Hub on Concrete Diversion Downstream from Well (#19668)

May 19 2005 at approximately 15:00 PST at Pooley Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.704 m deep at 15:00 PST

Staff Gauge = 0.708 m at 15:00 PST

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.4	0.06	0.1	0.006	0.06	0.00036	0.04%
0.6	0.10	0.2	0.020	0.41	0.00820	0.94%
0.8	0.20	0.2	0.040	0.45	0.01800	2.06%
1	0.23	0.2	0.046	0.69	0.03174	3.63%
1.2	0.27	0.2	0.054	0.86	0.04644	5.31%
1.4	0.34	0.2	0.068	0.87	0.05916	6.76%
1.6	0.36	0.15	0.054	1.26	0.06804	7.78%
1.7	0.42	0.1	0.042	1.11	0.04662	5.33%
1.8	0.42	0.1	0.042	1.02	0.04284	4.90%
1.9	0.42	0.1	0.042	1.05	0.04410	5.04%
2	0.42	0.1	0.042	1.16	0.04872	5.57%
2.1	0.45	0.1	0.045	1.10	0.04950	5.66%
2.2	0.47	0.1	0.047	1.41	0.06627	7.58%
2.3	0.46	0.1	0.046	1.40	0.06440	7.36%
2.4	0.46	0.1	0.046	1.40	0.06440	7.36%
2.5	0.42	0.1	0.042	1.22	0.05124	5.86%
2.6	0.42	0.1	0.042	0.98	0.04116	4.71%
2.7	0.40	0.1	0.040	0.88	0.03520	4.02%
2.8	0.40	0.1	0.040	0.70	0.02800	3.20%
2.9	0.36	0.1	0.036	0.72	0.02592	2.96%
3	0.21	0.1	0.021	0.53	0.01113	1.27%
3.1	0.24	0.1	0.024	0.51	0.01224	1.40%
3.2	0.26	0.1	0.026	0.42	0.01092	1.25%

0.87460

Liters/second	874.60
US Gal/second	231.05
US Gal/minute	13862.73
ft3/second	30.89
ft3/day	2668517.95
Acre Feet/day	61.26

June 2 2005 at approximately 1:30 PST at Pooley Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.640 m at 1:30 PST

Staff Gauge = 0.640 m at 1:30 PST

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.8	0.07	0.2	0.014	0.01	0.00014	0.03%
1	0.12	0.2	0.024	0.09	0.00216	0.45%
1.2	0.18	0.2	0.036	0.20	0.00720	1.50%
1.4	0.27	0.2	0.054	0.16	0.00864	1.80%
1.6	0.30	0.15	0.045	0.28	0.01260	2.63%
1.7	0.31	0.1	0.031	0.39	0.01209	2.52%
1.8	0.31	0.1	0.031	0.52	0.01612	3.36%
1.9	0.31	0.1	0.031	0.53	0.01643	3.43%
2	0.32	0.1	0.032	0.53	0.01696	3.54%
2.1	0.33	0.1	0.033	0.44	0.01452	3.03%
2.2	0.34	0.1	0.034	0.47	0.01598	3.33%
2.3	0.34	0.1	0.034	0.49	0.01666	3.47%
2.4	0.33	0.15	0.050	0.50	0.02475	5.16%
2.6	0.32	0.2	0.064	0.52	0.03328	6.94%
2.8	0.32	0.2	0.064	0.53	0.03392	7.07%
3	0.32	0.2	0.064	0.40	0.02560	5.34%
3.2	0.32	0.2	0.064	0.57	0.03648	7.61%
3.4	0.33	0.2	0.066	0.54	0.03564	7.43%
3.6	0.34	0.2	0.068	0.52	0.03536	7.37%
3.8	0.28	0.2	0.056	0.58	0.03248	6.77%
4	0.30	0.2	0.060	0.59	0.03540	7.38%
4.2	0.30	0.2	0.060	0.54	0.03240	6.76%
4.4	0.21	0.2	0.042	0.31	0.01302	2.71%
4.6	0.08	0.2	0.016	0.11	0.00176	0.37%

0.47959

Liters/second	479.59
US Gal/second	126.69
US Gal/minute	7601.68
ft3/second	16.94
ft3/day	1463291.24
Acre Feet/day	33.59

June 29 2005 at approximately 12:00 PST at Pooley Creek.

Part of flow shunted down Pooley Creek, see below for addtnl Q

Used 0.6 depth for flow meter.

Stilling Well = 0.692 m at 1:30 PST

Staff Gauge = 0.692 m at 1:30 PST

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.8	0.16	0.2	0.032	0.21	0.00672	0.96%
1	0.24	0.2	0.048	0.26	0.01248	1.78%
1.2	0.28	0.2	0.056	0.22	0.01232	1.76%
1.4	0.36	0.2	0.072	0.32	0.02304	3.29%
1.6	0.38	0.15	0.057	0.58	0.03306	4.72%
1.7	0.38	0.1	0.038	0.59	0.02242	3.20%
1.8	0.38	0.1	0.038	0.59	0.02242	3.20%
1.9	0.40	0.1	0.040	0.53	0.02120	3.03%
2	0.40	0.1	0.040	0.50	0.02000	2.86%
2.1	0.41	0.1	0.041	0.48	0.01968	2.81%
2.2	0.40	0.1	0.040	0.46	0.01840	2.63%
2.3	0.40	0.1	0.040	0.51	0.02040	2.91%
2.4	0.40	0.15	0.060	0.57	0.03420	4.88%
2.6	0.42	0.2	0.084	0.61	0.05124	7.32%
2.8	0.40	0.2	0.080	0.60	0.04800	6.85%
3	0.40	0.2	0.080	0.61	0.04880	6.97%
3.2	0.39	0.2	0.078	0.61	0.04758	6.79%
3.4	0.40	0.2	0.080	0.61	0.04880	6.97%
3.6	0.40	0.2	0.080	0.66	0.05280	7.54%
3.8	0.39	0.2	0.078	0.67	0.05226	7.46%
4	0.36	0.2	0.072	0.62	0.04464	6.37%
4.2	0.30	0.2	0.060	0.47	0.02820	4.03%
4.4	0.20	0.2	0.040	0.23	0.00920	1.31%
4.6	0.10	0.2	0.020	0.13	0.00260	0.37%

0.70046

Liters/second 700.46
 US Gal/second 185.04
 US Gal/minute 11102.55
 ft3/second 24.74

ft3/day 2137194.24
 Acre Feet/day 49.06

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.3	0.10	0.1	0.010	0.02	0.00020	0.03%
0.4	0.15	0.1	0.015	0.04	0.00060	0.09%
0.5	0.18	0.1	0.018	0.24	0.00432	0.62%
0.6	0.18	0.1	0.018	0.42	0.00756	1.08%
0.7	0.18	0.1	0.018	0.35	0.00630	0.90%
0.8	0.13	0.1	0.013	0.36	0.00468	0.67%
0.9	0.13	0.1	0.013	0.30	0.00390	0.56%
1	0.14	0.1	0.014	0.19	0.00266	0.38%
1.1	0.14	0.1	0.014	0.05	0.00070	0.10%

0.03092

Liters/second 30.92
 US Gal/second 8.17
 US Gal/minute 490.09
 ft3/second 1.09

Oct 13 2005 at approximately 12:00 PST at Pooley Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.366 m at 12:00 PST

Staff Gauge = 0.367 m at 12:00 PST

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.5	0.04	0.1	0.004	0.08	0.000320	3.45%
0.60	0.05	0.1	0.005	0.12	0.000600	6.47%
0.7	0.05	0.1	0.005	0.17	0.000850	9.17%
0.80	0.06	0.1	0.006	0.21	0.001260	13.59%
0.9	0.06	0.1	0.006	0.27	0.001620	17.48%
1.00	0.06	0.1	0.006	0.25	0.001500	16.18%
1.1	0.06	0.1	0.006	0.19	0.001140	12.30%
1.20	0.06	0.1	0.006	0.13	0.000780	8.41%
1.3	0.06	0.1	0.006	0.12	0.000720	7.77%
1.40	0.06	0.1	0.006	0.06	0.000360	3.88%
1.5	0.04	0.1	0.004	0.03	0.000120	1.29%

Low flow difficult to achieve 20 station across channel

0.00927

Liters/second	9.27
US Gal/second	2.45
US Gal/minute	146.93
ft3/second	0.33
ft3/day	28283.97
Acre Feet/day	0.65

October 20 2005 at approximately 11:30 PST at Pooley Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.454 m at 11:30 PST

Staff Gauge = 0.460 m at 11:30 PST

Pooley Creek Diversion.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.6	0.08	0.1	0.008	0.01	0.00008	0.16%
0.7	0.10	0.1	0.010	0.13	0.00130	2.52%
0.8	0.10	0.1	0.010	0.25	0.00250	4.85%
0.9	0.10	0.1	0.010	0.34	0.00340	6.60%
1	0.11	0.1	0.011	0.43	0.00473	9.18%
1.05	0.11	0.05	0.006	0.43	0.00237	4.59%
1.1	0.12	0.05	0.006	0.44	0.00264	5.12%
1.15	0.12	0.05	0.006	0.47	0.00282	5.47%
1.2	0.12	0.05	0.006	0.49	0.00294	5.71%
1.25	0.12	0.05	0.006	0.49	0.00294	5.71%
1.3	0.12	0.05	0.006	0.48	0.00288	5.59%
1.35	0.12	0.05	0.006	0.43	0.00258	5.01%
1.4	0.12	0.05	0.006	0.40	0.00240	4.66%
1.45	0.11	0.05	0.006	0.37	0.00204	3.95%
1.5	0.11	0.05	0.006	0.38	0.00209	4.06%
1.55	0.10	0.05	0.005	0.39	0.00195	3.78%
1.6	0.10	0.05	0.005	0.40	0.00200	3.88%
1.65	0.10	0.05	0.005	0.35	0.00175	3.40%
1.7	0.10	0.05	0.005	0.37	0.00185	3.59%
1.75	0.10	0.05	0.005	0.38	0.00190	3.69%
1.8	0.09	0.05	0.005	0.34	0.00153	2.97%
1.85	0.09	0.05	0.005	0.34	0.00153	2.97%
1.9	0.08	0.05	0.004	0.26	0.00104	2.02%
1.95	0.06	0.025	0.002	0.18	0.00027	0.52%

0.05152

Liters/second	51.52
US Gal/second	13.61
US Gal/minute	816.61
ft3/second	1.82
ft3/day	157194.20
Acre Feet/day	3.61

