

MEMORANDUM

Sampling Dates: July 26 and August 8, 2010  
 To: *Bear Creek Watershed Association*  
 From: Russell N. Clayshulte, Manager  
 Re: 2010 Bear Creek Reservoir Summary Data



Table 1 Reservoir Profile 7/26/2010

Site	Time	SC	DO	Temp	pH		
TCIn; 16a	9:29	1.12	8.16	15.4	8.42		
BCIn; 15a	9:54	0.2691	7.67	16.96	8.3		
LBCout; 45	10:18	0.3151	7.31	22.74	8.45		
BCReservoir	40a/40c					Secchi m	T Depth m
1m	11:19	0.3156	7.76	22.52	8.42	1.45	10.8
2m		0.3157	7.52	22.44	8.34		
3m		0.3156	7.36	22.31	8.29		
4m		0.3157	7.31	22.28	8.26		
5m		0.3164	7.18	22.25	8.23		
6m		0.3121	7.14	22.23	8.21		
7m		0.3156	7.11	22.22	8.19		
8m		0.3167	6.81	22.15	8.14		
9m		0.3151	6.55	22.04	8.11		
10m		0.3111	5.87	21.66	7.98		
11m		0.3095	6	21.48	7.98		

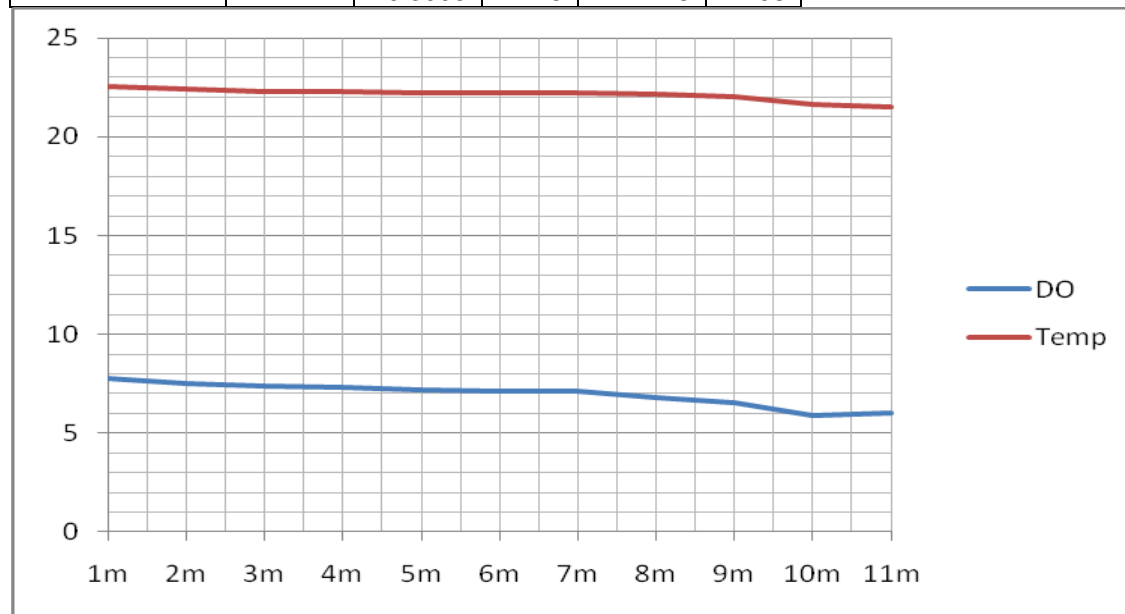


Figure 1 DO and Temperature Profile for 7/26/2010

Table 2 Coyote Gulch Field Data 7/26/10

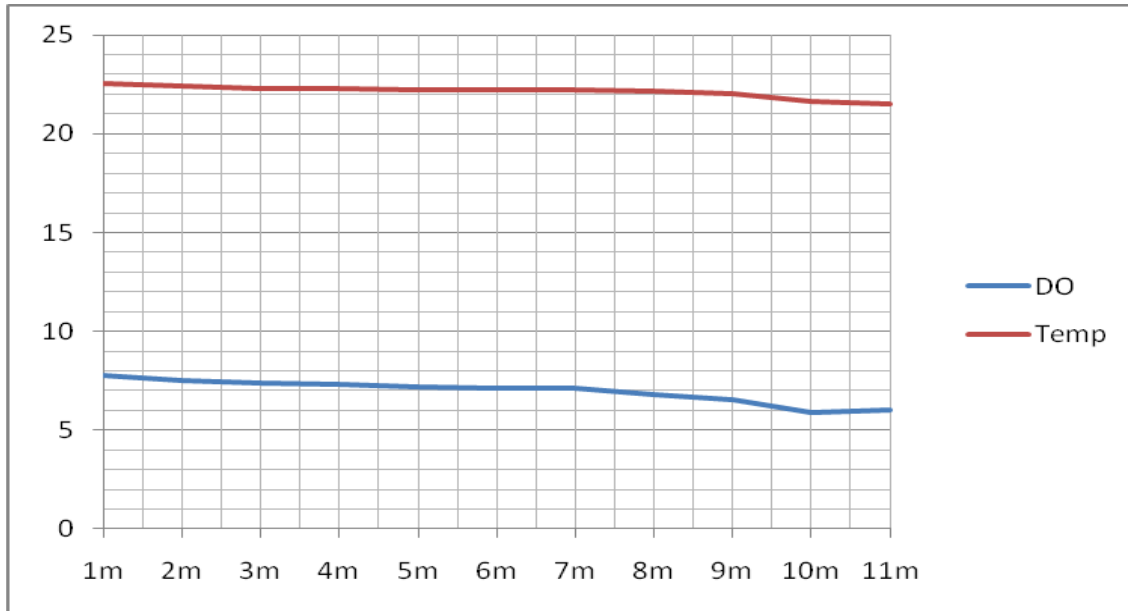
	Time	SC	DO	Temp	pH	Flow
Upper Coyote	10:38	1.191	7.12	15.45	8.21	.55 cfs
Lower Coyote	10:44	1.173	8.73	17.58	8.48	.65 cfs

**Table 3 Reservoir profiles 7/26/10**

Site 1	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:40	0.3142	8.04	22.52	8.44	2.45	8.3
2m		0.3158	7.66	22.37	8.34		
3m		0.3156	7.4	22.29	8.28		
4m		0.3142	7.42	22.22	8.28		
