United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7093
www.blm.gov/co

TAKE PRIDE IN AMERICA

JAN 11 2012

In Reply Refer To:
7250 (CO-932)

RECEIVED
JAN 12 [illegible]
Colorado Water Conservation Board

Ms. Linda Bassi
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Dear Ms. Bassi:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its recommendation for instream flow water rights on Kerber Creek, located in Water Division 3. This is an atypical instream flow recommendation from the BLM, because the BLM owns and manages only a very small portion of the creek. The BLM's rationale for the instream flow recommendation is explained below.

One of the missions assigned to the BLM by the U.S. Congress is to manage public lands in historical mining districts, and to facilitate community-based efforts to remediate water quality impacts from historic mining activities. Pursuant to this mission, the BLM and multiple other partners have worked to address acid mine drainage impacts associated with the Bonanza historic mining district in the Kerber Creek watershed. These partners include other federal and state agencies, nonprofit groups, private companies, and private landowners. Projects implemented by this partnership have included relocation of tailings into repositories, stream rehabilitation projects to reduce erosion, and in-place treatment of mine wastes using phytostabilization techniques. Phytostabilization involves amendments to soils with limestone, lime, and compost, followed by revegetation. These remediation activities have significantly improved riparian vegetation, upland vegetation, and water quality along the creek, with a continuing upward trend in stream health.

Once the water quality of impaired streams is sufficiently improved to be able to support aquatic life, that achievement can be compromised by new diversions. New diversions can divert clean water necessary for dilution of heavy metals and maintenance of Ph levels. The BLM has worked with partners and private landowners in Kerber Creek to obtain support for instream flow water rights that will help insure the flows necessary to maintain the improving natural environment in Kerber Creek. These partners have asked the BLM to take the lead in making an instream flow recommendation for the creek to the Colorado Water Conservation Board.

The details of the BLM's instream flow recommendation are outlined in the attachment to this letter.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross sections were included with the BLM's draft recommendation in February 2011.

If you have any questions regarding our instream flow recommendation, please contact Roy Smith at 303-239-3940. We thank both the Colorado Parks and Wildlife and the Colorado Water Conservation Board for their cooperation in this effort.

Sincerely,

Leigh D. Espy
Deputy State Director, Resources and Fire

Enclosure

cc: Andrew Archuleta, San Luis Valley Field Office
Mark Uppendahl, Colorado Parks and Wildlife

ENCLOSURE – INSTREAM FLOW RECOMMENDATION FOR KERBER CREEK

Location and Land Status. Kerber Creek is tributary to San Luis Creek approximately 1.5 miles northeast of Villa Grove. This recommendation covers two stream reaches. The uppermost reach begins at the confluence of Kerber Creek with Elkhorn Gulch and extends downstream to the confluence with the Brewery Creek, a distance of approximately 0.5 miles. Approximately 30 percent of this reach is managed by the BLM and the remainder of the reach is in private ownership. The lower reach starts at the confluence with Brewery Creek and extends downstream to the headgate of the Wells Kerber Ditch, a distance of approximately 13.95 miles miles. The BLM manages approximately 2.5 percent of this stream reach (0.35 miles), and the remaining 97.5% is in private ownership.

Biological Summary. Kerber Creek is a moderate gradient stream, and historically had extensive functional floodplains and an abundance of point bars. As noted previously, the natural environment in Kerber Creek has been and continues to be affected by acid mine drainage from historical mining activities within the Kerber Creek watershed. The acid mine drainage significantly altered the vegetation regime along the creek, resulting in extensive changes in channel morphology.

Kerber Creek supports a naturally reproducing brook trout population, which is the trout species typically most tolerant of reduced Ph levels and some presence of heavy metals. Fish surveys have noted a full range of fish weights and ages. Macroinvertebrate surveys indicate that the creek has achieved a diversity of species that is typical of streams in the southern Rocky Mountains ecoregion. However, abundance and biomass of macroinvertebrates remains below average for streams in the southern Rocky Mountain ecoregion, which is to be expected in a stream with some continuing influence from acid mine drainage.

The riparian community is comprised primarily of willow and sedge species, with coyote willow as the most dominant shrub in the riparian community. The treatment of historic tailing deposition areas has resulted in a higher percentage of vegetation cover in the riparian zone, resulting in improved width-to-depth ratios, sinuosity, and bank stability. The brook trout population now has access to a wide range of physical habitats, including overhanging banks, pools and velocity cover behind larger rocks in the stream channel.

R2Cross Analysis. The BLM collected the following R2Cross data from the Kerber Creek reach between Elkhorn Gulch and Brewery Creek:

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)
06/16/2010 #2	9.90 cfs	17.96 feet	Out of range	Out of range
10/07/2010 #3	1.58 cfs	15.82 feet	1.45 cfs	3.53 cfs
		Averages:	1.45 cfs	3.53 cfs

The BLM's analysis of this data, coordinated with the Colorado Parks and Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

> 3.5 cubic feet per second is recommended for the snowmelt runoff period, from April 16 through July 15. This recommendation is driven by the average velocity criteria. This flow rate should make an adequate amount of physical habitat available in the stream's riffle habitat so that the creek can continue to support the limited fish population.
>
> 1.45 cubic feet per second is recommended for the late summer and fall period, from July 16 through October 31. 1.45 cubic feet per second is also recommended for the period during which snowmelt begins, from March 2 through April 15. Although the R2Cross model suggests a higher flow rate for these time periods, the BLM has reduced its recommendation for these periods based on water availability. This flow rate will meet the average depth and wetted perimeter criteria, and will provide an average velocity in riffles of approximately 0.70 feet per second.
>
> 0.8 cubic feet per second is recommended during the winter period from Nov. 1 to March 1. This recommendation is driven by limited water availability during the winter. This flow rate should provide sufficient velocity and depth to prevent icing of all physical habitat within the stream.

The BLM collected the following R2Cross data from the Kerber Creek reach between of the confluence with Brewery Creek and the headgate of the Wells Ditch:

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)
06/16/2010 #1	28.75 cfs	28.93 feet	Out of range	Out of range
10/07/2010 #2	3.18 cfs	27.10 feet	3.67 cfs	Out of range
06/16/2010 #3	17.40 cfs	31.72 feet	Out of range	8.7 cfs
10/07/2010 #1	2.26 cfs	32.47 feet	2.84 cfs	4.77 cfs
		Averages:	3.25 cfs	6.74 cfs

The BLM's analysis of this data, coordinated with the Colorado Parks and Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

> 6.75 cubic feet per second is recommended for the snowmelt runoff period, from April 1 through July 31. This recommendation is driven by the average depth criteria and wetted perimeter criteria. This flow rate should make an adequate

amount of physical habitat available in the stream's riffle habitat so that the creek can continue to support the limited fish population.
4.0 cubic feet per second is recommended for the late summer and fall period, from August 1 through November 15. Although the R2Cross model suggests a higher flow rate for this time period, the BLM has reduced its recommendation for this period based on water availability. This flow rate will meet the average velocity criteria and will provide an average depth between 0.20 to 0.25 feet.

2.6 cubic feet per second is recommended during the winter period from Nov. 16 to March 31. Although the R2Cross model suggests a higher flow rate for this time period, the BLM has reduced its recommendation for this period based on water availability. This flow rate meets the average depth criteria and average velocity criteria, while providing 35 to 45% percent wetted perimeter. This flow rate should provide sufficient velocity and depth to prevent icing of critical pool habitats along the creek.

Water Availability. For water availability analysis, the BLM recommends analysis of U.S. Geological Survey stream gage 08224500, (Kerber Creek above Little Kerber Creek near Villa Grove, CO). This gage has a long period of record between 1923 and 2007, providing an excellent indication of raw water availability. When utilizing this gage, it should be understood that the gage may have been affected by icing during the winter, and may be influenced by irrigation operations in the vicinity of the gage. To estimate water availability for the Kerber Creek reach between Elkhorn Creek and Brewery Creek, a basin apportionment procedure can be used.

The BLM is not aware of any decree water rights that operate within the reach between Elkhorn Gulch and Brewery Creek. The BLM is aware of the following decreed water rights in the reach between Brewery Creek and the headgate of the Wells Kerber Ditch: Turner Ditch, Henry White Ditch, Clayton Ditch F&G, LD Ditches 1 and 2, Clayton Old Channel Ditch, Clayton Ditch, Clayton Ditch Alternate Point of Diversion, Wagner Ditch, and Wagner Ditch 3. The BLM's understanding is that during low flow periods, the Wells Kerber Ditch draws water through the recommended instream flow reach because the Wells Kerber Ditch is the most senior water right on the creek. The BLM also understands that intervening ditches do not export any water from the basin, so return flows from those diversions accrue to Kerber Creek.

DRAFT INSTREAM FLOW RECOMMENDATION

Ms. Linda Bassi
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

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The details of BLM's instream flow recommendation are outlined in the attachment to this letter. Data sheets, R2Cross output, fishery survey information, and photographs of the cross sections were included with BLM's draft recommendation in February 2011. If you have any questions regarding our instream flow recommendation, please contact Roy Smith at 303-239-3940. We thank both the Division of Wildlife and the Water Conservation Board for their cooperation in this effort.

Sincerely,

Leigh Espy
Deputy State Director
Resources and Fire

Cc: Andrew Archuleta, Saguache Field Office
Steve Sanchez, Saguache Field Office

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BLM's analysis of this data, coordinated with the Division of Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

> 3.5 cubic feet per second is recommended for the snowmelt runoff period, from April 1 through July 31. This recommendation is driven by the average velocity criteria. This flow rate should make an adequate amount of physical habitat available in the stream's riffle habitat so that the creek can continue to support the limited fish population.
>
> 2.2 cubic feet per second is recommended for the late summer and fall period, from August 1 through November 15. Although the R2Cross model suggests a higher flow rate for this time period, BLM has preliminarily reduced its recommendation for this period based on water availability. This flow rate will meet the average depth and wetted perimeter criteria, and will provide an average velocity in riffles of approximately 0.85 feet per second.
>
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BLM's analysis of this data, coordinated with the Division of Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

> 6.75 cubic feet per second is recommended for the snowmelt runoff period, from April 1 through July 31. This recommendation is driven by the average depth criteria and wetted perimeter criteria. This flow rate should make an adequate amount of physical habitat available in the stream's riffle habitat so that the creek can continue to support the limited fish population.

4.0 cubic feet per second is recommended for the late summer and fall period, from August 1 through November 15. Although the R2Cross model suggests a higher flow rate for this time period, BLM has preliminarily reduced its recommendation for this period based on water availability. This flow rate will meet the average velocity criteria and will provide an average depth between 0.20 to 0.25 feet.

2.6 cubic feet per second is recommended during the winter period from Nov. 16 to March 31. Although the R2Cross model suggests a higher flow rate for this time period, BLM has preliminarily reduced its recommendation for this period based on water availability. This flow rate meets the average depth criteria and average velocity criteria, while providing 35 to 45% percent wetted perimeter. This flow rate should provide sufficient velocity and depth to prevent icing of critical pool habitats along the creek.

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List of Fish Species, Length, and Weight Sampled Collected in 2008

Site AL1 Fish Monitoring Data, 2008

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	61	1	1
2	Brook Trout	77	5	1
3	Brook Trout	210	101	1
4	Brook Trout	55	1	1
5	Brook Trout	160	46	1
6	Brook Trout	150	41	1
7	Brook Trout	59	2	1
8	Brook Trout	105	13	1
9	Brook Trout	107	11	1
10	Brook Trout	107	13	1
11	Brook Trout	112	15	1
12	Brook Trout	102	12	1
13	Brook Trout	176	63	1
14	Brook Trout	177	55	1
15	Brook Trout	184	65	1
16	Brook Trout	134	25	1
17	Brook Trout	98	12	1
18	Brook Trout	132	24	1
19	Brook Trout	105	11	1
20	Brook Trout	99	11	1
21	Brook Trout	58	1	1
22	Brook Trout	65	3	1
23	Brook Trout	97	10	1
24	Brook Trout	95	9	1
25	Brook Trout	58	3	1
26	Brook Trout	64	3	1
27	Brook Trout	59	2	1
28	Brook Trout	54	1	1
29	Brook Trout	48	1	1
30	Brook Trout	54	2	1
31	Brook Trout	52	1	1
32	Brook Trout	147	36	2
33	Brook Trout	154	40	2
34	Brook Trout	56	2	2
35	Brook Trout	95	9	2
36	Brook Trout	69	3	2
37	Brook Trout	51	2	2
38	Brook Trout	56	1	2
39	Brook Trout	55	1	2

40	Brook Trout	60	3	2
41	Brook Trout	58	1	2
42	Brook Trout	55	2	2

Site ALH Fish Monitoring Data, 2008

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Longnose Dace	113	17	1
2	Longnose Dace	128	19	1
3	Longnose Dace	93	7	1
4	Longnose Dace	72	4	1
5	Longnose Dace	86	6	2

Site AL3 Fish Monitoring Data, 2008

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	177	55	1
2	Brook Trout	194	65	1
3	Brook Trout	176	58	1
4	Brook Trout	200	83	1
5	Brook Trout	199	85	1
6	Brook Trout	201	80	1
7	Brook Trout	128	19	1
8	Brook Trout	180	54	1
9	Brook Trout	70	5	1
10	Brook Trout	64	2	1

Site AL5 Fish Monitoring Data, 2008

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	155	38	1
2	Longnose Dace	73	4	1
3	Longnose Dace	74	4	2

Site AL6 Fish Monitoring Data, 2008

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	205	107	1
2	Brook Trout	219	92	2

Water: Kerber Creek
Date: 9/4/2008
Location: Site 1, Hutchinson
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X: 414337
UTM Y: 4232384
Station Length = 300
Station Width = 11
Crew: A. Archuleta, L. Archuleta
Notes: just u/s of large cottonwoods

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
LND	1	113	17	1		
LND	1	128	19	1		
LND	1	93	7	1		
LND	1	72	4	1		
LND	1	86	6	2		

Water:Kerber Creek
Date: 9/4/2008
Location: Site 2,@ Soda Springs Trailhead
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X:
UTM Y:
Station Length = 300
Station Width = 1
Crew:A. Archuelta, L. Archuleta
Notes:Historic CDOW site located @ Soda Springs Trailhead d/s of bridge about 400m

_____

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	155	38	1		
BRK	1	73	4	1		
BRK	1	74	4	2		

Water: Kerber Creek
Date: 9/4/2008
Location: Site 3,u/s KC01
Drainage: San Luis Creek
Water Code:40903
UTM Zone:13S
UTM X:
UTM Y:
Station Length = 300
Station Width = 11
Crew:A. Archuelta, L. Archuleta
Notes: KC01 is Kerber Creek Restoration Project site

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	205	107	1		
BRK	1	219	92	2		

Water: Kerber Creek
Date: 9/5/2008
Location: Site 4,d/s confluence w/ Brewery Creek
Drainage: San Luis Creek
Water Code:40903
UTM Zone: 13S
UTM X:
UTM Y:
Station Length = 400
Station Width = 13
Crew: A. Archuelta, L. Archuleta
Notes: site starts about 500m d/s of bridge

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	177	55	1		
BRK	1	194	65	1		
BRK	1	176	58	1		
BRK	1	200	83	1		
BRK	1	199	85	1		
BRK	1	201	80	1		
BRK	1	128	19	1		
BRK	1	180	54	1		
BRK	1	70	5	1		
BRK	1	64	2	1		

Water:Kerber Creek
Date: 9/5/2008
Location: Site 5,u/s mining influence & d/s Mosquito Creek
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X:399298
UTM Y: 4241487
Station Length = 150
Station Width = 5
Crew:A. Archuelta, L. Archuleta
Notes: a little u/s of historic CDOW site

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	61	1	1		
BRK	1	77	5	1		
BRK	1	210	101	1		
BRK	1	55	1	1		
BRK	1	160	46	1		
BRK	1	150	41	1		
BRK	1	59	2	1		
BRK	1	105	13	1		
BRK	1	107	11	1		
BRK	1	107	13	1		
BRK	1	112	15	1		
BRK	1	102	12	1		
BRK	1	176	63	1		
BRK	1	177	55	1		
BRK	1	184	65	1		
BRK	1	134	25	1		
BRK	1	98	12	1		
BRK	1	132	24	1		
BRK	1	105	11	1		
BRK	1	99	11	1		
BRK	1	58	1	1		
BRK	1	65	3	1		
BRK	1	97	10	1		
BRK	1	95	9	1		
BRK	1	58	3	1		
BRK	1	64	3	1		
BRK	1	59	2	1		
BRK	1	54	1	1		
BRK	1	48	1	1		
BRK	1	54	2	1		
BRK	1	52	1	1		
BRK	1	147	36	2		
BRK	1	154	40	2		
BRK	1	56	2	2		
BRK	1	95	9	2		
BRK	1	69	3	2		
BRK	1	51	2	2		
BRK	1	56	1	2		
BRK	1	55	1	2		
BRK	1	60	3	2		
BRK	1	58	1	2		

BRK	1	55	2	2

List of Fish Species, Length, and Weight Sampled Collected in 2009

Site K21 Fish Monitoring Data, 2009

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	127	27	1
2	Brook Trout	93	11	1
3	Brook Trout	95	10	1
4	Brook Trout	98	11	1
5	Brook Trout	89	8.5	1
6	Brook Trout	102	12.5	1
7	Brook Trout	111	10.5	1
8	Brook Trout	102	12	1
9	Brook Trout	60	2	1
10	Brook Trout	92	9	1
11	Brook Trout	164	64.5	1
12	Brook Trout	97	12	1
13	Brook Trout	57	2	1
14	Brook Trout	127	21.5	1
15	Brook Trout	92	8.5	1
16	Brook Trout	91	9	1
17	Brook Trout	94	9	1
18	Brook Trout	41	10	1
19	Brook Trout	98	10	1
20	Brook Trout	128	22.5	1
21	Brook Trout	54	1.5	1
22	Brook Trout	163	44.5	1
23	Brook Trout	47	0.5	1
24	Brook Trout	96	9.5	1
25	Brook Trout	93	7.5	1
26	Brook Trout	93	9	1
27	Brook Trout	51	10	1
28	Brook Trout	83	7.5	1
29	Brook Trout	55	2	1
30	Brook Trout	54	2.5	1
31	Brook Trout	102	13	1
32	Brook Trout	141	34.5	1
33	Brook Trout	93	9	1
34	Brook Trout	51	2.5	1
35	Brook Trout	143	30	2
36	Brook Trout	106	13.5	2
37	Brook Trout	97	11	2
38	Brook Trout	84	6.5	2
39	Brook Trout	94	8	2

40	Brook Trout	96	9	2
41	Brook Trout	56	2	2
42	Brook Trout	56	2	2
43	Brook Trout	99	9.5	2
44	Brook Trout	85	7.5	2
45	Brook Trout	57	2.5	2
46	Brook Trout	58	2	2

Site K10 Fish Monitoring Data, 2009

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	169	51.5	1
2	Brook Trout	130	17.5	1
3	Brook Trout	113	15.5	1
4	Brook Trout	125	20	1
5	Brook Trout	115	16	1
6	Brook Trout	98	10.5	1

Site K3 Fish Monitoring Data, 2009

Sample #	**Species**	**Length (mm)**	**Weight (g)**	**Pass Number**
1	Brook Trout	230	125.6	1
2	Brook Trout	215	113	1
3	Brook Trout	188	78.5	1
4	Brook Trout	190	66	1
5	Brook Trout	200	88	1
6	Brook Trout	201	77.5	1
7	Brook Trout	176	70.5	1
8	Brook Trout	215	111.5	1
9	Brook Trout	124	22.5	1
10	Brook Trout	129	21.8	1
11	Brook Trout	193	77.5	1
12	Brook Trout	187	70.8	1
13	Brook Trout	111	20.8	1
14	Brook Trout	152	48	1
15	Brook Trout	166	36.5	1
16	Brook Trout	110	13.5	1
17	Brook Trout	117	18.5	1
18	Brook Trout	116	19.8	1
19	Brook Trout	134	19.8	1
20	Brook Trout	185	59	1
21	Brook Trout	177	56	1
22	Brook Trout	57	4.5	1
23	Brook Trout	57	3.5	1
24	Brook Trout	56	3.5	1
25	Brook Trout	57	2.5	1
26	Brook Trout	104	11.5	1
27	Brook Trout	43	1	1
28	Brook Trout	46	1	1

29	Brook Trout	58	2.5	1
30	Brook Trout	63	3.5	1
31	Brook Trout	103	12.5	1
32	Brook Trout	62	3	1
33	Brook Trout	56	2	1
34	Brook Trout	186	63.5	1
35	Brook Trout	156	34.5	1
36	Brook Trout	156	37.6	2
37	Brook Trout	109	15.8	2
38	Brook Trout	53	2	2
39	Brook Trout	64	3.5	2

Site K2 Fish Monitoring Data, 2009

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	213	98.8	1
2	Brook Trout	250	176.5	1
3	Brook Trout	185	61.5	1
4	Brook Trout	226	123.5	1
5	Brook Trout	164	47.5	1
6	Brook Trout	183	68.5	1
7	Brook Trout	213	115	1
8	Brook Trout	217	109	1
9	Brook Trout	277	215.5	1
10	Brook Trout	208	103.5	2
11	Brook Trout	194	81.5	2

Site Soda Springs Fish Monitoring Data, 2009

Sample #	Species	Length (mm)	Weight (g)	Pass Number
1	Brook Trout	72	4.5	1
2	Brook Trout	247	128.8	1
3	Brook Trout	141	27.5	1
4	Brook Trout	149	33.5	1
5	Brook Trout	151	37.5	1
6	Brook Trout	140	26	1
7	Brook Trout	136	25.8	1
8	Brook Trout	75	6.5	1
9	Brook Trout	66	4.5	1
10	Brook Trout	210	86.5	1
11	Brook Trout	125	22.8	1
12	Brook Trout	71	5	2
13	Brook Trout	215	105.8	2

Water: Kerber Creek
Date: 8/17/10
Location: Site 1, Hutchinson
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X: 414337
UTM Y: 4232384
Station Length = 300
Station Width = 11
Crew: L. Archuleta, K. Schott, J. Weldgen, M. Skarie, B Divine
Notes: just u/s of large cottonwoods

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
LND	1	35		1		
LND	1	27		1		
LND	1	33		1		
LND	1	30		1		
LND	1	36		1		
LND	1	33		1		
LND	1	34		1		
LND	1	19		1		
LND	1	35		1		
LND	1	22		1		
LND	1	34		1		
LND	1	28		1		
LND	1	31		1		
LND	1	26		1		
LND	1	36		1		
LND	1	34		1		
LND	1	38		1		
LND	1	30		1		
LND	1	30		1		
LND	1	30		1		
LND	1	35		1		
LND	1	28		1		
LND	1	31		1		
LND	1	37		1		
LND	1	26		1		
LND	1	31		1		
LND	1	37		1		
LND	1	40		1		
LND	1	21		1		
LND	1	19		1		
LND	1	27		1		
LND	1	27		1		
LND	1	33		1		
LND	1	26		1		
LND	1	26		1		
LND	1	27		1		
LND	1	26		1		
LND	1	32		1		
LND	1	35		1		
LND	1	35		1		
LND	1	26		1		

LND	1	37	1
LND	1	34	1
LND	1	32	1
LND	1	30	2
LND	1	32	2
LND	1	26	2
LND	1	37	2
LND	1	32	2
LND	1	25	2
LND	1	37	2
LND	1	31	2
LND	1	34	2
LND	1	27	2
LND	1	22	2
LND	1	23	2
LND	1	40	2
LND	1	38	2
LND	1	30	2
LND	1	35	2
LND	1	23	2
LND	1	26	2
LND	1	34	2
LND	1	31	2
LND	1	26	2
LND	1	28	2
LND	1	30	2
LND	1	30	2
LND	1	24	2
LND	1	26	2
LND	1	22	2
LND	1	27	2
LND	1	26	2
LND	1	67	2
LND	1	30	2
LND	1	29	2
LND	1	40	2
LND	1	17	2
LND	1	28	2

Water:Kerber Creek
Date: 8/17/10
Location: Site 2,@ Soda Springs Trailhead
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X:
UTM Y:
Station Length = 300
Station Width = 1
Crew: L. Archuleta, K. Schott, J. Weldgen, M. Skarie, B Divine
Notes:Historic CDOW site located @ Soda Springs Trailhead d/s of bridge about 400m

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	247	142.0	1		
BRK	1	179	58.0	1		
BRK	1	221	105.0	1		
BRK	1	176	47.0	1		
BRK	1	163	44.5	1		
BRK	1	209	90.5	1		
BRK	1	185	54.0	1		
BRK	1	229	96.5	1		
BRK	1	207	61.0	1		
BRK	1	227	110.5	1		
BRK	1	167	41.0	1		
BRK	1	133	34.0	1		
BRK	1	172	57.5	1		
BRK	1	67	5.0	1		
BRK	1	131	21.0	1		
BRK	1	129	23.5	1		
BRK	1	126	28.5	1		
BRK	1	121	19.0	1		
BRK	1	110	18.5	1		
BRK	1	190	65.5	2		
BRK	1	152	39.5	2		
BRK	1	125	21.5	2		
BRK	1	171	51.0	2		
BRK	1	129	30.5	2		
BRK	1	130	25.5	2		
BRK	1	110	13.0	2		
BRK	1	122	16.5	2		
BRK	1	126	19.0	2		
BRK	1	109	16.5	2		
BRK	1	112	13.5	2		
BRK	1	114	15.0	2		
BRK	1	122	21.0	3		
BRK	1	187	68.0	3		

Water: Kerber Creek
Date: 8/16/10
Location: Site 3,u/s KC01
Drainage: San Luis Creek
Water Code:40903
UTM Zone:13S
UTM X:
UTM Y:
Station Length = 300
Station Width = 11
Crew: L. Archuleta, K. Schott, J. Weldgen, B. Flack, J. Trujillo
Notes: KC01 is Kerber Creek Restoration Project site

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	231	145	1		
BRK	1	183	60	1		
BRK	1	163	45	1		
BRK	1	165	36	1		
BRK	1	85	9.6	1		

Water: Kerber Creek
Date: 8/16/10
Location: Site 4,d/s confluence w/ Brewery Creek
Drainage: San Luis Creek
Water Code:40903
UTM Zone: 13S
UTM X:
UTM Y:
Station Length = 400
Station Width = 13
Crew: L. Archuleta, K. Schott, J. Weldgen, B. Flack, J. Trujillo
Notes: site starts about 500m d/s of bridge

Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	211		1		
BRK	1	180		1		
BRK	1	66		1		
BRK	1	188		1		
BRK	1	145		1		
BRK	1	143		1		
BRK	1	205		1		
BRK	1	189		1		
BRK	1	114		1		
BRK	1	121		1		
BRK	1	145		1		
BRK	1	120		1		
BRK	1	98		1		
BRK	1	140		1		
BRK	1	123		1		
BRK	1	150		1		
BRK	1	120		1		
BRK	1	110		1		
BRK	1	96		1		
BRK	1	137		1		
BRK	1	146		1		
BRK	1	120		1		
BRK	1	150		1		
BRK	1	109		1		
BRK	1	55		1		
BRK	1	56		1		
BRK	1	114		1		
BRK	1	75		1		
BRK	1	65		1		
BRK	1	62		1		
BRK	1	166		2		
BRK	1	153		2		
BRK	1	185		2		
BRK	1	131		2		
BRK	1	53		2		

BRK	1	59	2
BRK	1	62	2
BRK	1	54	2
BRK	1	53	2
BRK	1	44	2

Water:Kerber Creek
Date: 8/16/10
Location: Site 5,u/s mining influence & d/s Mosquito Creek
Drainage: San Luis Creek
Water Code: 40903
UTM Zone: 13S
UTM X:399298
UTM Y: 4241487
Station Length = 150
Station Width = 5
Crew: L. Archuleta, K. Schott, J. Weldgen, B. Flack, J. Trujillo
Notes: a little u/s of historic CDOW site; 2.5 grams were added to weight

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Species	Count	Length (mr	Weight (g)	Status	Mark	TagID
BRK	1	131	33.1	1		
BRK	1	93	15.0	1		
BRK	1	89	16.0	1		
BRK	1	94	17.0	1		
BRK	1	85	16.0	1		
BRK	1	84	13.5	1		
BRK	1	139	35.0	1		
BRK	1	120	26.0	1		
BRK	1	85	17.0	1		
BRK	1	85	17.5	1		
BRK	1	133	35.0	1		
BRK	1	115	29.0	1		
BRK	1	89	16.5	1		
BRK	1	105	20.0	1		
BRK	1	165	61.0	1		
BRK	1	82	12.0	1		
BRK	1	89	14.0	1		
BRK	1	92	16.5	1		
BRK	1	129	27.5	1		
BRK	1	140	32.0	1		
BRK	1	145	40.0	1		
BRK	1	96	13.5	1		
BRK	1	121	20.5	1		
BRK	1	55	5.0	1		
BRK	1	125	24.0	1		
BRK	1	45	6.0	1		
BRK	1	113	19.0	1		
BRK	1	107	18.0	1		
BRK	1	92	11.0	1		
BRK	1	110	19.0	1		
BRK	1	94	13.0	1		
BRK	1	83	12.0	1		
BRK	1	111	25.5	1		
BRK	1	80	11.0	1		
BRK	1	93	13.0	1		

BRK	1	117	24.0	2
BRK	1	129	28.0	2
BRK	1	131	29.5	2
BRK	1	119	20.5	2
BRK	1	117	21.0	2
BRK	1	83	10.5	2
BRK	1	96	13.0	2
BRK	1	49	4.0	2
BRK	1	110	17.0	2
BRK	1	77	6.5	2

Water: Kerber Creek
Date: 8/17/10
Location: us Squirrel, ds Cocomongo mine site
Drainage: San Luis Creek
Water Code:40903
UTM Zone: 13S
UTM X:
UTM Y:
Station Length = 360
Station Width = 10
Crew: L. Archuleta, K. Schott, J. Weldgen, M. Skarie, B Divine
Notes: DOW site 2 - by water Quality Site

Species	Count	Length (mm)	Weight (g)	Status	Mark	TagID
BRK	1	140	29.0	1		
BRK	1	115	18.0	1		
BRK	1	145	39.0	1		
BRK	1	153	33.5	1		
BRK	1	147	35.5	1		
BRK	1	122	20.5	1		
BRK	1	67	4.5	1		
BRK	1	52	4.0	1		
BRK	1	150	36.0	2		
BRK	1	60	4.0	2		

Metric Values for Kerber Creek

Abundance data is the estimated number per square meter for quantitative samples

Abundance data is the estimated number per sample for qualitative samples

EPT = Ephemeroptera + Plecoptera +Trichoptera

Sample ID	Station	Stream	County	State	Latitude	Longitude	Elevation (ı	Date	Habitat Sar	Collection ı	field notes	Lab notes
139855	KERBERCK-	Kerber Cre	Saguache	CO	38.318	106.1515556	3009.146	9/12/2008	Riffle	Surber net		
139856	KERBERCK-	Kerber Cre	Saguache	CO	38.318	106.1515556	3009.146	9/12/2008	Riffle	Kick net	Also Pool Habitat	
139857	KERBERCK-	Kerber Cre	Saguache	CO	38.27852778	106.1481667	2814.329	9/12/2008	Riffle	Surber net		
139858	KERBERCK-	Kerber Cre	Saguache	CO	38.278528	106.148167	2814	9/12/2008	Riffle	Kick net	Also Pool Habitat	
139859	KERBERCK-	Kerber Cre	Saguache	CO	38.27130556	106.1489722	2794.512	9/12/2008	Riffle	Surber net		
139860	KERBERCK-	Kerber Cre	Saguache	CO	38.27130556	106.1489722	2794.512	9/12/2008	Riffle	Kick net	Also Pool Habitat	
139861	KERBERCK-	Kerber Cre	Saguache	CO	38.25413889	106.12825	2739.939	9/12/2008	Riffle	Surber net		
139862	KERBERCK-	Kerber Cre	Saguache	CO	38.25413889	106.12825	2739.939	9/12/2008	Riffle	Kick net	Also Pool Habitat	
139863	KERBERCK-	Kerber Cre	Saguache	CO	38.21491667	106.0802778	2625.915	9/12/2008	Riffle	Surber net		
139864	KERBERCK-	Kerber Cre	Saguache	CO	38.21491667	106.0802778	2625.915	9/12/2008	Riffle	Kick net	Also Pool Habitat	
139865	KERBERCK-	Kerber Cre	Saguache	CO	38.23666667	105.9788611	2479.878	9/12/2008	Riffle	Surber net		
139866	KERBERCK-	Kerber Cre	Saguache	CO	38.23666667	105.9788611	2479.878	9/12/2008	Riffle	Kick net	Also Pool Habitat	

area (m^2)	Field split	LABSPLIT	# of subsan	Richness	Abundance	Shannon's	Simpson's I	Evenness	# of Famili	Abundance	Abundance	# of genera	# of EPT ta
0.743238	100	18.75	629	43	4442.273	2.688528	0.118756	0.714806	25	926	911	28	23
0.18581	100	100	205	25	205	2.637128	9.00E-02	0.81927	21	34	33	18	14
0.743238	100	100	62	17	83.41876	2.471487	9.57E-02	0.872326	14	27	16	13	10
0.186	100	100.00	16	9	16	2.101	0.075	0.956	8	3	3	6	4
0.743238	100	75	624	24	1113.147	1.658418	3.96E-01	0.521834	18	688	688	16	12
0.18581	100	100	88	12	88	1.713447	2.75E-01	0.689542	10	42	42	10	9
0.743238	100	100	256	21	344.4388	2.173887	2.16E-01	0.714032	15	151	151	13	11
0.18581	100	100	59	13	59	2.156649	0.141438	0.840815	10	18	18	11	8
0.743238	100	87.25	614	26	944.4771	2.418946	0.118181	0.742442	15	345	196	17	12
0.18581	100	100	82	14	82	2.296384	1.12E-01	0.870153	11	15	15	11	8
0.743238	100	28.125	625	26	2926.683	2.554486	1.03E-01	0.784043	14	844	564	14	16
0.18581	100	100	287	33	287	3.059335	5.55E-02	0.874969	21	54	33	22	12