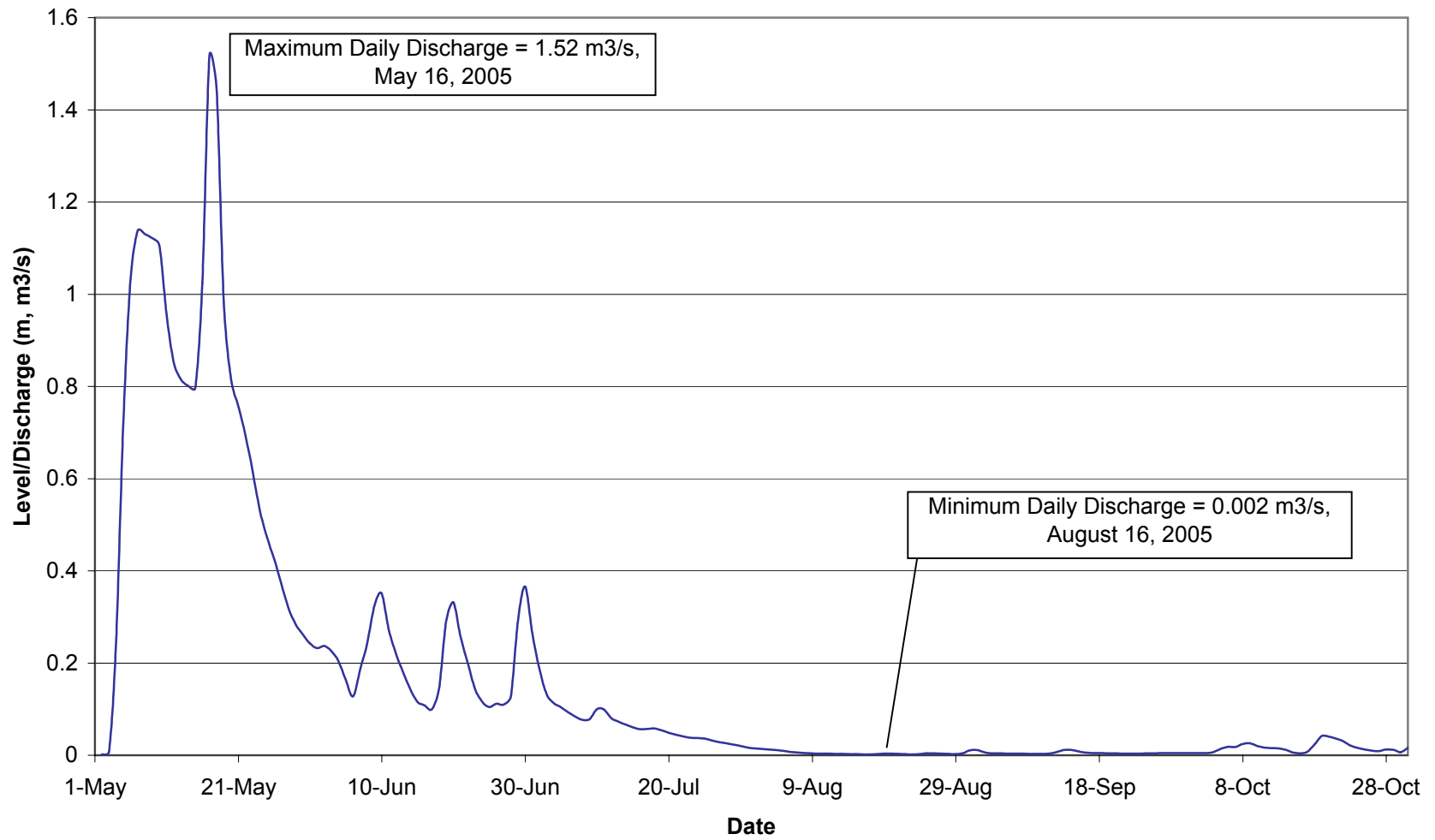
Expanded Stage Discharge Table For Pooley Creek (2004/2005)

	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.002	0.001		
Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
-0.04	0.0000	0.0003	0.0006	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	-0.04
-0.03	0.0028	0.0030	0.0033	0.0036	0.0039	0.0041	0.0044	0.0047	0.0050	0.0052	-0.03
-0.02	0.0055	0.0056	0.0056	0.0057	0.0057	0.0058	0.0058	0.0059	0.0059	0.0060	-0.02
-0.01	0.0060	0.0061	0.0061	0.0062	0.0062	0.0063	0.0063	0.0064	0.0064	0.0064	-0.01
0.00	0.0065	0.0070	0.0076	0.0081	0.0087	0.0092	0.0098	0.0104	0.0109	0.0115	0.00
0.01	0.0120	0.0126	0.0131	0.0137	0.0142	0.0148	0.0153	0.0159	0.0164	0.0170	0.01
0.02	0.0175	0.0180	0.0185	0.0190	0.0195	0.0200	0.0205	0.0210	0.0215	0.0220	0.02
0.03	0.0225	0.0230	0.0235	0.0240	0.0245	0.0250	0.0255	0.0260	0.0265	0.0270	0.03
0.04	0.0275	0.0283	0.0290	0.0298	0.0305	0.0313	0.0320	0.0328	0.0335	0.0343	0.04
0.05	0.0350	0.0358	0.0365	0.0373	0.0380	0.0388	0.0395	0.0403	0.0410	0.0418	0.05
0.06	0.0425	0.0438	0.0450	0.0463	0.0475	0.0488	0.0500	0.0513	0.0525	0.0538	0.06
0.07	0.0550	0.0563	0.0575	0.0588	0.0600	0.0613	0.0625	0.0638	0.0650	0.0663	0.07
0.08	0.0675	0.0689	0.0703	0.0716	0.0730	0.0744	0.0758	0.0771	0.0785	0.0799	0.08
0.09	0.0813	0.0826	0.0840	0.0854	0.0868	0.0881	0.0895	0.0909	0.0923	0.0936	0.09
0.10	0.0950	0.0968	0.0985	0.1003	0.1020	0.1038	0.1055	0.1073	0.1090	0.1108	0.10
0.11	0.1125	0.1143	0.1160	0.1178	0.1195	0.1213	0.1230	0.1248	0.1265	0.1283	0.11
0.12	0.1300	0.1324	0.1348	0.1371	0.1395	0.1419	0.1443	0.1466	0.1490	0.1514	0.12
0.13	0.1538	0.1561	0.1585	0.1609	0.1633	0.1656	0.1680	0.1704	0.1728	0.1751	0.13
0.14	0.1775	0.1806	0.1838	0.1869	0.1900	0.1931	0.1963	0.1994	0.2025	0.2056	0.14
0.15	0.2088	0.2119	0.2150	0.2181	0.2213	0.2244	0.2275	0.2306	0.2338	0.2369	0.15
0.16	0.2400	0.2438	0.2475	0.2513	0.2550	0.2588	0.2625	0.2663	0.2700	0.2737	0.16
0.17	0.2775	0.2812	0.2850	0.2887	0.2925	0.2962	0.3000	0.3037	0.3075	0.3112	0.17
0.18	0.3150	0.3186	0.3222	0.3259	0.3295	0.3331	0.3367	0.3404	0.3440	0.3476	0.18
0.19	0.3512	0.3549	0.3585	0.3621	0.3657	0.3694	0.3730	0.3766	0.3802	0.3839	0.19
0.20	0.3875	0.3911	0.3947	0.3984	0.4020	0.4056	0.4092	0.4129	0.4165	0.4201	0.20
0.21	0.4237	0.4274	0.4310	0.4346	0.4382	0.4419	0.4455	0.4491	0.4527	0.4564	0.21
0.22	0.4600	0.4635	0.4670	0.4705	0.4740	0.4775	0.4810	0.4845	0.4880	0.4915	0.22
0.23	0.4950	0.4985	0.5020	0.5055	0.5090	0.5125	0.5160	0.5195	0.5230	0.5265	0.23
0.24	0.5300	0.5335	0.5370	0.5405	0.5440	0.5475	0.5510	0.5545	0.5580	0.5615	0.24
0.25	0.5650	0.5685	0.5720	0.5755	0.5790	0.5825	0.5860	0.5895	0.5930	0.5965	0.25
0.26	0.6000	0.6035	0.6070	0.6105	0.6140	0.6175	0.6210	0.6245	0.6280	0.6315	0.26
0.27	0.6350	0.6385	0.6420	0.6455	0.6490	0.6525	0.6560	0.6595	0.6630	0.6665	0.27
0.28	0.6700	0.6740	0.6780	0.6820	0.6860	0.6900	0.6940	0.6980	0.7020	0.7060	0.28
0.29	0.7100	0.7140	0.7180	0.7220	0.7260	0.7300	0.7340	0.7380	0.7420	0.7460	0.29
0.30	0.7500	0.7537	0.7575	0.7612	0.7650	0.7687	0.7725	0.7762	0.7800	0.7837	0.30
0.31	0.7875	0.7912	0.7950	0.7987	0.8025	0.8062	0.8100	0.8137	0.8175	0.8212	0.31

Expanded Stage Discharge Table For Pooley Creek (2004/2005)