5m		0.3151	7.26	22.21	8.25		
6m		0.5154	7.05	22.15	8.21		
7m		0.3149	6.74	22.1	8.16		
8m		0.3162	5.27	21.76	7.99		
Site 3	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:49	0.3151	7.6	22.53	8.32	2.3	5
2m		0.3145	7.62	22.45	8.31		
3m		0.3152	7.4	22.34	8.28		
4m		0.3149	7.28	22.25	8.23		
5m		0.3139	7.3	22.15	8.25		
Site 4	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:57	0.317	8.12	22.7	8.54	2.4	3.8
2m		0.3174	8.02	22.4	8.42		
3m		0.3194	8	22.38	8.42		
Site 5	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	12:06	0.3127	8	22.53	8.41	2.4	6.2
2m		0.3127	7.71	22.54	8.37		
3m		0.3129	7.7	22.34	8.37		
4m		0.3124	7.58	22.23	8.32		
5m		0.3125	7.46	22.2	8.29		
6m		0.3118	7.2	22.01	8.25		

**Table 4 Reservoir Profile 8/9/10**

Site	Time	SC	DO	Temp	pH	Secchi m	T Depth m
TCIn	9:34	0.99	8.06	16.3	8.63		
BCIn	9:56	0.157	7.66	16.8	8.71		
LBCout	10:20	0.285	6.52	22.1	8.63		
BCReservoir		40a/40c				Secchi m	T Depth m
1m	10:53	0.284	6.79	21.8	8.5	2.2	10.6
2m		0.278	4.37	21.4	8.26		
3m		0.28	4.31	21.2	8.15		
4m		0.278	3.64	21	8.07		
5m		0.277	3.3	20.9	8.02		
6m		0.276	3.21	20.8	7.94		
7m		0.276	3.11	20.7	7.9		
8m		0.277	3.07	20.7	7.89		
9m		0.276	2.91	20.7	7.86		
10m		0.271	2.88	20.2	7.86		
11m		0.275	1.8	20.5	7.76		