EPT taxa ab	# of taxa w	# of taxa w	Taxa abunc	Taxa abunc	TV1 Index	# of clinger	# of long-li	Elmidae ab	CTQd	# of shredd	Shredder A	# of scrape	Scraper abu
2770	13	1	1127	29	3.583468	19	8	610	68	5	309	6	310
170	5	1	77	1	3.087805	11	6	16	51	2	12	1	5
57	5	0	43	0	3.596774	6	3	3	59	2	12	0	0
7	2	0	5	0	5.75	2	2	0	68	1	1	0	0
872	8	0	148	0	4.094617	11	7	84	71	2	16	1	2
80	3	0	17	0	3.659091	5	3	4	56	1	1	0	0
266	5	0	75	0	4.492188	5	3	0	67	2	17	0	0
49	3	0	22	0	3.457627	5	4	1	55	0	0	0	0
584	4	0	156	0	4.453488	7	3	0	77	2	9	0	0
49	3	0	18	0	5.158537	7	3	0	76	0	0	0	0
2282	6	0	338	0	4.395387	7	4	0	72	1	174	0	0
155	4	0	30	0	5.233449	7	11	0	73	2	16	0	0

# of collect	Collector-fi	# of collect	Collector-g	# of predat	Predator al	# of Ephem	Ephemeroj	# of Plecop	Plecoptera	# of Tricho	Trichoptera	# of Coleop	Coleoptera
5	151	12	3014	12	415	10	2104	6	407	7	259	5	610
3	29	8	82	8	60	5	74	5	44	4	52	4	22
2	19	4	27	7	17	3	12	2	5	5	39	1	3
1	1	2	4	5	10	0		2	3	2	4	1	2
3	82	5	823	10	123	2	690	5	70	5	113	3	86
1	16	2	44	6	21	1	42	6	17	2	21	1	4
4	39	3	176	11	102	1	151	4	51	6	65	1	1
3	31	2	7	7	20	1	6	4	12	3	31	2	5
6	353	4	459	12	120	2	345	4	71	6	168	1	8
4	32	2	17	6	31	1	14	4	12	3	23	3	17
6	1349	5	970	10	271	2	841	6	355	8	1086	1	10
6	109	7	64	13	86	2	39	4	44	6	72	9	45

# of Megal	Megalopte	# of Dipter	Diptera abu	# of Chiron	Chironomi	# of Crusta	Crustacea a	# of Oligoc	Oligochaet	# of Mollus	Mollusca al	# of other t	Other abur
0	0	13	1005	4	825	0	0	0	0	0	0	2	57.27323
0	0	4	10	1	7	0	0	1	1	1	1	0	0
0	0	3	19	1	15	0	0	0	0	0	0	3	5.41876
0	0	1	3	1	3	0	0	0	0	0	0	3	23
0	0	7	125	2	102	0	0	0	0	0	0	2	29.14711
0	0	1	2	1	2	0	0	0	0	0	0	1	2
0	0	6	38	2	26	0	0	0	0	0	0	3	38.43875
0	0	2	2	1	1	0	0	0	0	0	0	1	3
0	0	9	317	2	114	0	0	0	0	0	0	4	35.47709
0	0	2	12	1	3	0	0	0	0	0	0	1	4
0	0	8	626	3	129	0	0	0	0	0	0	0	0
0	0	6	77	3	19	0	0	0	0	1	1	3	7

# of Insect	Insect abur	# of non-in	Non-insect abundance
41	4384.867	2	57.40646
22	202	3	3
14	78.0369	3	5.381855
6	12	3	4
22	1082.65	2	30.49718
11	86	1	2
18	305.4203	3	39.01845
12	56	1	3
22	909.0093	4	35.46782
13	78	1	4
26	2926.683	0	0
32	286	1	1

Taxa by sample abundances
Abundance data is the estimated number per square meter for quantitative samples
Abundance data is the estimated number per sample for qualitative samples

Code	Phylum	Class	Order	Family	Subfamily	Genus	Species
19	Annelida	Clitellata					
63	Arthropoda	Arachnida	Trombidiformes	Lebertiidae		Lebertia	
67	Arthropoda	Arachnida	Trombidiformes	Sperchonidae		Sperchon	
2162	Arthropoda	Arachnida	Trombidiformes	Sperchonidae		Sperchonopsis	
2171	Arthropoda	Arachnida	Trombidiformes	Torrenticolidae		Testudacarus	
2172	Arthropoda	Arachnida	Trombidiformes	Torrenticolidae		Torrenticola	
54	Arthropoda	Arachnida	Trombidiformes	Torrenticolidae			
58	Arthropoda	Arachnida	Trombidiformes				
101	Arthropoda	Insecta	Coleoptera	Amphizoidae		Amphizoa	
104	Arthropoda	Insecta	Coleoptera	Dryopidae		Helichus	
119	Arthropoda	Insecta	Coleoptera	Dytiscidae	Colymbetinae	Rhantus	
2180	Arthropoda	Insecta	Coleoptera	Dytiscidae	Hydroporinae	Liodessus	obscurellus
1767	Arthropoda	Insecta	Coleoptera	Dytiscidae	Laccophilinae	Laccophilus	maculosus
730	Arthropoda	Insecta	Coleoptera	Dytiscidae		Uvarus	
105	Arthropoda	Insecta	Coleoptera	Dytiscidae			
129	Arthropoda	Insecta	Coleoptera	Elmidae		Heterlimnius	corpulentus
134	Arthropoda	Insecta	Coleoptera	Elmidae		Narpus	concolor
135	Arthropoda	Insecta	Coleoptera	Elmidae		Optioservus	
146	Arthropoda	Insecta	Coleoptera	Elmidae		Zaitzevia	parvulus
121	Arthropoda	Insecta	Coleoptera	Elmidae			

152	Arthropoda	Insecta	Coleoptera	Haliplidae		Peltodytes	
160	Arthropoda	Insecta	Coleoptera	Helophoridae		Helophorus	
1221	Arthropoda	Insecta	Coleoptera	Hydraenidae		Ochthebius	
158	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Hydrophilinae	Enochrus	
161	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Hydrophilinae	Hydrobius	
166	Arthropoda	Insecta	Coleoptera	Hydrophilidae	Hydrophilinae	Tropisternus	
908	Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogoninae	Probezzia	
182	Arthropoda	Insecta	Diptera	Chironomidae	Chironominae		
184	Arthropoda	Insecta	Diptera	Chironomidae	Orthocladiinae		
187	Arthropoda	Insecta	Diptera	Chironomidae	Tanypodinae		
180	Arthropoda	Insecta	Diptera	Chironomidae			
202	Arthropoda	Insecta	Diptera	Empididae		Clinocera	
2253	Arthropoda	Insecta	Diptera	Empididae		Neoplasta	
200	Arthropoda	Insecta	Diptera	Empididae			
216	Arthropoda	Insecta	Diptera	Psychodidae		Pericoma	
672	Arthropoda	Insecta	Diptera	Ptychopteridae		Ptychoptera	
2767	Arthropoda	Insecta	Diptera	Simuliidae	Simuliinae	Simulium	tuberosum group
223	Arthropoda	Insecta	Diptera	Simuliidae	Simuliinae	Simulium	
221	Arthropoda	Insecta	Diptera	Simuliidae			
225	Arthropoda	Insecta	Diptera	Stratiomyidae			
236	Arthropoda	Insecta	Diptera	Tipulidae		Antocha	monticola
237	Arthropoda	Insecta	Diptera	Tipulidae		Dicranota	
241	Arthropoda	Insecta	Diptera	Tipulidae		Hexatoma	
247	Arthropoda	Insecta	Diptera	Tipulidae		Tipula	
173	Arthropoda	Insecta	Diptera				
303	Arthropoda	Insecta	Ephemeroptera	Ameletidae		Ameletus	
250	Arthropoda	Insecta	Ephemeroptera	Baetidae		Baetis	
834	Arthropoda	Insecta	Ephemeroptera	Baetidae		Diphetor	hageni
249	Arthropoda	Insecta	Ephemeroptera	Baetidae			
267	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae		Drunella	doddsii
836	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae		Drunella	spinifera
943	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae		Serratella	tibialis
262	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae			
279	Arthropoda	Insecta	Ephemeroptera	Heptageniidae		Cinygmula	
276	Arthropoda	Insecta	Ephemeroptera	Heptageniidae			
292	Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae		Paraleptophlebia	
314	Arthropoda	Insecta	Hemiptera	Corixidae			
925	Arthropoda	Insecta	Hemiptera	Gerridae	Gerrinae	Aquarius	
337	Arthropoda	Insecta	Hemiptera	Notonectidae	Notonectinae	Notonecta	

364	Arthropoda	Insecta	Odonata	Aeshnidae			
385	Arthropoda	Insecta	Odonata	Gomphidae			
404	Arthropoda	Insecta	Plecoptera	Capniidae	Capniinae		
418	Arthropoda	Insecta	Plecoptera	Chloroperlidae	Chloroperlinae	Suwallia	
419	Arthropoda	Insecta	Plecoptera	Chloroperlidae		Sweltsa	
412	Arthropoda	Insecta	Plecoptera	Chloroperlidae			
909	Arthropoda	Insecta	Plecoptera	Nemouridae		Zapada	cinctipes
1318	Arthropoda	Insecta	Plecoptera	Nemouridae		Zapada	oregonensis group
439	Arthropoda	Insecta	Plecoptera	Nemouridae		Zapada	
429	Arthropoda	Insecta	Plecoptera	Nemouridae			
838	Arthropoda	Insecta	Plecoptera	Perlidae		Hesperoperla	pacifica
462	Arthropoda	Insecta	Plecoptera	Perlodidae	Isoperlinae	Isoperla	
972	Arthropoda	Insecta	Plecoptera	Perlodidae	Perlodinae	Skwala	americana
944	Arthropoda	Insecta	Plecoptera	Perlodidae		Megarcys	signata
455	Arthropoda	Insecta	Plecoptera	Perlodidae			
800	Arthropoda	Insecta	Plecoptera	Pteronarcyidae	Pteronarcyinae	Pteronarcella	badia
403	Arthropoda	Insecta	Plecoptera				
809	Arthropoda	Insecta	Trichoptera	Brachycentridae		Brachycentrus	americanus
483	Arthropoda	Insecta	Trichoptera	Brachycentridae		Brachycentrus	
484	Arthropoda	Insecta	Trichoptera	Brachycentridae		Micrasema	
491	Arthropoda	Insecta	Trichoptera	Glossosomatidae	Glossosomatinae	Glossosoma	
807	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Arctopsychinae	Arctopsyche	grandis
499	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsychinae	Hydropsyche	
495	Arthropoda	Insecta	Trichoptera	Hydropsychidae			
506	Arthropoda	Insecta	Trichoptera	Hydroptilidae			
519	Arthropoda	Insecta	Trichoptera	Lepidostomatidae	Lepidostomatinae	Lepidostoma	
540	Arthropoda	Insecta	Trichoptera	Limnephilidae		Grammotaulius	
528	Arthropoda	Insecta	Trichoptera	Limnephilidae			
567	Arthropoda	Insecta	Trichoptera	Philopotamidae	Philopotaminae	Dolophilodes	
1206	Arthropoda	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	brunnea/vemna gro
584	Arthropoda	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	
480	Arthropoda	Insecta	Trichoptera				
647	Mollusca	Bivalvia	Veneroida	Pisidiidae	Pisidiinae	Pisidium	
610	Mollusca	Gastropoda	Basommatophora	Physidae	Physinae	Physa	
655	Platyhelminthes	Turbellaria					

Sample ID	139855	139856	139857	139858	139859	139860	139861	139862	139863	139864
Station	KERBERCK-01	KERBERCK-0	KERBERCK-0	KERBERCK-02	KERBERCK-0	KERBERCK-03	KERBERCK-0	KERBERCK-0	KERBERCK-0	KERBERCK-0
Stream	Kerber Creek dov	Kerber Creel	Kerber Cree	Kerber Creek u	Kerber Creek	Kerber Creek	Kerber Creek	Kerber Creek	Kerber Creel	Kerber Creek
County	Saguache	Saguache	Saguache	Saguache	Saguache	Saguache	Saguache	Saguache	Saguache	Saguache
State	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO
Latitude	38.318	38.318	38.278528	38.278528	38.271306	38.2713056	38.254139	38.2541389	38.214917	38.214917
Longitude	106.1515556	106.15156	106.14817	106.148167	106.14897	106.148972	106.12825	106.12825	106.08028	106.08028
Elevation (m)	3009.146341	3009.1463	2814.3293	2814	2794.5122	2794.5122	2739.939	2739.93902	2625.9146	2625.9146
Date	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008
Habitat Sampled	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle
Collection method	Surber net	Kick net	Surber net	Kick net	Surber net	Kick net	Surber net	Kick net	Surber net	Kick net
field notes		Also Pool Habitat		Also Pool Habitat		Also Pool Habitat		Also Pool Habitat		Also Pool Hal
Lab notes										
area (m^2) sampled	0.74323809	0.1858095	0.7432381	0.186	0.7432381	0.18580952	0.7432381	0.18580952	0.7432381	0.1858095
Field split	100	100	100	100	100	100	100	100	100	100
LABSPLIT	18.75	100	100	100.00	75	100	100	100	87.25	100
# of subsampled organisms	629	205	62	16	624	88	256	59	614	82
	0	1	0	0	0	0	0	0	0	0
	14.35161018	0	1.345464	1	21.52742	2	30.945669	3	21.589109	4
	0	0	0	2	8.969759	0	6.7273188	0	10.79455	0
	0	0	0	0	0	0	0	0	1.542079	0
	43.05484009	0	2.690928	0	0	0	1.345464	0	0	0
	0	0	0	0	0	0	0	0	1.542079	0
	0	1	0	0	0	0	0	0	0	0
	0	0	1.345464	0	0	0	0	0	0	0
	0	5	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0
	0	0	0	2	0	0	0	4	7.7103949	15
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1.345464	0	0	0
	0	0	0	0	1.793952	0	0	0	0	0
	193.7467957	64.582268	2.690928	0	53.370071	21.52742	0	1	0	0
	28.7032299	0	0	0	0	0	0	0	0	0
	93.28549194	0	0	0	0	0	0	0	0	0
	21.52742004	0	0	0	0	0	0	0	0	0
	272.6806946	4	0	0	30.497181	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
21.52742004	0	1.345464	0	10.76371	0	5.381855	0	0	0
35.87903976	0	0	0	0	0	0	0	0	0
753.4597778	7	14.8001	3	93.285492	2	21.52742	1	105.8136	3
14.35161018	0	0	0	0	0	0	0	0	0
21.52742004	0	0	0	8.969759	0	4.0363922	0	7.7103949	0
0	1	0	0	0	0	0	0	1.542079	0
0	0	0	0	0	0	0	0	0	0
7.175806999	0	0	0	0	0	1.345464	0	0	0
28.7032299	1	0	0	0	0	0	0	0	0
14.35161018	0	0	0	0	0	0	0	0	0
7.175806999	0	0	0	0	0	0	0	0	0
28.7032299	0	0	0	1.793952	0	1.345464	0	123.1697	9
0	0	0	0	0	0	0	0	70.935631	0
0	0	0	0	1.793952	0	0	0	0	0
7.175806999	0	0	0	0	0	0	0	0	0
64.58226776	1	2.690928	0	6.7273188	0	4.0363922	1	3.0841579	0
1.345463991	0	0	0	0	0	0	0	1.542079	0
0	0	0	0	0	0	0	0	1.542079	0
0	0	0	0	1.793952	0	0	0	1.542079	0
15.69707966	0	0	0	0	0	0	0	0	0
911.3275146	33	2.690928	0	687.98053	42	150.692	6	195.6474	14
0	1	0	0	0	0	0	0	0	0
14.35161018	0	0	0	0	0	0	0	149.5816	0
14.35161018	0	0	0	1.793952	0	0	0	0	0
14.35161018	0	0	0	0	0	0	0	0	0
7.175806999	0	0	0	0	0	0	0	0	0
868.2727051	26	8.0727835	0	0	0	0	0	0	0
107.6371002	0	0	0	0	0	0	0	0	0
71.7580719	5	0	0	0	0	0	0	0	0
78.93388367	9	1.345464	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	7.175806999	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	2.690928	2	0	2
	21.52742004	6	4.0363922	2	47.988209	11	24.218349	2	15.42079	2
	0	0	0	0	0	0	16.145571	0	30.841579	0
	114.8128967	0	0	0	0	0	0	0	0	0
	0	0	1.345464	0	0	1	0	0	0	0
	0	11	0	0	0	0	0	0	0	0
	64.58226776	0	0	1	0	0	0	0	0	0
	26.90928078	21	0	0	5.381855	1	0	0	0	0
	0	2	0	0	0	1	0	1	1.542079	2
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	1.345464	1	0	0	0	0
	172.2194061	0	0	0	0	0	8.0727835	7	23.13118	6
	0	0	0	0	3.587904	0	0	0	0	0
	0	4	0	0	12.55766	2	0	0	0	0
	0	0	0	0	56.95797	0	20.181959	18	102.1396	14
	7.175806999	0	16.145571	0	0	0	0	0	0	0
	114.8128967	1	10.76371	0	12.55766	0	12.10917	0	0	0
	7.175806999	0	0	0	0	0	0	0	0	0
	64.58226776	27	2.690928	1	23.321369	16	9.4182472	9	9.2524738	0
	0	0	0	0	0	0	0	4	35.271198	2
	43.05484009	0	0	0	0	0	8.0727835	0	12.33663	7
	0	0	0	0	0	0	0	0	1.542079	0
	7.175806999	0	0	0	0	0	0	0	7.7103949	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	5.381855	0	0	0
	0	1	0	0	0	0	0	0	0	0
up	15.24859047	23	4.0363922	3	5.381855	5	0	0	0	0
	0	0	0	0	14.35161	0	0	0	0	0
	0	0	5.381855	0	0	0	9.4182472	0	0	0
	0	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	1	0	0	0	0	0	0

139865	139866
KERBERCK-0	KERBERCK-06
Kerber Creel	Kerber Creek at Hutchinson
Saguache	Saguache
CO	CO
38.236667	38.236667
105.97886	105.97886
2479.878	2479.878
9/12/2008	9/12/2008
Riffle	Riffle
Surber net	Kick net
ɔitat	Also Pool Habitat
0.7432381	0.1858095
100	100
28.125	100
625	287
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	3
9.5677433	20
0	7
0	0
0	0
0	0
0	0
0	0
0	0
0	0

0	1
0	1
0	2
0	5
0	2
0	4
0	0
9.5677433	10
105.2452	5
0	0
14.35161	4
0	0
9.5677433	0
0	0
0	0
0	0
0	0
278.81	33
177.0033	21
0	0
0	0
0	0
26.610279	4
0	0
4.7838721	0
0	0
276.7171	23
0	0
564.49683	16
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	5
0	1
0	1

0	1
9.5677433	1
0	0
0	0
57.40646	0
43.05484	10
0	0
0	0
0	0
0	0
0	0
26.610279	23
17.04254	4
0	0
66.974213	7
0	0
143.5161	0
49.184181	4
0	0
0	0
0	0
144.11411	15
207.0519	21
492.7388	15
0	0
173.5648	15
1.345464	2
0	0
0	0
0	0
4.7838721	0
14.35161	0
0	0
0	1
0	0

Metric Values for 2009 Kerber Creek Samples

Abundance data is the estimated number per square meter for quantitative samples

Abundance data is the estimated number per sample for qualitative samples

EPT = Ephemeroptera + Plecoptera +Trichoptera

Note that data has NOT been standardized to operational taxonomic units (OTUs) prior to metric computation

Sample ID	Station	Stream	County	State	Latitude	Longitude	Elevation (r	Date	Habitat Sar	Collection r	field notes	Lab notes	area (m^2)
142078	KERBERCK-	Kerber Cre	Saguache	CO	38.318	-106.15156	3009.146	10/2/2009	Riffle	Surber net			74
142079	KERBERCK-	Kerber Cre	Saguache	CO	38.27853	-106.14817	2814.329	10/2/2009	Riffle	Surber net			0.74
142080	KERBERCK-	Kerber Cre	Saguache	CO	38.27131	-106.14897	2794.512	10/2/2009	Riffle	Surber net			0.74
142081	KERBERCK-	Kerber Cre	Saguache	CO	38.25414	-106.12825	2739.939	10/2/2009	Riffle	Surber net			0.74
142082	KERBERCK-	Kerber Cre	Saguache	CO	38.21492	-106.08028	2625.915	10/2/2009	Riffle	Surber net			0.74
142083	KERBERCK-	Kerber Cre	Saguache	CO	38.23667	-105.97886	2479.878	10/2/2009	Riffle	Surber net			0.74

Field split	LABSPLIT	# of subsar	Richness	Abundance	Shannon's	Simpson's I	Evenness	# of Famili	Abundance	Abundance	# of genera	# of EPT ta	EPT taxa ab
100	25	803	39	42.14865	2.650661	1.18E-01	0.72352	25	13	10	24	24	25
100	100	167	39	225.6757	2.882337	1.01E-01	0.786758	29	58	57	22	21	108
100	100	628	39	848.6486	2.609282	1.29E-01	0.712226	23	251	243	22	22	520
100	100	437	33	590.5405	2.007551	2.66E-01	0.574159	20	272	268	18	15	227
100	31.25	665	26	2863.784	2.09263	2.24E-01	0.642286	20	1511	1250	13	15	2302
100	25	652	32	3350	2.155347	1.74E-01	0.621902	20	1576	1016	20	17	3009

# of taxa w	# of taxa w	Taxa abunc	Taxa abunc	TV1 Index	# of clinger	# of long-li	Elmidae ab	CTQd	# of shredd	Shredder A	# of scrape	Scraper abı	# of collect
17	1	10	0	3.735751	17	7	2	80	7	6	4	2	3
14	0	58	0	3.203593	12	6	14	67	7	24	3	8	3
16	0	192	0	3.280255	17	9	224	64	5	50	5	12	4
9	0	72	0	4.370709	9	5	4	73	4	7	0	0	4
8	0	363	0	3.66112	6	3	4	76	2	43	0	0	6
11	0	853	0	3.297209	10	6	0	71	2	49	0	0	5

Collector-fi	# of collect	Collector-g	# of predat	Predator al	# of Ephem	Ephemeroı	# of Plecop	Plecoptera	# of Tricho	Trichopter	# of Coleoı	Coleoptera	# of Megal
1	10	25	12	4	9	16	9	6	6	3	3	2	0
4	9	115	15	61	8	51	7	20	6	36	3	18	0
81	6	362	15	180	4	255	10	132	8	132	5	224	0
30	4	409	18	139	1	139	6	49	8	39	3	15	0
817	3	1558	11	268	2	1511	5	221	8	571	2	26	0
1623	7	751	17	916	3	600	5	722	9	1688	2	49	0

Megalopte	# of Dipter	Diptera abu	# of Chiron	Chironomic	# of Crusta	Crustacea a	# of Oligocl	Oligochaet	# of Mollus	Mollusca al	# of other t	Other abur	# of Insect
0	8	14	3	13	0	0	1	0	0	0	3	1.148649	35
0	8	76	2	58	0	0	1	3	1	1	5	20.67568	32
0	6	80	3	42	0	0	0	0	0	0	6	25.64865	33
0	9	327	3	272	0	0	0	0	0	0	6	21.54054	27
0	6	510	1	48	0	0	0	0	0	0	3	24.78378	23
0	10	235	4	162	0	0	0	0	0	0	1	26	31

Insect abur	# of non-in	Non-insect abundance
40.90541	4	1.243243
201.3514	7	24.32432
824.3243	6	24.32432
568.9189	6	21.62162
2837.838	3	25.94595
3322.973	1	27.02703

Taxa by sample abundances
Abundance data is the estimated number per square meter for quantitative samples
Abundance data is the estimated number per sample for qualitative samples

Code	Phylum	Class	Order	Family	Subfamily	Genus	Species
19	Annelida	Clitellata					
65	Arthropoda	Arachnida	Trombidiformes	Hydryphantidae		Protzia	
63	Arthropoda	Arachnida	Trombidiformes	Lebertiidae		Lebertia	
2150	Arthropoda	Arachnida	Trombidiformes	Mideopsidae		Mideopsis	
67	Arthropoda	Arachnida	Trombidiformes	Sperchonidae		Sperchon	
2162	Arthropoda	Arachnida	Trombidiformes	Sperchonidae		Sperchonopsis	
66	Arthropoda	Arachnida	Trombidiformes	Sperchonidae			
2171	Arthropoda	Arachnida	Trombidiformes	Torrenticolidae		Testudacarus	
2172	Arthropoda	Arachnida	Trombidiformes	Torrenticolidae		Torrenticola	
58	Arthropoda	Arachnida	Trombidiformes				
94	Arthropoda	Entognatha	Collembola				
2180	Arthropoda	Insecta	Coleoptera	Dytiscidae	Hydroporinae	Liodessus	obscurellus
129	Arthropoda	Insecta	Coleoptera	Elmidae		Heterlimnius	corpulentus
2095	Arthropoda	Insecta	Coleoptera	Elmidae		Optioservus	divergens/pecosensis
1076	Arthropoda	Insecta	Coleoptera	Elmidae		Optioservus	quadrimaculatus
135	Arthropoda	Insecta	Coleoptera	Elmidae		Optioservus	
146	Arthropoda	Insecta	Coleoptera	Elmidae		Zaitzevia	parvulus

121	Arthropoda	Insecta	Coleoptera	Elmidae			
1221	Arthropoda	Insecta	Coleoptera	Hydraenidae		Ochthebius	
908	Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogoninae	Probezzia	
179	Arthropoda	Insecta	Diptera	Ceratopogonidae			
182	Arthropoda	Insecta	Diptera	Chironomidae	Chironominae		
184	Arthropoda	Insecta	Diptera	Chironomidae	Orthocladiinae		
187	Arthropoda	Insecta	Diptera	Chironomidae	Tanypodinae		
180	Arthropoda	Insecta	Diptera	Chironomidae			
201	Arthropoda	Insecta	Diptera	Empididae	Hemerodromiinae	Chelifera	
2253	Arthropoda	Insecta	Diptera	Empididae		Neoplasta	
206	Arthropoda	Insecta	Diptera	Empididae		Wiedemannia	
200	Arthropoda	Insecta	Diptera	Empididae			
216	Arthropoda	Insecta	Diptera	Psychodidae		Pericoma	
223	Arthropoda	Insecta	Diptera	Simuliidae	Simuliinae	Simulium	
221	Arthropoda	Insecta	Diptera	Simuliidae			
243	Arthropoda	Insecta	Diptera	Tipulidae	Limoniinae	Limnophila	
237	Arthropoda	Insecta	Diptera	Tipulidae		Dicranota	
241	Arthropoda	Insecta	Diptera	Tipulidae		Hexatoma	
303	Arthropoda	Insecta	Ephemeroptera	Ameletidae		Ameletus	
907	Arthropoda	Insecta	Ephemeroptera	Baetidae		Acentrella	
250	Arthropoda	Insecta	Ephemeroptera	Baetidae		Baetis	
249	Arthropoda	Insecta	Ephemeroptera	Baetidae			
4077	Arthropoda	Insecta	Ephemeroptera	Baetidae			
267	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae		Drunella	doddsii
262	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae			
279	Arthropoda	Insecta	Ephemeroptera	Heptageniidae		Cinygmula	
280	Arthropoda	Insecta	Ephemeroptera	Heptageniidae		Epeorus	
285	Arthropoda	Insecta	Ephemeroptera	Heptageniidae		Rhithrogena	
276	Arthropoda	Insecta	Ephemeroptera	Heptageniidae			
292	Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae		Paraleptophlebia	
287	Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae			
1248	Arthropoda	Insecta	Odonata	Gomphidae		Ophiogomphus	severus
385	Arthropoda	Insecta	Odonata	Gomphidae			
404	Arthropoda	Insecta	Plecoptera	Capniidae	Capniinae		
419	Arthropoda	Insecta	Plecoptera	Chloroperlidae		Sweltsa	

412	Arthropoda	Insecta	Plecoptera	Chloroperlidae			
909	Arthropoda	Insecta	Plecoptera	Nemouridae		Zapada	cinctipes
1318	Arthropoda	Insecta	Plecoptera	Nemouridae		Zapada	oregonensis group
429	Arthropoda	Insecta	Plecoptera	Nemouridae			
838	Arthropoda	Insecta	Plecoptera	Perlidae		Hesperoperla	pacifica
444	Arthropoda	Insecta	Plecoptera	Perlidae			
462	Arthropoda	Insecta	Plecoptera	Perlodidae	Isoperlinae	Isoperla	
458	Arthropoda	Insecta	Plecoptera	Perlodidae	Perlodinae	Diura	
469	Arthropoda	Insecta	Plecoptera	Perlodidae	Perlodinae	Skwala	
464	Arthropoda	Insecta	Plecoptera	Perlodidae		Megarcys	
455	Arthropoda	Insecta	Plecoptera	Perlodidae			
800	Arthropoda	Insecta	Plecoptera	Pteronarcyidae	Pteronarcyinae	Pteronarcella	badia
474	Arthropoda	Insecta	Plecoptera	Taeniopterygidae			
403	Arthropoda	Insecta	Plecoptera				
809	Arthropoda	Insecta	Trichoptera	Brachycentridae		Brachycentrus	americanus
932	Arthropoda	Insecta	Trichoptera	Brachycentridae		Brachycentrus	occidentalis
483	Arthropoda	Insecta	Trichoptera	Brachycentridae		Brachycentrus	
484	Arthropoda	Insecta	Trichoptera	Brachycentridae		Micrasema	
481	Arthropoda	Insecta	Trichoptera	Brachycentridae			
807	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Arctopsychinae	Arctopsyche	grandis
499	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsychinae	Hydropsyche	
495	Arthropoda	Insecta	Trichoptera	Hydropsychidae			
506	Arthropoda	Insecta	Trichoptera	Hydroptilidae			
519	Arthropoda	Insecta	Trichoptera	Lepidostomatidae	Lepidostomatinae	Lepidostoma	
525	Arthropoda	Insecta	Trichoptera	Leptoceridae	Leptocerinae	Oecetis	
520	Arthropoda	Insecta	Trichoptera	Leptoceridae			
528	Arthropoda	Insecta	Trichoptera	Limnephilidae			
1206	Arthropoda	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	brunnea/vemna group
2354	Arthropoda	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	sibirica group A
584	Arthropoda	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	
480	Arthropoda	Insecta	Trichoptera				
647	Mollusca	Bivalvia	Veneroida	Pisidiidae	Pisidiinae	Pisidium	
652	Nemata						
655	Platyhelminthes	Turbellaria					

Sample ID	142078	142079
Station	KERBERCK-01	KERBERCK-02
Stream	Kerber Creek downstream from Mosquito Creek	Kerber Creek upstream of confluence with Brewery Creek
County	Saguache	Saguache
State	CO	CO
Latitude	38.318	38.27852778
Longitude	-106.1515556	-106.1481667
Elevation (m)	3009.146341	2814.329268
Date	10/2/2009	10/2/2009
Habitat Sampled	Riffle	Riffle
Collection method	Surber net	Surber net
field notes		
Lab notes		
area (m^2) sampled	74	0.74
Field split	100	100
LABSPLIT	25	100
# of subsampled organisms	803	167
	0.108108103	2.702702999
	0	0
	0	4.054053783
	0	2.702702999
	0	0
	0	0
	0	0
	0.810810804	1.351351023
	0	0
	0.270270288	1.351351023
	0.054054055	0
	0	4.054053783
	2.216216087	12.16215992
	0	0
	0	0
	0.1621622	0
	0.054054055	0

0	1.351351023
0	0
0	4.054053783
0.054054055	2.702702999
4.432433128	1.351351023
8.202703476	56.75675964
0.108108103	0
0	0
0	2.702702999
0	0
0.378378391	0
0	1.351351023
0.1621622	0
0.108108103	0
0	1.351351023
0	0
0.364864886	5.405405998
0	0
0.054054055	1.351351023
0	0
9.97297287	35.13513947
0	0
1.783784032	1.351351023
0	0
1.297297001	1.351351023
0.270270288	2.702702999
0.378378391	4.054053783
0.054054055	0
1.405405045	4.054053783
0.594594598	0
0	1.351351023
0	0
0	0
1.675675988	9.459459305
0.148648605	2.702702999

0.108108103	0
1.581081033	2.702702999
0.5	0
0	0
0.82432431	1.351351023
0	0
0.918918908	0
0	0
0	0
0	1.351351023
0	0
0.013513514	1.351351023
0.108108103	1.351351023
0	0
0.216216207	0
0	0
0	0
0.32432431	1.351351023
0	0
0.743243217	1.351351023
0	0
0	0
0	0
1.513514042	6.756756783
0	0
0	0
0	1.351351023
0.108108103	6.756756783
0	0
0.067567565	18.91892052
0	0
0	1.351351023
0	0
0	10.81081009