	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.002	0.001		
Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.32	0.8250	0.8285	0.8320	0.8355	0.8390	0.8425	0.8460	0.8495	0.8530	0.8565	0.32
0.33	0.8600	0.8635	0.8670	0.8705	0.8740	0.8775	0.8810	0.8845	0.8880	0.8915	0.33
0.34	0.8950	0.8985	0.9020	0.9055	0.9090	0.9125	0.9160	0.9195	0.9230	0.9265	0.34
0.35	0.9300	0.9335	0.9370	0.9405	0.9440	0.9475	0.9510	0.9545	0.9580	0.9615	0.35
0.36	0.9650	0.9685	0.9720	0.9755	0.9790	0.9825	0.9860	0.9895	0.9930	0.9965	0.36
0.37	1.0000	1.0035	1.0070	1.0105	1.0140	1.0175	1.0210	1.0245	1.0280	1.0315	0.37
0.38	1.0350	1.0405	1.0460	1.0515	1.0570	1.0625	1.0680	1.0735	1.0790	1.0845	0.38
0.39	1.0900	1.0955	1.1010	1.1065	1.1120	1.1175	1.1230	1.1285	1.1340	1.1395	0.39
0.40	1.1450	1.1505	1.1559	1.1614	1.1668	1.1723	1.1777	1.1832	1.1886	1.1941	0.40
0.41	1.1995	1.2050	1.2104	1.2159	1.2213	1.2268	1.2322	1.2377	1.2431	1.2486	0.41
0.42	1.2540	1.2595	1.2649	1.2704	1.2758	1.2813	1.2867	1.2922	1.2976	1.3031	0.42
0.43	1.3085	1.3140	1.3194	1.3249	1.3303	1.3358	1.3412	1.3467	1.3521	1.3576	0.43
0.44	1.3630	1.3685	1.3739	1.3794	1.3848	1.3903	1.3957	1.4012	1.4066	1.4121	0.44
0.45	1.4175	1.4230	1.4284	1.4339	1.4393	1.4448	1.4502	1.4557	1.4611	1.4666	0.45
0.46	1.4720	1.4775	1.4829	1.4884	1.4938	1.4993	1.5047	1.5102	1.5156	1.5211	0.46
0.47	1.5265	1.5320	1.5374	1.5429	1.5483	1.5538	1.5592	1.5647	1.5701	1.5756	0.47
0.48	1.5810	1.5865	1.5919	1.5974	1.6028	1.6083	1.6137	1.6192	1.6246	1.6301	0.48
0.49	1.6355	1.6410	1.6464	1.6519	1.6573	1.6628	1.6682	1.6737	1.6791	1.6846	0.49
0.50	1.6900	1.6956	1.7013	1.7069	1.7126	1.7182	1.7238	1.7295	1.7351	1.7408	0.50
0.51	1.7464	1.7520	1.7577	1.7633	1.7690	1.7746	1.7802	1.7859	1.7915	1.7972	0.51
0.52	1.8028	1.8084	1.8141	1.8197	1.8254	1.8310	1.8366	1.8423	1.8479	1.8536	0.52
0.53	1.8592	1.8648	1.8705	1.8761	1.8818	1.8874	1.8930	1.8987	1.9043	1.9100	0.53
0.54	1.9156	1.9212	1.9269	1.9325	1.9382	1.9438	1.9494	1.9551	1.9607	1.9664	0.54
0.55	1.9720	1.9776	1.9833	1.9889	1.9946	2.0002	2.0058	2.0115	2.0171	2.0228	0.55
0.56	2.0284	2.0340	2.0397	2.0453	2.0510	2.0566	2.0622	2.0679	2.0735	2.0792	0.56
0.57	2.0848	2.0904	2.0961	2.1017	2.1074	2.1130	2.1186	2.1243	2.1299	2.1356	0.57
0.58	2.1412	2.1468	2.1525	2.1581	2.1638	2.1694	2.1750	2.1807	2.1863	2.1920	0.58
0.59	2.1976	2.2032	2.2089	2.2145	2.2202	2.2258	2.2314	2.2371	2.2427	2.2484	0.59
0.60	2.2540	2.2615	2.2689	2.2764	2.2838	2.2913	2.2988	2.3062	2.3137	2.3211	0.60
0.61	2.3286	2.3361	2.3435	2.3510	2.3584	2.3659	2.3734	2.3808	2.3883	2.3957	0.61
0.62	2.4032	2.4107	2.4181	2.4256	2.4330	2.4405	2.4480	2.4554	2.4629	2.4703	0.62
0.63	2.4778	2.4853	2.4927	2.5002	2.5076	2.5151	2.5226	2.5300	2.5375	2.5449	0.63
0.64	2.5524	2.5599	2.5673	2.5748	2.5822	2.5897	2.5972	2.6046	2.6121	2.6195	0.64
0.65	2.6270	2.6345	2.6419	2.6494	2.6568	2.6643	2.6718	2.6792	2.6867	2.6941	0.65
0.66	2.7016	2.7091	2.7165	2.7240	2.7314	2.7389	2.7464	2.7538	2.7613	2.7687	0.66
0.67	2.7762	2.7837	2.7911	2.7986	2.8060	2.8135	2.8210	2.8284	2.8359	2.8433	0.67

Stirling Creek Mean Daily Discharge (2005)



**Stirling Creek
Benchmark Survey Notes
10/26/2005 at 4:15 PST**

**HI=BS+Elevation
Elevation=HI-FS**

Station	Backsight	H.I.	Foresight	Elevation	Notes
BM1	1.131	2.695		1.564	
BM2		2.695	0.895	1.800	
BM3		2.695	1.72	0.975	
H2O Surface		2.695	2.655	0.040	
1 m Staff		2.695	1.773	0.922	
Well x		2.695	0.373	2.322	
TP Well x	0.438	2.760		2.322	Instrument Moved
1 m Staff		2.760	1.835	0.925	
BM3		2.760	1.782	0.978	
BM2		2.760	0.958	1.802	
BM1		2.760	1.197	1.563	
H2O Surface		2.760	2.716	0.044	
Well x		2.760	0.438	2.322	

Circuit Closure Acceptable

0.001

BM1 = Rebar Pin (painted red) in ground approx. 5.5m upstream from stilling well and near the middle of the Left bank.

BM2 = Lag Screw in Pine (10 cm DBH) approx. 2.5 m upstream from stilling well and approx. 10m in from Right bank.

BM3 = Rebar Pin (painted red) in ground approx. 1.5m downstream from stilling well and approx. 8m in from Right bank.

May 3 2005 at approximately 4:00 PST at Stirling Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.315 m at 4:00 PST

Staff Gauge = 0.315 m at 4:00 PST (not accurate)

Stirling Creek Ditch.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.9	0.14	0.1	0.014	0.14	0.001960	0.45%
1.0	0.19	0.1	0.019	0.42	0.007980	1.81%
1.1	0.22	0.1	0.022	0.52	0.011440	2.60%
1.2	0.25	0.1	0.025	0.52	0.013000	2.95%
1.3	0.28	0.1	0.028	0.79	0.022120	5.03%
1.4	0.29	0.1	0.029	0.85	0.024650	5.60%
1.5	0.28	0.1	0.028	0.85	0.023800	5.41%
1.6	0.30	0.1	0.030	0.85	0.025500	5.80%
1.7	0.30	0.1	0.030	0.93	0.027900	6.34%
1.8	0.30	0.1	0.030	0.87	0.026100	5.93%
1.9	0.30	0.1	0.030	0.85	0.025500	5.80%
2.0	0.31	0.1	0.031	0.93	0.028830	6.55%
2.1	0.30	0.1	0.030	0.91	0.027300	6.20%
2.2	0.30	0.1	0.030	0.89	0.026700	6.07%
2.3	0.31	0.1	0.031	0.91	0.028210	6.41%
2.4	0.30	0.1	0.030	0.83	0.024900	5.66%
2.5	0.29	0.1	0.029	0.83	0.024070	5.47%
2.6	0.29	0.1	0.029	0.77	0.022330	5.07%
2.7	0.28	0.1	0.028	0.76	0.021280	4.84%
2.8	0.26	0.1	0.026	0.66	0.017160	3.90%
2.9	0.22	0.1	0.022	0.33	0.007260	1.65%
3	0.16	0.1	0.016	0.12	0.001920	0.44%
3.1	0.11	0.1	0.011	0.01	0.000110	0.02%

0.44002

Liters/second	440.02
US Gal/second	116.24
US Gal/minute	6974.48
ft3/second	15.54
ft3/day	1342558.05
Acre Feet/day	30.82

June 29 2005 at approximately 8:00 PST at Stirling Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.235 m at 8:00 PST

Staff Gauge = 0.235 m at 8:00 PST

Stirling Creek Ditch.

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.2	0.12	0.1	0.012	0.01	0.000120	0.07%
0.3	0.16	0.1	0.016	0.06	0.000960	0.58%
0.4	0.18	0.1	0.018	0.39	0.007020	4.23%
0.5	0.20	0.1	0.020	0.54	0.010800	6.51%
0.6	0.21	0.1	0.021	0.50	0.010500	6.33%
0.7	0.22	0.1	0.022	0.57	0.012540	7.55%
0.8	0.21	0.075	0.016	0.70	0.011025	6.64%
0.85	0.21	0.05	0.011	0.68	0.007140	4.30%
0.9	0.20	0.05	0.010	0.67	0.006700	4.04%
0.95	0.19	0.05	0.010	0.69	0.006555	3.95%
1.0	0.18	0.05	0.009	0.66	0.005940	3.58%
1.05	0.17	0.05	0.009	0.65	0.005525	3.33%
1.1	0.17	0.05	0.009	0.69	0.005865	3.53%
1.15	0.17	0.05	0.009	0.67	0.005695	3.43%
1.2	0.18	0.05	0.009	0.65	0.005850	3.52%
1.25	0.18	0.05	0.009	0.66	0.005940	3.58%
1.3	0.18	0.05	0.009	0.64	0.005760	3.47%
1.35	0.18	0.05	0.009	0.58	0.005220	3.14%
1.4	0.18	0.05	0.009	0.55	0.004950	2.98%
1.45	0.18	0.05	0.009	0.58	0.005220	3.14%
1.5	0.19	0.05	0.010	0.66	0.006270	3.78%
1.55	0.19	0.05	0.010	0.57	0.005415	3.26%
1.6	0.18	0.05	0.009	0.44	0.003960	2.39%
1.65	0.17	0.05	0.009	0.43	0.003655	2.20%
1.7	0.17	0.075	0.013	0.47	0.005993	3.61%
1.8	0.16	0.1	0.016	0.41	0.006560	3.95%
1.9	0.13	0.1	0.013	0.37	0.004810	2.90%

0.16599

Liters/second 165.99
 US Gal/second 43.85
 US Gal/minute 2630.96
 ft3/second 5.86

ft3/day 506449.37
 Acre Feet/day 11.63

Oct 13 2005 at approximately 8:30 PST at Stirling Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.121 m at 8:30 PST

Staff Gauge = 0.128 m at 8:30 PST

Stirling Creek Ditch.

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q
Very Low Flow, Created rectangular channel and estimated discharge with several surface velocity measurements. Channel dimensions w=.9 m, d=.02 m					
	Velocity	average v	w (m)	d(m)	Q
Run 1	0.17				
Run 2	0.16				
Run 3	0.14				
Run 4	0.18				
Run 5	0.17				
Run 6	0.19				
Run 7	0.15	0.166	0.70	0.02	0.00232
*Run 8	0.08				
*Run 9	0.08				
*Run 10	0.08	0.080	0.20	0.02	0.00032
*Treated as a separate entity as flow much slower in this final 20 cm section of channel.					