**Figure 2 DO and Temperature Profile for 7/13/10**

**Table 5 Reservoir Profiles 8/9/10**

Site 1	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:16	0.28	6.7	22.2	8.72	1.85	5.6
2m		0.275	5.84	21.7	8.57		
3m		0.28	4.5	21.5	8.43		
4m		0.283	3.88	21.2	8.33		
5m		0.281	3.25	21	8.22		
6m		0.281	2.78	20.9	8.14		
Site 3	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:26	0.284	6.64	22.2	8.66	2	5
2m		0.279	5.32	21.7	8.5		
3m		0.276	5.2	21.5	8.43		
4m		0.282	3.91	21.3	8.27		
5m		0.279	3.06	20.9	8.15		
Site 4	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:35	0.281	6.61	22.2	8.73	2	4.4
2m		0.281	6.61	22	8.74		
3m		0.281	6.4	21.8	8.61		
4m		0.302	4.26	21.3	8.44		
Site 5	Time	SC	DO	Temp	pH	Secchi m	T Depth m
1m	11:44	0.281	6.98	22.3	8.86	2.4	6.5
2m		0.281	6.47	22	8.86		
3m		0.268	6.2	21.6	8.76		
4m		0.27	5.57	21.3	8.6		
5m		0.271	4.91	21.3	8.44		
6m		0.256	5.2	20.7	8.41		

**Table 6 Bear Creek Laboratory 2010 Monitoring Data**

Site	Parameter (ug/l)	1/25	2/22	3/29	4/26	5/24	6/29
Bear Creek Inflow, Site 15a	Nitrate/Nitrite as N, dissolved	1,453	1467	1084	554	555	303
	Phosphorus, total	45	41	32	39	62	38
	Total Dissolved Phosphorus	41	29	9	11	6	11
	Residue, Non-Filterable (TSS)	5.2		9.8	58.4	39	11.2
Turkey Creek Inflow, Site 16a	Nitrate/Nitrite as N, dissolved	695	789	784	465	466	339
	Phosphorus, total	11	16	46	81	22	39
	Total Dissolved Phosphorus	5	2	5	19	5	10
	Residue, Non-Filterable (TSS)	5.6	17.2	29.8	58.6	14.8	10.9
Bear Creek Reservoir Top, Site 40a	Chlorophyll a	2.1	14	1.8	0.9	2.5	1.2
	Nitrate/Nitrite as N, dissolved	791	1019	593	456	459	205
	Total Nitrogen						
	Phosphorus, total	15	26	16	39	22	29
	Total Dissolved Phosphorus	16	12	8	15	5	15
	Residue, Non-Filterable (TSS)			5.4	14.2	10.8	
Bear Creek Reservoir Bottom, Site 40c	Nitrate/Nitrite as N, dissolved	393	547	348	487	490	200
	Total Nitrogen						
	Phosphorus, total	15	13	15	38	22	37
	Total Dissolved Phosphorus	8	9	6	14	5	23
	Residue, Non-Filterable (TSS)	13.3		4.6	17.8	12.4	
Lower Bear Creek Outflow, Site 45	Nitrate/Nitrite as N, dissolved	693	973	579	464	465	211
	Total Nitrogen					634	636
	Phosphorus, total	17	28	16	39	20	32
	Total Dissolved Phosphorus	11	14	6	13	5	19
	Residue, Non-Filterable (TSS)				17.2	16	

**Table 7 2010 Flows, cfs**

SITE	25- Jan	22- Feb	29 Mar	26 Apr	24 May	29 Jun	13 Jul	26 Jul	8 Aug
<b>Turkey Creek Inflow</b>	3.2	1.8	13.5	164	46	9.2	4.1	2.9	3.6
<b>Bear Creek Inflow</b>	8.7	5.3	35.3	130	140	38.3	22.2	10.6	36.8
<b>Lower Bear Creek</b>	7.8	7.9	58.7	150	148	70.7	24.2	14.9	50

**Table 8 Kerr/Swede Gulch Sampling on 6/29/10**

BCWA Site	Time	Temp	pH	SC	DO	Rel NO3	E. Coli #/100ml
52	13:20	17.9	8.38	0.83	7.48	2.13	40
53	13:35	19.0	8.30	0.83	7.23	2.15	40
54	13:50	19.1	8.24	0.81	6.63	2.07	90/76
55	13:45	21.2	8.22	0.86	6.79	2.13	38

**Table 9 Kerr/Swede Gulch Flow Estimates (CFS)**

BCWA Site	6/22/2010	7/20/2010
Site 52 - Confluence	1.15	0.62
Site 53 - Riefenberg	1.15	0.44
Site 54 Kerr	0.57	0.21
Site 55 - Swede	0.42	0.15