142080	142081	142082
KERBERCK-03	KERBERCK-04	KERBERCK-05
Kerber Creek downstream from confluence of Brewery Creek	Kerber Creek at Ashley upstream from construction	Kerber Creek at Soda Springs
Saguache	Saguache	Saguache
CO	CO	CO
38.27130556	38.25413889	38.21491667
-106.1489722	-106.12825	-106.0802778
2794.512195	2739.939024	2625.914634
10/2/2009	10/2/2009	10/2/2009
Riffle	Riffle	Riffle
Surber net	Surber net	Surber net
0.74	0.74	0.74
100	100	100
100	100	31.25
628	437	665
0	0	0
1.351351023	0	0
13.51350975	6.756756783	17.29730034
0	1.351351023	0
0	5.405405998	0
1.351351023	0	0
1.351351023	0	4.324324131
0	4.054053783	0
4.054053783	0	4.324324131
0	2.702702999	0
0	1.351351023	0
0	10.81081009	21.62162018
150	2.702702999	0
2.702702999	0	0
1.351351023	1.351351023	4.324324131
1.351351023	0	0
0	0	0

68.91892242	0	0
0	0	0
5.405405998	8.108109474	4.324324131
0	8.108109474	0
1.351351023	0	0
39.18918991	267.5675964	47.56756973
0	2.702702999	0
1.351351023	1.351351023	0
0	0	0
0	8.108109474	0
0	0	0
0	1.351351023	4.324324131
0	0	0
4.054053783	0	134.0540009
0	0	307.0270081
0	2.702702999	0
28.37837982	27.02703094	12.97297001
0	0	0
0	0	0
0	0	0
243.2431946	139.1891937	260.810791
8.108109474	0	1249.72998
0	0	0
2.702702999	0	0
0	0	0
0	0	0
0	0	0
0	0	0
1.351351023	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	2.702702999	0
21.62162018	12.16215992	4.324324131

13.51350975	21.62162018	172.9730072
1.351351023	0	0
0	0	0
0	1.351351023	8.648648262
32.43243027	0	0
0	0	0
0	0	0
4.054053783	0	0
0	0	0
1.351351023	0	0
36.48648834	9.459459305	8.648648262
5.405405998	0	0
6.756756783	0	0
9.459459305	1.351351023	25.94594955
0	16.21622086	17.29730034
0	0	0
10.81081009	0	0
35.13513947	1.351351023	0
0	0	103.7837982
63.51351166	5.405405998	0
0	4.054053783	129.4595032
2.702702999	4.054053783	125.4054031
0	0	4.324324131
1.351351023	0	34.59458923
0	0	0
0	0	0
0	1.351351023	0
9.459459305	1.351351023	0
8.108109474	0	0
1.351351023	5.405405998	12.97297001
0	0	142.7026978
0	0	0
2.702702999	0	0
0	0	0

	142083
KERBERCK-06	
Kerber Creek at Hutchinson	
Saguache	
CO	
	38.23666667
	-105.9788611
	2479.878049
	10/2/2009
Riffle	
Surber net	
	0.74
	100
	25
	652
	0
	0
	0
	0
	0
	0
	0
	27.02703094
	0
	0
	0
	37.83784103
	0
	0
	0
	0
	0

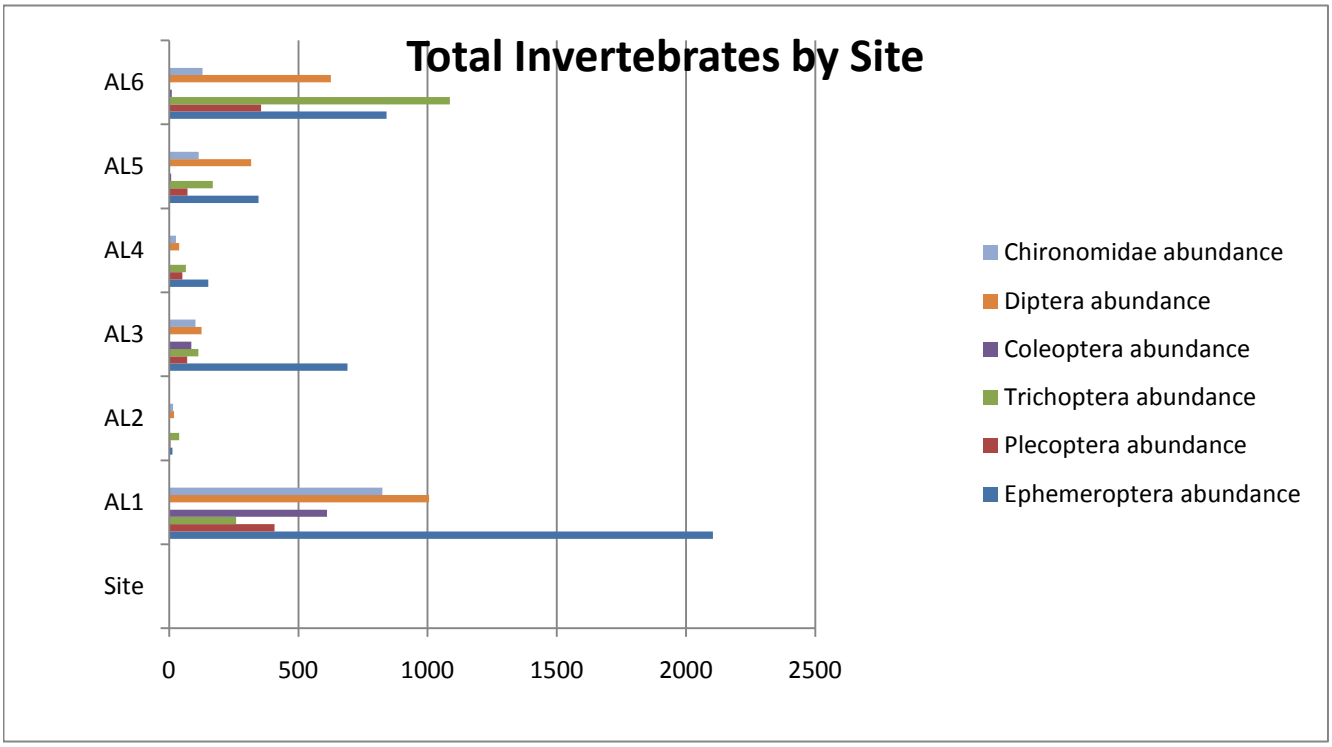
0
10.81081009
10.81081009
0
16.21622086
108.1081009
21.62162018
16.21622086
0
5.405405998
0
0
0
10.81081009
0
5.405405998
5.405405998
35.13513947
0
5.405405998
583.7838135
0
0
0
10.81081009
0
0
0
0
0
0
18.91892052
10.81081009
0
64.86486816

486.4865112
0
0
0
0
16.21622086
0
0
1.351351023
0
152.7026978
0
0
0
0
36.48648834
0
0
0
20.27026939
1016.216003
539.189209
0
43.24324036
5.405405998
10.81081009
5.405405998
0
0
10.81081009
0
0
0
0

Data Analysis of Quantitative Invertebrate Samples: July, 2009

Total Invertebrates by Site

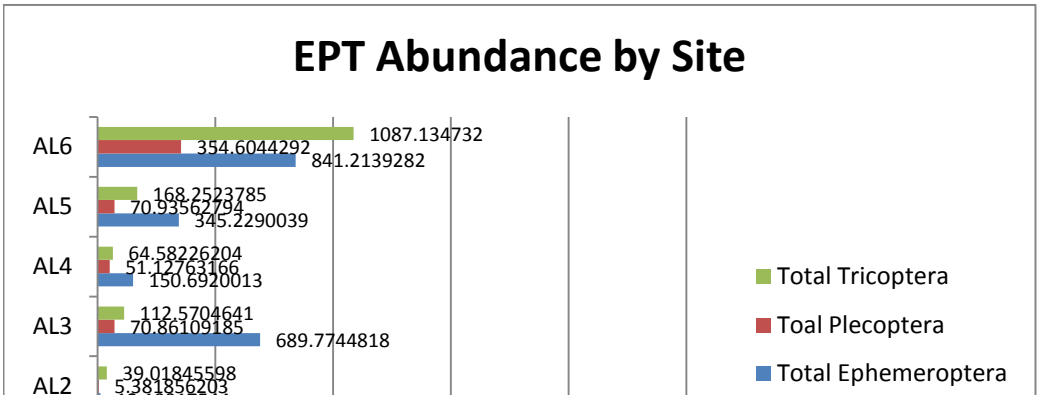
Site	Ephemeroptera abundance	Plecoptera abundance	Trichoptera abundance	Coleoptera abundance	Diptera abundance	Chironomidae abundance
AL1	2104	407	259	610	1005	825
AL2	12	5	39	3	19	15
AL3	690	70	113	86	125	102
AL4	151	51	65	1	38	26
AL5	345	71	168	8	317	114
AL6	841	355	1086	10	626	129

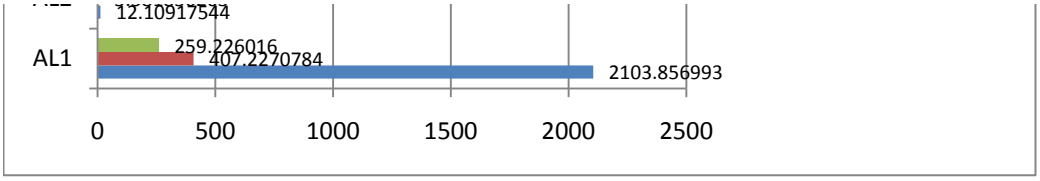


Total EPT by Site

	AL1	AL2	AL3	AL4	AL5	AL6
Total Ephe	2103.857	12.10918	689.7745	150.692	345.229	841.2139
Toal Plecop	407.2271	5.381856	70.86109	51.12763	70.93563	354.6044
Total Tricop	259.226	39.01846	112.5705	64.58226	168.2524	1087.135
%E	0.75943	0.214286	0.789933	0.565657	0.590724	0.368476
%P	0.146997	0.095238	0.08115	0.191919	0.121378	0.155327
%T	0.093573	0.690476	0.128916	0.242424	0.287898	0.476197

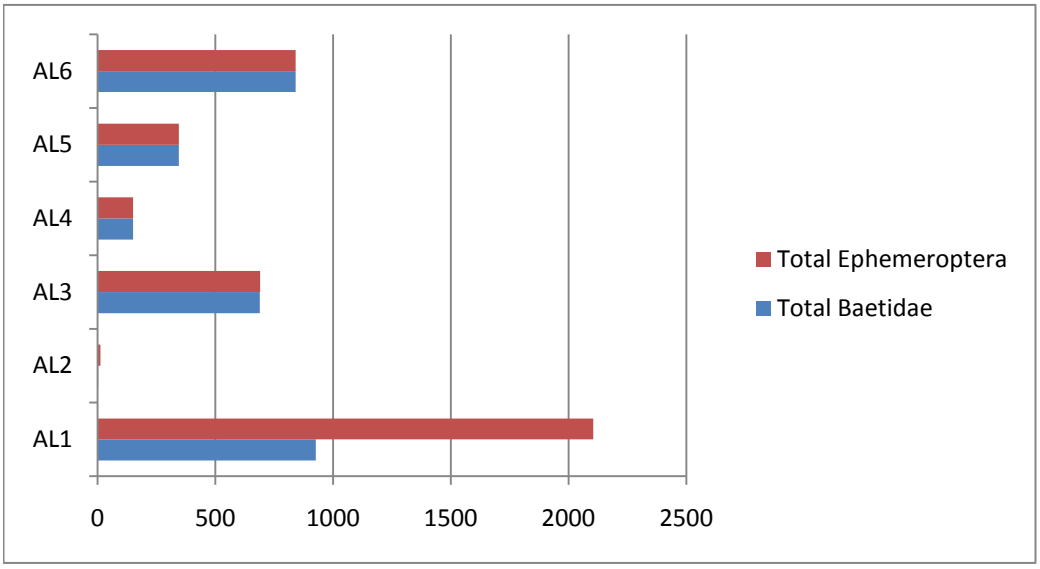
	AL2
Total Ephe	12.10918
Toal Plecop	5.381856
Total Tricop	39.01846





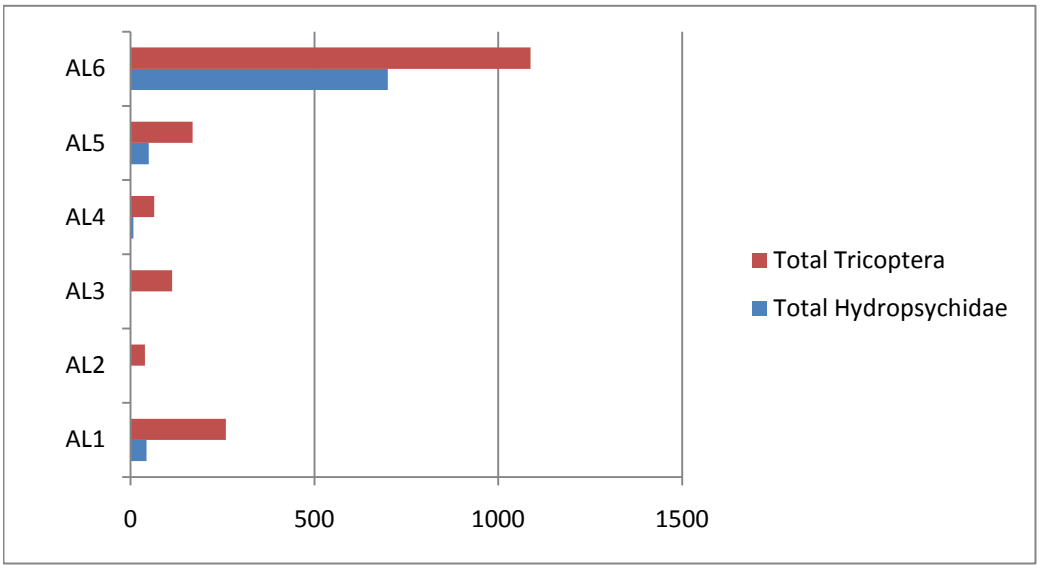
Percent Baetidae of Ephemeroptera

	AL1	AL2	AL3	AL4	AL5	AL6		AL2
Total Baetidae	925.6791	2.690928	687.9805	150.692	345.229	841.2139	Total Baeti	2.69
Total Ephemeroptera	2103.857	12.10918	689.7745	150.692	345.229	841.2139	Total Other	9.42
Percent Baetidae of Ep	0.439991	0.222222	0.997399	1	1	1		



Percent Hydropsychidae of Tricoptera

	AL1	AL2	AL3	AL4	AL5	AL6
Total Hydropsychidae	43.05484	0	0	8.072783	49.14991	699.7907
Total Tricoptera	259.226	39.01846	112.5705	64.58226	168.2524	1087.135



Species abundance/ square m

				Stream	Downstrea	Upstream (	Downstrea	Upstream (	Soda Sprin	Hutchinsor
Order	Family	Genus	Species							
Ephemerop	Ameletidae	Ameletus			15.69708	0	0	0	0	0
Ephemerop	Baetidae	Baetis			911.3275	2.690928	687.9805	150.692	195.6474	276.7171

Ephemerop	Baetidae	Diphetor	hageni	0	0	0	0	0	0
Ephemerop	Baetidae			14.35161	0	0	0	149.5816	564.4968
Ephemerop	Ephemerel	Drunella	doddsii	14.35161	0	1.793952	0	0	0
Ephemerop	Ephemerel	Drunella	spinifera	14.35161	0	0	0	0	0
Ephemerop	Ephemerel	Serratella	tibialis	7.175807	0	0	0	0	0
Ephemerop	Ephemerellidae			868.2727	8.072783	0	0	0	0
Ephemerop	Heptagenii	Cinygmula		107.6371	0	0	0	0	0
Ephemerop	Heptageniidae			71.75807	0	0	0	0	0
Ephemerop	Leptophleb	Paraleptophlebia		78.93388	1.345464	0	0	0	0

Total Baetidae	925.6791	2.690928	687.9805	150.692	345.229	841.2139
Total Ephemeroptera	2103.857	12.10918	689.7745	150.692	345.229	841.2139
Percent Baetidae of Ep	0.439991	0.222222	0.997399	1	1	1

			Stream	Downstrea	Upstream (	Downstrea	Upstream (	Soda Sprin	Hutchinsor
Order	Family	Genus	Species						
Trichoptera	Brachycent	Brachycent	americanus	0	0	56.95797	20.18196	102.1396	49.18418
Trichoptera	Brachycent	Brachycentrus		7.175807	16.14557	0	0	0	0
Trichoptera	Brachycent	Micrasema		114.8129	10.76371	12.55766	12.10917	0	0
Trichoptera	Glossosom	Glossosoma		7.175807	0	0	0	0	0
Trichoptera	Hydropsycl	Arctopsych	grandis	64.58227	2.690928	23.32137	9.418247	9.252474	144.1141
Trichoptera	Hydropsycl	Hydropsyche		0	0	0	0	35.2712	207.0519
Trichoptera	Hydropsychidae			43.05484	0	0	8.072783	12.33663	492.7388
Trichoptera	Hydroptilidae			0	0	0	0	1.542079	0
Trichoptera	Lepidoston	Lepidostoma		7.175807	0	0	0	7.710395	173.5648
Trichoptera	Limnephilic	Grammotaulius		0	0	0	0	0	1.345464
Trichoptera	Limnephilidae			0	0	0	5.381855	0	0
Trichoptera	Philopotam	Dolophilodes		0	0	0	0	0	0
Trichoptera	Rhyacophil	Rhyacophil	brunnea/vemna group	15.24859	4.036392	5.381855	0	0	0
Trichoptera	Rhyacophil	Rhyacophila		0	0	14.35161	0	0	4.783872
Trichoptera				0	5.381855	0	9.418247	0	14.35161

Total Hydropsychidae	43.05484	0	0	8.072783	49.14991	699.7907
Total Tricoptera	259.226	39.01846	112.5705	64.58226	168.2524	1087.135
Percent Hydropsychida	0.16609	0	0	0.125	0.29212	0.643702

			Stream	Downstrea	Upstream (	Downstrea	Upstream (	Soda Sprin	Hutchinsor
Order	Family	Genus	Species						
Plecoptera	Capniidae			7.175807	0	0	0	0	0
Plecoptera	Chloroperli	Suwallia		0	0	0	2.690928	0	0
Plecoptera	Chloroperli	Sweltsa		21.52742	4.036392	47.98821	24.21835	15.42079	57.40646
Plecoptera	Chloroperlidae			0	0	0	16.14557	30.84158	43.05484
Plecoptera	Nemourida	Zapada	cinctipes	114.8129	0	0	0	0	0
Plecoptera	Nemourida	Zapada	oregonensis group	0	1.345464	0	0	0	0
Plecoptera	Nemourida	Zapada		0	0	0	0	0	0
Plecoptera	Nemouridae			64.58227	0	0	0	0	0
Plecoptera	Perlidae	Hesperope	pacifica	26.90928	0	5.381855	0	0	0
Plecoptera	Perlodidae	Isoperla		0	0	0	0	1.542079	26.61028
Plecoptera	Perlodidae	Skwala	americana	0	0	0	0	0	17.04254
Plecoptera	Perlodidae	Megarcys	signata	0	0	1.345464	0	0	0
Plecoptera	Perlodidae			172.2194	0	0	8.072783	23.13118	66.97421
Plecoptera	Pteronarcy	Pteronarce	badia	0	0	3.587904	0	0	0

Plecoptera				0	0	12.55766	0	0	143.5161		

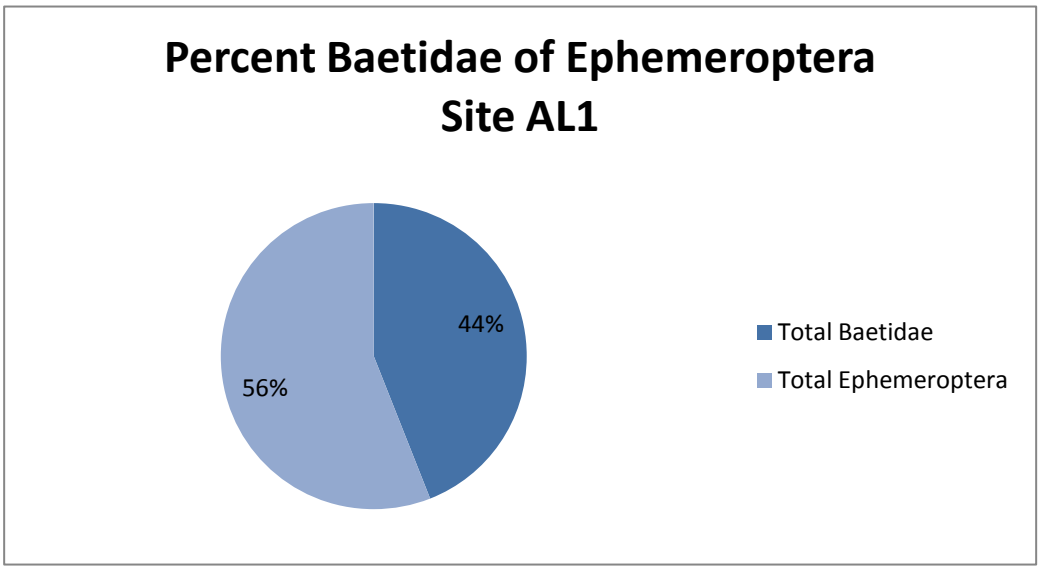
			Total Plecoptera	407.2271	5.381856	70.86109	51.12763	70.93563	354.6044		

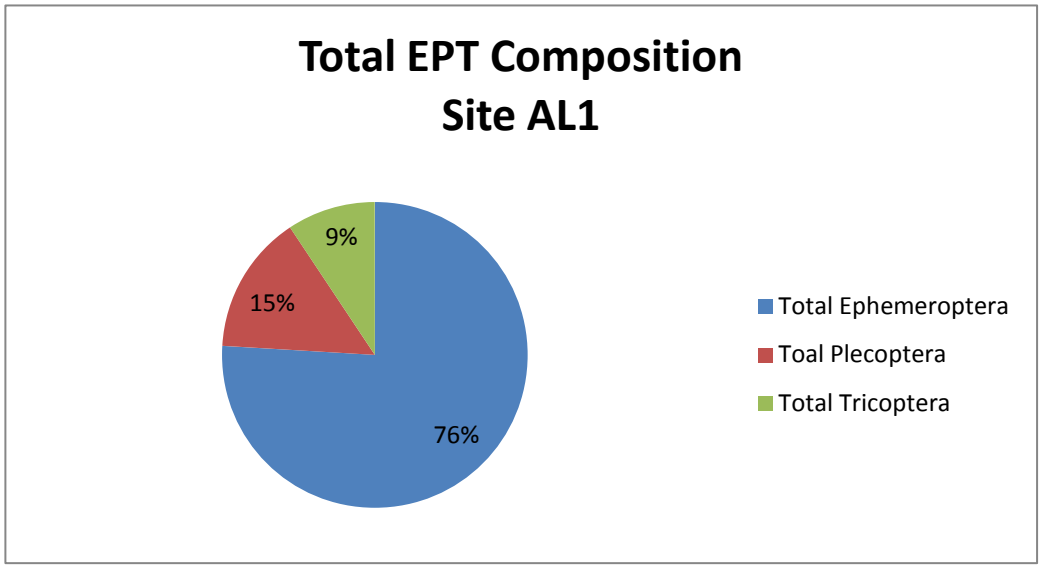
				Stream	Downstrea	Upstream (	Downstrea	Upstream (	Soda Sprin	Hutchinsor
Order	Family	Genus	Species							
Diptera	Chironomidae				35.87904	0	0	0	0	9.567743
Diptera	Chironomidae				753.4598	14.8001	93.28549	21.52742	105.8136	105.2452
Diptera	Chironomidae				14.35161	0	0	0	0	0
Diptera	Chironomidae				21.52742	0	8.969759	4.036392	7.710395	14.35161

	AL4
Total Ephei	150.692
Toal Plecop	51.12763
Total Tricoj	64.58226

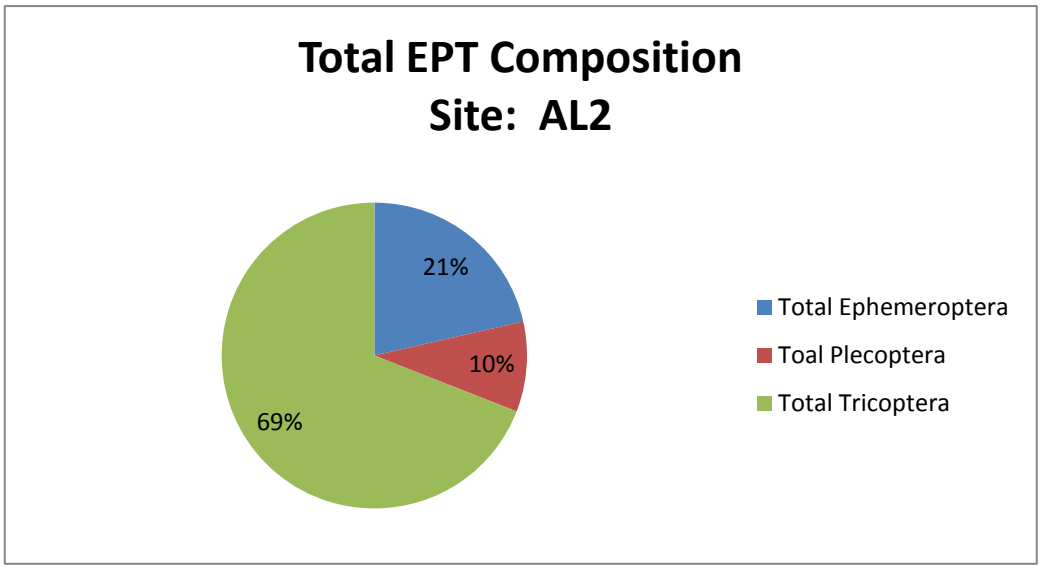
	AL5
Total Ephei	345.229
Toal Plecop	70.93563
Total Tricoj	168.2524

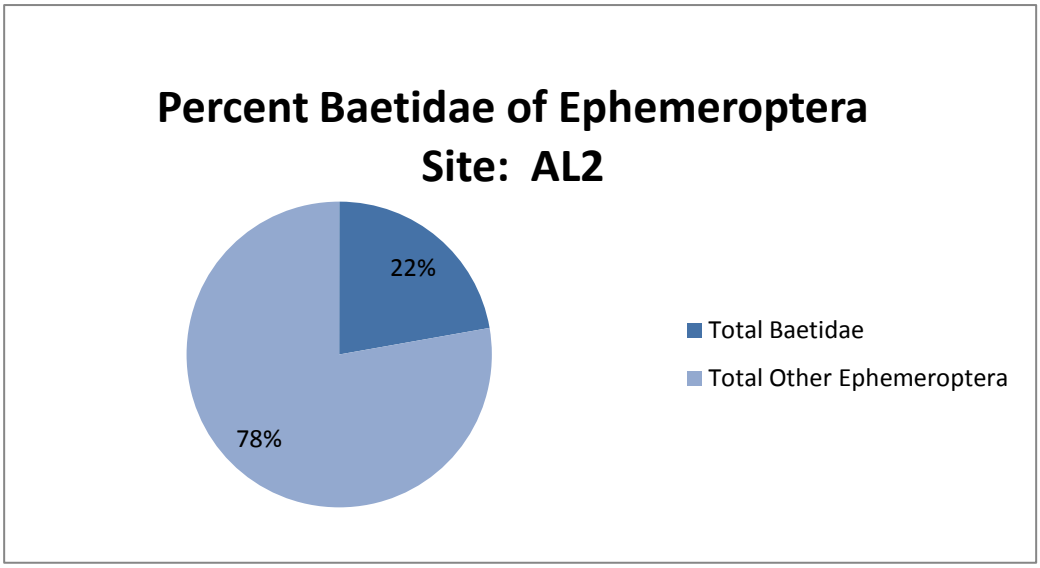
AL6
841.2139
841.2139



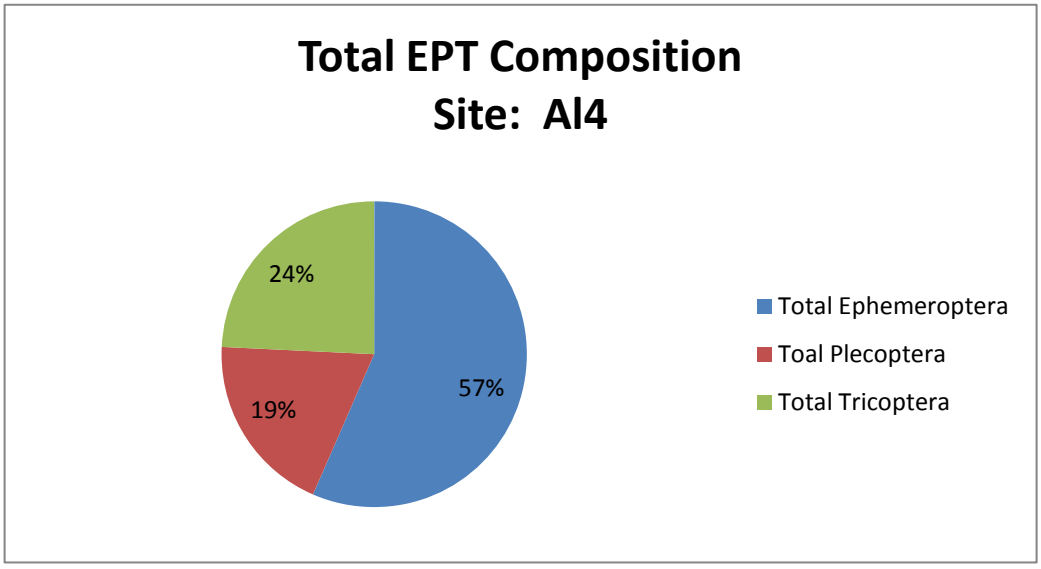


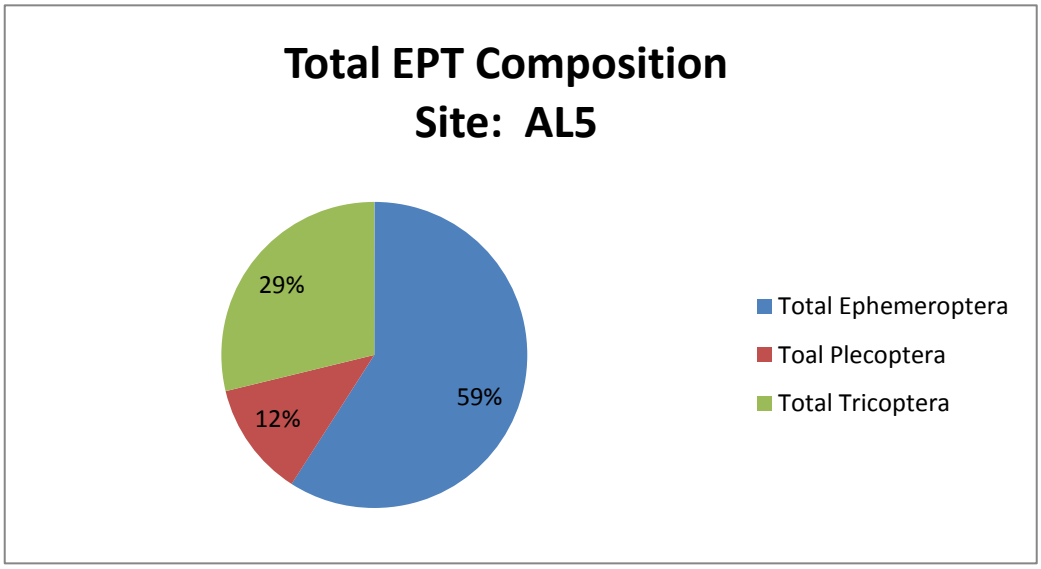
	AL1
Total Baetidae	925.6791
Total Ephemeroptera	1178.18


Total EPT Composition
Site: AL2
21%
10%
69%
Total Ephemeroptera
Toal Plecoptera
Total Tricoptera


Percent Baetidae of Ephemeroptera
Site: AL2
22%
78%
Total Baetidae
Total Other Ephemeroptera

1


Total EPT Composition
Site: Al4
24%
57%
19%
Total Ephemeroptera
Toal Plecoptera
Total Tricoptera


Total EPT Composition
Site: AL5
29%
59%
12%
Total Ephemeroptera
Toal Plecoptera
Total Tricoptera

Total EPT by Site

	AL1	AL2	AL3	AL4	AL5	AL6
Total Ephe	2103.857	12.10918	689.7745	150.692	345.229	841.2139
Toal Plecop	407.2271	5.381856	70.86109	51.12763	70.93563	354.6044
Total Tricop	259.226	39.01846	112.5705	64.58226	168.2524	1087.135