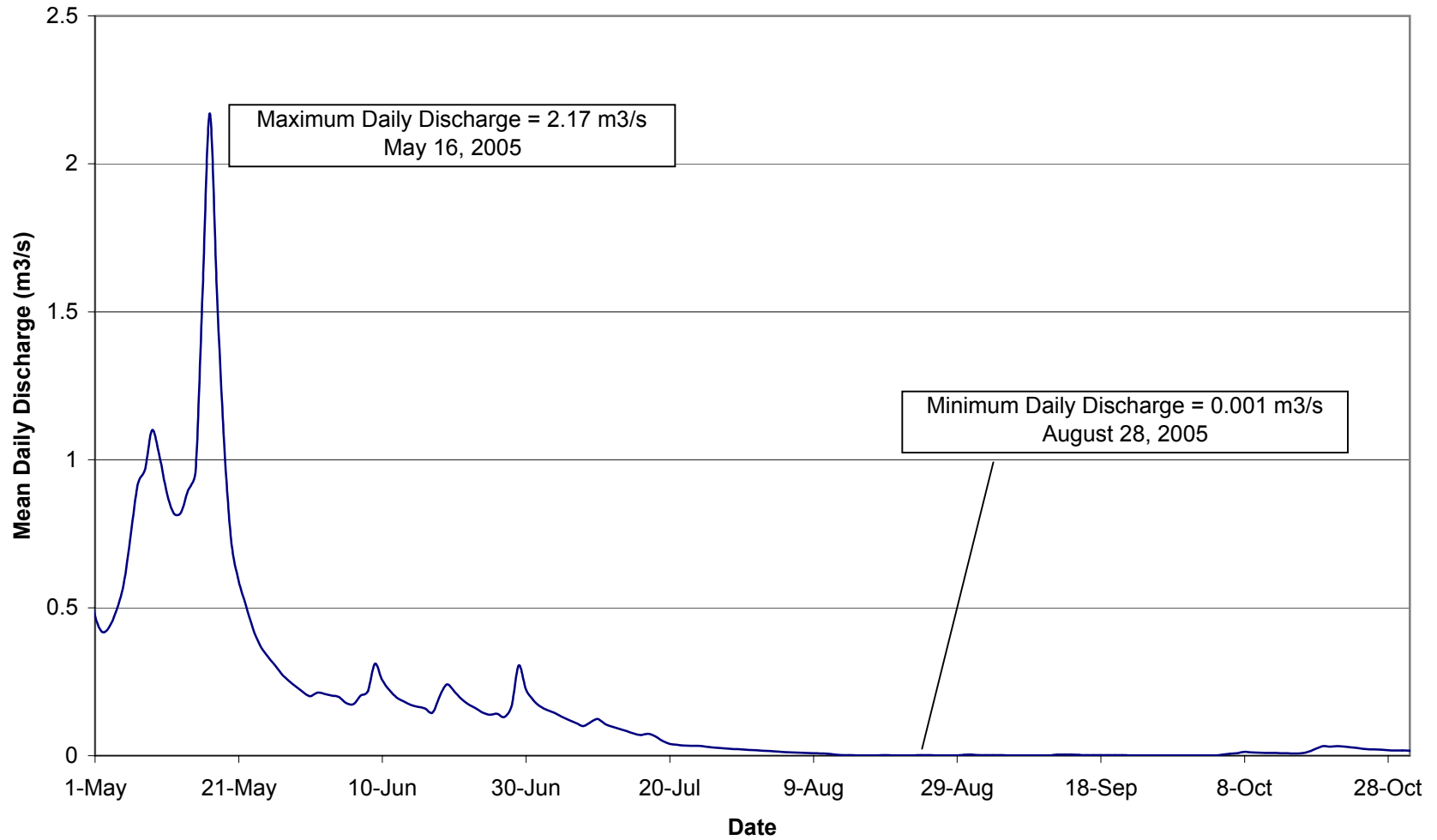
0.00264

Liters/second	2.64
US Gal/second	0.70
US Gal/minute	41.84
ft ³ /second	0.09
ft ³ /day	8054.98
Acre Feet/day	0.18

Expanded Stage Discharge Table For Stirling Creek (Based on 2005 Curve)

Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.10	0.0000	0.0001	0.0003	0.0004	0.0005	0.0007	0.0008	0.0009	0.0010	0.0012	0.10
0.11	0.0013	0.0014	0.0016	0.0017	0.0018	0.0020	0.0021	0.0022	0.0023	0.0025	0.11
0.12	0.0026	0.0032	0.0037	0.0043	0.0049	0.0055	0.0060	0.0066	0.0072	0.0077	0.12
0.13	0.0083	0.0089	0.0094	0.0100	0.0106	0.0112	0.0117	0.0123	0.0129	0.0134	0.13
0.14	0.0140	0.0146	0.0151	0.0157	0.0162	0.0168	0.0173	0.0179	0.0184	0.0190	0.14
0.15	0.0195	0.0201	0.0206	0.0212	0.0217	0.0223	0.0228	0.0234	0.0239	0.0245	0.15
0.16	0.0250	0.0258	0.0265	0.0273	0.0280	0.0288	0.0295	0.0303	0.0310	0.0318	0.16
0.17	0.0325	0.0333	0.0340	0.0348	0.0355	0.0363	0.0370	0.0378	0.0385	0.0393	0.17
0.18	0.0400	0.0413	0.0425	0.0438	0.0450	0.0463	0.0475	0.0488	0.0500	0.0513	0.18
0.19	0.0525	0.0538	0.0550	0.0563	0.0575	0.0588	0.0600	0.0613	0.0625	0.0638	0.19
0.20	0.0650	0.0675	0.0700	0.0725	0.0750	0.0775	0.0800	0.0825	0.0850	0.0875	0.20
0.21	0.0900	0.0925	0.0950	0.0975	0.1000	0.1025	0.1050	0.1075	0.1100	0.1125	0.21
0.22	0.1150	0.1183	0.1215	0.1248	0.1280	0.1313	0.1345	0.1378	0.1410	0.1443	0.22
0.23	0.1475	0.1508	0.1540	0.1573	0.1605	0.1638	0.1670	0.1703	0.1735	0.1768	0.23
0.24	0.1800	0.1835	0.1870	0.1905	0.1940	0.1975	0.2010	0.2045	0.2080	0.2115	0.24
0.25	0.2150	0.2185	0.2220	0.2255	0.2290	0.2325	0.2360	0.2395	0.2430	0.2465	0.25
0.26	0.2500	0.2535	0.2570	0.2605	0.2640	0.2675	0.2710	0.2745	0.2780	0.2815	0.26
0.27	0.2850	0.2885	0.2920	0.2955	0.2990	0.3025	0.3060	0.3095	0.3130	0.3165	0.27
0.28	0.3200	0.3233	0.3265	0.3298	0.3330	0.3363	0.3395	0.3428	0.3460	0.3493	0.28
0.29	0.3525	0.3558	0.3590	0.3623	0.3655	0.3688	0.3720	0.3753	0.3785	0.3818	0.29
0.30	0.3850	0.3885	0.3920	0.3955	0.3990	0.4025	0.4060	0.4095	0.4130	0.4165	0.30
0.31	0.4200	0.4235	0.4270	0.4305	0.4340	0.4375	0.4410	0.4445	0.4480	0.4515	0.31
0.32	0.4550	0.4585	0.4620	0.4655	0.4690	0.4725	0.4760	0.4795	0.4830	0.4865	0.32
0.33	0.4900	0.4935	0.4970	0.5005	0.5040	0.5075	0.5110	0.5145	0.5180	0.5215	0.33
0.34	0.5250	0.5285	0.5320	0.5355	0.5390	0.5425	0.5460	0.5495	0.5530	0.5565	0.34
0.35	0.5600	0.5635	0.5670	0.5705	0.5740	0.5775	0.5810	0.5845	0.5880	0.5915	0.35
0.36	0.5950	0.5985	0.6020	0.6055	0.6090	0.6125	0.6160	0.6195	0.6230	0.6265	0.36
0.37	0.6300	0.6335	0.6370	0.6405	0.6440	0.6475	0.6510	0.6545	0.6580	0.6615	0.37
0.38	0.6650	0.6685	0.6720	0.6755	0.6790	0.6825	0.6860	0.6895	0.6930	0.6965	0.38
0.39	0.7000	0.7035	0.7070	0.7105	0.7140	0.7175	0.7210	0.7245	0.7280	0.7315	0.39
0.40	0.7350	0.7385	0.7420	0.7455	0.7490	0.7525	0.7560	0.7595	0.7630	0.7665	0.40
0.41	0.7700	0.7735	0.7770	0.7805	0.7840	0.7875	0.7910	0.7945	0.7980	0.8015	0.41
0.42	0.8050	0.8085	0.8120	0.8155	0.8190	0.8225	0.8260	0.8295	0.8330	0.8365	0.42
0.43	0.8400	0.8435	0.8470	0.8505	0.8540	0.8575	0.8610	0.8645	0.8680	0.8715	0.43
0.44	0.8750	0.8785	0.8820	0.8855	0.8890	0.8925	0.8960	0.8995	0.9030	0.9065	0.44
0.45	0.9100	0.9135	0.9170	0.9205	0.9240	0.9275	0.9310	0.9345	0.9380	0.9415	0.45
0.46	0.9450	0.9485	0.9520	0.9555	0.9590	0.9625	0.9660	0.9695	0.9730	0.9765	0.46
0.47	0.9800	0.9835	0.9870	0.9905	0.9940	0.9975	1.0010	1.0045	1.0080	1.0115	0.47
0.48	1.0150	1.0185	1.0220	1.0255	1.0290	1.0325	1.0360	1.0395	1.0430	1.0465	0.48
0.49	1.0500	1.0535	1.0570	1.0605	1.0640	1.0675	1.0710	1.0745	1.0780	1.0815	0.49
0.50	1.0850	1.0885	1.0920	1.0955	1.0990	1.1025	1.1060	1.1095	1.1130	1.1165	0.50
0.51	1.1200	1.1235	1.1270	1.1305	1.1340	1.1375	1.1410	1.1445	1.1480	1.1515	0.51
0.52	1.1550	1.1585	1.1620	1.1655	1.1690	1.1725	1.1760	1.1795	1.1830	1.1865	0.52
0.53	1.1900	1.1935	1.1970	1.2005	1.2040	1.2075	1.2110	1.2145	1.2180	1.2215	0.53
0.54	1.2250	1.2285	1.2320	1.2355	1.2390	1.2425	1.2460	1.2495	1.2530	1.2565	0.54
0.55	1.2600	1.2635	1.2670	1.2705	1.2740	1.2775	1.2810	1.2845	1.2880	1.2915	0.55
0.56	1.2950	1.2985	1.3020	1.3055	1.3090	1.3125	1.3160	1.3195	1.3230	1.3265	0.56
0.57	1.3300	1.3335	1.3370	1.3405	1.3440	1.3475	1.3510	1.3545	1.3580	1.3615	0.57
0.58	1.3650	1.3685	1.3720	1.3755	1.3790	1.3825	1.3860	1.3895	1.3930	1.3965	0.58
0.59	1.4000	1.4035	1.4070	1.4105	1.4140	1.4175	1.4210	1.4245	1.4280	1.4315	0.59
0.60	1.4350	1.4385	1.4420	1.4455	1.4490	1.4525	1.4560	1.4595	1.4630	1.4665	0.60
0.61	1.4700	1.4735	1.4770	1.4805	1.4840	1.4875	1.4910	1.4945	1.4980	1.5015	0.61
0.62	1.5050	1.5085	1.5120	1.5155	1.5190	1.5225	1.5260	1.5295	1.5330	1.5365	0.62
0.63	1.5400	1.5435	1.5470	1.5505	1.5540	1.5575	1.5610	1.5645	1.5680	1.5715	0.63
0.64	1.5750	1.5785	1.5820	1.5855	1.5890	1.5925	1.5960	1.5995	1.6030	1.6065	0.64
0.65	1.6100	1.6135	1.6170	1.6205	1.6240	1.6275	1.6310	1.6345	1.6380	1.6415	0.65
0.66	1.6450	1.6485	1.6520	1.6555	1.6590	1.6625	1.6660	1.6695	1.6730	1.6765	0.66

Canyon Creek Mean Daily Discharge (2005)



**Canyon Creek
Benchmark Survey Notes
10/26/2005 at 3:00 PST**

**HI=BS+Elevation
Elevation=HI-FS**

Station	Backsight	H.I.	Foresight	Elevation	Notes
BM1	0.664	2.487		1.823	
BM2		2.487	0.224	2.263	
BM3		2.487	1.293	1.194	
H2O Surface		2.487	2.215	0.272	
Staff		2.487	1.487	1.000	
BM3		2.487	1.293	1.194	
TP BM3	1.236	2.430		1.194	
BM2		2.43	0.168	2.262	
BM1		2.43	0.610	1.820	

Circuit Closure Acceptable

-0.003

BM1 = Lag Screw in Spruce (17 cm DBH) approx. 3m upstream from stilling well and approx. 6m in from Right bank.