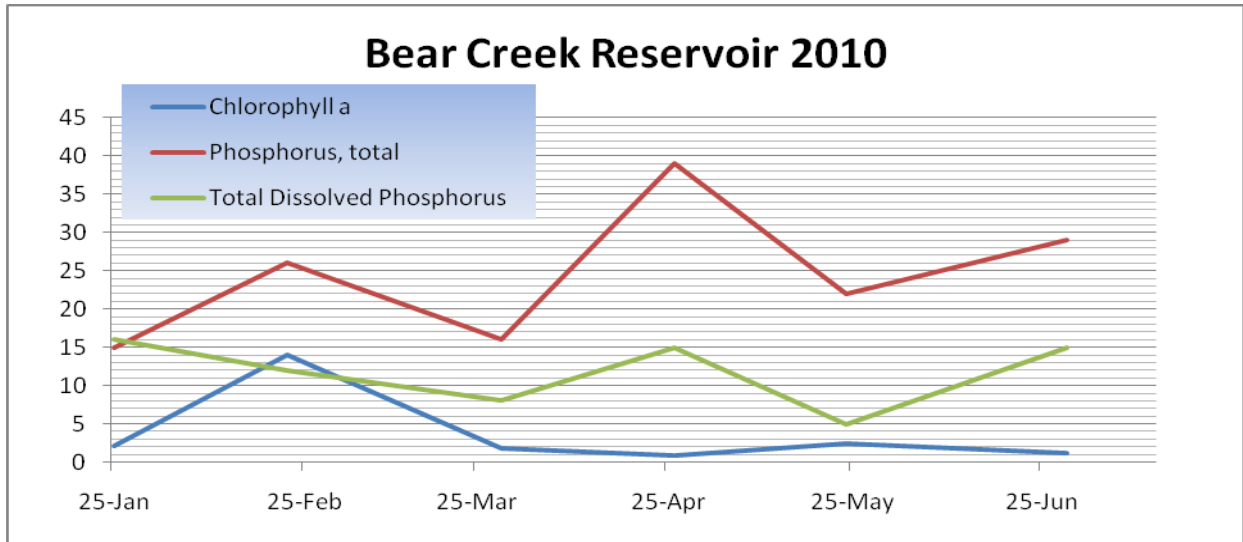


Figure 3 Bear Creek Reservoir Trends

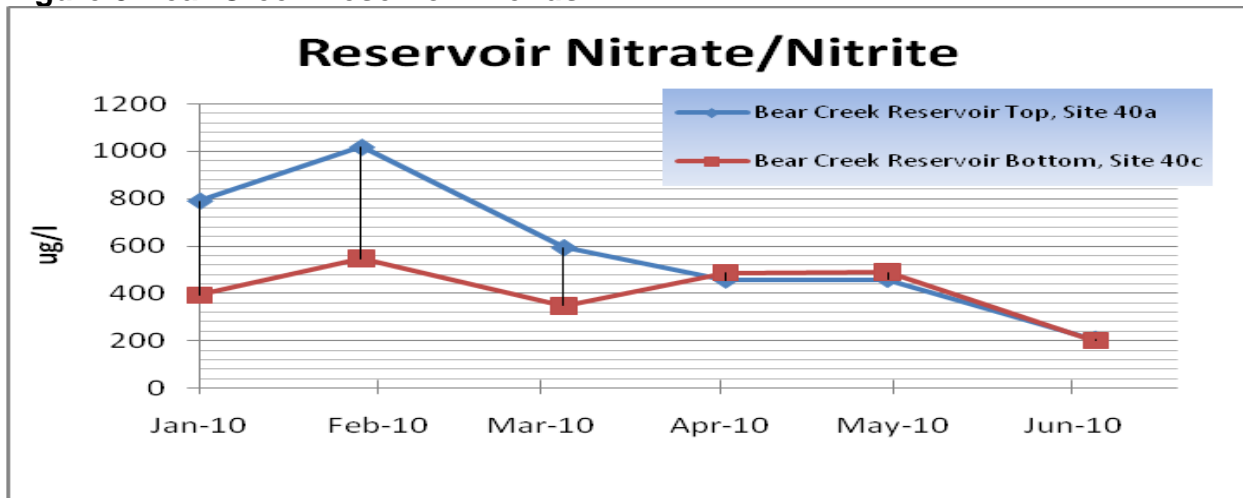


Figure 4 Bear Creek Reservoir Nitrate

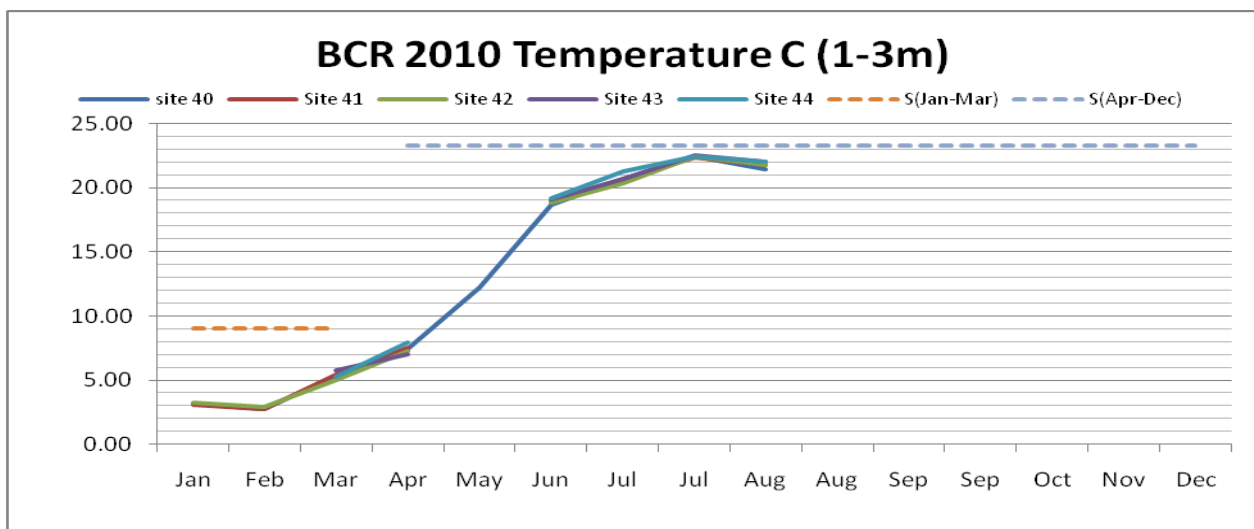


Figure 5 Bear Creek Reservoir Temperature Compliance

**Table 10 Watershed Data 7-8-10**

Site ID	Site Location by Stream Segment	7/8/2010			
		NO3-NO2 Ug/l	T Nitrogen Ug/l	Ammonia Ug/l	T Phos Ug/l
<b>Segment 1a</b>					
Site 1a	Above Lost and Found (Singin' River Ranch) complex	38		9	8
Site 3a	Above Evergreen Lake at CDOW Site	23		11	11
<b>Segment 1d</b>					
Site 4b	Evergreen Lake Profile Station, one meter down	7		22	10
Site 4e	Evergreen Lake Profile Station, four meters down	16		147	22
<b>Segment 1e</b>					
Site 5	Above EMD WWTP, at CDOW downtown site	19		30	14
Site 8a	Bear Creek Cabins at CDOW Site	61		64	24
Site 9	O'Fallon Park, west end at CDOW Site	121		83	19
Site 12	Lair o' the Bear Park, at CDOW site	201		25	32
Site 13a	Below Idledale, Shady Lane at CDOW site	208		19	13
Site 14a	Morrison Park west end of town, at CDOW Site	168		17	21
<b>Segment 3</b>					
Site 25	Vance Creek (Mt. Evans Wilderness drainage)	11		16	9
<b>Segment 5</b>					
Site 50	Cub Creek, Upstream of Cub Creek Park	126		15	18
Site 35	Cub Creek, Upstream @ Brookforest Inn	174		10	54
Site 39	Genesee Reservoir				
<b>Segment 6a</b>					
Site 18	South Turkey Creek Aspen Park Metropolitan District	113		27	45
<b>Segment 6b</b>					
Site 19	North Turkey Creek Flying J Ranch Bridge	120		20	29
<b>Segments 7 and 8</b>					
Site 37	Bear Creek, Mainstem from Lake 1/4 mile downstream (Segment 7)	24	211	5	10
Site 36	Summit Lake outfall (Mount Evans Wilderness) (Segment 8)	3	237	15	17
Site 38	Bear Creek at Bear Tracks, Bridge (Segment 7)				