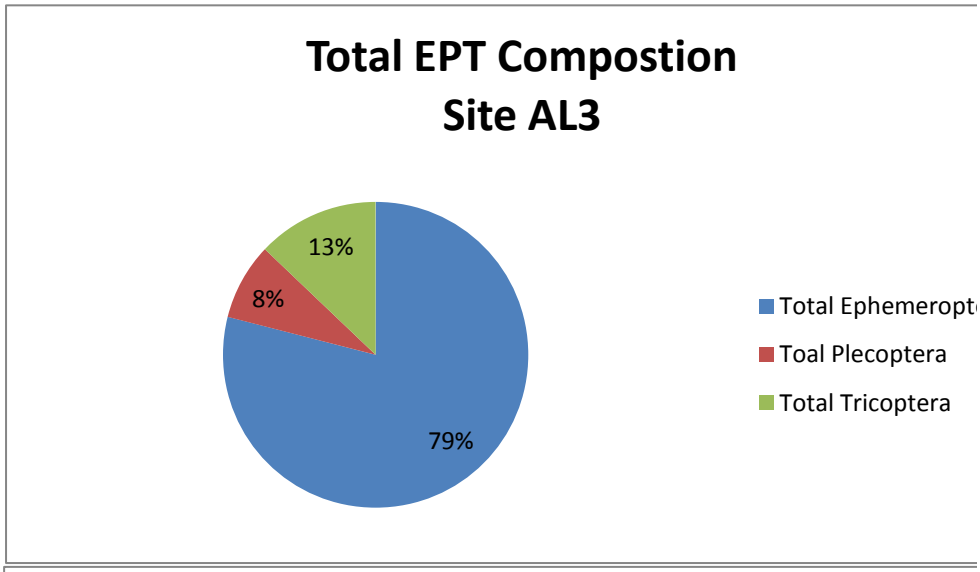
	AL3
Total Ephe	689.7745
Toal Plecop	70.86109
Total Tricop	112.5705

Percent Baetidae of Ephemeroptera

	AL1	AL2	AL3	AL4	AL5	AL6	
Total Baetidae	925.6791	2.690928	687.9805	150.692	345.229	841.2139	Total Baeti
Total Ephemeroptera	2103.857	12.10918	689.7745	150.692	345.229	841.2139	Total Other
Percent Baetidae of Ep	0.439991	0.222222	0.997399	1	1	1	

	AL3
Total Baeti	687.9805
Total Other	0

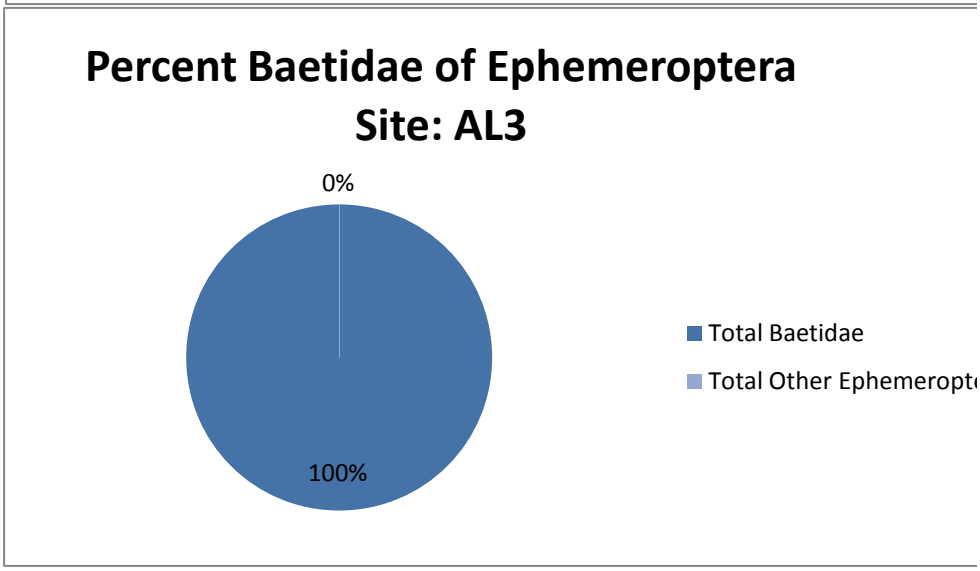
	AL4
Total Baeti	150.692
Total Other	0

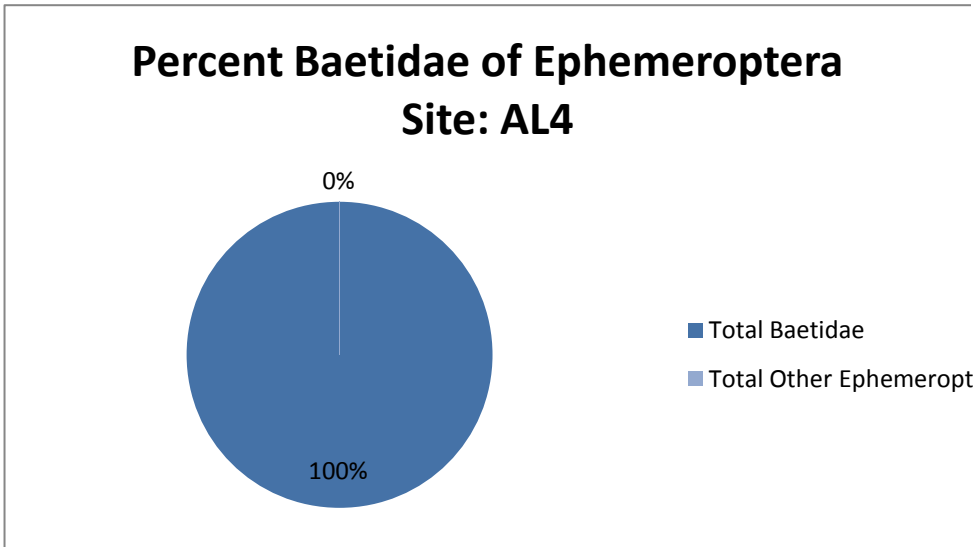

Total EPT Compostion
Site AL3
13%
8%
79%
Total Ephemeropt
Toal Plecoptera
Total Tricoptera

AL2

2.69

9.42


Percent Baetidae of Ephemeroptera
Site: AL3
0%
100%
Total Baetidae
Total Other Ephemeropt


Percent Baetidae of Ephemeroptera
Site: AL4
0%
100%
Total Baetidae
Total Other Ephemeropt

Total Invertebrates by Site

Site	Ephemeroptera	Plecoptera	Trichoptera	Coleoptera abundance	Diptera abu	Chironomidae abundar
AL1	2104	407	259	610	1005	825
AL2	12	5	39	3	19	15
AL3	690	70	113	86	125	102
AL4	151	51	65	1	38	26
AL5	345	71	168	8	317	114
AL6	841	355	1086	10	626	129

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kerber Creek - furthest downstream						CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION: BLM property							
DATE: 10-7-10	OBSERVERS: R. Smith, S. Sanchez, J. Weldgen						
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 25	TOWNSHIP: 46 (N)/S	RANGE: 8 E/W	PM: NM		
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40903				
MAP(S): USGS:							
USFS:							

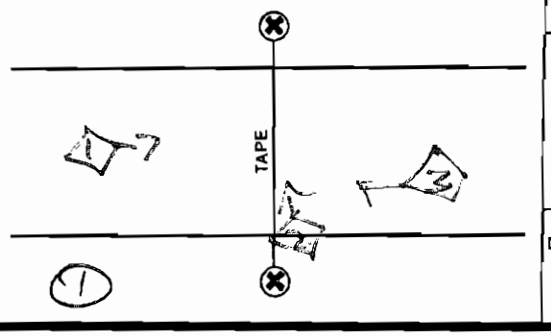
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 6" cobbles	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	6.30 / 6.38
② WS Upstream	14.6'	5.86
③ WS Downstream	11.8'	6.38
SLOPE	0.52 / 26.4' =	

SKETCH



LEGEND:
- Stake ⊗
- Station ①
- Photo ◇①
- Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED: ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

COMMENTS

pH = 6.68 Temp = 9.1°C Cond = 150 µS
D.O = 10.8

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kerber Creek | CROSS-SECTION NO.: 1 | DATE: 10-7-10 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 8:45 am

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS/G	0.0		5.08								
	8.0		5.55								
	17.3		5.83								
W	18.6		6.30					Ø			
	19.0		6.35	.05	-			Ø			
	19.5		6.40	.10				.91			
	20.0		6.45	.15				1.03			
	20.5		6.40	.10				0.86			
	21.0		6.45	.15				0.46			
	21.5		6.45	.15				1.10			
	22.0		6.45	.15				0.88			
	22.5		6.45	.15				0.35			
	23.0		6.55	.20				0.29			
	23.5		6.60	.25				0.79			
	24.0		6.60	.25				1.45			
	24.5		6.60	.25				2.03			
	25.0		6.65	.30				1.98			
	25.5		6.65	.30				1.91			
	26.0		6.70	.35				1.61			
	26.5		6.65	.30				0.84			
	27.0		6.65	.30				0.70			
	27.5		6.70	.35				0.94			
	28.0		6.70	.35				0.17			
	28.5		6.55	.20				0.19			
	29.0		6.55	.20				0.05			
	29.5		6.55	.20				0.03			
	30.0		6.50	.15				0.04			
W	30.1		6.36								
	31.7		5.97								
G	32.5		5.04								
LS	42.8		3.45								
TOTALS:											

End of Measurement | Time: | Gage Reading: _____ ft | CALCULATIONS PERFORMED BY: | CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	Furthest downstream BLM property
XS NUMBER:	1
DATE:	7-Oct-10
OBSERVERS:	R. Smith, S. Sanchez
1/4 SEC:	NW
SECTION:	25
TWP:	46N
RANGE:	8E
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

TAPE WT:	0.0106
TENSION:	99999

*** NOTE ***
Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod

CHANNEL PROFILE DATA

SLOPE:	0.02

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: Furthest downstream BLM property
XS NUMBER: 1

DATA POINTS= 31

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
1	RS & G	0.00	5.08			0.00		0.00	0.00	0.0%
		8.00	5.55			0.00		0.00	0.00	0.0%
		17.30	5.83			0.00		0.00	0.00	0.0%
	W	18.60	6.30	0.00	0.00	0.00		0.00	0.00	0.0%
		19.00	6.35	0.05	0.00	0.40	0.05	0.02	0.00	0.0%
		19.50	6.40	0.10	0.91	0.50	0.10	0.05	0.05	2.0%
		20.00	6.45	0.15	1.03	0.50	0.15	0.08	0.08	3.4%
		20.50	6.40	0.10	0.86	0.50	0.10	0.05	0.04	1.9%
		21.00	6.45	0.15	0.46	0.50	0.15	0.08	0.03	1.5%
		21.50	6.45	0.15	1.10	0.50	0.15	0.08	0.08	3.7%
		22.00	6.45	0.15	0.88	0.50	0.15	0.08	0.07	2.9%
		22.50	6.45	0.15	0.35	0.50	0.15	0.08	0.03	1.2%
		23.00	6.55	0.20	0.29	0.51	0.20	0.10	0.03	1.3%
		23.50	6.60	0.25	0.79	0.50	0.25	0.13	0.10	4.4%
		24.00	6.60	0.25	1.45	0.50	0.25	0.13	0.18	8.0%
		24.50	6.60	0.25	2.03	0.50	0.25	0.13	0.25	11.2%
		25.00	6.65	0.30	1.98	0.50	0.30	0.15	0.30	13.2%
		25.50	6.65	0.30	1.91	0.50	0.30	0.15	0.29	12.7%
		26.00	6.70	0.35	1.61	0.50	0.35	0.18	0.28	12.5%
		26.50	6.65	0.30	0.84	0.50	0.30	0.15	0.13	5.6%
		27.00	6.65	0.30	0.70	0.50	0.30	0.15	0.11	4.7%
		27.50	6.70	0.35	0.94	0.50	0.35	0.18	0.16	7.3%
		28.00	6.70	0.35	0.17	0.50	0.35	0.18	0.03	1.3%
		28.50	6.55	0.20	0.19	0.52	0.20	0.10	0.02	0.8%
		29.00	6.55	0.20	0.05	0.50	0.20	0.10	0.01	0.2%
		29.50	6.55	0.20	0.03	0.50	0.20	0.10	0.00	0.1%
		30.00	6.50	0.15	0.04	0.50	0.15	0.05	0.00	0.1%
	W	30.10	6.36	0.00	0.00	0.17		0.00	0.00	0.0%
		31.70	5.97			0.00		0.00	0.00	0.0%
1	G	32.50	5.04			0.00		0.00	0.00	0.0%
	LS	42.80	3.45			0.00		0.00	0.00	0.0%
	TOTALS ----------					11.63	0.35 (Max.)	2.44	2.26	100.0%

Manning's n = 0.0803
Hydraulic Radius= 0.20998083

STREAM NAME: Kerber Creek
XS LOCATION: Furthest downstream BLM property
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	2.44	2.47	1.2%
6.08	2.44	5.57	128.0%
6.10	2.44	5.30	117.2%
6.12	2.44	5.04	106.5%
6.14	2.44	4.79	95.9%
6.16	2.44	4.53	85.5%
6.18	2.44	4.28	75.1%
6.20	2.44	4.03	64.9%
6.22	2.44	3.78	54.7%
6.24	2.44	3.54	44.7%
6.26	2.44	3.29	34.8%
6.28	2.44	3.05	25.0%
6.29	2.44	2.94	20.2%
6.30	2.44	2.82	15.4%
6.31	2.44	2.70	10.6%
6.32	2.44	2.59	5.9%
6.33	2.44	2.47	1.2%
6.34	2.44	2.36	-3.5%
6.35	2.44	2.25	-8.1%
6.36	2.44	2.14	-12.6%
6.37	2.44	2.03	-17.1%
6.38	2.44	1.92	-21.5%
6.40	2.44	1.70	-30.3%
6.42	2.44	1.50	-38.7%
6.44	2.44	1.31	-46.6%
6.46	2.44	1.14	-53.4%
6.48	2.44	0.99	-59.5%
6.50	2.44	0.84	-65.5%
6.52	2.44	0.70	-71.3%
6.54	2.44	0.57	-76.8%
6.56	2.44	0.45	-81.8%
6.58	2.44	0.34	-86.0%

WATERLINE AT ZERO
AREA ERROR = 6.333

STREAM NAME: Kerber Creek
XS LOCATION: Furthest downstream BLM property
XS NUMBER: 1 Constant Manning's n

STAGING TABLE *GL* = lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	5.08	32.47	0.85	1.62	27.75	33.15	100.0%	0.84	64.48	2.32
	5.33	27.95	0.72	1.37	20.12	28.51	86.0%	0.71	41.72	2.07
	5.38	27.06	0.69	1.32	18.75	27.60	83.2%	0.68	37.90	2.02
	5.43	26.16	0.67	1.27	17.42	26.68	80.5%	0.65	34.29	1.97
	5.48	25.27	0.64	1.22	16.13	25.76	77.7%	0.63	30.89	1.91
	5.53	24.37	0.61	1.17	14.89	24.84	74.9%	0.60	27.69	1.86
	5.58	22.95	0.60	1.12	13.70	23.40	70.6%	0.59	25.09	1.83
	5.63	21.25	0.59	1.07	12.60	21.67	65.4%	0.58	22.95	1.82
	5.68	19.55	0.59	1.02	11.58	19.94	60.1%	0.58	21.08	1.82
	5.73	17.84	0.60	0.97	10.64	18.21	54.9%	0.58	19.46	1.83
	5.78	16.14	0.61	0.92	9.79	16.49	49.7%	0.59	18.10	1.85
	5.83	14.51	0.62	0.87	9.03	14.84	44.7%	0.61	16.96	1.88
	5.88	14.33	0.58	0.82	8.31	14.62	44.1%	0.57	14.91	1.79
	5.93	14.15	0.54	0.77	7.60	14.41	43.5%	0.53	12.97	1.71
	5.98	13.93	0.49	0.72	6.89	14.16	42.7%	0.49	11.16	1.62
	6.03	13.58	0.46	0.67	6.21	13.80	41.6%	0.45	9.53	1.54
	6.08	13.24	0.42	0.62	5.53	13.44	40.5%	0.41	8.01	1.45
	6.13	12.90	0.38	0.57	4.88	13.09	39.5%	0.37	6.62	1.36
	6.18	12.55	0.34	0.52	4.25	12.73	38.4%	0.33	5.34	1.26
	6.23	12.21	0.30	0.47	3.63	12.37	37.3%	0.29	4.19	1.15
	6.28	11.87	0.25	0.42	3.02	12.01	36.2%	0.25	3.15	1.04
WL	6.33	11.35	0.22	0.37	2.44	11.49	34.6%	0.21	2.28	0.93
	6.38	10.76	0.18	0.32	1.89	10.87	32.8%	0.17	1.54	0.81
	6.43	9.57	0.14	0.27	1.38	9.66	29.1%	0.14	0.98	0.71
	6.48	7.35	0.13	0.22	0.97	7.40	22.3%	0.13	0.66	0.68
	6.53	6.76	0.09	0.17	0.62	6.80	20.5%	0.09	0.32	0.53
	6.58	5.07	0.06	0.12	0.33	5.09	15.4%	0.06	0.14	0.42
	6.63	3.40	0.04	0.07	0.12	3.42	10.3%	0.04	0.04	0.29
	6.68	1.08	0.01	0.02	0.01	1.09	3.3%	0.01	0.00	0.14

STREAM NAME: Kerber Creek
XS LOCATION: Furthest downstream BLM property
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	2.26	cfs
CALCULATED FLOW (Qc)=	2.28	cfs
(Qm-Qc)/Qm * 100 =	-0.8	%
MEASURED WATERLINE (WLm)=	6.33	ft
CALCULATED WATERLINE (WLc)=	6.33	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.35	ft
MAX CALCULATED DEPTH (Dc)=	0.37	ft
(Dm-Dc)/Dm * 100	-5.0	%
MEAN VELOCITY=	0.93	ft/sec
MANNING'S N=	0.080	
SLOPE=	0.02	ft/ft
.4 * Qm =	0.9	cfs
2.5 * Qm=	5.6	cfs

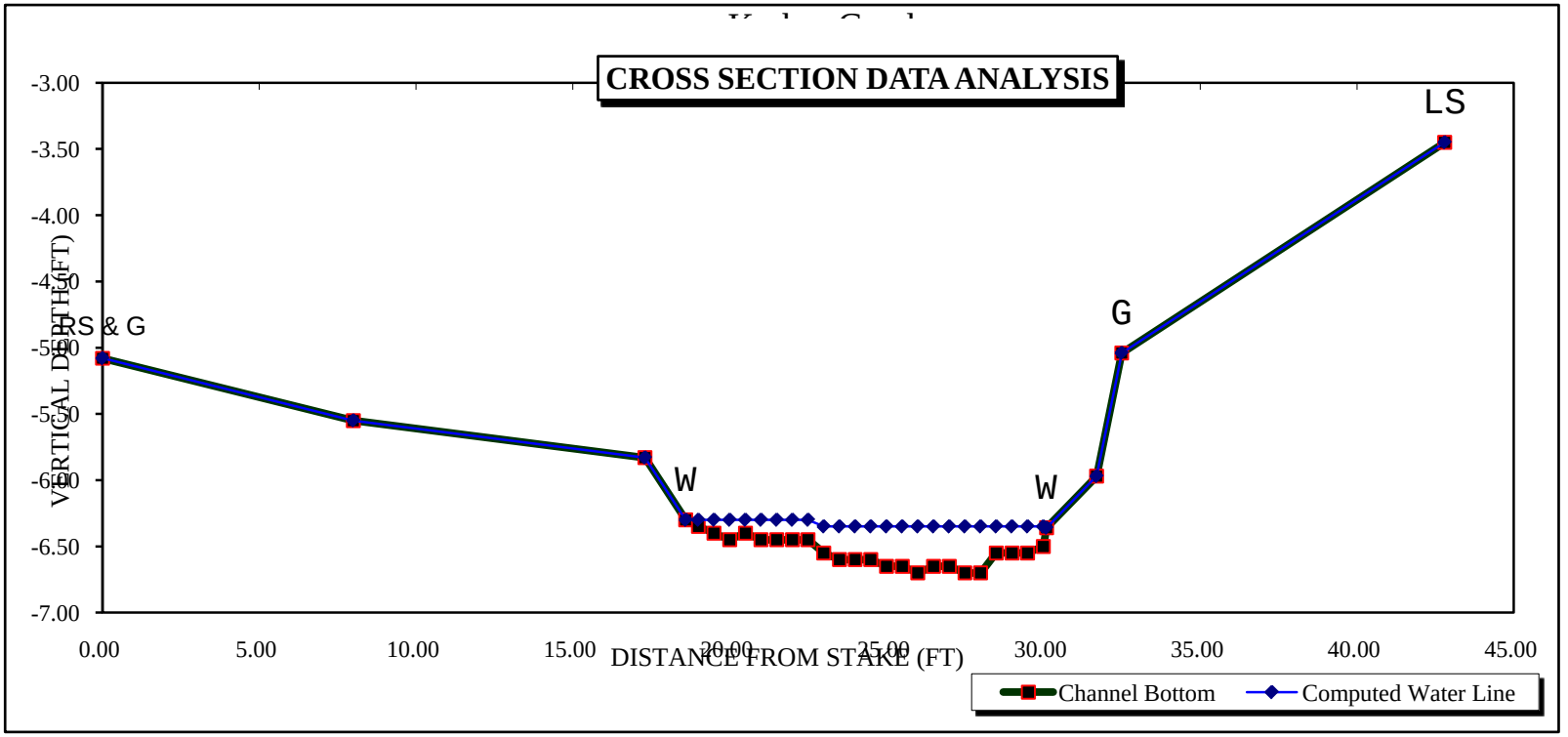
RECOMMENDED INSTREAM FLOW:
=============================

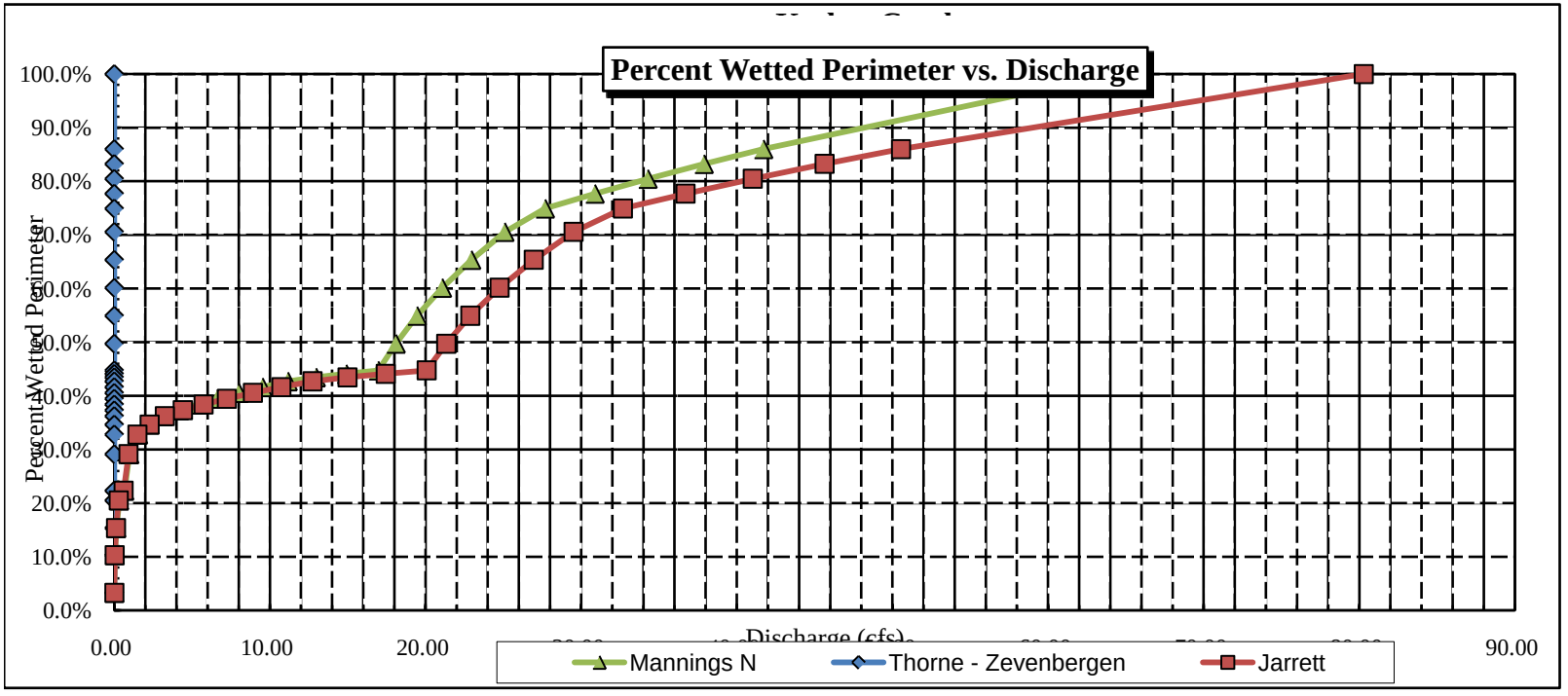
FLOW (CFS)	PERIOD
===========	========
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________

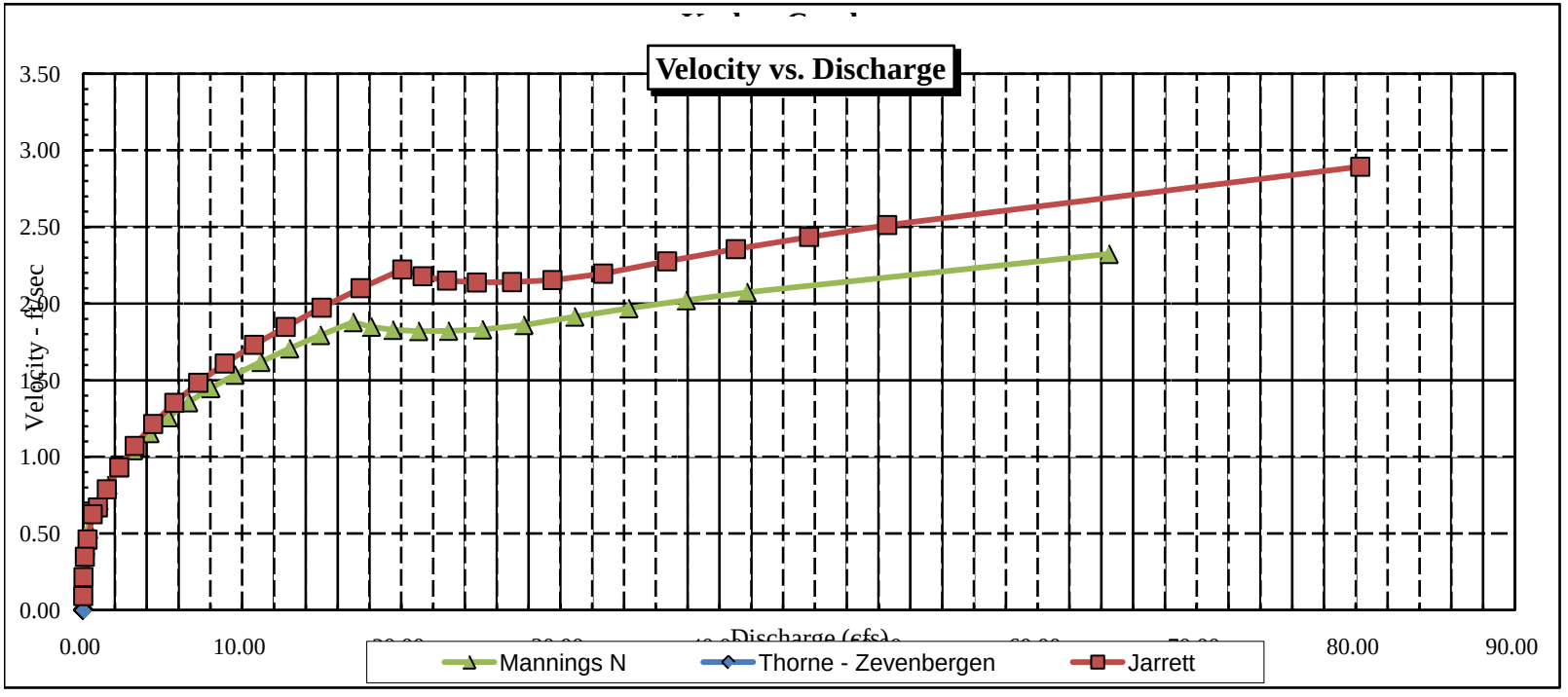
RATIONALE FOR RECOMMENDATION:
=============================

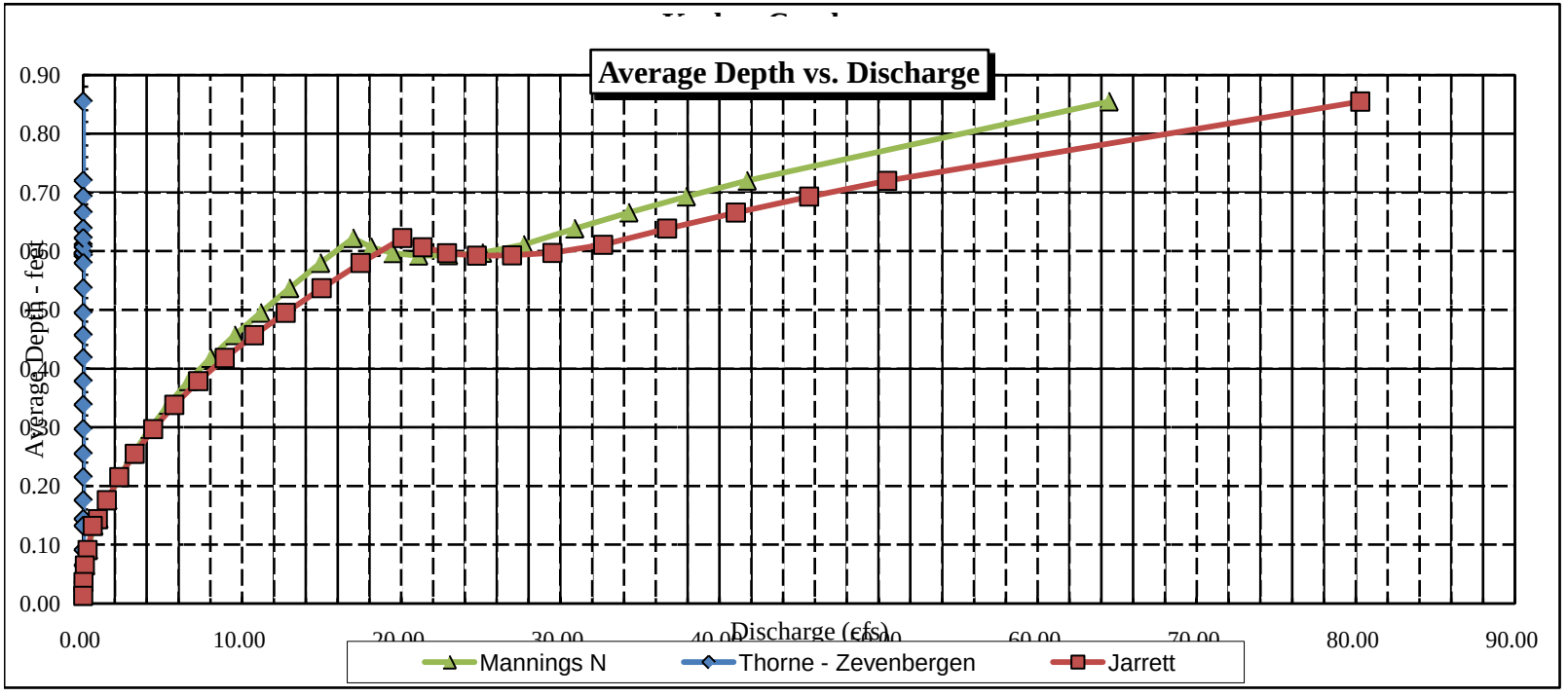
RECOMMENDATION BY: ……………………...………...……............................... AGENCY...………………………......……....…...…….…....... DATE:.......….....….......……………

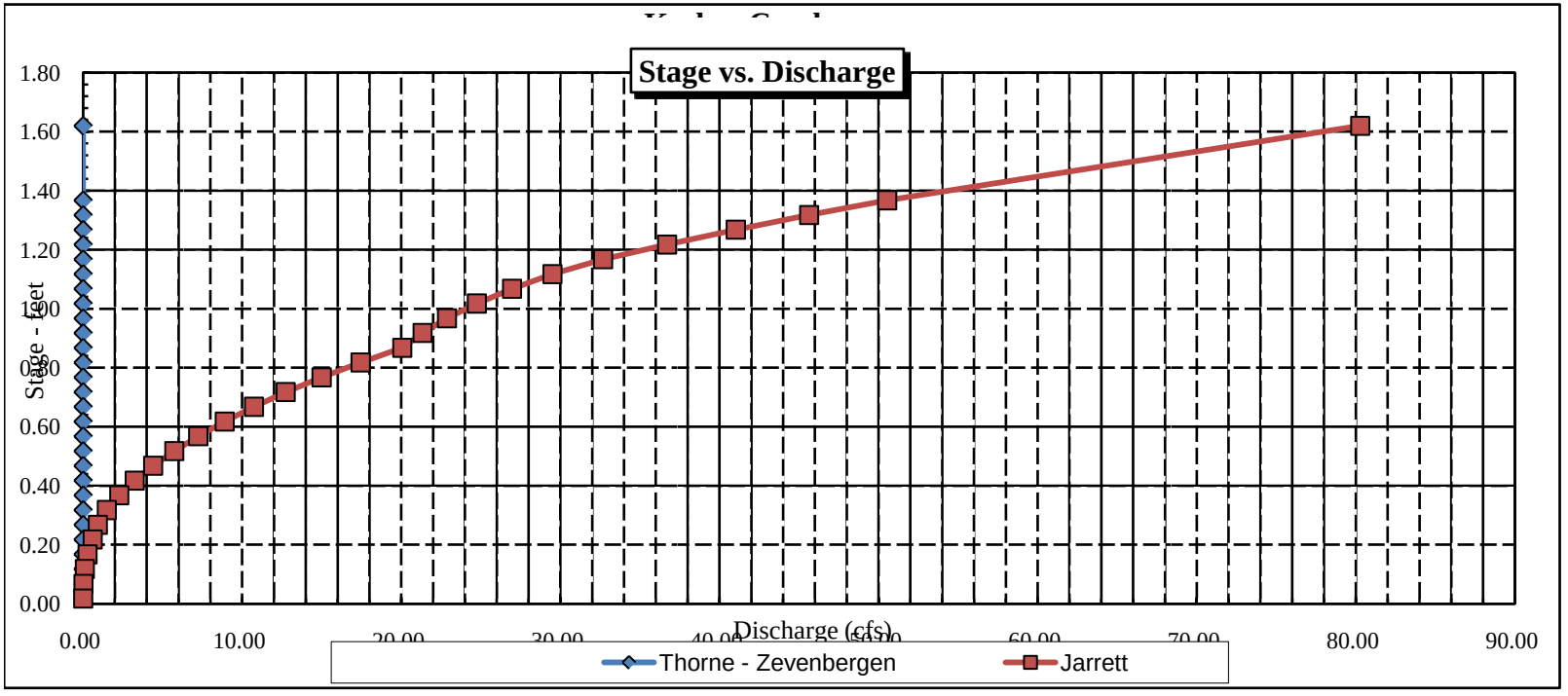
CWCB REVIEW BY: ...…………………………....…………………………………………………...…............. DATE:..................……………....…