BM2 = Lag Screw in Spruce (45 cm DBH) approx. 1m upstream from stilling well and approx. 2m in from Right bank.

BM3 = Rebar Pin (painted red) in ground approx. 2m upstream from stilling well and approx. 1.6m in from Right bank.

May 2 2005 at approximately 12:45 PST at Canyon Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.544 m at 12:45 PST

Staff Gauge = 0.546 m at 12:45 PST

Canyon Creek

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
0.6	0.15	0.2	0.030	0.42	0.01260	2.66%
0.8	0.14	0.2	0.028	0.45	0.01260	2.66%
1	0.14	0.2	0.028	0.17	0.00476	1.00%
1.2	0.15	0.2	0.030	0.01	0.00030	0.06%
1.4	0.15	0.2	0.030	0.01	0.00030	0.06%
1.6	0.17	0.2	0.034	0.01	0.00034	0.07%
1.8	0.18	0.2	0.036	0.01	0.00036	0.08%
2	0.20	0.2	0.040	0.08	0.00320	0.67%
2.2	0.24	0.2	0.048	0.13	0.00624	1.32%
2.4	0.30	0.2	0.060	0.24	0.01440	3.04%
2.6	0.36	0.15	0.054	0.47	0.02538	5.35%
2.7	0.37	0.1	0.037	0.41	0.01517	3.20%
2.8	0.30	0.1	0.030	0.48	0.01440	3.04%
2.9	0.31	0.1	0.031	0.53	0.01643	3.46%
3	0.32	0.1	0.032	0.50	0.01600	3.37%
3.1	0.41	0.1	0.041	0.35	0.01435	3.03%
3.2	0.40	0.1	0.040	0.48	0.01920	4.05%
3.3	0.41	0.1	0.041	0.60	0.02460	5.19%
3.4	0.40	0.1	0.040	0.61	0.02440	5.14%
3.5	0.42	0.1	0.042	0.67	0.02814	5.93%
3.6	0.44	0.1	0.044	0.68	0.02992	6.31%
3.7	0.43	0.1	0.043	0.68	0.02924	6.16%
3.8	0.45	0.1	0.045	0.68	0.03060	6.45%
3.9	0.41	0.1	0.041	0.67	0.02747	5.79%
4	0.48	0.1	0.048	0.67	0.03216	6.78%
4.1	0.48	0.1	0.048	0.66	0.03168	6.68%
4.2	0.49	0.1	0.049	0.51	0.02499	5.27%
4.3	0.16	0.1	0.016	0.47	0.00752	1.59%
4.4	0.17	0.1	0.017	0.31	0.00527	1.11%
4.5	0.19	0.1	0.019	0.06	0.00114	0.24%
4.6	0.2	0.1	0.020	0.06	0.00120	0.25%

0.47436

Liters/second 474.36
 US Gal/second 125.31
 US Gal/minute 7518.78
 ft3/second 16.75

ft3/day 1447333.84
 Acre Feet/day 33.22

June 2 2005 at approximately 12:15 PST at Canyon Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.440 m at 12:15 PST

Staff Gauge = 0.440 m at 12:15 PST

Canyon Creek

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
2.4	0.12	0.1	0.012	0.01	0.00012	0.05%
2.5	0.15	0.1	0.015	0.02	0.00030	0.13%
2.6	0.18	0.1	0.018	0.14	0.00252	1.06%
2.7	0.21	0.1	0.021	0.17	0.00357	1.50%
2.8	0.20	0.1	0.020	0.17	0.00340	1.43%
2.9	0.22	0.1	0.022	0.24	0.00528	2.22%
3	0.22	0.1	0.022	0.35	0.00770	3.24%
3.1	0.22	0.075	0.017	0.46	0.00759	3.19%
3.15	0.22	0.05	0.011	0.44	0.00484	2.04%
3.2	0.23	0.05	0.012	0.49	0.00564	2.37%
3.25	0.26	0.05	0.013	0.61	0.00793	3.34%
3.3	0.24	0.05	0.012	0.76	0.00912	3.84%
3.35	0.25	0.05	0.013	0.78	0.00975	4.10%
3.4	0.26	0.05	0.013	0.81	0.01053	4.43%
3.45	0.28	0.05	0.014	0.81	0.01134	4.77%
3.5	0.28	0.05	0.014	0.85	0.01190	5.01%
3.55	0.26	0.05	0.013	0.96	0.01248	5.25%
3.6	0.26	0.05	0.013	0.98	0.01274	5.36%
3.65	0.26	0.05	0.013	1.01	0.01313	5.52%
3.7	0.30	0.05	0.015	0.94	0.01410	5.93%
3.75	0.30	0.05	0.015	0.84	0.01260	5.30%
3.8	0.27	0.05	0.014	0.86	0.01161	4.88%
3.85	0.29	0.05	0.015	0.82	0.01189	5.00%
3.9	0.30	0.05	0.015	0.80	0.01200	5.05%
3.95	0.30	0.05	0.015	0.53	0.00795	3.34%
4	0.30	0.075	0.023	0.53	0.01193	5.02%
4.1	0.31	0.1	0.031	0.51	0.01581	6.65%

0.23776

Liters/second 237.76
 US Gal/second 62.81
 US Gal/minute 3768.58
 ft3/second 8.40

 ft3/day 725436.57
 Acre Feet/day 16.65

Oct 13 2005 at approximately 11:00 PST at Canyon Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.227 m at 11:00 PST

Staff Gauge = 0.227 m at 11:00 PST

Canyon Creek

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q
Very Low Flow, Created rectangular channel and estimated discharge with several surface velocity measurements. Channel dimensions w=.3 m, d=.04 m					
	Velocity	average v	w (m)	d(m)	Q
Run 1	0.28				
Run 2	0.33				
Run 3	0.28				
Run 4	0.21	0.275	0.30	0.04	0.00330

0.00330

Liters/second	3.30
US Gal/second	0.87
US Gal/minute	52.31
ft ³ /second	0.12
ft ³ /day	10068.73
Acre Feet/day	0.23

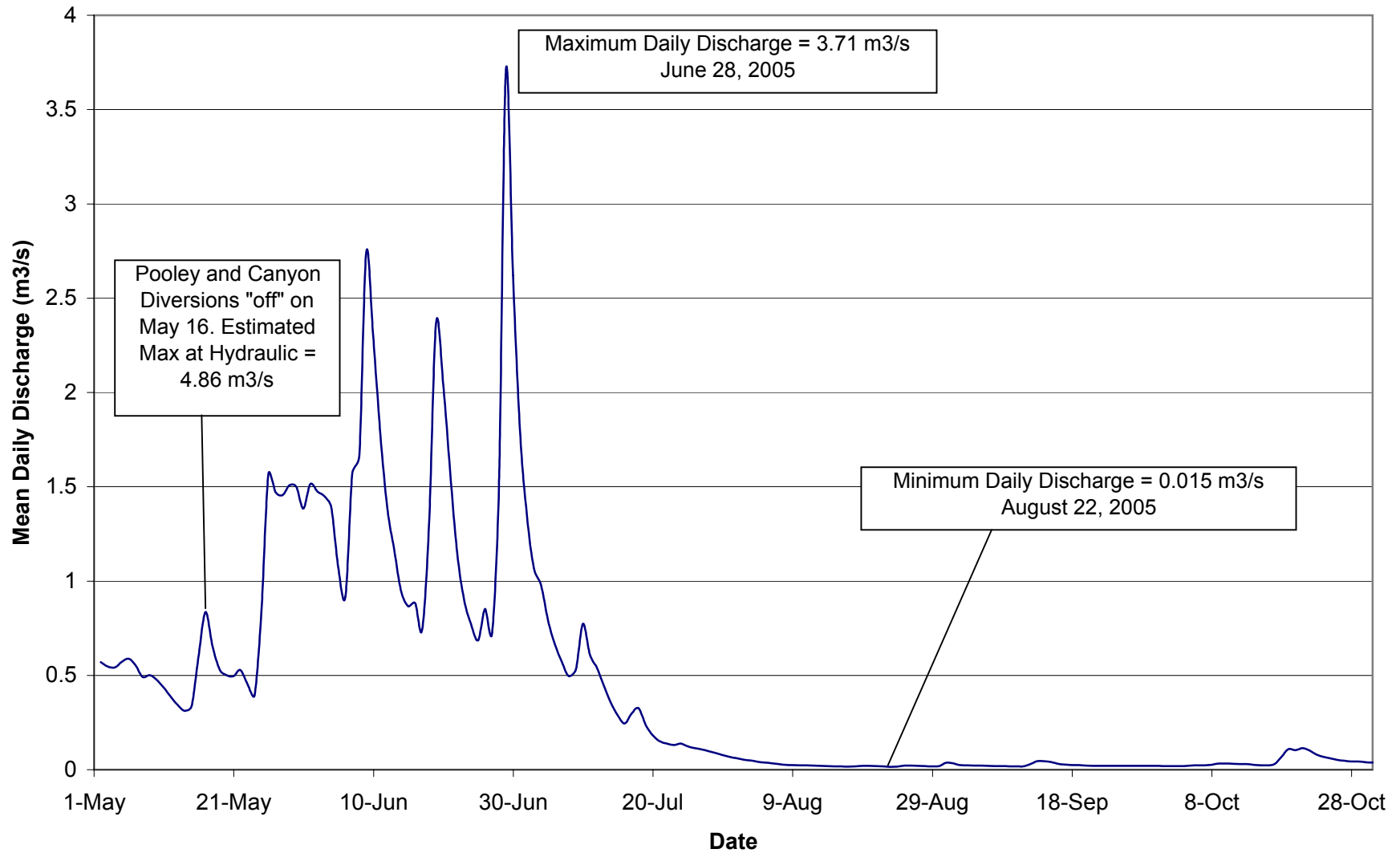
Canyon Cre Expanded Stage Discharge Table For Canyon Creek (2004/2005)