Site ID	Site Location by Stream Segment	7/8/2010				
		DO Mg/l	SC (ms)	Temp C	pH	Rel NO3 mg/l
<b>Segment 1a</b>						
Site 1a	Above Lost and Found (Singin' River Ranch) complex	11.41	0.044	8.9	7.99	1.55
Site 3a	Above Evergreen Lake at CDOW Site	10.74	0.068	11.4	8.18	1.93
<b>Segment 1d</b>						
Site 4b	Evergreen Lake Profile Station, one meter down	9.12	0.072	15.5	8.25	2.75
Site 4e	Evergreen Lake Profile Station, four meters down	5.69	0.075	12.9	7.67	1.53
<b>Segment 1e</b>						
Site 5	Above EMD WWTP, at CDOW downtown site	9.78	0.081	14.8	8.16	1.95
Site 8a	Bear Creek Cabins at CDOW Site	9.69	0.091	15.2	8.13	1.97
Site 9	O'Fallon Park, west end at CDOW Site	9.54	0.121	15.3	8.17	1.9
Site 12	Lair o' the Bear Park, at CDOW site	9.79	0.146	15.2	8.39	1.75
Site 13a	Below Idledale, Shady Lane at CDOW site	9.73	0.153	15.2	8.35	1.57
Site 14a	Morrison Park west end of town, at CDOW Site	9.84	0.145	15.2	8.28	1.45
<b>Segment 3</b>						

Site ID	Site Location by Stream Segment	7/8/2010				
		DO Mg/l	SC (ms)	Temp C	pH	Rel NO3 mg/l
Site 25	Vance Creek (Mt. Evans Wilderness drainage)	11.1	0.063	9.1	7.91	1.41
<b>Segment 5</b>						
Site 50	Cub Creek, Upstream of Cub Creek Park	10.08	0.128	12.1	8.26	1.33
Site 35	Cub Creek, Upstream @ Brookforest Inn	10.06	0.078	9.1	8.17	
Site 39	Genesee Reservoir					
<b>Segment 6a</b>						
Site 18	South Turkey Creek Aspen Park Metropolitan District	8.86	0.75	12.9	8.02	1.17
<b>Segment 6b</b>						
Site 19	North Turkey Creek Flying J Ranch Bridge	9.26	0.257	12.9	8.13	1.22
<b>Segments 7 and 8</b>						
Site 37	Bear Creek, Mainstem from Lake 1/4 mile downstream (Segment 7)	7.64	0.02	7.9	9.04	2.52
Site 36	Summit Lake outfall (Mount Evans Wilderness) (Segment 8)	7.46	0.02	7.9	8.43	2.46
Site 38	Bear Creek at Bear Tracks, Bridge (Segment 7)	8.72	0.037	10.38	6.1	

**Table 11 Stream Flows**

Site ID	Site Location by Stream Segment	Flow cfs	
		7/8/2010	8/5/10
<b>Segment 1a</b>			
Site 1a	Above Lost and Found (Singin' River Ranch) complex	39.3	51.4
Site 3a	Above Evergreen Lake at CDOW Site	49.5	66.4
<b>Segment 1e</b>			
Site 5	Above EMD WWTP, at CDOW downtown site	62.2	59.4
Site 8a	Bear Creek Cabins at CDOW Site	63	77.6
Site 9	O'Fallon Park, west end at CDOW Site	52.4	77.5
Site 12	Lair o' the Bear Park, at CDOW site	63	76.1
Site 13a	Below Idledale, Shady Lane at CDOW site	74.1	76.9
Site 14a	Morrison Park west end of town, at CDOW Site	67.4	75.6
<b>Segment 3</b>			
Site 25	Vance Creek (Mt. Evans Wilderness drainage)	9.5	10.4
<b>Segment 5</b>			
Site 50	Cub Creek, Upstream of Cub Creek Park	6.3	
Site 35	Cub Creek, Upstream @ Brookforest Inn	6.0	
<b>Segment 6a</b>			
Site 18	South Turkey Creek Aspen Park Metropolitan District	0.41	0.1
<b>Segment 6b</b>			
Site 19	North Turkey Creek Flying J Ranch Bridge	1.9	1.2
<b>Segments 7 and 8</b>			
Site 37	Bear Creek, Mainstem from Lake 1/4 mile downstream (Segment 7)	3.1	17.9
Site 36	Summit Lake outfall (Mount Evans Wilderness) (Segment 8)	3	7.1
Site 38	Bear Creek at Bear Tracks, Bridge (Segment 7)	17.6	