CROSS SECTION DATA ANALYSIS
-3.00
-3.50
-4.00
-4.50
-5.00
-5.50
-6.00
-6.50
-7.00
VERTICAL DEPTH (FT)
LS & G
W
W
G
LS
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Percent Wetted Perimeter
0.00
10.00
20.00
90.00
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
Velocity - ft/sec
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
10.00
80.00
90.00
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.90
0.80
0.70
0.60
0.40
0.30
0.20
0.10
0.00
0.00
10.00
80.00
90.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
Stage - feet
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.00
10.00
80.00
90.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kerber Creek						CROSS-SECTION NO.: 2
CROSS-SECTION LOCATION: at boundary w/ Bartlow property						
DATE: 10-7-10	OBSERVERS: R Smith, S Sanchez					
LEGAL DESCRIPTION	¼ SECTION: SE	SECTION: 7	TOWNSHIP: 46 N/S	RANGE: 8 E/W	PM: NM	
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40903			
MAP(S): USGS:			GPS 401029			
USFS:			4234089			

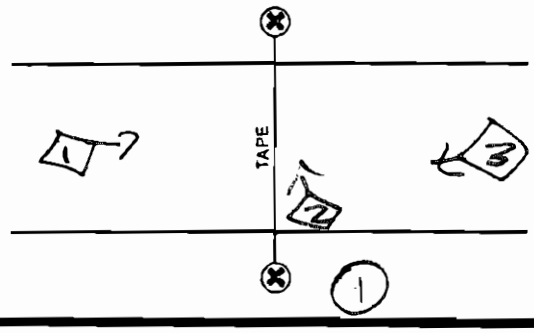
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN. ____ sec	TAPE WEIGHT surveyed ____ lbs/lool	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: 4" to 8" cobbles	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
Tape @ Stake LB	0.0	surveyed
Tape @ Stake RB	0.0	surveyed
1 WS @ Tape LB/RB	0.0 166 →	7.82 / 7.78
2 WS Upstream	29.0'	7.65
3 WS Downstream	44.5'	8.65
SLOPE	1.0 / 73.5' = .014	

SKETCH



LEGEND: Stake ⊗ Station ① Photo ◇ Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED. ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

COMMENTS

TDS: Ph = 7.85 Cond = 136 D.O = 19.5
Temp = 10° C

FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kerber Creek | CROSS-SECTION NO.: 2 | DATE: 10-7-10 | SHEET __ OF __

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 9:55 am

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec): At Point	Velocity (ft/sec): Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		6.00								
G	2.5		6.90								
	3.5		7.31								
W	4.4		7.78	0				0			
	5.0		8.1	.3	-			.16			
	5.5		8.1	.3				.82			
	6.0		8.1	.3				.93			
	6.5		8.1	.3				.59			
	7.0		8.1	.3				1.53			
	7.5		8.25	.45				1.40			
	8		8.30	.5				.95			
	8.5		8.15	.35				.82			
	9		8.15	.35				1.23			
	9.5		8.15	.35				1.15			
	10		8.10	.3				.94			
	10.5		8.05	.25				1.32			
	11		8.15	.35				.61			
	11.5		8.1	.3				.59			
	12		8.1	.3				1.07			
	12.5		8.05	.25				1.16			
	13		8.05	.25				1.20			
	13.5		8.05	.25				1.02			
	14		8.05	.25				1.04			
	14.8		7.90	.1				.70			
	15		7.95	.15				1.18			
	15.5		7.95	.15				.69			
	16.0		7.95	.15				.82			
	16.5		7.95	.15				.28			
W	16.6		7.82	0							
	18.0		7.31								
G	29.6		6.90								
LS	32.0		6.28								
TOTALS:											

End of Measurement | Time: | Gage Reading: _____ ft | CALCULATIONS PERFORMED BY: | CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	At boundary with Bartlow Property
XS NUMBER:	2
DATE:	7-Oct-10
OBSERVERS:	R. Smith, S. Sanchez
1/4 SEC:	SE
SECTION:	7
TWP:	46N
RANGE:	8W
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.014

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: At boundary with Bartlow Property
XS NUMBER: 2

DATA POINTS= 32

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	RS	0.00	6.00			0.00		0.00	0.00	0.0%
1	G	2.50	6.90			0.00		0.00	0.00	0.0%
		3.50	7.31			0.00		0.00	0.00	0.0%
	W	4.40	7.78	0.00	0.00	0.00		0.00	0.00	0.0%
		5.00	8.10	0.30	0.16	0.68	0.30	0.17	0.03	0.8%
		5.50	8.10	0.30	0.82	0.50	0.30	0.15	0.12	3.9%
		6.00	8.10	0.30	0.93	0.50	0.30	0.15	0.14	4.4%
		6.50	8.10	0.30	0.59	0.50	0.30	0.15	0.09	2.8%
		7.00	8.10	0.30	1.53	0.50	0.30	0.15	0.23	7.2%
		7.50	8.25	0.45	1.40	0.52	0.45	0.23	0.32	9.9%
		8.00	8.30	0.50	0.95	0.50	0.50	0.25	0.24	7.5%
		8.50	8.15	0.35	0.82	0.52	0.35	0.18	0.14	4.5%
		9.00	8.15	0.35	1.23	0.50	0.35	0.18	0.22	6.8%
		9.50	8.15	0.35	1.15	0.50	0.35	0.18	0.20	6.3%
		10.00	8.10	0.30	0.94	0.50	0.30	0.15	0.14	4.4%
		10.50	8.05	0.25	1.32	0.50	0.25	0.13	0.17	5.2%
		11.00	8.15	0.35	0.61	0.51	0.35	0.18	0.11	3.4%
		11.50	8.10	0.30	0.59	0.50	0.30	0.15	0.09	2.8%
		12.00	8.10	0.30	1.07	0.50	0.30	0.15	0.16	5.0%
		12.50	8.05	0.25	1.16	0.50	0.25	0.13	0.15	4.6%
		13.00	8.05	0.25	1.20	0.50	0.25	0.13	0.15	4.7%
		13.50	8.05	0.25	1.02	0.50	0.25	0.13	0.13	4.0%
		14.00	8.05	0.25	1.04	0.50	0.25	0.13	0.13	4.1%
		14.50	7.90	0.10	0.70	0.52	0.10	0.05	0.04	1.1%
		15.00	7.95	0.15	1.18	0.50	0.15	0.08	0.09	2.8%
		15.50	7.95	0.15	0.69	0.50	0.15	0.08	0.05	1.6%
		16.00	7.95	0.15	0.82	0.50	0.15	0.08	0.06	1.9%
		16.50	7.95	0.15	0.28	0.50	0.15	0.05	0.01	0.4%
	W	16.60	7.82	0.00	0.00	0.16		0.00	0.00	0.0%
		18.00	7.31			0.00		0.00	0.00	0.0%
1	G	29.60	6.90			0.00		0.00	0.00	0.0%
	LS	32.00	6.28			0.00		0.00	0.00	0.0%
	TOTALS ----------					12.43	0.5 (Max.)	3.34	3.18	100.0%

Manning's n = 0.0766
Hydraulic Radius= 0.26819628

STREAM NAME: Kerber Creek
XS LOCATION: At boundary with Bartlow Property
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	3.34	3.33	-0.1%
7.55	3.34	6.53	95.8%
7.57	3.34	6.26	87.8%
7.59	3.34	6.00	79.9%
7.61	3.34	5.74	72.0%
7.63	3.34	5.48	64.2%
7.65	3.34	5.22	56.4%
7.67	3.34	4.96	48.7%
7.69	3.34	4.70	41.0%
7.71	3.34	4.45	33.4%
7.73	3.34	4.20	25.9%
7.75	3.34	3.95	18.4%
7.76	3.34	3.82	14.6%
7.77	3.34	3.70	10.9%
7.78	3.34	3.58	7.2%
7.79	3.34	3.45	3.5%
7.80	3.34	3.33	-0.1%
7.81	3.34	3.21	-3.8%
7.82	3.34	3.09	-7.4%
7.83	3.34	2.97	-11.1%
7.84	3.34	2.85	-14.7%
7.85	3.34	2.72	-18.3%
7.87	3.34	2.48	-25.5%
7.89	3.34	2.25	-32.7%
7.91	3.34	2.01	-39.8%
7.93	3.34	1.78	-46.8%
7.95	3.34	1.55	-53.5%
7.97	3.34	1.36	-59.2%
7.99	3.34	1.17	-64.9%
8.01	3.34	0.98	-70.5%
8.03	3.34	0.80	-76.1%
8.05	3.34	0.61	-81.6%

WATERLINE AT ZERO
AREA ERROR = 7.800

STREAM NAME: Kerber Creek
XS LOCATION: At boundary with Bartlow Property
XS NUMBER: 2

Constant Manning's n

GL = lowest Grassline elevation corrected for sag
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.90	27.10	0.68	1.40	18.40	27.63	100.0%	0.67	32.22	1.75
	6.95	25.57	0.67	1.35	17.10	26.09	94.4%	0.66	29.60	1.73
	7.00	24.04	0.66	1.30	15.86	24.54	88.8%	0.65	27.19	1.72
	7.05	22.50	0.65	1.25	14.69	23.00	83.2%	0.64	25.01	1.70
	7.10	20.96	0.65	1.20	13.61	21.45	77.6%	0.63	23.05	1.69
	7.15	19.43	0.65	1.15	12.60	19.90	72.0%	0.63	21.31	1.69
	7.20	17.89	0.65	1.10	11.66	18.35	66.4%	0.64	19.78	1.70
	7.25	16.35	0.66	1.05	10.81	16.81	60.8%	0.64	18.48	1.71
	7.30	14.82	0.68	1.00	10.03	15.26	55.2%	0.66	17.40	1.73
	7.35	14.32	0.65	0.95	9.30	14.74	53.3%	0.63	15.72	1.69
	7.40	14.08	0.61	0.90	8.60	14.48	52.4%	0.59	13.93	1.62
	7.45	13.85	0.57	0.85	7.90	14.23	51.5%	0.55	12.24	1.55
	7.50	13.62	0.53	0.80	7.21	13.98	50.6%	0.52	10.64	1.48
	7.55	13.38	0.49	0.75	6.54	13.72	49.7%	0.48	9.15	1.40
	7.60	13.15	0.45	0.70	5.87	13.47	48.7%	0.44	7.75	1.32
	7.65	12.92	0.40	0.65	5.22	13.21	47.8%	0.40	6.45	1.24
	7.70	12.68	0.36	0.60	4.58	12.96	46.9%	0.35	5.25	1.15
	7.75	12.45	0.32	0.55	3.95	12.71	46.0%	0.31	4.16	1.05
WL	7.80	12.22	0.27	0.50	3.33	12.45	45.1%	0.27	3.18	0.95
	7.85	12.05	0.23	0.45	2.73	12.25	44.3%	0.22	2.30	0.84
	7.90	11.92	0.18	0.40	2.13	12.08	43.7%	0.18	1.54	0.72
	7.95	9.62	0.16	0.35	1.55	9.74	35.2%	0.16	1.05	0.68
	8.00	9.36	0.12	0.30	1.08	9.45	34.2%	0.11	0.58	0.54
	8.05	7.60	0.08	0.25	0.62	7.68	27.8%	0.08	0.26	0.43
	8.10	3.76	0.07	0.20	0.27	3.82	13.8%	0.07	0.11	0.39
	8.15	1.34	0.09	0.15	0.12	1.37	5.0%	0.09	0.05	0.45
	8.20	1.00	0.06	0.10	0.06	1.03	3.7%	0.06	0.02	0.34
	8.25	0.67	0.03	0.05	0.02	0.68	2.5%	0.02	0.00	0.20
	8.30	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Kerber Creek
XS LOCATION: At boundary with Bartlow Property
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	3.18	cfs
CALCULATED FLOW (Qc)=	3.18	cfs
(Qm-Qc)/Qm * 100 =	0.1	%
MEASURED WATERLINE (WLm)=	7.80	ft
CALCULATED WATERLINE (WLc)=	7.80	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.50	ft
MAX CALCULATED DEPTH (Dc)=	0.50	ft
(Dm-Dc)/Dm * 100	-0.1	%
MEAN VELOCITY=	0.95	ft/sec
MANNING'S N=	0.077	
SLOPE=	0.014	ft/ft
.4 * Qm =	1.3	cfs
2.5 * Qm=	8.0	cfs

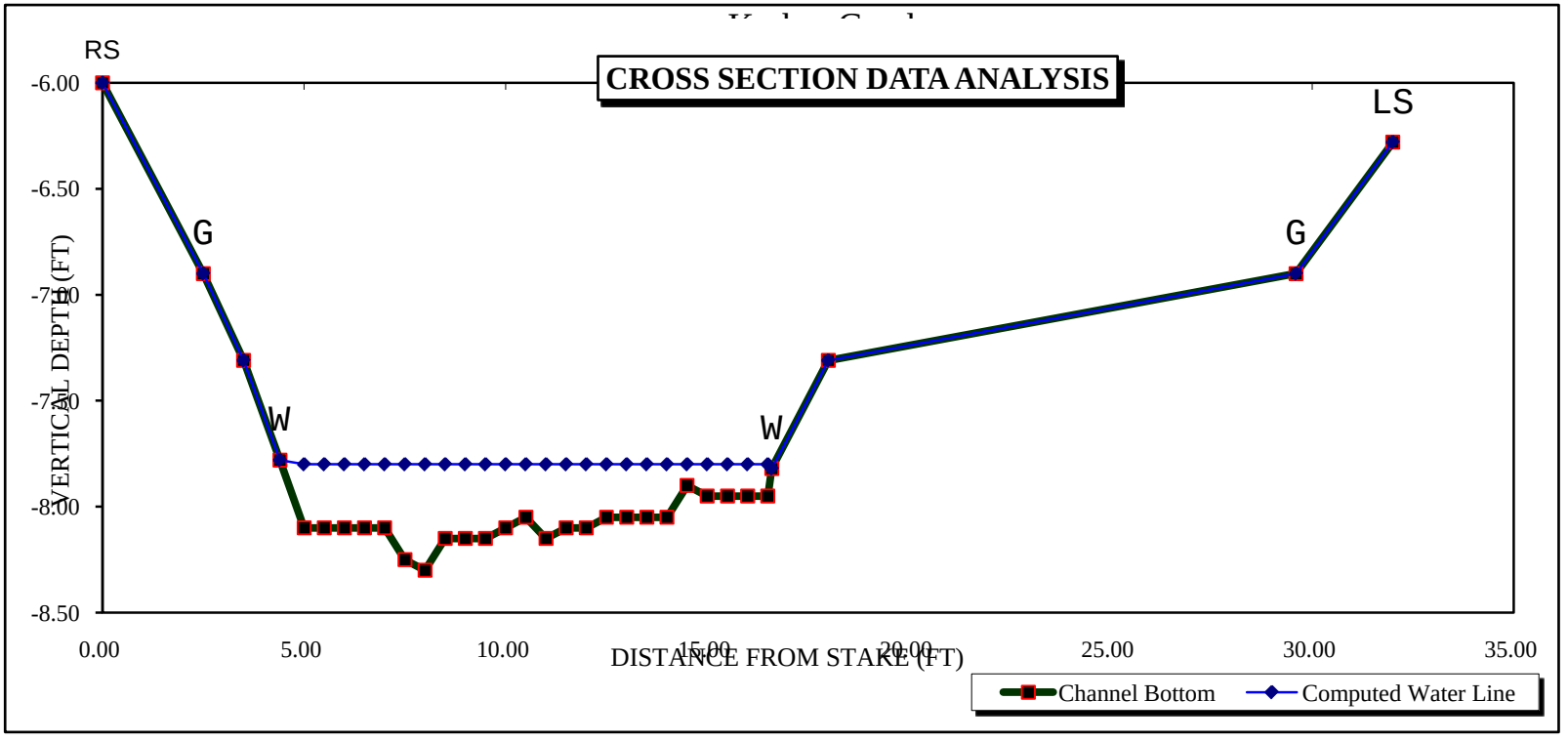
RECOMMENDED INSTREAM FLOW:
==============================

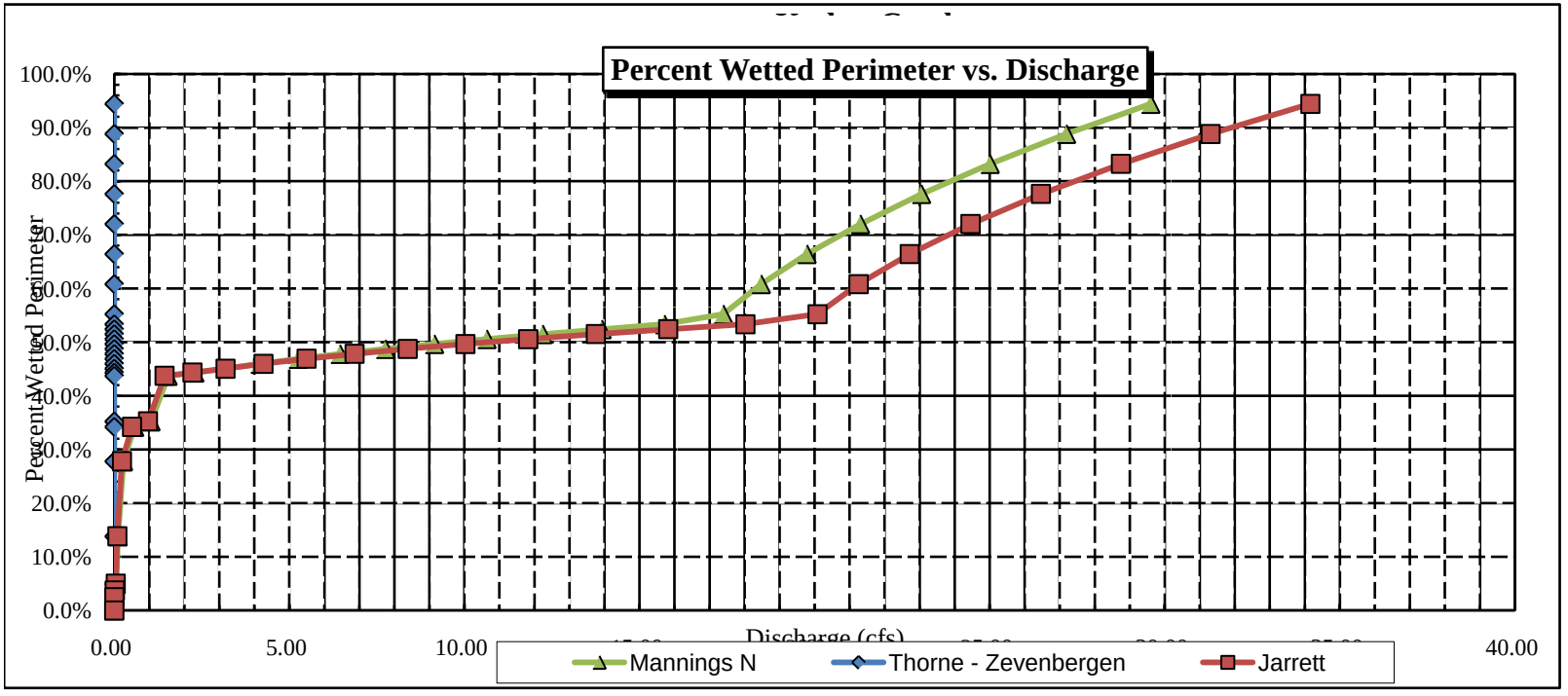
FLOW (CFS)	PERIOD

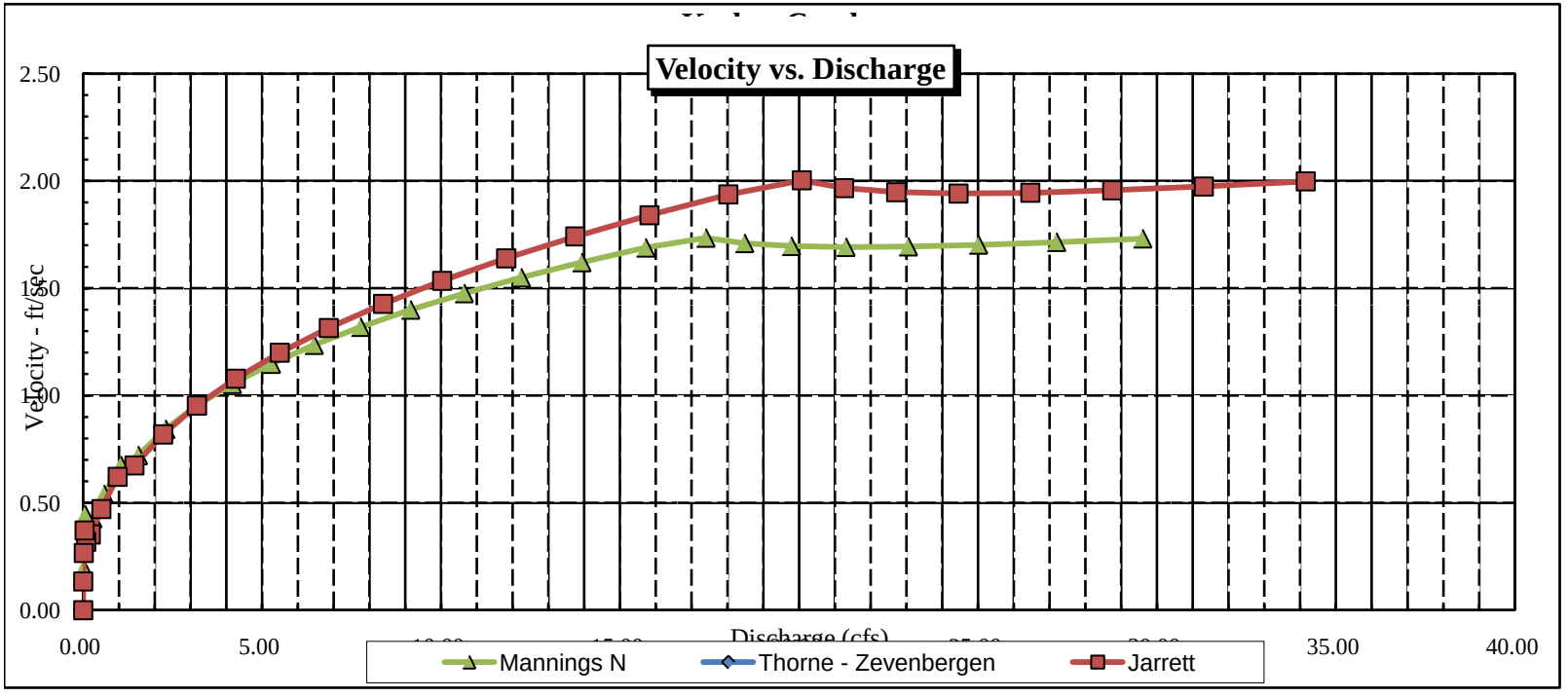
RATIONALE FOR RECOMMENDATION:
==============================

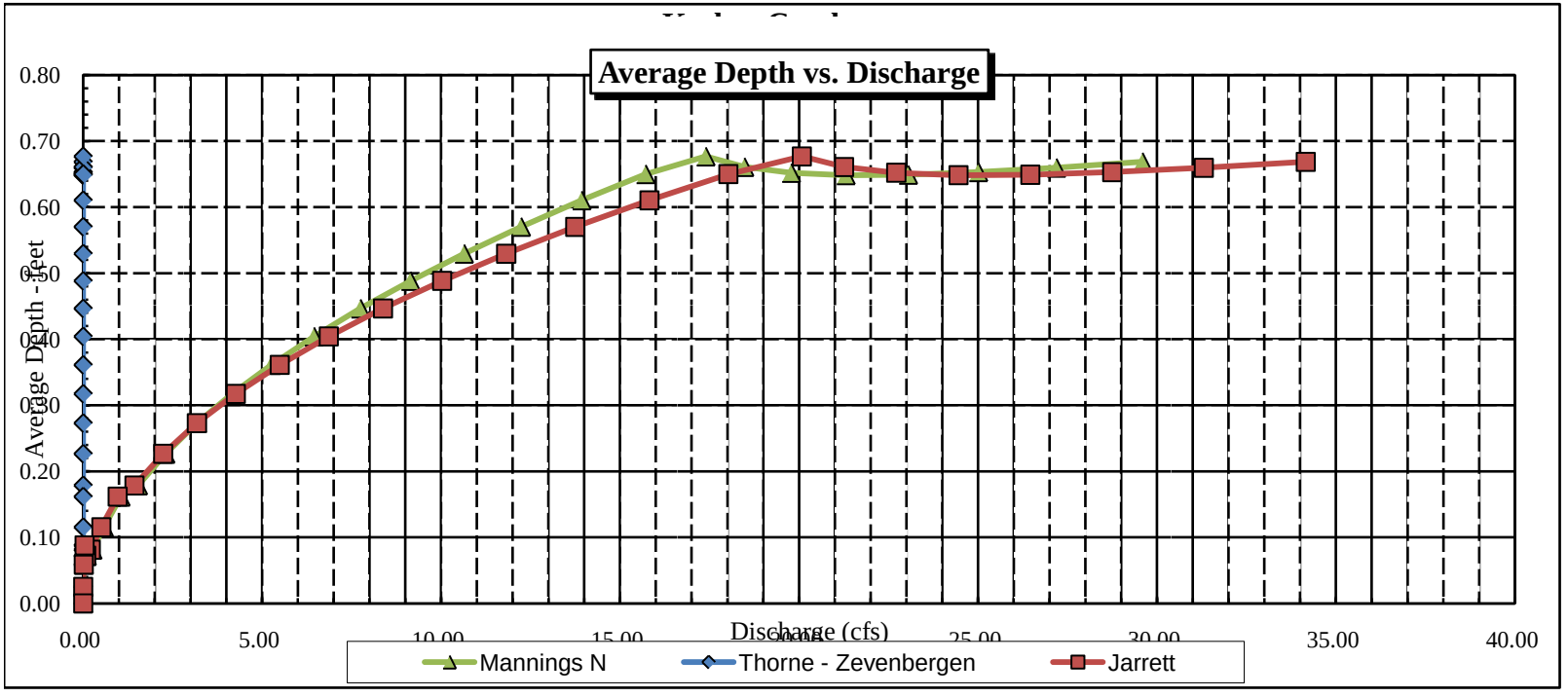
RECOMMENDATION BY: ………………...………..……............................... AGENCY..……………………......…....…....…....... DATE:......….....…......……………

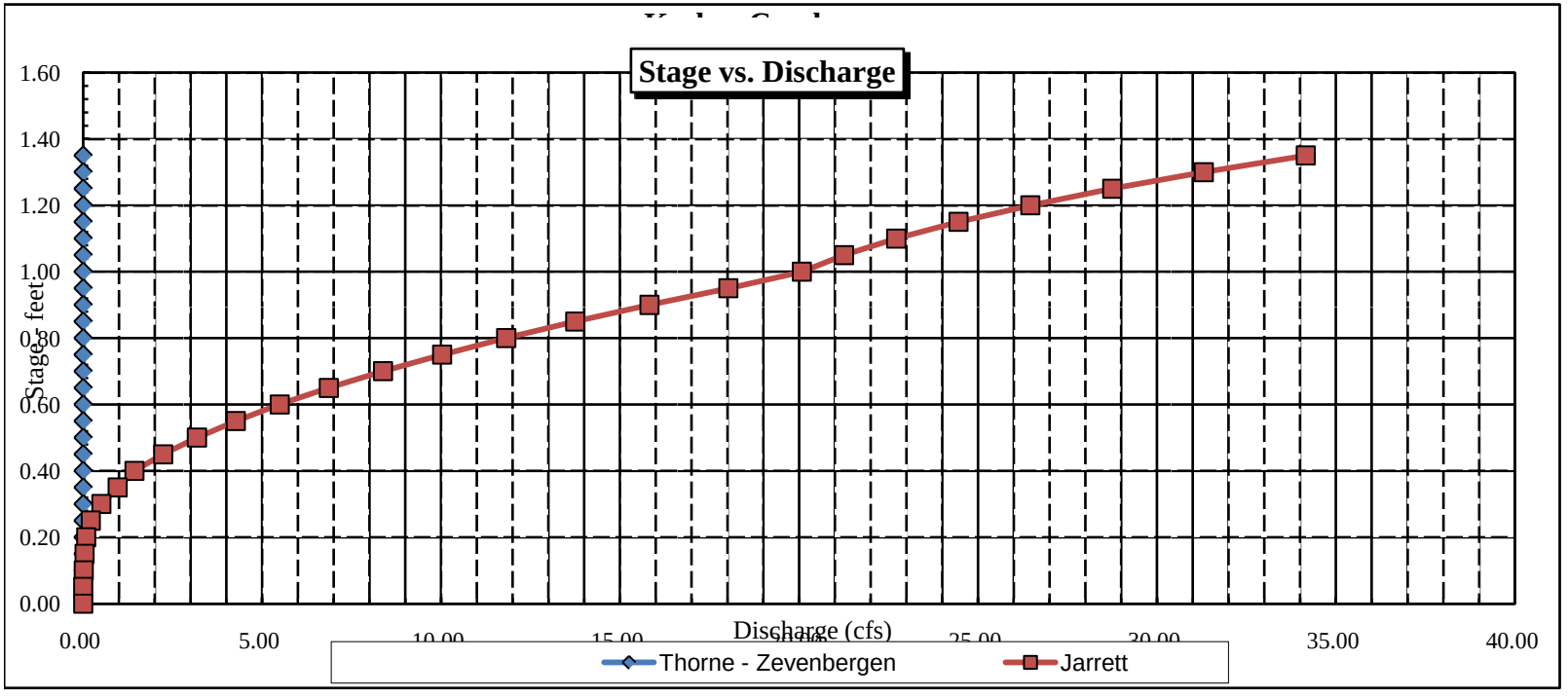
CWCB REVIEW BY: ..……………………….....…………………………………………………...…............. DATE:.................…………….....