Stage (m)	Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.166	0.16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	0.16
	0.17	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0006	0.0007	0.0008	0.0008	0.17
0.18	0.18	0.0009	0.0009	0.0010	0.0011	0.0011	0.0012	0.0013	0.0013	0.0014	0.0014	0.18
	0.19	0.0015	0.0016	0.0016	0.0017	0.0018	0.0018	0.0019	0.0019	0.0020	0.0021	0.19
0.2	0.20	0.0021	0.0024	0.0026	0.0028	0.0031	0.0033	0.0036	0.0038	0.0040	0.0043	0.20
	0.21	0.0045	0.0047	0.0050	0.0052	0.0055	0.0057	0.0059	0.0062	0.0064	0.0066	0.21
0.22	0.22	0.0069	0.0071	0.0073	0.0075	0.0077	0.0079	0.0082	0.0084	0.0086	0.0088	0.22
	0.23	0.0090	0.0092	0.0094	0.0096	0.0098	0.0101	0.0103	0.0105	0.0107	0.0109	0.23
0.24	0.24	0.0111	0.0114	0.0117	0.0120	0.0123	0.0126	0.0129	0.0132	0.0135	0.0138	0.24
	0.25	0.0141	0.0144	0.0147	0.0149	0.0152	0.0155	0.0158	0.0161	0.0164	0.0167	0.25
0.26	0.26	0.0170	0.0173	0.0176	0.0179	0.0183	0.0186	0.0189	0.0192	0.0195	0.0198	0.26
	0.27	0.0201	0.0204	0.0208	0.0211	0.0214	0.0217	0.0220	0.0223	0.0226	0.0229	0.27
0.28	0.28	0.0233	0.0237	0.0241	0.0246	0.0250	0.0254	0.0259	0.0263	0.0268	0.0272	0.28
	0.29	0.0276	0.0281	0.0285	0.0289	0.0294	0.0298	0.0303	0.0307	0.0311	0.0316	0.29
0.3	0.30	0.0320	0.0325	0.0330	0.0335	0.0340	0.0345	0.0350	0.0355	0.0360	0.0365	0.30
	0.31	0.0370	0.0375	0.0380	0.0385	0.0390	0.0395	0.0400	0.0405	0.0410	0.0415	0.31
0.32	0.32	0.0420	0.0437	0.0453	0.0470	0.0486	0.0503	0.0519	0.0536	0.0552	0.0569	0.32
	0.33	0.0585	0.0602	0.0618	0.0635	0.0651	0.0668	0.0684	0.0701	0.0717	0.0734	0.33
0.34	0.34	0.0750	0.0760	0.0770	0.0780	0.0790	0.0800	0.0810	0.0820	0.0830	0.0840	0.34
	0.35	0.0850	0.0860	0.0870	0.0880	0.0890	0.0900	0.0910	0.0920	0.0930	0.0940	0.35
0.36	0.36	0.0950	0.0963	0.0975	0.0988	0.1000	0.1013	0.1025	0.1038	0.1050	0.1063	0.36
	0.37	0.1075	0.1088	0.1100	0.1113	0.1125	0.1138	0.1150	0.1163	0.1175	0.1188	0.37
0.38	0.38	0.1200	0.1213	0.1225	0.1238	0.1250	0.1263	0.1275	0.1288	0.1300	0.1313	0.38
	0.39	0.1325	0.1338	0.1350	0.1363	0.1375	0.1388	0.1400	0.1413	0.1425	0.1438	0.39
0.4	0.40	0.1450	0.1464	0.1477	0.1491	0.1504	0.1518	0.1531	0.1545	0.1558	0.1572	0.40
	0.41	0.1585	0.1599	0.1612	0.1626	0.1639	0.1653	0.1666	0.1680	0.1693	0.1707	0.41
0.42	0.42	0.1720	0.1735	0.1750	0.1765	0.1780	0.1795	0.1810	0.1825	0.1840	0.1855	0.42
	0.43	0.1870	0.1885	0.1900	0.1915	0.1930	0.1945	0.1960	0.1975	0.1990	0.2005	0.43
0.44	0.44	0.2020	0.2039	0.2058	0.2077	0.2096	0.2115	0.2134	0.2153	0.2172	0.2191	0.44
	0.45	0.2210	0.2229	0.2248	0.2267	0.2286	0.2305	0.2324	0.2343	0.2362	0.2381	0.45
0.46	0.46	0.2400	0.2420	0.2440	0.2460	0.2480	0.2500	0.2520	0.2540	0.2560	0.2580	0.46
	0.47	0.2600	0.2620	0.2640	0.2660	0.2680	0.2700	0.2720	0.2740	0.2760	0.2780	0.47
0.48	0.48	0.2800	0.2820	0.2840	0.2860	0.2880	0.2900	0.2920	0.2940	0.2960	0.2980	0.48
	0.49	0.3000	0.3020	0.3040	0.3060	0.3080	0.3100	0.3120	0.3140	0.3160	0.3180	0.49
0.5	0.50	0.3200	0.3215	0.3230	0.3245	0.3260	0.3275	0.3290	0.3305	0.3320	0.3335	0.50
	0.51	0.3350	0.3365	0.3380	0.3395	0.3410	0.3425	0.3440	0.3455	0.3470	0.3485	0.51
0.52	0.52	0.3500	0.3520	0.3540	0.3560	0.3580	0.3600	0.3620	0.3640	0.3660	0.3680	0.52

Canyon Cre Expanded Stage Discharge Table For Canyon Creek (2004/2005)

Stage (m)	Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.54	0.53	0.3700	0.3720	0.3740	0.3760	0.3780	0.3800	0.3820	0.3840	0.3860	0.3880	0.53
	0.54	0.3900	0.3925	0.3950	0.3975	0.4000	0.4025	0.4050	0.4075	0.4100	0.4125	0.54
	0.55	0.4150	0.4175	0.4200	0.4225	0.4250	0.4275	0.4300	0.4325	0.4350	0.4375	0.55
0.56	0.56	0.4400	0.4420	0.4440	0.4460	0.4480	0.4500	0.4520	0.4540	0.4560	0.4580	0.56
	0.57	0.4600	0.4620	0.4640	0.4660	0.4680	0.4700	0.4720	0.4740	0.4760	0.4780	0.57
0.58	0.58	0.4800	0.4820	0.4840	0.4860	0.4880	0.4900	0.4920	0.4940	0.4960	0.4980	0.58
	0.59	0.5000	0.5020	0.5040	0.5060	0.5080	0.5100	0.5120	0.5140	0.5160	0.5180	0.59
0.6	0.60	0.5200	0.5220	0.5240	0.5260	0.5280	0.5300	0.5320	0.5340	0.5360	0.5380	0.60
	0.61	0.5400	0.5420	0.5440	0.5460	0.5480	0.5500	0.5520	0.5540	0.5560	0.5580	0.61
0.62	0.62	0.5600	0.5630	0.5660	0.5690	0.5720	0.5750	0.5780	0.5810	0.5840	0.5870	0.62
	0.63	0.5900	0.5930	0.5960	0.5990	0.6020	0.6050	0.6080	0.6110	0.6140	0.6170	0.63
0.64	0.64	0.6200	0.6225	0.6250	0.6275	0.6300	0.6325	0.6350	0.6375	0.6400	0.6425	0.64
	0.65	0.6450	0.6475	0.6500	0.6525	0.6550	0.6575	0.6600	0.6625	0.6650	0.6675	0.65
0.66	0.66	0.6700	0.6725	0.6750	0.6775	0.6800	0.6825	0.6850	0.6875	0.6900	0.6925	0.66
	0.67	0.6950	0.6975	0.7000	0.7025	0.7050	0.7075	0.7100	0.7125	0.7150	0.7175	0.67
0.68	0.68	0.7200	0.7230	0.7260	0.7290	0.7320	0.7350	0.7380	0.7410	0.7440	0.7470	0.68
	0.69	0.7500	0.7530	0.7560	0.7590	0.7620	0.7650	0.7680	0.7710	0.7740	0.7770	0.69
0.7	0.70	0.7800	0.7825	0.7850	0.7875	0.7900	0.7925	0.7950	0.7975	0.8000	0.8025	0.70
	0.71	0.8050	0.8075	0.8100	0.8125	0.8150	0.8175	0.8200	0.8225	0.8250	0.8275	0.71
0.72	0.72	0.8300	0.8325	0.8350	0.8375	0.8400	0.8425	0.8450	0.8475	0.8500	0.8525	0.72
	0.73	0.8550	0.8575	0.8600	0.8625	0.8650	0.8675	0.8700	0.8725	0.8750	0.8775	0.73
0.74	0.74	0.8800	0.8825	0.8850	0.8875	0.8900	0.8925	0.8950	0.8975	0.9000	0.9025	0.74
	0.75	0.9050	0.9075	0.9100	0.9125	0.9150	0.9175	0.9200	0.9225	0.9250	0.9275	0.75
0.76	0.76	0.9300	0.9325	0.9350	0.9375	0.9400	0.9425	0.9450	0.9475	0.9500	0.9525	0.76
	0.77	0.9550	0.9575	0.9600	0.9625	0.9650	0.9675	0.9700	0.9725	0.9750	0.9775	0.77
0.78	0.78	0.9800	0.9847	0.9895	0.9942	0.9990	1.0037	1.0085	1.0132	1.0180	1.0227	0.78
	0.79	1.0275	1.0322	1.0370	1.0417	1.0465	1.0512	1.0560	1.0607	1.0655	1.0702	0.79
0.8	0.80	1.0750	1.0790	1.0830	1.0870	1.0910	1.0950	1.0990	1.1030	1.1070	1.1110	0.80
	0.81	1.1150	1.1190	1.1230	1.1270	1.1310	1.1350	1.1390	1.1430	1.1470	1.1510	0.81
0.82	0.82	1.1550	1.1590	1.1630	1.1670	1.1710	1.1750	1.1790	1.1830	1.1870	1.1910	0.82
	0.83	1.1950	1.1990	1.2030	1.2070	1.2110	1.2150	1.2190	1.2230	1.2270	1.2310	0.83
0.84	0.84	1.2350	1.2390	1.2430	1.2470	1.2510	1.2550	1.2590	1.2630	1.2670	1.2710	0.84
	0.85	1.2750	1.2790	1.2830	1.2870	1.2910	1.2950	1.2990	1.3030	1.3070	1.3110	0.85
0.86	0.86	1.3150	1.3190	1.3230	1.3270	1.3310	1.3350	1.3390	1.3430	1.3470	1.3510	0.86
	0.87	1.3550	1.3590	1.3630	1.3670	1.3710	1.3750	1.3790	1.3830	1.3870	1.3910	0.87
0.88	0.88	1.3950	1.3990	1.4030	1.4070	1.4110	1.4150	1.4190	1.4230	1.4270	1.4310	0.88
	0.89	1.4350	1.4390	1.4430	1.4470	1.4510	1.4550	1.4590	1.4630	1.4670	1.4710	0.89
0.9	0.90	1.4750	1.4803	1.4855	1.4908	1.4960	1.5013	1.5065	1.5118	1.5170	1.5222	0.90
	0.91	1.5275	1.5327	1.5380	1.5432	1.5485	1.5537	1.5590	1.5642	1.5695	1.5747	0.91

Hydraulic Creek Mean Daily Discharge (2005)



Hydraulic Creek
 Benchmark Survey Notes
 10/26/2005 at 3:45 PST

$HI=BS+Elevation$
 $Elevation=HI-FS$

Station	Backsight	H.I.	Foresight	Elevation	Notes
BM1	0.304	2.762		2.458	
BM2		2.762	0.967	1.795	
BM3		2.762	0.514	2.248	
Water Surf		2.762	2.47	0.292	
1 m Staff		2.762	1.76	1.002	
Well Lock	0.852	2.762	0.936	1.826	
TP Well Lock		2.678		1.826	
BM3		2.678	0.431	2.247	
BM2		2.678	0.885	1.793	
BM1		2.678	0.219	2.459	Inst. Moved
1 m Staff		2.678	1.678	1.000	Not Moved

Circuit Closure Acceptable

0.001

BM1 = Lag Screw in Spruce (35 cm DBH) approx. 3.5 m upstream from stilling well and approx. 4m in from right bank.