CROSS SECTION DATA ANALYSIS
RS
LS
G
G
W
W
-6.00
-6.50
-7.00
-7.50
-8.00
-8.50
VERTICAL DEPTH (FT)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
5.00
10.00
40.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
Velocity - ft/sec
2.50
2.00
1.50
1.00
0.50
0.00
0.00
5.00
35.00
40.00
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
Stage - feet
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.00
5.00
35.00
40.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kerber Creek					CROSS-SECTION NO.: 3	
CROSS-SECTION LOCATION: adjacent to AML repository						
DATE: 10-7-10	OBSERVERS: R. Smith, S. Sanchez					
LEGAL DESCRIPTION	¼ SECTION: SE	SECTION: 36	TOWNSHIP: 47 (N/S)	RANGE: 7 (E/W)	PM: NM	
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40903			
MAP(S): USGS:						
USFS:						

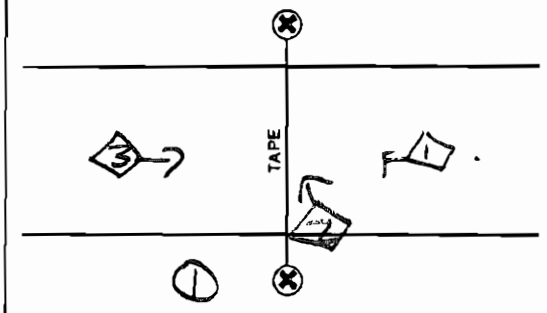
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN. ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 1" boulders	PHOTOGRAPHS TAKEN: (YES/NO)	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	6.30 / 6.30
② WS Upstream	40.0'	5.84
③ WS Downstream	43.8'	7.80
SLOPE	1.96 ÷ 83.8' = .023	

SKETCH



AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/(NO)	DISTANCE ELECTROFISHED: ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

COMMENTS

Ph = 7.45 Temp = 12.2°C Cond = 192.8 DO = 20.2%

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kerber Creek	CROSS-SECTION NO.: 3	DATE: 10-7-10	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 11:10 am

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		5.60								
G	4.0		5.69								
	7.0		5.96								
W	9.0		6.30								
		18	6.50	.2	-			0.15			
		17.5	6.55	.25				0.70			
		17	6.60	.3				0.80			
		16.5	6.55	.25				0.74			
		16	6.50	.2				0.81			
		15.5	6.50	.2				0.88			
		15	6.50	.2				0.89			
	move over & invert	14.5	6.50	.2				0.82			
		14	6.50	.2				0.94			
		13.5	6.50	.2				1.04			
		13	6.55	.25				0.96			
		12.5	6.45	.15				0.86			
		12	6.80	.5				0.74			
		11.5	6.60	.3				0.75			
		11	6.45	.15				0.58			
		10.5	6.50	.2				0.64			
		10.0	6.55	.25				.74			
		9.5	6.40	.1				.28			
W	19.0		6.30								
G	20.6		5.76								
LS	30.5		4.04								
TOTALS:											

End of Measurement	Time:	Gage Reading: ____ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	Adjacent to AML repository
XS NUMBER:	3
DATE:	7-Oct-10
OBSERVERS:	S. Sanchez, R. Smith
1/4 SEC:	SE
SECTION:	36
TWP:	47N
RANGE:	7E
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

TAPE WT:	0.0106
TENSION:	99999

*** NOTE ***
Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod

CHANNEL PROFILE DATA

SLOPE:	0.023

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to AML repository
XS NUMBER: 3

DATA POINTS= 25

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	RS	0.00	5.60			0.00		0.00	0.00	0.0%
1	G	4.00	5.69			0.00		0.00	0.00	0.0%
		7.00	5.96			0.00		0.00	0.00	0.0%
	W	9.00	6.30	0.00	0.00	0.00		0.00	0.00	0.0%
		9.50	6.40	0.10	0.28	0.51	0.10	0.05	0.01	0.9%
		10.00	6.55	0.25	0.74	0.52	0.25	0.13	0.09	5.9%
		10.50	6.50	0.20	0.94	0.50	0.20	0.10	0.09	6.0%
		11.00	6.45	0.15	0.58	0.50	0.15	0.08	0.04	2.8%
		11.50	6.60	0.30	0.75	0.52	0.30	0.15	0.11	7.1%
		12.00	6.80	0.50	0.74	0.54	0.50	0.25	0.19	11.7%
		12.50	6.45	0.15	0.86	0.61	0.15	0.08	0.06	4.1%
		13.00	6.55	0.25	0.86	0.51	0.25	0.13	0.11	6.8%
		13.50	6.50	0.20	1.08	0.50	0.20	0.10	0.11	6.8%
		14.00	6.50	0.20	0.94	0.50	0.20	0.10	0.09	6.0%
		14.50	6.50	0.20	0.82	0.50	0.20	0.10	0.08	5.2%
		15.00	6.50	0.20	0.89	0.50	0.20	0.10	0.09	5.6%
		15.50	6.50	0.20	0.88	0.50	0.20	0.10	0.09	5.6%
		16.00	6.50	0.20	0.81	0.50	0.20	0.10	0.08	5.1%
		16.50	6.55	0.25	0.74	0.50	0.25	0.13	0.09	5.9%
		17.00	6.60	0.30	0.80	0.50	0.30	0.15	0.12	7.6%
		17.50	6.55	0.25	0.70	0.50	0.25	0.13	0.09	5.5%
		18.00	6.50	0.20	0.15	0.50	0.20	0.15	0.02	1.4%
	W	19.00	6.30	0.00	0.00	1.02		0.00	0.00	0.0%
1	G	20.60	5.76			0.00		0.00	0.00	0.0%
	LS	30.50	4.04			0.00		0.00	0.00	0.0%
	TOTALS ----------					10.25	0.5 (Max.)	2.10	1.58	100.0%

Manning's n = 0.1042
Hydraulic Radius= 0.20487926

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to AML repository
XS NUMBER: 3

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	2.10	2.10	0.0%
6.05	2.10	4.88	132.2%
6.07	2.10	4.63	120.7%
6.09	2.10	4.40	109.3%
6.11	2.10	4.16	98.1%
6.13	2.10	3.93	87.0%
6.15	2.10	3.70	76.2%
6.17	2.10	3.47	65.5%
6.19	2.10	3.25	54.9%
6.21	2.10	3.04	44.6%
6.23	2.10	2.82	34.4%
6.25	2.10	2.61	24.3%
6.26	2.10	2.51	19.4%
6.27	2.10	2.40	14.5%
6.28	2.10	2.30	9.6%
6.29	2.10	2.20	4.8%
6.30	2.10	2.10	0.0%
6.31	2.10	2.00	-4.7%
6.32	2.10	1.90	-9.4%
6.33	2.10	1.80	-14.1%
6.34	2.10	1.71	-18.7%
6.35	2.10	1.61	-23.2%
6.37	2.10	1.42	-32.2%
6.39	2.10	1.24	-40.9%
6.41	2.10	1.06	-49.5%
6.43	2.10	0.88	-57.9%
6.45	2.10	0.71	-66.2%
6.47	2.10	0.54	-74.1%
6.49	2.10	0.39	-81.4%
6.51	2.10	0.27	-87.0%
6.53	2.10	0.20	-90.5%
6.55	2.10	0.15	-92.9%

WATERLINE AT ZERO
AREA ERROR = 6.300

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to AML repository
XS NUMBER: 3

Constant Manning's n

STAGING TABLE

GL = lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	5.76	15.82	0.56	1.04	8.89	16.20	100.0%	0.55	12.90	1.45
	5.80	15.26	0.54	1.00	8.27	15.63	96.5%	0.53	11.71	1.41
	5.85	14.56	0.52	0.95	7.53	14.91	92.1%	0.50	10.32	1.37
	5.90	13.85	0.49	0.90	6.82	14.20	87.7%	0.48	9.04	1.33
	5.95	13.15	0.47	0.85	6.14	13.48	83.2%	0.46	7.86	1.28
	6.00	12.65	0.43	0.80	5.50	12.98	80.1%	0.42	6.71	1.22
	6.05	12.21	0.40	0.75	4.88	12.52	77.3%	0.39	5.62	1.15
	6.10	11.77	0.36	0.70	4.28	12.07	74.5%	0.35	4.63	1.08
	6.15	11.33	0.33	0.65	3.70	11.61	71.7%	0.32	3.73	1.01
	6.20	10.88	0.29	0.60	3.14	11.16	68.9%	0.28	2.92	0.93
	6.25	10.44	0.25	0.55	2.61	10.70	66.1%	0.24	2.20	0.84
WL	6.30	10.00	0.21	0.50	2.10	10.25	63.3%	0.20	1.58	0.75
	6.35	9.50	0.17	0.45	1.61	9.74	60.1%	0.17	1.05	0.65
	6.40	9.00	0.13	0.40	1.15	9.23	57.0%	0.12	0.62	0.54
	6.45	8.58	0.08	0.35	0.71	8.80	54.3%	0.08	0.29	0.40
	6.50	4.68	0.07	0.30	0.32	4.85	30.0%	0.07	0.11	0.35
	6.55	2.02	0.07	0.25	0.15	2.15	13.3%	0.07	0.05	0.36
	6.60	0.79	0.10	0.20	0.08	0.89	5.5%	0.09	0.03	0.43
	6.65	0.59	0.07	0.15	0.04	0.67	4.1%	0.07	0.02	0.35
	6.70	0.39	0.05	0.10	0.02	0.44	2.7%	0.04	0.01	0.27
	6.75	0.20	0.02	0.05	0.00	0.22	1.4%	0.02	0.00	0.17

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to AML repository
XS NUMBER: 3

SUMMARY SHEET

MEASURED FLOW (Qm)=	1.58	cfs
CALCULATED FLOW (Qc)=	1.58	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	6.30	ft
CALCULATED WATERLINE (WLc)=	6.30	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.50	ft
MAX CALCULATED DEPTH (Dc)=	0.50	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	0.75	ft/sec
MANNING'S N=	0.104	
SLOPE=	0.023	ft/ft
.4 * Qm =	0.6	cfs
2.5 * Qm=	3.9	cfs

RECOMMENDED INSTREAM FLOW:
==============================

FLOW (CFS)	PERIOD
___________	___________
___________	___________
___________	___________
___________	___________

RATIONALE FOR RECOMMENDATION:
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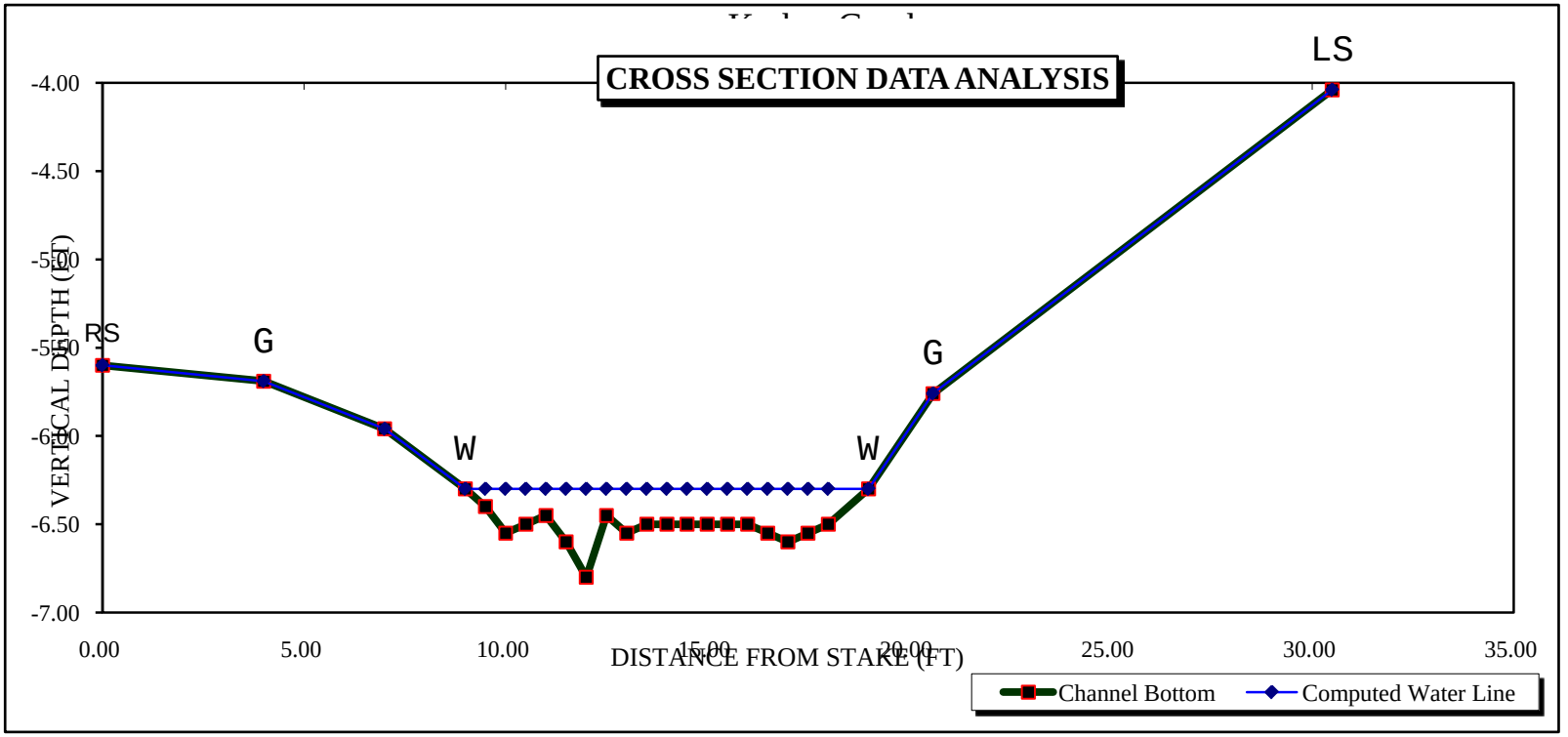
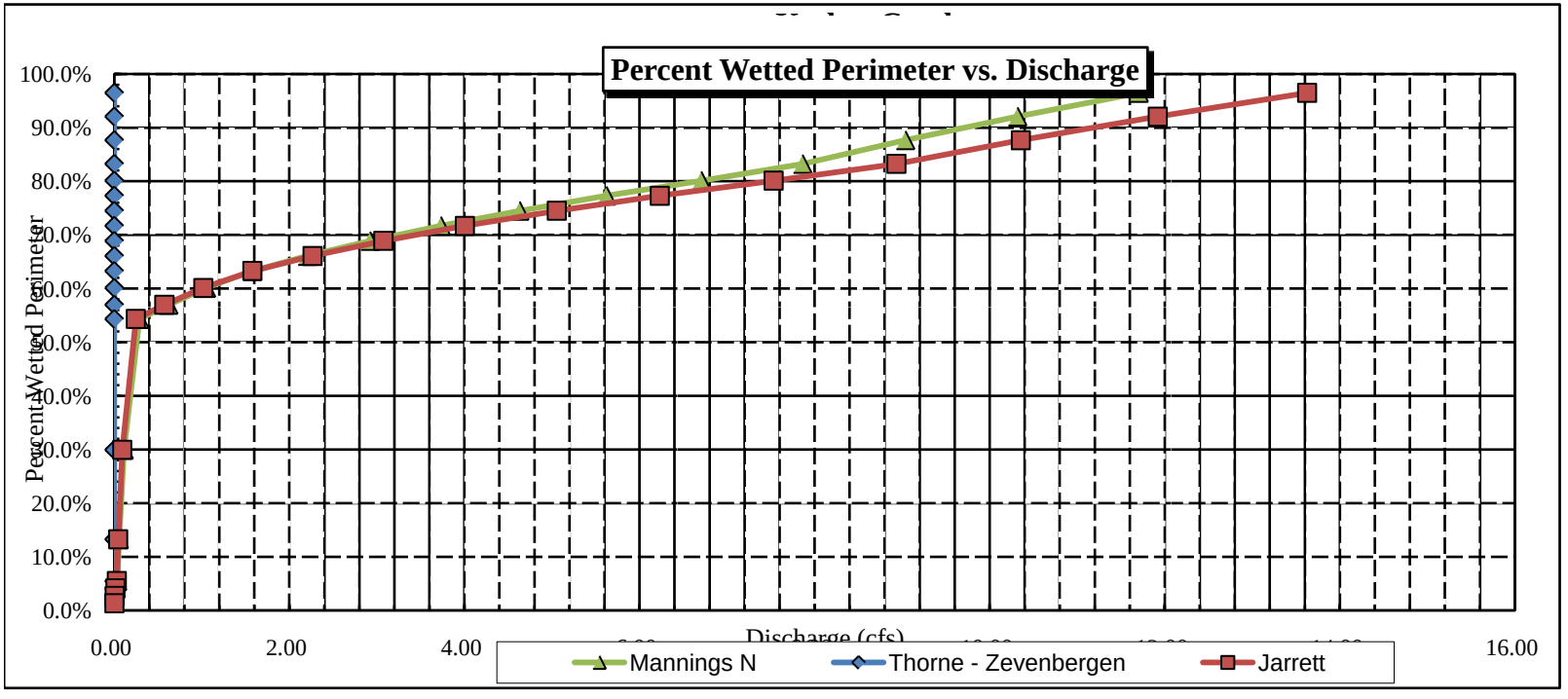
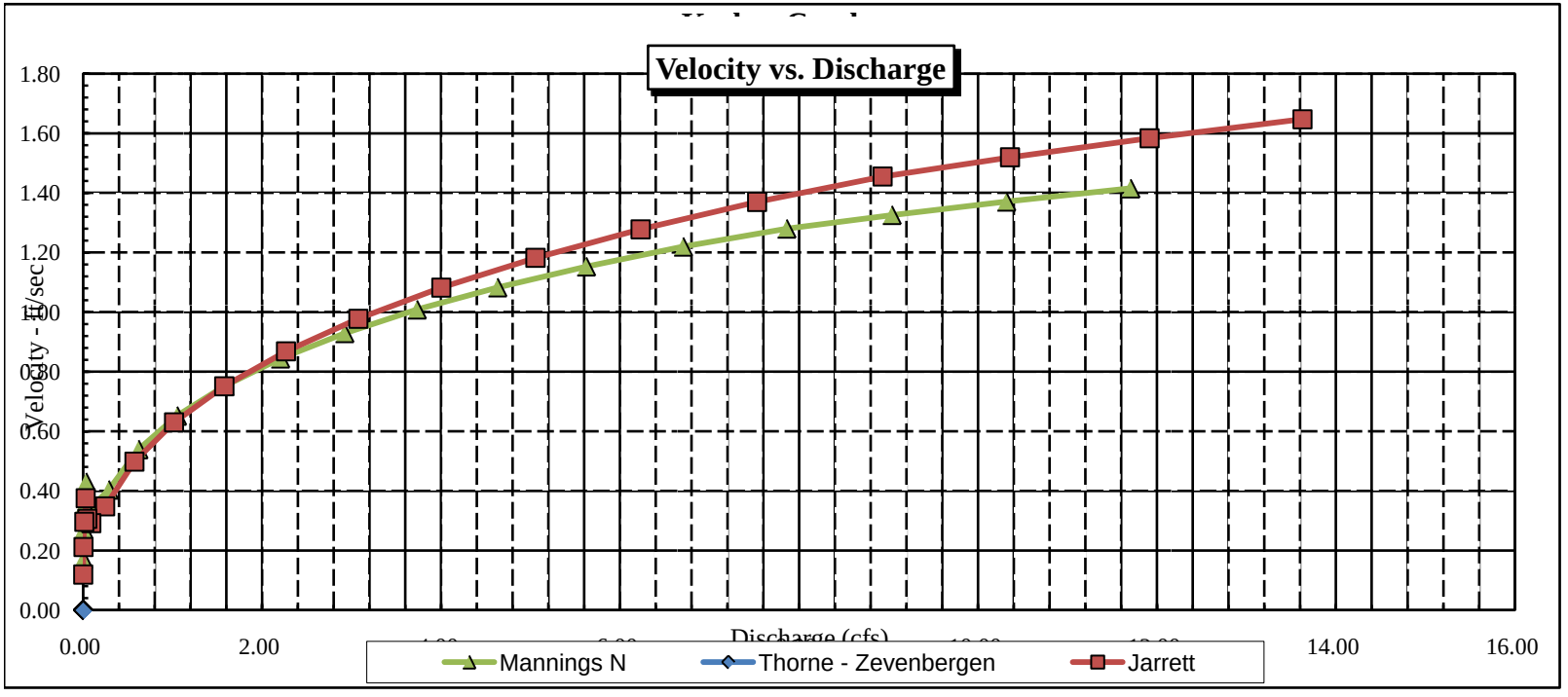
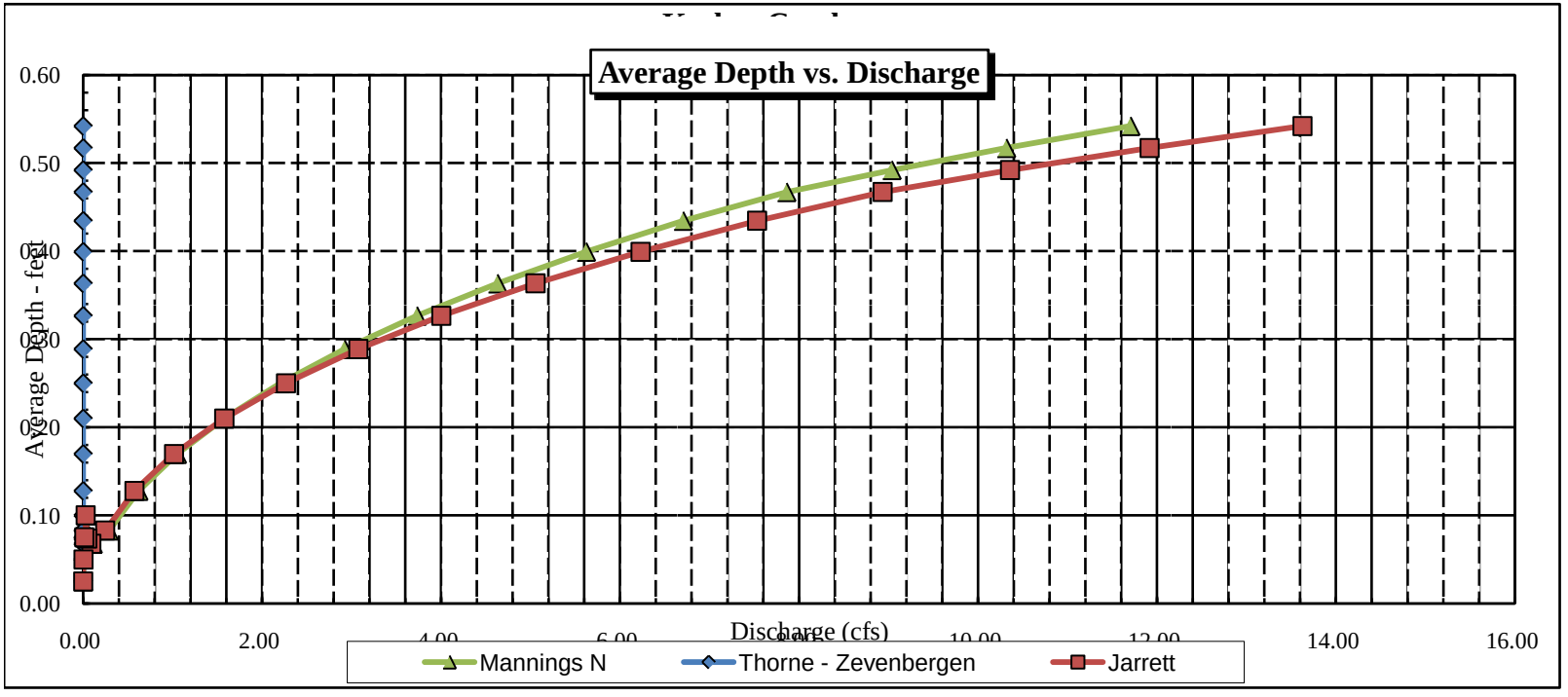
RECOMMENDATION BY: ……………………………………… AGENCY……………………………………… DATE:………………………

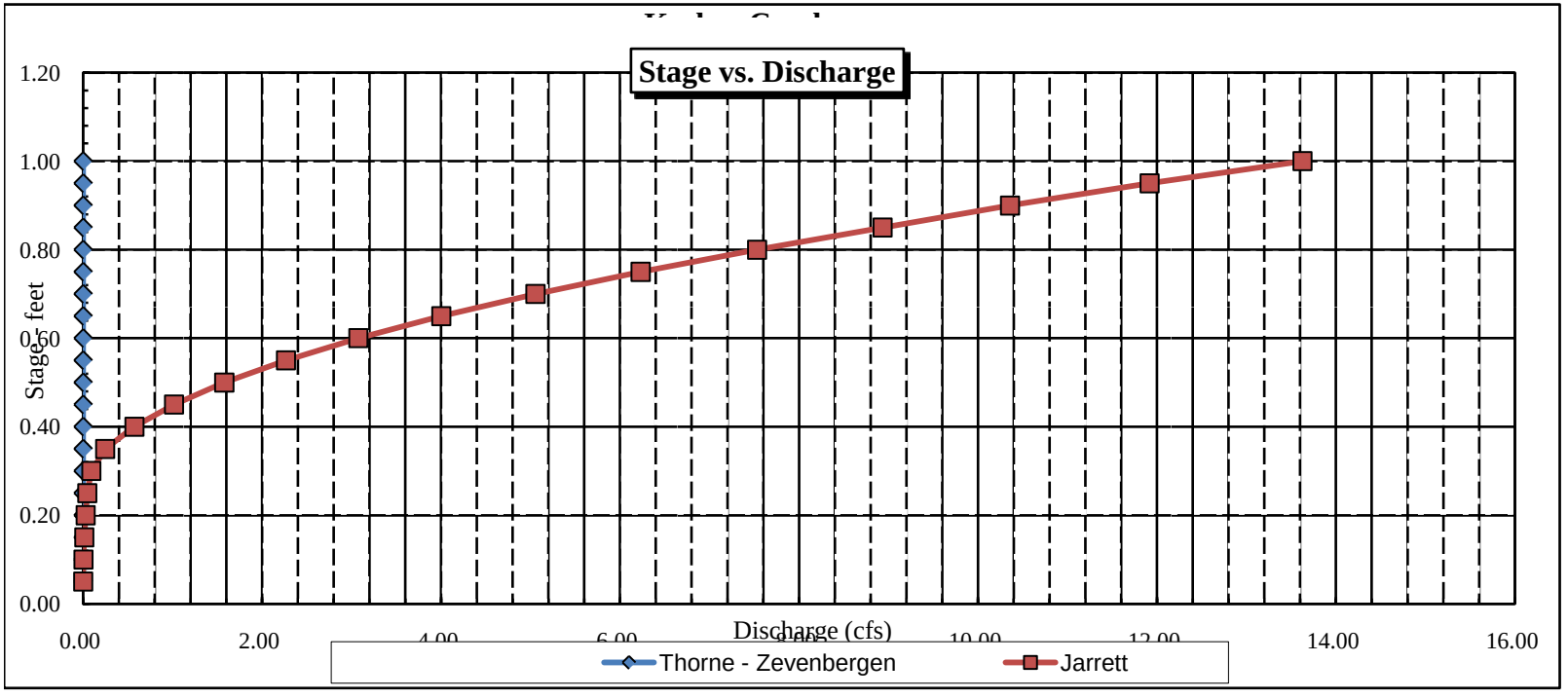
CWCB REVIEW BY: ……………………………………………………………………………………………… DATE:………………………


CROSS SECTION DATA ANALYSIS
LS
RS
G
W
W
G
-4.00
-4.50
-5.00
-5.50
-6.00
-6.50
-7.00
VERTICAL DEPTH (FT)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
2.00
4.00
16.00
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
Velocity - ft/sec
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.00
2.00
14.00
16.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
2.00
14.00
16.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Stage, feet
0.00
2.00
14.00
16.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

LOCATION INFORMATION

STREAM NAME: Kerber Creek						CROSS-SECTION NO.: 1
CROSS-SECTION LOCATION: at boundary between BLM & Bartlow property						
DATE: 6-16-90	OBSERVERS: R. Smith, S. Sanchez					
LEGAL DESCRIPTION	¼ SECTION: SE	SECTION: 7	TOWNSHIP: 46 (N)S	RANGE: 8 (E)W	PM: NM	
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40903			
MAP(S): USGS:						
USFS:						

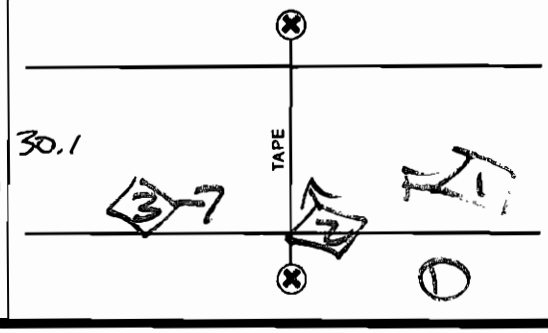
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES)/NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 6" cobbles	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
(X) Tape @ Stake LB	0.0	surveyed
(X) Tape @ Stake RB	0.0	surveyed
(1) WS @ Tape LB/RB	0.0 7.6	4.98 / 4.98
(2) WS Upstream	37.0'	4.86
(3) WS Downstream	35.0'	5.40
SLOPE	0.54 / 72.0 = .0075	

SKETCH



LEGEND:
- Stake (X)
- Station (1)
- Photo (1)
- Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/(NO)	DISTANCE ELECTROFISHED: ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

caddisfly, mayfly,

COMMENTS

pH = not functioning
TDS = 250
Temp = 9° C

FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kerber Creek	CROSS-SECTION NO.: 1	DATE: 6-16-10	SHEET __ OF __
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME 10 am

Features (Stake (S), Grassline (G), Waterline (W), Rock (R))	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		3.80								
	3.2		4.64								
G	5.6		4.85								
W	7.6		5.00								
	8		5.35	.35				0.7			
	9		5.40	.40				0.98			
	10		5.45	.45				1.51			
	11		5.40	.40				1.67			
	12		5.30	.30				2.58			
	13		5.50	.50				1.21			
	14		5.50	.50				2.67			
	15		5.75	.75				2.51			
	16		5.70	.70				3.07			
	17		5.70	.70				2.78			
	18		5.80	.80				2.43			
	19		5.90	.90				2.89			
	20		5.90	.90				2.75			
	21		5.80	.80				2.58			
	22		5.80	.80				2.38			
	23		5.50	.50				2.59			
	24		5.60	.60				2.59			
	25		5.60	.60				2.15			
	26		5.55	.55				2.07			
	27		5.55	.55				2.03			
	28		5.55	.50				1.51			
	29		5.25	.25				0.66			
W	30.1		5.00								
G	36.0		4.80								
	44.0		4.76								
RS	47.8		4.62								
TOTALS:											

End of Measurement	Time 10:30	Gage Reading ___ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	BLM-Bartlow property boundary
XS NUMBER:	1
DATE:	16-Jun-10
OBSERVERS:	R. Smith, S. Sanchez
1/4 SEC:	SE
SECTION:	7
TWP:	46N
RANGE:	8W
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.0075

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: BLM-Bartlow property boundary
XS NUMBER: 1

DATA POINTS= 30

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
RS	0.00	3.80			0.00		0.00	0.00	0.0%
	3.20	4.64			0.00		0.00	0.00	0.0%
1 G	5.60	4.85			0.00		0.00	0.00	0.0%
W	7.60	5.00	0.00	0.70	0.00		0.00	0.00	0.0%
	8.00	5.35	0.35	0.98	0.53	0.35	0.25	0.24	0.8%
	9.00	5.40	0.40	1.51	1.00	0.40	0.40	0.60	2.1%
	10.00	5.45	0.45	1.67	1.00	0.45	0.45	0.75	2.6%
	11.00	5.40	0.40	2.58	1.00	0.40	0.40	1.03	3.6%
	12.00	5.30	0.30	1.21	1.00	0.30	0.30	0.36	1.3%
	13.00	5.50	0.50	2.67	1.02	0.50	0.50	1.34	4.6%
	14.00	5.50	0.50	2.51	1.00	0.50	0.50	1.26	4.4%
	15.00	5.75	0.75	3.07	1.03	0.75	0.75	2.30	8.0%
	16.00	5.70	0.70	2.78	1.00	0.70	0.70	1.95	6.8%
	17.00	5.70	0.70	2.43	1.00	0.70	0.70	1.70	5.9%
	18.00	5.80	0.80	2.89	1.00	0.80	0.80	2.31	8.0%
	19.00	5.90	0.90	2.75	1.00	0.90	0.90	2.48	8.6%
	20.00	5.90	0.90	2.58	1.00	0.90	0.90	2.32	8.1%
	21.00	5.80	0.80	2.38	1.00	0.80	0.80	1.90	6.6%
	22.00	5.80	0.80	2.59	1.00	0.80	0.80	2.07	7.2%
	23.00	5.50	0.50	2.59	1.04	0.50	0.50	1.30	4.5%
	24.00	5.60	0.60	2.15	1.00	0.60	0.60	1.29	4.5%
	25.00	5.60	0.60	2.07	1.00	0.60	0.60	1.24	4.3%
	26.00	5.55	0.55	2.03	1.00	0.55	0.55	1.12	3.9%
	27.00	5.55	0.55	1.51	1.00	0.55	0.55	0.83	2.9%
	28.00	5.55	0.55	0.66	1.00	0.55	0.55	0.36	1.3%
	29.00	5.25	0.25	0.00	1.04	0.25	0.26	0.00	0.0%
W	30.10	5.00			1.13		0.00	0.00	0.0%
1 G	36.00	4.80			0.00		0.00	0.00	0.0%
	44.00	4.76			0.00		0.00	0.00	0.0%
RS	47.80	4.62			0.00		0.00	0.00	0.0%
TOTALS ----------					22.83	0.9 (Max.)	12.76	28.75	100.0%

Manning's n = 0.0387
Hydraulic Radius= 0.55881928

STREAM NAME: Kerber Creek
XS LOCATION: BLM-Bartlow property boundary
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	12.76	12.76	0.0%
4.75	12.76	19.92	56.1%
4.77	12.76	19.14	50.0%
4.79	12.76	18.43	44.5%
4.81	12.76	17.80	39.6%
4.83	12.76	17.20	34.8%
4.85	12.76	16.61	30.2%
4.87	12.76	16.04	25.8%
4.89	12.76	15.49	21.4%
4.91	12.76	14.96	17.2%
4.93	12.76	14.44	13.2%
4.95	12.76	13.94	9.2%
4.96	12.76	13.69	7.3%
4.97	12.76	13.45	5.4%
4.98	12.76	13.22	3.6%
4.99	12.76	12.98	1.8%
5.00	12.76	12.76	0.0%
5.01	12.76	12.53	-1.8%
5.02	12.76	12.31	-3.5%
5.03	12.76	12.09	-5.3%
5.04	12.76	11.86	-7.0%
5.05	12.76	11.64	-8.8%
5.07	12.76	11.20	-12.2%
5.09	12.76	10.76	-15.7%
5.11	12.76	10.32	-19.1%
5.13	12.76	9.88	-22.6%
5.15	12.76	9.44	-26.0%
5.17	12.76	9.01	-29.4%
5.19	12.76	8.58	-32.7%
5.21	12.76	8.15	-36.1%
5.23	12.76	7.73	-39.4%
5.25	12.76	7.31	-42.7%

WATERLINE AT ZERO
AREA ERROR = 5.000

STREAM NAME: Kerber Creek
XS LOCATION: BLM-Bartlow property boundary
XS NUMBER: 1

Constant Manning's n

GL = lowest Grassline elevation corrected for sag
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	4.85	28.93	0.57	1.05	16.61	29.26	100.0%	0.57	37.84	2.28
	4.85	28.92	0.57	1.05	16.61	29.26	100.0%	0.57	37.84	2.28
	4.90	26.78	0.57	1.00	15.22	27.12	92.7%	0.56	34.41	2.26
	4.95	24.64	0.57	0.95	13.94	24.97	85.3%	0.56	31.38	2.25
WL	5.00	22.50	0.57	0.90	12.76	22.83	78.0%	0.56	28.75	2.25
	5.05	22.22	0.52	0.85	11.64	22.53	77.0%	0.52	24.90	2.14
	5.10	21.95	0.48	0.80	10.54	22.23	76.0%	0.47	21.28	2.02
	5.15	21.67	0.44	0.75	9.44	21.92	74.9%	0.43	17.90	1.89
	5.20	21.39	0.39	0.70	8.37	21.62	73.9%	0.39	14.76	1.76
	5.25	21.11	0.35	0.65	7.31	21.32	72.9%	0.34	11.88	1.63
	5.30	20.89	0.30	0.60	6.26	21.07	72.0%	0.30	9.25	1.48
	5.35	19.92	0.26	0.55	5.24	20.06	68.6%	0.26	7.10	1.36
	5.40	18.00	0.24	0.50	4.29	18.13	62.0%	0.24	5.45	1.27
	5.45	15.58	0.22	0.45	3.45	15.70	53.7%	0.22	4.17	1.21
	5.50	14.17	0.19	0.40	2.68	14.27	48.8%	0.19	2.92	1.09
	5.55	11.13	0.18	0.35	2.00	11.21	38.3%	0.18	2.10	1.05
	5.60	8.27	0.18	0.30	1.49	8.33	28.5%	0.18	1.57	1.05
	5.65	7.90	0.14	0.25	1.08	7.95	27.2%	0.14	0.95	0.88
	5.70	6.53	0.11	0.20	0.70	6.57	22.5%	0.11	0.52	0.74
	5.75	4.67	0.09	0.15	0.42	4.69	16.0%	0.09	0.28	0.66
	5.80	3.00	0.07	0.10	0.20	3.01	10.3%	0.07	0.11	0.54
	5.85	2.00	0.04	0.05	0.08	2.01	6.9%	0.04	0.03	0.37
	5.90	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Kerber Creek
XS LOCATION: BLM-Bartlow property boundary
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	28.75	cfs
CALCULATED FLOW (Qc)=	28.75	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	5.00	ft
CALCULATED WATERLINE (WLc)=	5.00	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.90	ft
MAX CALCULATED DEPTH (Dc)=	0.90	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	2.25	ft/sec
MANNING'S N=	0.039	
SLOPE=	0.0075	ft/ft
.4 * Qm =	11.5	cfs
2.5 * Qm=	71.9	cfs

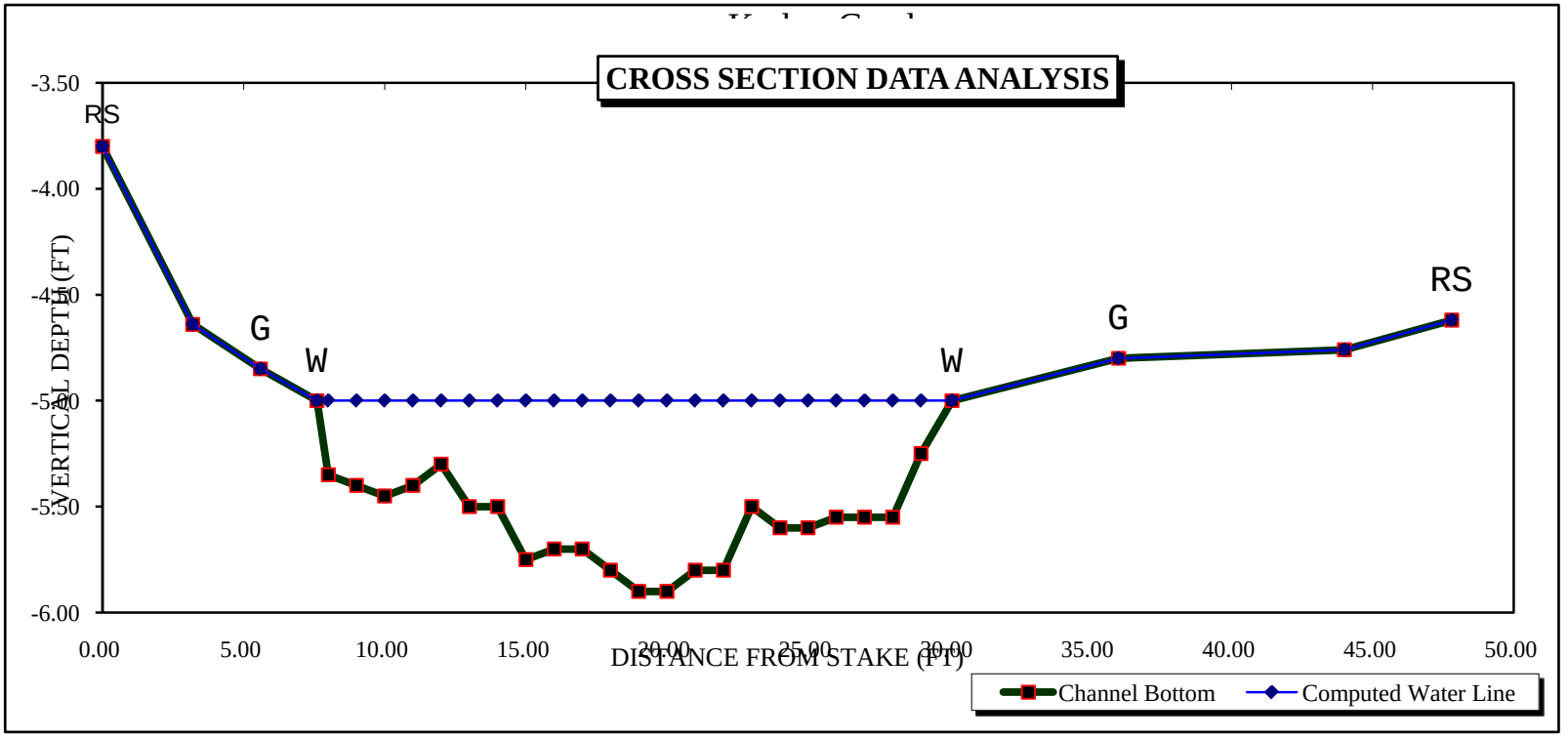
RECOMMENDED INSTREAM FLOW:
=============================

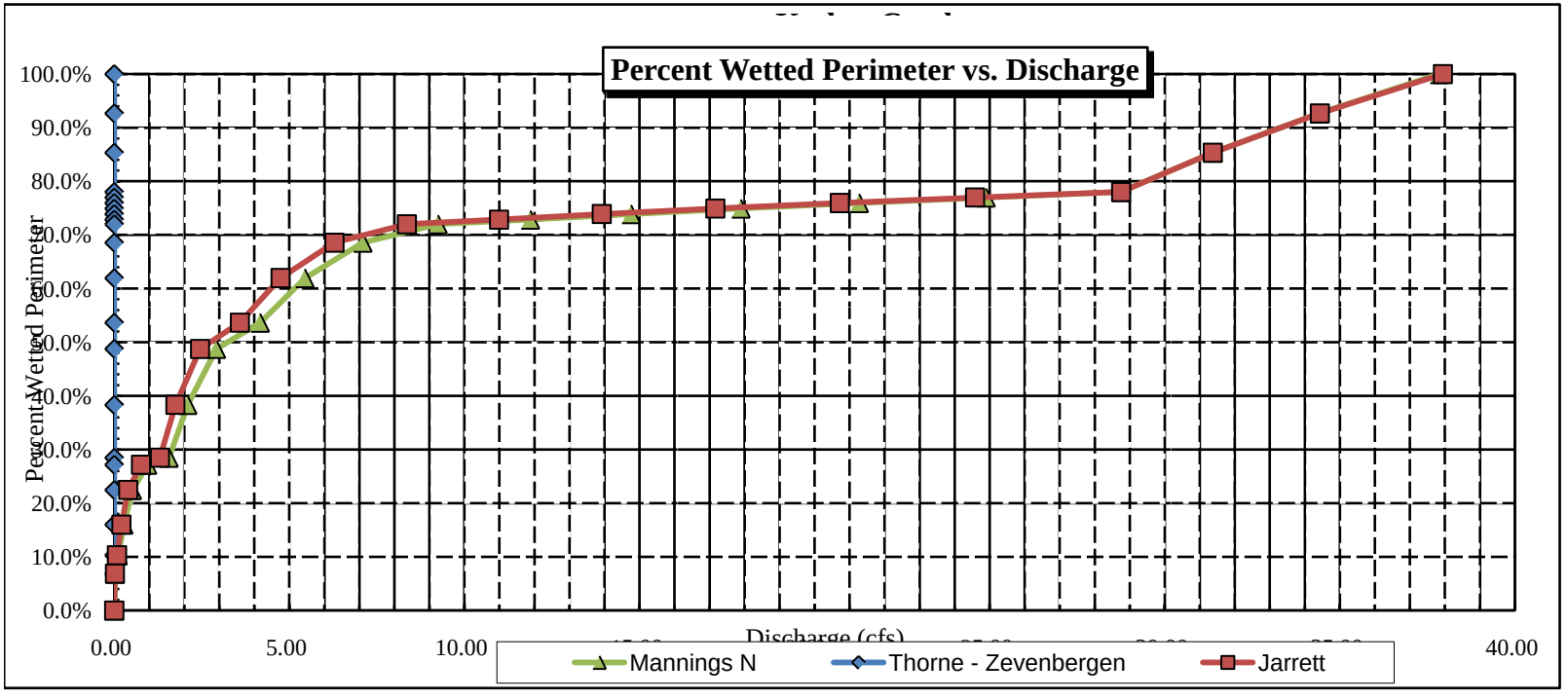
FLOW (CFS)	PERIOD
___________	___________
___________	___________
___________	___________
___________	___________

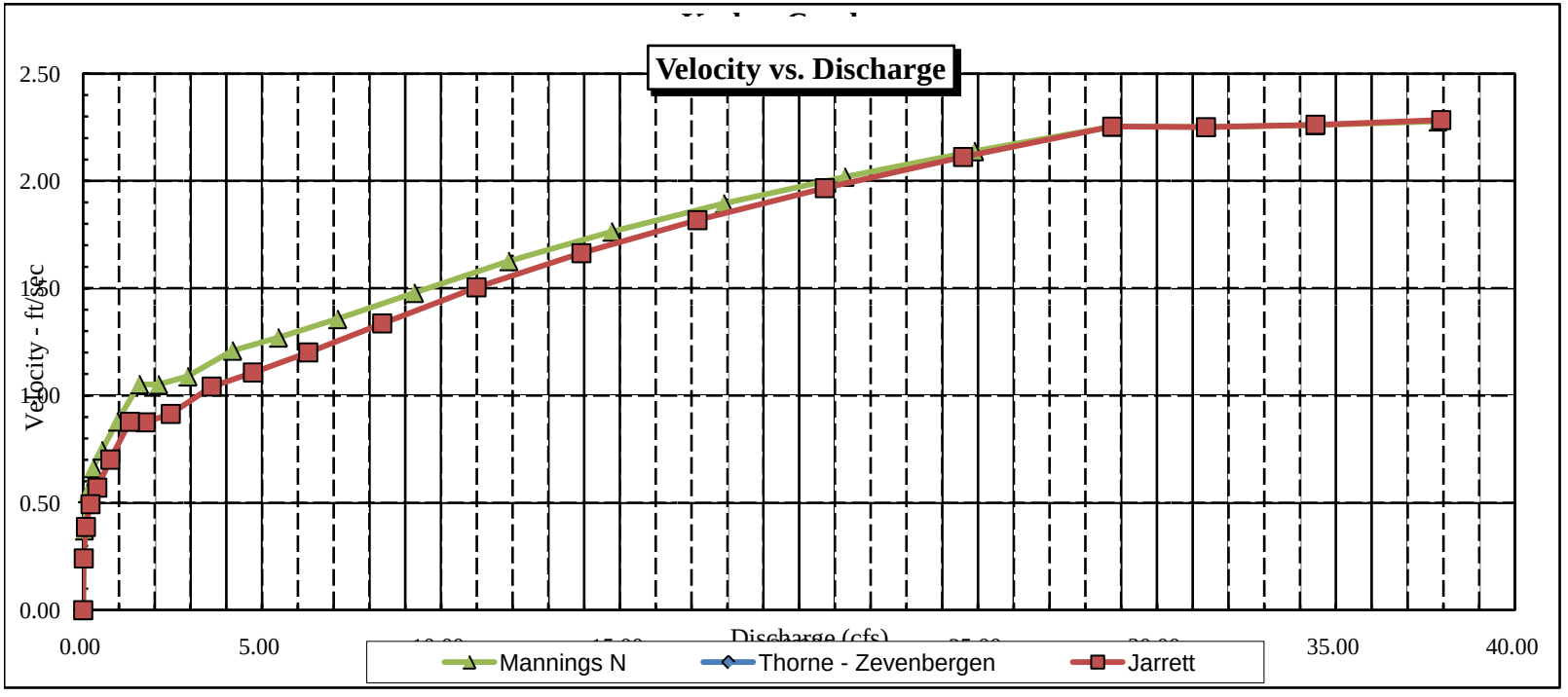
RATIONALE FOR RECOMMENDATION:
=============================

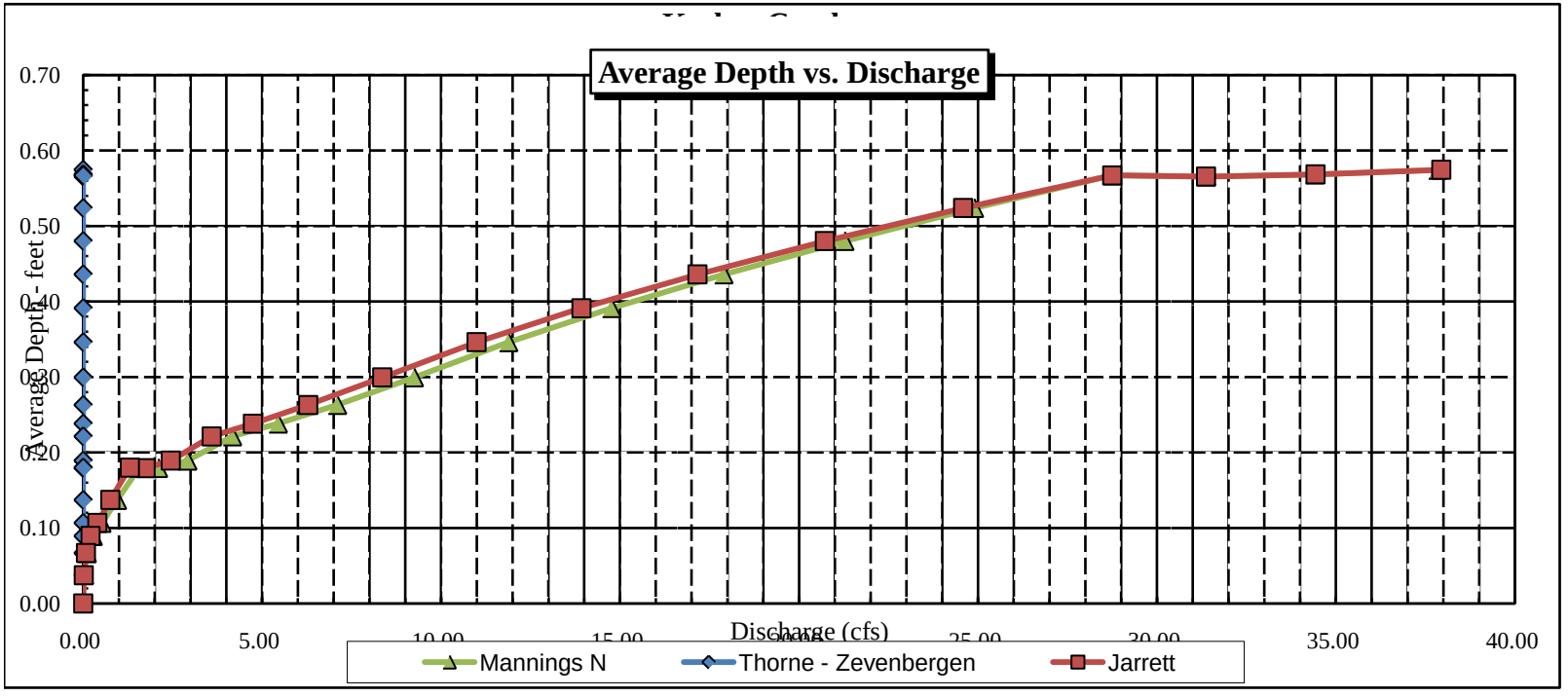
RECOMMENDATION BY: ……………………...………..……............................... AGENCY...……………………….....……...…...……...... DATE:.......…...…......……………

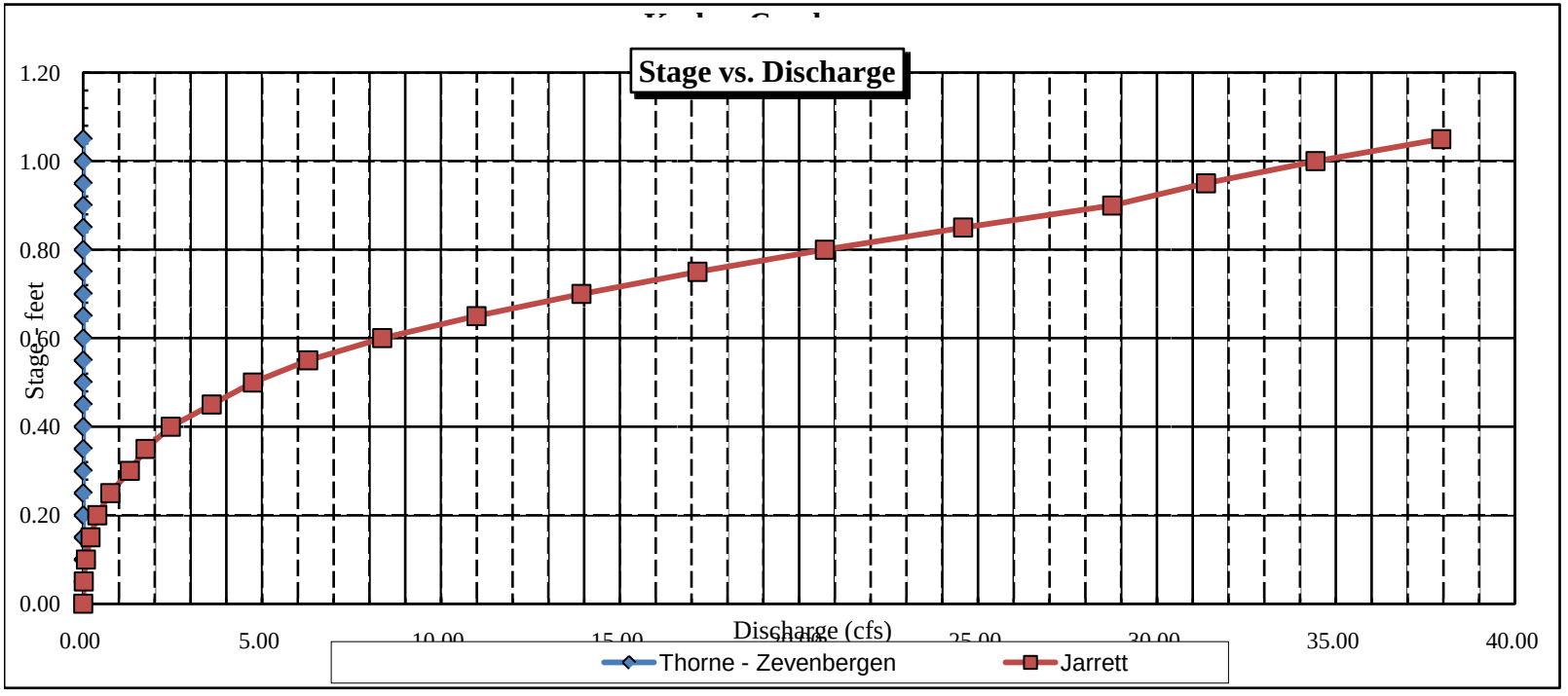
CWCB REVIEW BY: ..…………………………....……………………………………………………..…............. DATE:.................…………….....


CROSS SECTION DATA ANALYSIS
-3.50
-4.00
-4.50
-5.00
-5.50
-6.00
VERTICAL DEPTH (FT)
RS
G
W
W
G
RS
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
5.00
10.00
40.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
Velocity - ft/sec
2.50
2.00
1.50
1.00
0.50
0.00
0.00
5.00
35.00
40.00
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
5.00
35.00
40.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Stage, feet
0.00
5.00
35.00
40.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kerber Creek - Elkhorn to Brewery reach						CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: adjacent to fenced AML reposidony site							
DATE: 6-16-10	OBSERVERS: R. Smith, S. Sanchez						
LEGAL DESCRIPTION	¼ SECTION: SE	SECTION: 36	TOWNSHIP: 47 (N)S	RANGE: 7 (E)W	PM: NM		
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40905				
MAP(S): USGS:	GPS 13S 399907						
USFS:	4237686						

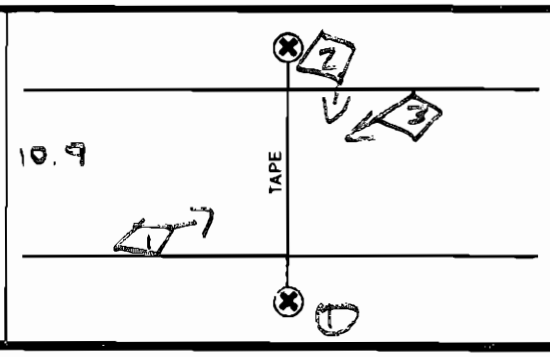
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 1-foot boulders	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0 (23.7)	5.45 / 5.45
② WS Upstream	17.0	4.80
③ WS Downstream	18.0	5.60
SLOPE	.8 / 35.0 = .023	

SKETCH



LEGEND: Stake ⊗ · Station ① · Photo ◇ · Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/(NO)	DISTANCE ELECTROFISHED ____ ft	FISH CAUGHT YES/NO	WATER CHEMISTRY SAMPLED (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

caddisfly, mayfly

COMMENTS

Temp = 15° C
TDS = 90
PH = 7.6

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Karber Creek | CROSS-SECTION NO.: 2 | DATE: 6-16-10 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 1:30

Features (Stake (S), Grassline (G), Waterline (W), Rock (R))	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		5.65								
	3.2		5.16								
G	7.0		5.18								
W	10.9		5.45								
	11.5		5.75	.3				.44			
	12		5.75	.3				.16			
	12.5		6.05	.6				1.99			
	13		5.95	.5				2.03			
	13.5		5.95	.5				2.17			
	14		5.95	.5				2.56			
	14.5		5.95	.5				2.28			
	15		6.00	.55				2.24			
	15.5		5.90	.45				1.14			
	16		5.95	.5				1.03			
	16.5		5.90	.45				1.78			
	17		5.85	.4				2.38			
	17.5		5.90	.45				2.14			
	18		6.05	.60				2.36			
	18.5		5.95	.50				2.31			
	19		6.00	.55				1.76			
	19.5		5.95	.50				1.96			
	20		6.00	.55				1.67			
	20.5		5.95	.50				2.20			
	21		5.85	.40				2.03			
	21.5		5.80	.35				1.93			
	22		5.75	.30				1.72			
	22.5		5.65	.20				1.22			
	23		5.56	.10				.92			
W	23.7		5.45								
G	27.2		5.16								
LS	32.0		5.08								
TOTALS:											

End of Measurement | Time | Gage Reading ____ ft | CALCULATIONS PERFORMED BY | CALCULATIONS CHECKED BY

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	Adjacent to fenced AML repository site
XS NUMBER:	2
DATE:	06\16\2010
OBSERVERS:	R. Smith, S. Sanchez
1/4 SEC:	SE
SECTION:	36
TWP:	47N
RANGE:	7E
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

TAPE WT:	0.0106
TENSION:	99999

*** NOTE ***
Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod

CHANNEL PROFILE DATA

SLOPE:	0.023

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to fenced AML repository site
XS NUMBER: 2

DATA POINTS= 31

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	RS	0.00	3.63			0.00		0.00	0.00	0.0%
		3.20	5.16			0.00		0.00	0.00	0.0%
1	G	9.00	5.18			0.00		0.00	0.00	0.0%
	W	10.90	5.45	0.00	0.00	0.00		0.00	0.00	0.0%
		11.50	5.75	0.30	0.44	0.67	0.30	0.17	0.07	0.7%
		12.00	5.75	0.30	0.16	0.50	0.30	0.15	0.02	0.2%
		12.50	6.05	0.60	1.99	0.58	0.60	0.30	0.60	6.0%
		13.00	5.95	0.50	2.03	0.51	0.50	0.25	0.51	5.1%
		13.50	5.95	0.50	2.17	0.50	0.50	0.25	0.54	5.5%
		14.00	5.95	0.50	2.56	0.50	0.50	0.25	0.64	6.5%
		14.50	5.95	0.50	2.28	0.50	0.50	0.25	0.57	5.8%
		15.00	6.00	0.55	2.24	0.50	0.55	0.28	0.62	6.2%
		15.50	5.90	0.45	1.14	0.51	0.45	0.23	0.26	2.6%
		16.00	5.95	0.50	1.03	0.50	0.50	0.25	0.26	2.6%
		16.50	5.90	0.45	1.78	0.50	0.45	0.23	0.40	4.0%
		17.00	5.85	0.40	2.38	0.50	0.40	0.20	0.48	4.8%
		17.50	5.90	0.45	2.17	0.50	0.45	0.23	0.49	4.9%
		18.00	6.05	0.60	2.38	0.52	0.60	0.30	0.71	7.2%
		18.50	5.95	0.50	2.31	0.51	0.50	0.25	0.58	5.8%
		19.00	6.00	0.55	1.76	0.50	0.55	0.28	0.48	4.9%
		19.50	5.95	0.50	1.96	0.50	0.50	0.25	0.49	4.9%
		20.00	6.00	0.55	1.67	0.50	0.55	0.28	0.46	4.6%
		20.50	5.95	0.50	2.20	0.50	0.50	0.25	0.55	5.6%
		21.00	5.85	0.40	2.03	0.51	0.40	0.20	0.41	4.1%
		21.50	5.80	0.35	1.93	0.50	0.35	0.18	0.34	3.4%
		22.00	5.75	0.30	1.72	0.50	0.30	0.15	0.26	2.6%
		22.50	5.65	0.20	1.22	0.51	0.20	0.10	0.12	1.2%
		23.00	5.55	0.10	0.92	0.51	0.10	0.06	0.06	0.6%
	W	23.70	5.45	0.00	0.00	0.71		0.00	0.00	0.0%
1	G	27.20	5.16			0.00		0.00	0.00	0.0%
	LS	32.00	5.08			0.00		0.00	0.00	0.0%
	TOTALS ----------					13.07	0.6 (Max.)	5.30	9.90	100.0%

Manning's n = 0.0661
Hydraulic Radius= 0.40551249

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to fenced AML repository site
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	5.30	5.30	0.0%
5.20	5.30	9.10	71.6%
5.22	5.30	8.75	65.1%
5.24	5.30	8.41	58.7%
5.26	5.30	8.08	52.4%
5.28	5.30	7.75	46.3%
5.30	5.30	7.43	40.3%
5.32	5.30	7.13	34.4%
5.34	5.30	6.82	28.7%
5.36	5.30	6.53	23.2%
5.38	5.30	6.24	17.8%
5.40	5.30	5.96	12.5%
5.41	5.30	5.83	9.9%
5.42	5.30	5.69	7.4%
5.43	5.30	5.56	4.9%
5.44	5.30	5.43	2.4%
5.45	5.30	5.30	0.0%
5.46	5.30	5.17	-2.4%
5.47	5.30	5.05	-4.8%
5.48	5.30	4.92	-7.2%
5.49	5.30	4.80	-9.5%
5.50	5.30	4.67	-11.9%
5.52	5.30	4.43	-16.5%
5.54	5.30	4.18	-21.0%
5.56	5.30	3.95	-25.5%
5.58	5.30	3.71	-30.0%
5.60	5.30	3.48	-34.4%
5.62	5.30	3.25	-38.7%
5.64	5.30	3.02	-43.0%
5.66	5.30	2.80	-47.2%
5.68	5.30	2.58	-51.4%
5.70	5.30	2.36	-55.5%

WATERLINE AT ZERO
AREA ERROR = 5.450

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to fenced AML repository site
XS NUMBER: 2 Constant Manning's n

STAGING TABLE
GL = lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	5.18	17.96	0.53	0.87	9.45	18.26	100.0%	0.52	20.78	2.20
	5.20	17.58	0.52	0.85	9.10	17.87	97.9%	0.51	19.78	2.17
	5.25	16.62	0.50	0.80	8.24	16.91	92.6%	0.49	17.41	2.11
	5.30	15.67	0.47	0.75	7.43	15.95	87.4%	0.47	15.24	2.05
	5.35	14.71	0.45	0.70	6.68	14.99	82.1%	0.45	13.27	1.99
	5.40	13.76	0.43	0.65	5.96	14.03	76.8%	0.43	11.50	1.93
WL	5.45	12.80	0.41	0.60	5.30	13.07	71.6%	0.41	9.90	1.87
	5.50	12.35	0.38	0.55	4.67	12.60	69.0%	0.37	8.22	1.76
	5.55	11.90	0.34	0.50	4.07	12.14	66.5%	0.33	6.68	1.64
	5.60	11.55	0.30	0.45	3.48	11.77	64.5%	0.30	5.26	1.51
	5.65	11.20	0.26	0.40	2.91	11.41	62.5%	0.26	3.99	1.37
	5.70	10.85	0.22	0.35	2.36	11.04	60.5%	0.21	2.87	1.22
	5.75	10.00	0.18	0.30	1.83	10.17	55.7%	0.18	1.98	1.08
	5.80	9.42	0.14	0.25	1.34	9.57	52.4%	0.14	1.23	0.92
	5.85	8.83	0.10	0.20	0.88	8.97	49.1%	0.10	0.64	0.73
	5.90	7.50	0.06	0.15	0.48	7.62	41.7%	0.06	0.25	0.54
	5.95	4.25	0.03	0.10	0.14	4.33	23.7%	0.03	0.05	0.35
	6.00	0.75	0.03	0.05	0.02	0.78	4.3%	0.02	0.01	0.28
	6.05	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Kerber Creek
XS LOCATION: Adjacent to fenced AML repository site
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	9.90	cfs
CALCULATED FLOW (Qc)=	9.90	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	5.45	ft
CALCULATED WATERLINE (WLc)=	5.45	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.60	ft
MAX CALCULATED DEPTH (Dc)=	0.60	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	1.87	ft/sec
MANNING'S N=	0.066	
SLOPE=	0.023	ft/ft
.4 * Qm =	4.0	cfs
2.5 * Qm=	24.8	cfs

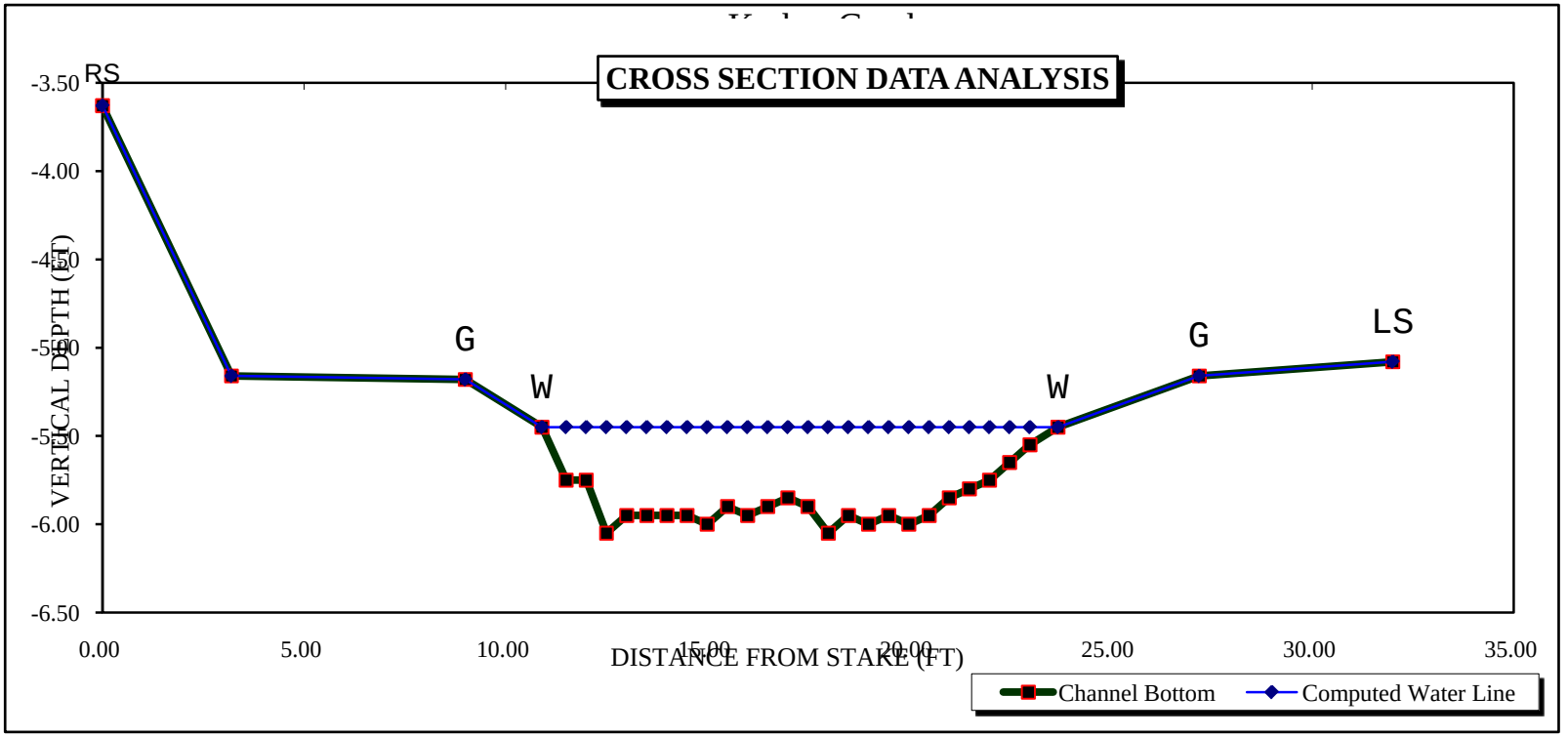
RECOMMENDED INSTREAM FLOW:
============================