BM2 = Rebar Pin (painted red) in ground approx. 0m upstream from stilling well and approx. 6m in from Right bank.

BM3 = Lag Screw in Spruce (25 cm DBH) approx. 8m downstream from stilling well and approx. 4m in from Right bank.

May 2 2005 at approximately 11:00 PST at Hydraulic Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.441 m at 11:003 PST

Staff Gauge = 0.440 m at 11:00 PST

Hydraulic Creek

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q	
1.2	0.04	0.2	0.008	0.01	0.00008	0.02%
1.4	0.09	0.2	0.018	0.01	0.00018	0.05%
1.6	0.09	0.2	0.018	0.14	0.00252	0.64%
1.8	0.18	0.2	0.036	0.24	0.00864	2.21%
2.0	0.20	0.2	0.040	0.36	0.01440	3.68%
2.2	0.19	0.2	0.038	0.34	0.01292	3.30%
2.4	0.16	0.2	0.032	0.24	0.00768	1.96%
2.6	0.17	0.2	0.034	0.17	0.00578	1.48%
2.8	0.21	0.2	0.042	0.39	0.01638	4.18%
3.0	0.27	0.2	0.054	0.30	0.01620	4.14%
3.2	0.30	0.2	0.060	0.58	0.03480	8.88%
3.4	0.31	0.2	0.062	0.58	0.03596	9.18%
3.6	0.34	0.2	0.068	0.43	0.02924	7.46%
3.8	0.34	0.2	0.068	0.67	0.04556	11.63%
4.0	0.31	0.2	0.062	0.58	0.03596	9.18%
4.2	0.30	0.2	0.060	0.66	0.03960	10.11%
4.4	0.24	0.2	0.048	0.76	0.03648	9.31%
4.6	0.20	0.2	0.040	0.49	0.01960	5.00%
4.8	0.24	0.2	0.048	0.24	0.01152	2.94%
5.0	0.21	0.2	0.042	0.21	0.00882	2.25%
5.2	0.17	0.2	0.034	0.10	0.00340	0.87%
5.4	0.14	0.2	0.028	0.08	0.00224	0.57%
5.6	0.12	0.2	0.024	0.09	0.00216	0.55%
5.7	0.09	0.2	0.018	0.09	0.00162	0.41%

0.39174

Liters/second	391.74
US Gal/second	103.49
US Gal/minute	6209.22
ft ³ /second	13.83
ft ³ /day	1195249.51
Acre Feet/day	27.44

June 2 2005 at approximately 11:00 PST at Hydraulic Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.539 m at 11:00 PST

Staff Gauge = 0.540 m at 11:00 PST

Hydraulic Creek

Station	(m) Water Depth	(m) width at depth	(m2) Flow Area	(m/s) velocity	(m3/s) Q	
1.2	0.08	0.2	0.016	0.15	0.00240	0.25%
1.4	0.16	0.2	0.032	0.35	0.01120	1.18%
1.6	0.14	0.2	0.028	0.59	0.01652	1.75%
1.8	0.26	0.2	0.052	0.53	0.02756	2.91%
2.0	0.28	0.2	0.056	0.66	0.03696	3.91%
2.2	0.29	0.2	0.058	0.69	0.04002	4.23%
2.4	0.25	0.2	0.050	0.68	0.03400	3.59%
2.6	0.30	0.2	0.060	0.62	0.03720	3.93%
2.8	0.28	0.2	0.056	0.43	0.02408	2.54%
3.0	0.35	0.2	0.070	0.72	0.05040	5.33%
3.2	0.38	0.2	0.076	0.78	0.05928	6.26%
3.4	0.36	0.2	0.072	1.06	0.07632	8.06%
3.5	0.42	0.1	0.042	0.96	0.04032	4.26%
3.6	0.41	0.1	0.041	0.79	0.03239	3.42%
3.7	0.41	0.1	0.041	0.77	0.03157	3.34%
3.8	0.43	0.1	0.043	1.11	0.04773	5.04%
4.0	0.40	0.2	0.080	0.92	0.07360	7.78%
4.2	0.39	0.2	0.078	0.85	0.06630	7.01%
4.4	0.30	0.2	0.060	1.25	0.07500	7.93%
4.6	0.35	0.2	0.070	0.71	0.04970	5.25%
4.8	0.29	0.2	0.058	0.70	0.04060	4.29%
5.0	0.28	0.2	0.056	0.61	0.03416	3.61%
5.2	0.24	0.2	0.048	0.64	0.03072	3.25%
5.4	0.20	0.2	0.040	0.20	0.00800	0.85%
5.6	0.16	0.2	0.032	0.01	0.00032	0.03%
		4.6				

0.94635

Liters/second	946.35
US Gal/second	250.00
US Gal/minute	15000.00
ft3/second	33.42
ft3/day	2887436.50
Acre Feet/day	66.28

July 29 2005 at approximately 8:45 PST at Hydraulic Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.325 m at 8:45 PST

Staff Gauge = 0.321 m at 8:45 PST

Hydraulic Creek

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q	
3.1	0.18	0.1	0.018	0.01	0.00018	0.29%
3.2	0.18	0.1	0.018	0.05	0.00090	1.45%
3.3	0.18	0.1	0.018	0.09	0.00162	2.61%
3.4	0.18	0.05	0.009	0.12	0.00108	1.74%
3.45	0.16	0.05	0.008	0.18	0.00144	2.32%
3.5	0.16	0.05	0.008	0.25	0.00200	3.22%
3.55	0.18	0.05	0.009	0.32	0.00288	4.63%
3.6	0.18	0.05	0.009	0.43	0.00387	6.22%
3.65	0.18	0.05	0.009	0.42	0.00378	6.08%
3.7	0.17	0.05	0.009	0.37	0.00315	5.06%
3.75	0.18	0.05	0.009	0.28	0.00252	4.05%
3.8	0.18	0.05	0.009	0.29	0.00261	4.20%
3.85	0.19	0.05	0.010	0.30	0.00285	4.58%
3.9	0.20	0.05	0.010	0.29	0.00290	4.66%
3.95	0.16	0.05	0.008	0.28	0.00224	3.60%
4	0.16	0.05	0.008	0.39	0.00312	5.02%
4.05	0.16	0.05	0.008	0.44	0.00352	5.66%
4.1	0.16	0.05	0.008	0.45	0.00360	5.79%
4.15	0.14	0.05	0.007	0.39	0.00273	4.39%
4.2	0.13	0.05	0.007	0.39	0.00254	4.08%
4.25	0.12	0.05	0.006	0.46	0.00276	4.44%
4.3	0.12	0.05	0.006	0.43	0.00258	4.15%
4.35	0.12	0.05	0.006	0.39	0.00234	3.76%
4.4	0.12	0.05	0.006	0.39	0.00234	3.76%
4.45	0.11	0.05	0.006	0.33	0.00182	2.92%
4.5	0.12	0.05	0.006	0.10	0.00060	0.97%
4.55	0.11	0.05	0.006	0.04	0.00022	0.35%

0.06218

Liters/second 62.18
 US Gal/second 16.42
 US Gal/minute 985.50
 ft³/second 2.20

ft³/day 189703.98
 Acre Feet/day 4.35

Oct 13 2005 at approximately 9:30 PST at Hydraulic Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.276 m at 9:30 PST

Staff Gauge = 0.270 m at 9:30 PST

Hydraulic Creek

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q	
0.5	0.04	0.1	0.004	0.08	0.00032	2.17%
0.6	0.04	0.1	0.004	0.11	0.00044	2.99%
0.7	0.06	0.1	0.006	0.05	0.00030	2.04%
0.8	0.05	0.1	0.005	0.10	0.00050	3.39%
0.9	0.04	0.1	0.004	0.24	0.00096	6.52%
1	0.06	0.1	0.006	0.20	0.00120	8.15%
1.1	0.05	0.1	0.005	0.22	0.00110	7.47%
1.2	0.04	0.1	0.004	0.20	0.00080	5.43%
1.3	0.06	0.1	0.006	0.43	0.00258	17.52%
1.4	0.08	0.1	0.008	0.13	0.00104	7.06%
1.5	0.08	0.1	0.008	0.20	0.00160	10.86%
1.6	0.08	0.1	0.008	0.18	0.00144	9.78%
1.7	0.08	0.1	0.008	0.21	0.00168	11.41%
1.8	0.07	0.1	0.007	0.11	0.00077	5.23%
Low flow difficult to achieve 20 station across channel						

0.01473

Liters/second	14.73
US Gal/second	3.89
US Gal/minute	233.48
ft ³ /second	0.52
ft ³ /day	44943.14
Acre Feet/day	1.03

October 20, 2005 at approximately 9:15 PST at Hydraulic Creek.

Used 0.6 depth for flow meter.

Stilling Well = 0.349 m at 9:15 PST

Staff Gauge = 0.345 m at 9:15 PST

Hydraulic Creek

Station	(m) Water Depth	(m) width at depth	(m ²) Flow Area	(m/s) velocity	(m ³ /s) Q	
0.4	0.06	0.1	0.006	0.12	0.00072	0.70%
0.5	0.06	0.1	0.006	0.41	0.00246	2.39%
0.6	0.07	0.1	0.007	0.41	0.00287	2.79%
0.7	0.10	0.1	0.010	0.37	0.00370	3.60%
0.8	0.12	0.1	0.012	0.48	0.00576	5.60%
0.9	0.10	0.1	0.010	0.49	0.00490	4.76%
1	0.08	0.1	0.008	0.56	0.00448	4.36%
1.05	0.12	0.075	0.009	0.52	0.00468	4.55%
1.1	0.12	0.05	0.006	0.52	0.00312	3.03%
1.15	0.15	0.05	0.008	0.55	0.00413	4.01%
1.2	0.14	0.05	0.007	0.52	0.00364	3.54%
1.25	0.15	0.05	0.008	0.51	0.00383	3.72%
1.3	0.10	0.05	0.005	0.51	0.00255	2.48%
1.35	0.11	0.05	0.006	0.54	0.00297	2.89%
1.4	0.15	0.05	0.008	0.51	0.00383	3.72%
1.45	0.16	0.05	0.008	0.49	0.00392	3.81%
1.5	0.16	0.05	0.008	0.46	0.00368	3.58%
1.55	0.13	0.05	0.007	0.55	0.00358	3.48%
1.6	0.14	0.05	0.007	0.54	0.00378	3.68%
1.65	0.15	0.05	0.008	0.54	0.00405	3.94%
1.7	0.14	0.05	0.007	0.54	0.00378	3.68%
1.75	0.16	0.05	0.008	0.46	0.00368	3.58%
1.8	0.14	0.05	0.007	0.54	0.00378	3.68%
1.85	0.14	0.05	0.007	0.57	0.00399	3.88%
1.9	0.14	0.05	0.007	0.48	0.00336	3.27%
2	0.12	0.075	0.009	0.55	0.00495	4.81%
2.1	0.10	0.1	0.010	0.44	0.00440	4.28%
2.2	0.06	0.1	0.006	0.38	0.00228	2.22%

0.10285

Liters/second 102.85
 US Gal/second 27.17
 US Gal/minute 1630.21
 ft³/second 3.63

 ft³/day 313808.68
 Acre Feet/day 7.20

Expanded Stage Discharge Table For Hydraulic Creek (2004/2005)

Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.16	0.0000	0.0002	0.0004	0.0006	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.16
0.17	0.0021	0.0023	0.0026	0.0028	0.0030	0.0032	0.0034	0.0036	0.0038	0.0040	0.17
0.18	0.0043	0.0045	0.0047	0.0049	0.0051	0.0053	0.0055	0.0057	0.0060	0.0062	0.18
0.19	0.0064	0.0066	0.0068	0.0070	0.0072	0.0074	0.0077	0.0079	0.0081	0.0083	0.19
0.20	0.0085	0.0087	0.0089	0.0091	0.0094	0.0096	0.0098	0.0100	0.0102	0.0104	0.20
0.21	0.0106	0.0108	0.0111	0.0113	0.0115	0.0117	0.0119	0.0121	0.0123	0.0125	0.21
0.22	0.0128	0.0130	0.0132	0.0134	0.0136	0.0138	0.0140	0.0142	0.0145	0.0147	0.22
0.23	0.0149	0.0151	0.0153	0.0155	0.0157	0.0159	0.0162	0.0164	0.0166	0.0168	0.23
0.24	0.0170	0.0172	0.0174	0.0176	0.0179	0.0181	0.0183	0.0185	0.0187	0.0189	0.24
0.25	0.0191	0.0193	0.0196	0.0198	0.0200	0.0202	0.0204	0.0206	0.0208	0.0210	0.25
0.26	0.0213	0.0215	0.0217	0.0219	0.0221	0.0223	0.0225	0.0227	0.0230	0.0232	0.26
0.27	0.0234	0.0236	0.0238	0.0240	0.0242	0.0244	0.0247	0.0249	0.0251	0.0253	0.27
0.28	0.0255	0.0264	0.0274	0.0283	0.0292	0.0301	0.0311	0.0320	0.0329	0.0338	0.28
0.29	0.0348	0.0357	0.0366	0.0375	0.0385	0.0394	0.0403	0.0412	0.0422	0.0431	0.29
0.30	0.0440	0.0456	0.0471	0.0487	0.0502	0.0518	0.0533	0.0549	0.0564	0.0580	0.30
0.31	0.0595	0.0611	0.0626	0.0642	0.0657	0.0673	0.0688	0.0704	0.0719	0.0735	0.31
0.32	0.0750	0.0768	0.0785	0.0803	0.0820	0.0838	0.0855	0.0873	0.0890	0.0908	0.32
0.33	0.0925	0.0943	0.0960	0.0978	0.0995	0.1013	0.1030	0.1048	0.1065	0.1083	0.33
0.34	0.1100	0.1113	0.1125	0.1138	0.1150	0.1163	0.1175	0.1188	0.1200	0.1213	0.34
0.35	0.1225	0.1238	0.1250	0.1263	0.1275	0.1288	0.1300	0.1313	0.1325	0.1338	0.35
0.36	0.1350	0.1365	0.1380	0.1395	0.1410	0.1425	0.1440	0.1455	0.1470	0.1485	0.36
0.37	0.1500	0.1515	0.1530	0.1545	0.1560	0.1575	0.1590	0.1605	0.1620	0.1635	0.37
0.38	0.1650	0.1698	0.1745	0.1793	0.1840	0.1888	0.1935	0.1983	0.2030	0.2078	0.38
0.39	0.2125	0.2173	0.2220	0.2268	0.2315	0.2363	0.2410	0.2458	0.2505	0.2553	0.39
0.40	0.2600	0.2674	0.2748	0.2822	0.2896	0.2970	0.3044	0.3118	0.3192	0.3266	0.40
0.41	0.3340	0.3414	0.3488	0.3562	0.3636	0.3710	0.3784	0.3858	0.3932	0.4006	0.41
0.42	0.4080	0.4154	0.4228	0.4302	0.4376	0.4450	0.4524	0.4598	0.4672	0.4746	0.42
0.43	0.4820	0.4894	0.4968	0.5042	0.5116	0.5190	0.5264	0.5338	0.5412	0.5486	0.43
0.44	0.5560	0.5634	0.5708	0.5782	0.5856	0.5930	0.6004	0.6078	0.6152	0.6226	0.44
0.45	0.6300	0.6374	0.6448	0.6522	0.6596	0.6670	0.6744	0.6818	0.6892	0.6966	0.45
0.46	0.7040	0.7114	0.7188	0.7262	0.7336	0.7410	0.7484	0.7558	0.7632	0.7706	0.46
0.47	0.7780	0.7854	0.7928	0.8002	0.8076	0.8150	0.8224	0.8298	0.8372	0.8446	0.47

Expanded Stage Discharge Table For Hydraulic Creek (2004/2005)

Meters	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Meters
0.48	0.8520	0.8594	0.8668	0.8742	0.8816	0.8890	0.8964	0.9038	0.9112	0.9186	0.48
0.49	0.9260	0.9334	0.9408	0.9482	0.9556	0.9630	0.9704	0.9778	0.9852	0.9926	0.49
0.50	1.0000	1.0138	1.0275	1.0413	1.0550	1.0688	1.0825	1.0963	1.1100	1.1238	0.50
0.51	1.1375	1.1513	1.1650	1.1788	1.1925	1.2063	1.2200	1.2338	1.2475	1.2613	0.51
0.52	1.2750	1.2888	1.3025	1.3163	1.3300	1.3438	1.3575	1.3713	1.3850	1.3988	0.52
0.53	1.4125	1.4263	1.4400	1.4538	1.4675	1.4813	1.4950	1.5088	1.5225	1.5363	0.53
0.54	1.5500	1.5638	1.5775	1.5913	1.6050	1.6188	1.6325	1.6462	1.6600	1.6737	0.54
0.55	1.6875	1.7012	1.7150	1.7287	1.7425	1.7562	1.7700	1.7837	1.7975	1.8112	0.55
0.56	1.8250	1.8387	1.8525	1.8662	1.8800	1.8937	1.9075	1.9212	1.9350	1.9487	0.56
0.57	1.9625	1.9762	1.9900	2.0037	2.0175	2.0312	2.0450	2.0587	2.0725	2.0862	0.57
0.58	2.1000	2.1137	2.1275	2.1412	2.1550	2.1687	2.1825	2.1962	2.2100	2.2237	0.58
0.59	2.2375	2.2512	2.2650	2.2787	2.2925	2.3062	2.3200	2.3337	2.3475	2.3612	0.59
0.60	2.3750	2.4010	2.4270	2.4530	2.4790	2.5050	2.5310	2.5570	2.5830	2.6090	0.60
0.61	2.6350	2.6610	2.6870	2.7130	2.7390	2.7650	2.7910	2.8170	2.8430	2.8690	0.61
0.62	2.8950	2.9210	2.9470	2.9730	2.9990	3.0250	3.0510	3.0770	3.1030	3.1290	0.62
0.63	3.1550	3.1810	3.2070	3.2330	3.2590	3.2850	3.3110	3.3370	3.3630	3.3890	0.63
0.64	3.4150	3.4410	3.4670	3.4930	3.5190	3.5450	3.5710	3.5970	3.6230	3.6490	0.64
0.65	3.6750	3.7010	3.7270	3.7530	3.7790	3.8050	3.8310	3.8570	3.8830	3.9090	0.65
0.66	3.9350	3.9610	3.9870	4.0130	4.0390	4.0650	4.0910	4.1170	4.1430	4.1690	0.66
0.67	4.1950	4.2210	4.2470	4.2730	4.2990	4.3250	4.3510	4.3770	4.4030	4.4290	0.67
0.68	4.4550	4.4810	4.5070	4.5330	4.5590	4.5850	4.6110	4.6370	4.6630	4.6890	0.68
0.69	4.7150	4.7410	4.7670	4.7930	4.8190	4.8450	4.8710	4.8970	4.9230	4.9490	0.69
0.70	4.9750	5.0240	5.0730	5.1220	5.1710	5.2200	5.2690	5.3180	5.3670	5.4160	0.70
0.71	5.4650	5.5140	5.5630	5.6120	5.6610	5.7100	5.7590	5.8080	5.8570	5.9060	0.71
0.72	5.9550	6.0040	6.0530	6.1020	6.1510	6.2000	6.2490	6.2980	6.3470	6.3960	0.72
0.73	6.4450	6.4940	6.5430	6.5920	6.6410	6.6900	6.7390	6.7880	6.8370	6.8860	0.73
0.74	6.9350	6.9840	7.0330	7.0820	7.1310	7.1800	7.2290	7.2780	7.3270	7.3760	0.74
0.75	7.4250	7.4740	7.5230	7.5720	7.6210	7.6700	7.7190	7.7680	7.8170	7.8660	0.75
0.76	7.9150	7.9640	8.0130	8.0620	8.1110	8.1600	8.2090	8.2580	8.3070	8.3560	0.76
0.77	8.4050	8.4540	8.5030	8.5520	8.6010	8.6500	8.6990	8.7480	8.7970	8.8460	0.77
0.78	8.8950	8.9440	8.9930	9.0420	9.0910	9.1400	9.1890	9.2380	9.2870	9.3360	0.78
0.79	9.3850	9.4340	9.4830	9.5320	9.5810	9.6300	9.6790	9.7280	9.7770	9.8260	0.79
0.80	9.8750	9.9577	10.0405	10.1233	10.2060	10.2888	10.3715	10.4543	10.5370	10.6198	0.80
0.81	10.7025	10.7853	10.8680	10.9508	11.0335	11.1163	11.1990	11.2818	11.3645	11.4473	0.81