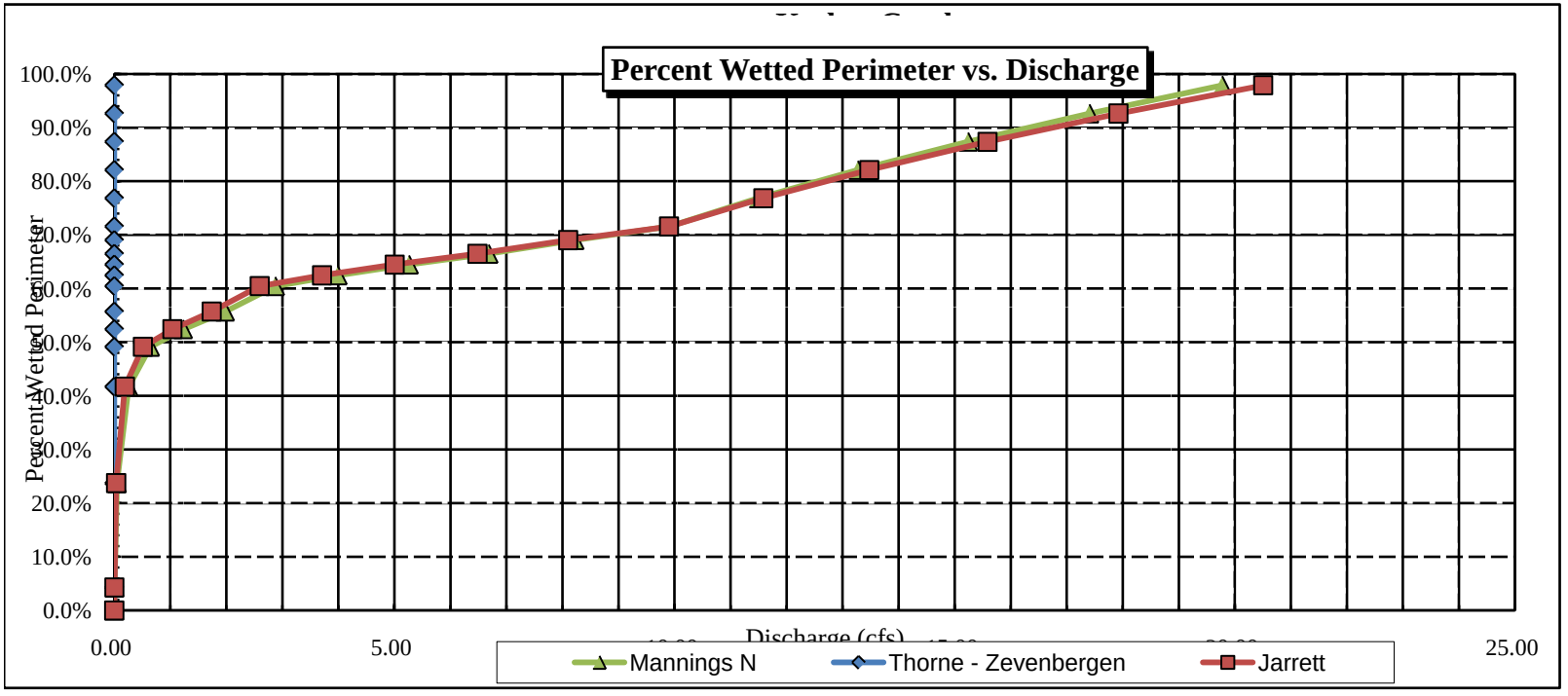
FLOW (CFS)	PERIOD
===========	========
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________

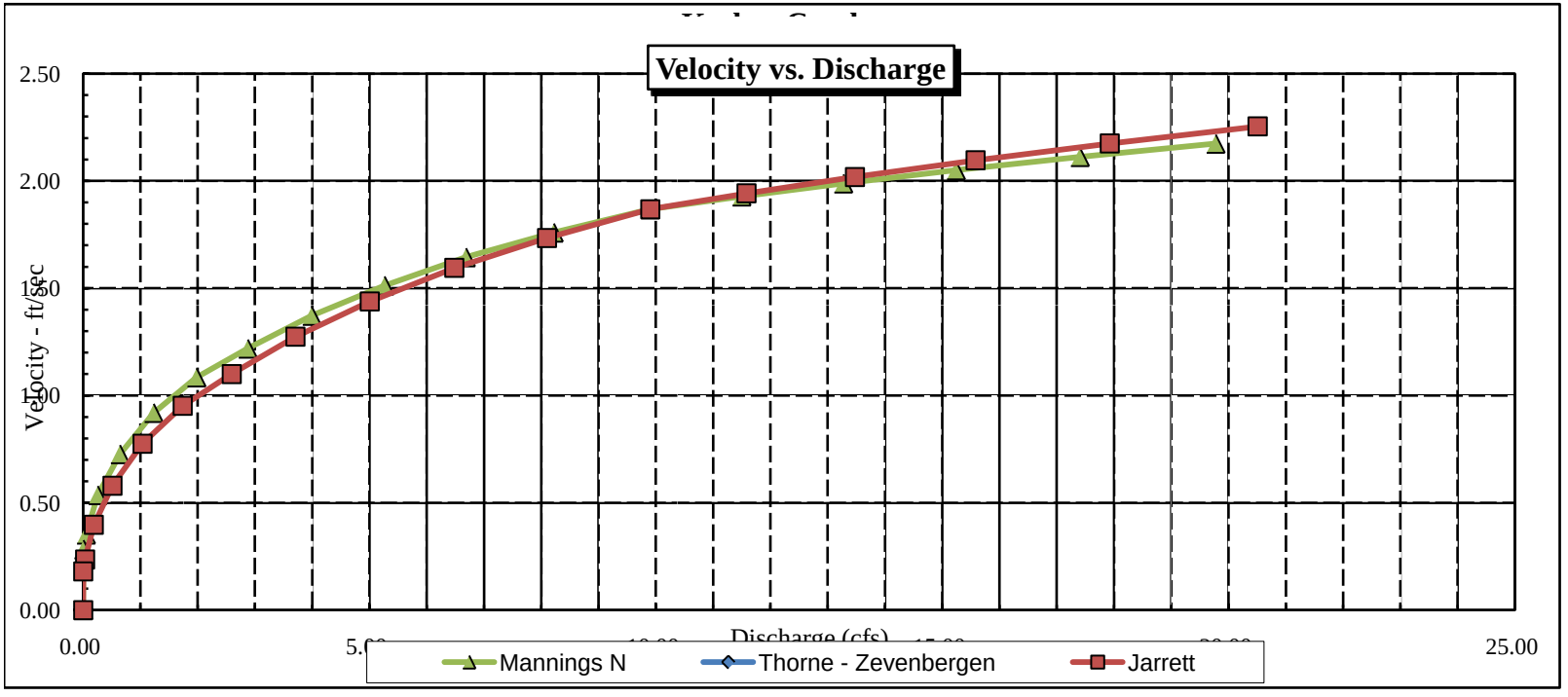
RATIONALE FOR RECOMMENDATION:
============================

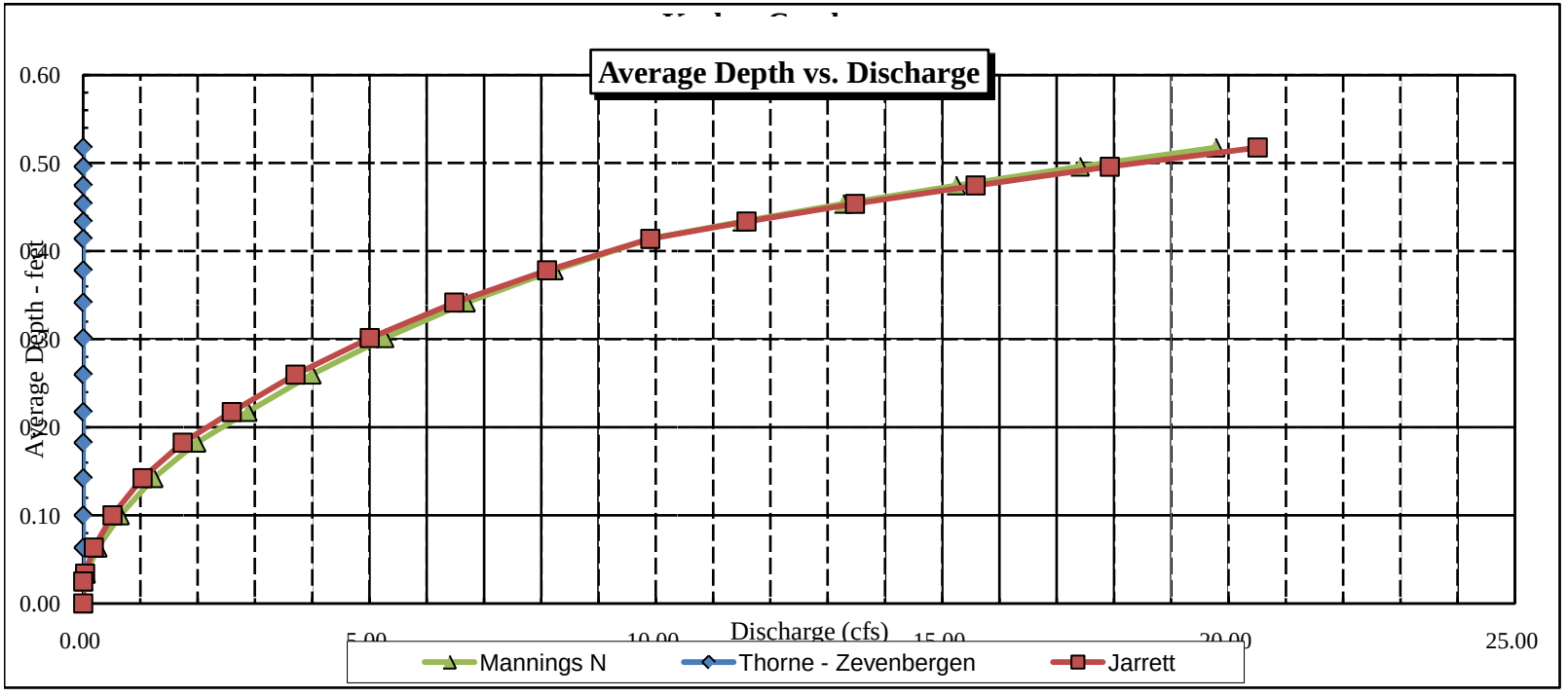
RECOMMENDATION BY: ……………………..……….…….............................. AGENCY..………………………......…....…...…....... DATE:.......…...…......……………

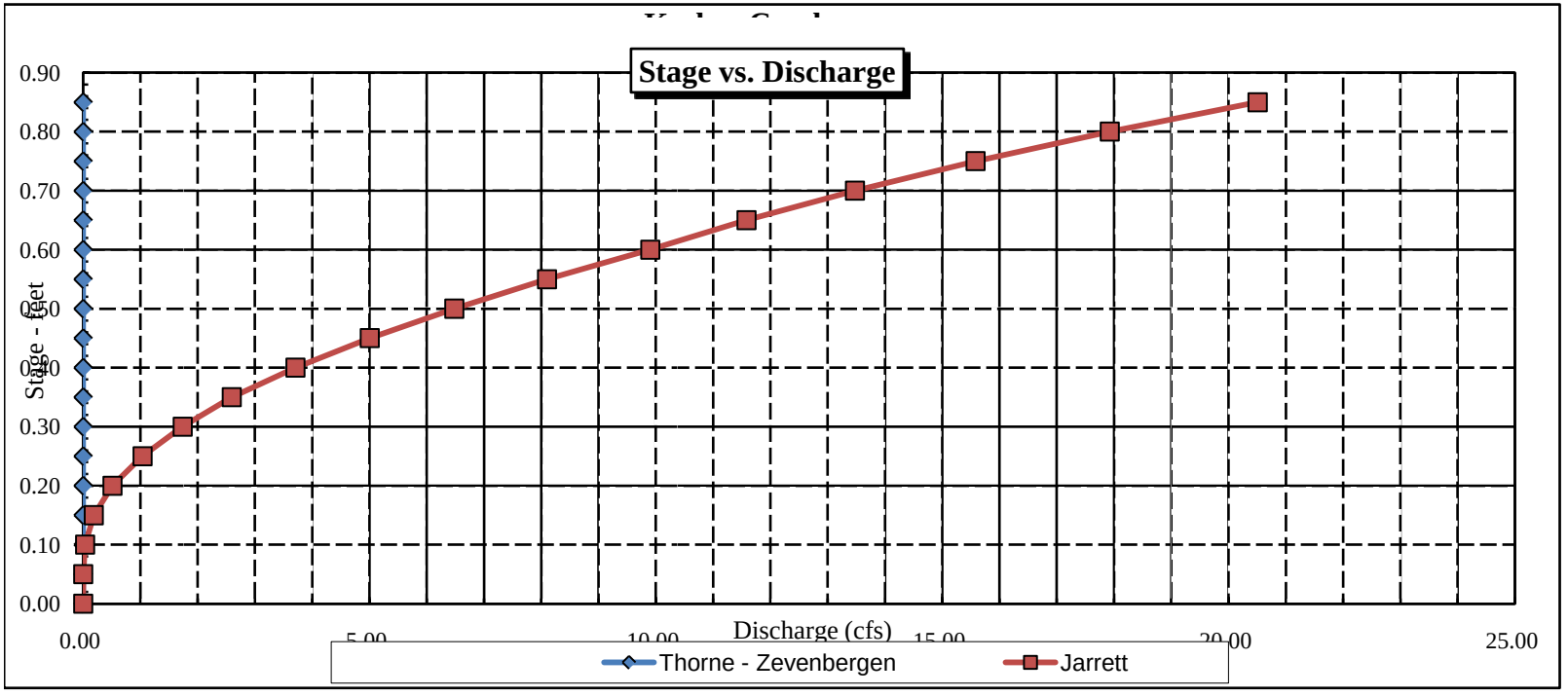
CWCB REVIEW BY: ..…………………………....…………………………………………………...…............. DATE:..................….…………...…


CROSS SECTION DATA ANALYSIS
RS
G
W
W
G
LS
-3.50
-4.00
-4.50
-5.00
-5.50
-6.00
-6.50
VERTICAL DEPTH (FT)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
5.00
25.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
2.50
2.00
1.50
1.00
0.50
0.00
Velocity - ft/sec
0.00
25.00
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.60
0.50
0.10
0.00
0.00
Discharge (cfs)
25.00
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Stage - feet
0.00
5.00
10.00
15.00
20.00
25.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kerber Creek						CROSS-SECTION NO.: 3	
CROSS-SECTION LOCATION: on furthest downstream property owned by BLM							
DATE: 6-16-10	OBSERVERS: R. Smith, S. Sanchez						
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 25	TOWNSHIP: 46 (N)/S	RANGE: 8 (E)W	PM: NM		
COUNTY: Saguache	WATERSHED: Closed Basin	WATER DIVISION: 3	DOW WATER CODE: 40903				
MAP(S): USGS:	GPS Z 13S 408444						
USFS:	4230553						

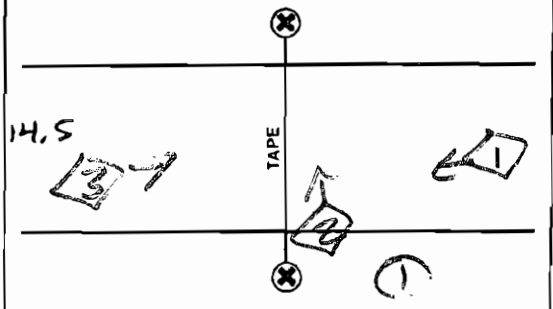
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 6" cobble	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	36 - 6.6 / 6.6
② WS Upstream	35.0	6.42
③ WS Downstream	26.0	6.88
SLOPE	0.46 / 61.0 = .0075	

SKETCH



LEGEND: Stake ⊗ Station ① Photo ① Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED. ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

mayfly

COMMENTS

Ph: 7.6
TDS: 130
Temp: 16° C

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kerber Creek | CROSS-SECTION NO.: 3 | DATE: 6-16-10 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 3:10 pm

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		5.10								
G	5.7		6.05								
	9.6		6.53								
W	14.5		6.60								
	15		6.95	.35				1.22			
	16		7.00	.40				1.77			
	17		6.95	.35				2.16			
	18		7.10	.50				2.07			
	19		7.05	.45				1.76			
	20		7.10	.50				2.14			
	21		7.10	.50				2.11			
	22		7.10	.50				2.21			
	23		7.10	.50				2.01			
	24		7.10	.50				2.11			
	25		7.0	.40				1.61			
	26		7.05	.45				1.85			
	27		7.15	.55				1.86			
	28		7.20	.60				1.93			
	29		7.20	.60				1.79			
	30		7.25	.65				1.27			
	31		7.25	.65				1.63			
	32		7.30	.70				1.59			
	33		7.10	.50				0.91			
	34		6.90	.30				0.73			
	35		6.85	.25				0.30			
W	36.0		6.60								
G	37.5		6.02								
LS	43.0		5.50								
TOTALS:											

End of Measurement | Time 3:30 | Gage Reading ft | CALCULATIONS PERFORMED BY | CALCULATIONS CHECKED BY

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME:	Kerber Creek
XS LOCATION:	furthest downstream BLM property
XS NUMBER:	3
DATE:	16-Jun-10
OBSERVERS:	R. Smith, S. Sanchez
1/4 SEC:	NW
SECTION:	25
TWP:	46N
RANGE:	8W
PM:	New Mexico
COUNTY:	Saguache
WATERSHED:	Closed Basin
DIVISION:	3
DOW CODE:	40903
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.0075

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: Kerber Creek
XS LOCATION: furthest downstream BLM property
XS NUMBER: 3

DATA POINTS= 28

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	RS	0.00	5.10			0.00		0.00	0.00	0.0%
1	G	5.70	6.05			0.00		0.00	0.00	0.0%
		9.60	6.53			0.00		0.00	0.00	0.0%
	W	14.50	6.60	0.00	0.00	0.00		0.00	0.00	0.0%
		15.00	6.95	0.35	1.22	0.61	0.35	0.26	0.32	1.8%
		16.00	7.00	0.40	1.77	1.00	0.40	0.40	0.71	4.1%
		17.00	6.95	0.35	2.16	1.00	0.35	0.35	0.76	4.3%
		18.00	7.10	0.50	2.07	1.01	0.50	0.50	1.04	5.9%
		19.00	7.05	0.45	1.76	1.00	0.45	0.45	0.79	4.6%
		20.00	7.10	0.50	2.14	1.00	0.50	0.50	1.07	6.2%
		21.00	7.10	0.50	2.11	1.00	0.50	0.50	1.06	6.1%
		22.00	7.10	0.50	2.21	1.00	0.50	0.50	1.11	6.4%
		23.00	7.10	0.50	2.01	1.00	0.50	0.50	1.01	5.8%
		24.00	7.10	0.50	2.11	1.00	0.50	0.50	1.06	6.1%
		25.00	7.00	0.40	1.61	1.00	0.40	0.40	0.64	3.7%
		26.00	7.05	0.45	1.89	1.00	0.45	0.45	0.85	4.9%
		27.00	7.15	0.55	1.86	1.00	0.55	0.55	1.02	5.9%
		28.00	7.20	0.60	1.93	1.00	0.60	0.60	1.16	6.7%
		29.00	7.20	0.60	1.79	1.00	0.60	0.60	1.07	6.2%
		30.00	7.25	0.65	1.27	1.00	0.65	0.65	0.83	4.7%
		31.00	7.25	0.65	1.63	1.00	0.65	0.65	1.06	6.1%
		32.00	7.30	0.70	1.59	1.00	0.70	0.70	1.11	6.4%
		33.00	7.10	0.50	0.91	1.02	0.50	0.50	0.46	2.6%
		34.00	6.90	0.30	0.73	1.02	0.30	0.30	0.22	1.3%
		35.00	6.85	0.25	0.30	1.00	0.25	0.25	0.08	0.4%
	W	36.00	6.60	0.00	0.00	1.03		0.00	0.00	0.0%
1	G	37.50	6.02			0.00		0.00	0.00	0.0%
	LS	43.00	5.50			0.00		0.00	0.00	0.0%
	TOTALS ----------					21.71	0.7 (Max.)	10.11	17.40	100.0%

Manning's n = 0.0449
Hydraulic Radius= 0.46573229

STREAM NAME: Kerber Creek
XS LOCATION: furthest downstream BLM property
XS NUMBER: 3

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	10.11	10.11	0.0%
6.35	10.11	16.75	65.7%
6.37	10.11	16.19	60.1%
6.39	10.11	15.62	54.5%
6.41	10.11	15.06	48.9%
6.43	10.11	14.51	43.5%
6.45	10.11	13.96	38.0%
6.47	10.11	13.41	32.6%
6.49	10.11	12.87	27.2%
6.51	10.11	12.33	21.9%
6.53	10.11	11.80	16.6%
6.55	10.11	11.28	11.5%
6.56	10.11	11.03	9.1%
6.57	10.11	10.79	6.7%
6.58	10.11	10.56	4.4%
6.59	10.11	10.33	2.2%
6.60	10.11	10.11	0.0%
6.61	10.11	9.90	-2.1%
6.62	10.11	9.68	-4.2%
6.63	10.11	9.47	-6.4%
6.64	10.11	9.26	-8.5%
6.65	10.11	9.04	-10.6%
6.67	10.11	8.62	-14.8%
6.69	10.11	8.20	-18.9%
6.71	10.11	7.78	-23.1%
6.73	10.11	7.36	-27.2%
6.75	10.11	6.95	-31.3%
6.77	10.11	6.54	-35.4%
6.79	10.11	6.13	-39.4%
6.81	10.11	5.72	-43.5%
6.83	10.11	5.31	-47.5%
6.85	10.11	4.91	-51.5%

WATERLINE AT ZERO
AREA ERROR = 6.600

STREAM NAME: Kerber Creek
XS LOCATION: furthest downstream BLM property
XS NUMBER: 3

Constant Manning's n

GL = lowest Grassline elevation corrected for sag
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.05	31.72	0.81	1.25	25.79	32.07	100.0%	0.80	63.86	2.48
	6.05	31.72	0.81	1.25	25.79	32.07	100.0%	0.80	63.86	2.48
	6.10	31.19	0.78	1.20	24.22	31.52	98.3%	0.77	58.16	2.40
	6.15	30.65	0.74	1.15	22.67	30.97	96.6%	0.73	52.72	2.33
	6.20	30.12	0.70	1.10	21.15	30.42	94.9%	0.70	47.53	2.25
	6.25	29.58	0.66	1.05	19.66	29.88	93.2%	0.66	42.58	2.17
	6.30	29.04	0.63	1.00	18.19	29.33	91.5%	0.62	37.89	2.08
	6.35	28.51	0.59	0.95	16.75	28.78	89.7%	0.58	33.44	2.00
	6.40	27.97	0.55	0.90	15.34	28.23	88.0%	0.54	29.25	1.91
	6.45	27.44	0.51	0.85	13.96	27.68	86.3%	0.50	25.31	1.81
	6.50	26.90	0.47	0.80	12.60	27.14	84.6%	0.46	21.63	1.72
	6.55	25.13	0.45	0.75	11.28	25.35	79.1%	0.44	18.82	1.67
WL	6.60	21.50	0.47	0.70	10.11	21.71	67.7%	0.47	17.40	1.72
	6.65	21.23	0.43	0.65	9.04	21.42	66.8%	0.42	14.58	1.61
	6.70	20.96	0.38	0.60	7.99	21.13	65.9%	0.38	11.96	1.50
	6.75	20.69	0.34	0.55	6.95	20.83	65.0%	0.33	9.57	1.38
	6.80	20.41	0.29	0.50	5.92	20.54	64.1%	0.29	7.40	1.25
	6.85	20.14	0.24	0.45	4.91	20.25	63.1%	0.24	5.46	1.11
	6.90	19.07	0.21	0.40	3.93	19.16	59.7%	0.20	3.91	1.00
	6.95	18.75	0.16	0.35	2.98	18.82	58.7%	0.16	2.50	0.84
	7.00	16.17	0.13	0.30	2.11	16.22	50.6%	0.13	1.55	0.73
	7.05	14.08	0.10	0.25	1.35	14.13	44.0%	0.10	0.81	0.60
	7.10	6.50	0.11	0.20	0.74	6.53	20.4%	0.11	0.49	0.67
	7.15	5.75	0.07	0.15	0.43	5.77	18.0%	0.07	0.22	0.51
	7.20	3.50	0.05	0.10	0.17	3.51	11.0%	0.05	0.07	0.39
	7.25	1.25	0.02	0.05	0.03	1.26	3.9%	0.02	0.01	0.24

STREAM NAME: Kerber Creek
XS LOCATION: furthest downstream BLM property
XS NUMBER: 3

SUMMARY SHEET

MEASURED FLOW (Qm)=	17.40	cfs
CALCULATED FLOW (Qc)=	17.40	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	6.60	ft
CALCULATED WATERLINE (WLc)=	6.60	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.70	ft
MAX CALCULATED DEPTH (Dc)=	0.70	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	1.72	ft/sec
MANNING'S N=	0.045	
SLOPE=	0.0075	ft/ft
.4 * Qm =	7.0	cfs
2.5 * Qm=	43.5	cfs

RECOMMENDED INSTREAM FLOW:
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FLOW (CFS)	PERIOD
===========	========
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________

RATIONALE FOR RECOMMENDATION:
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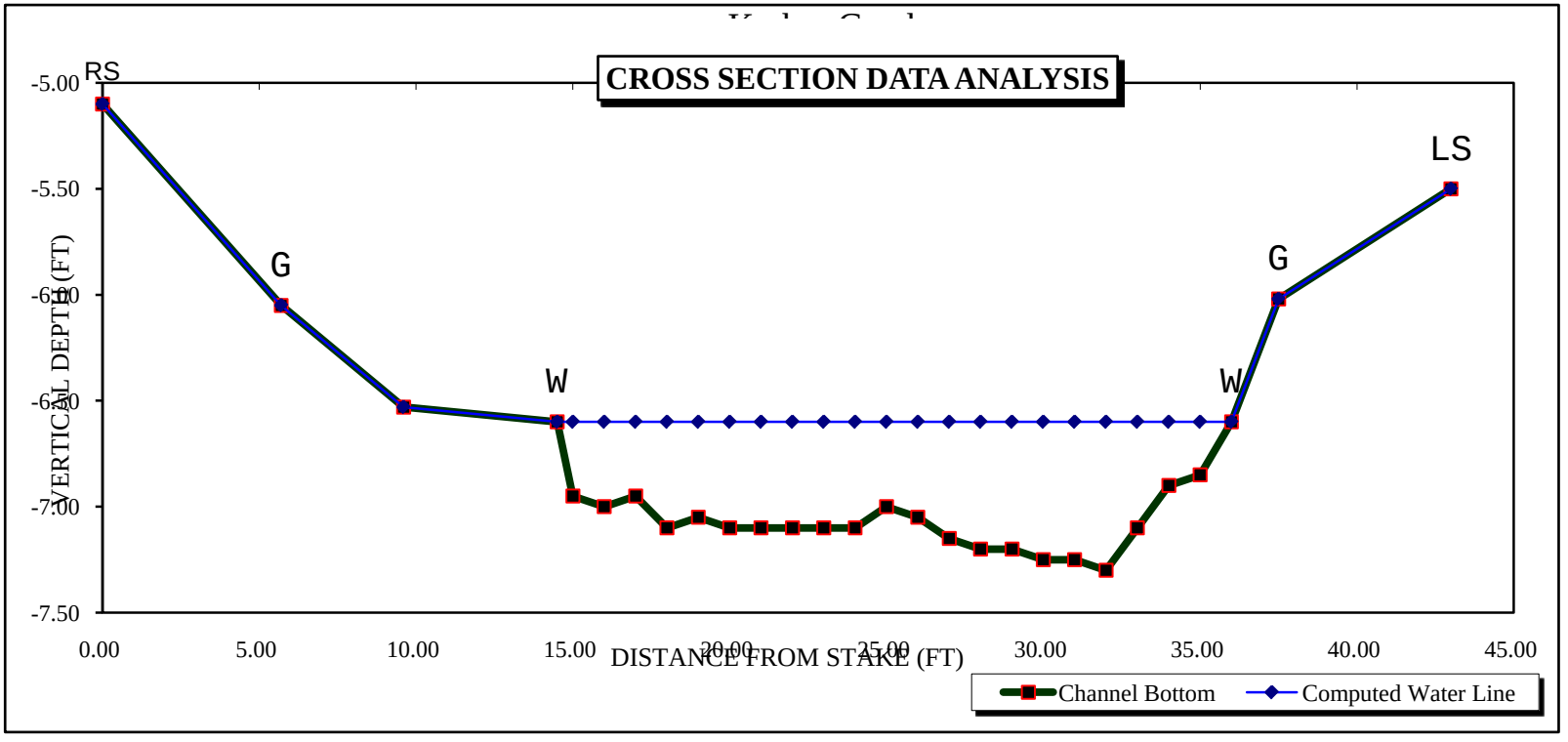
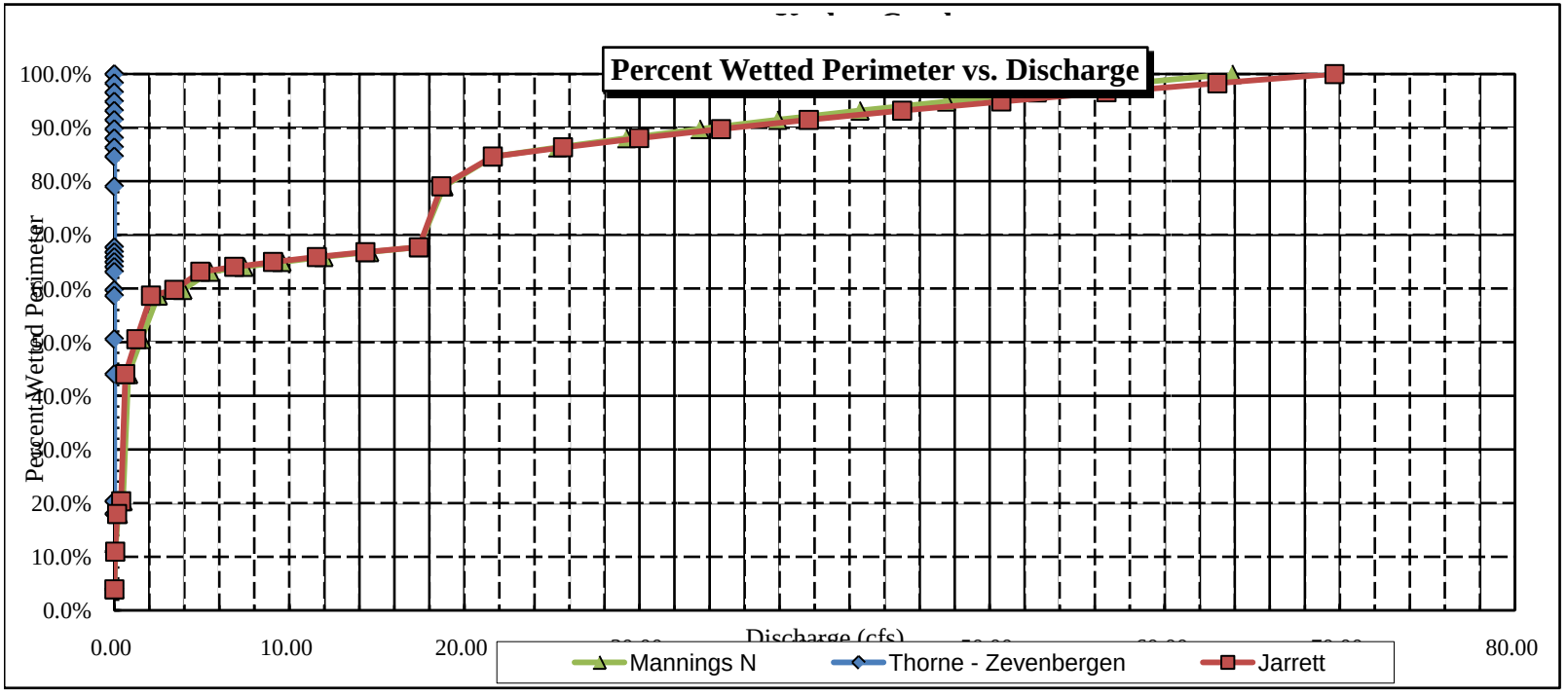
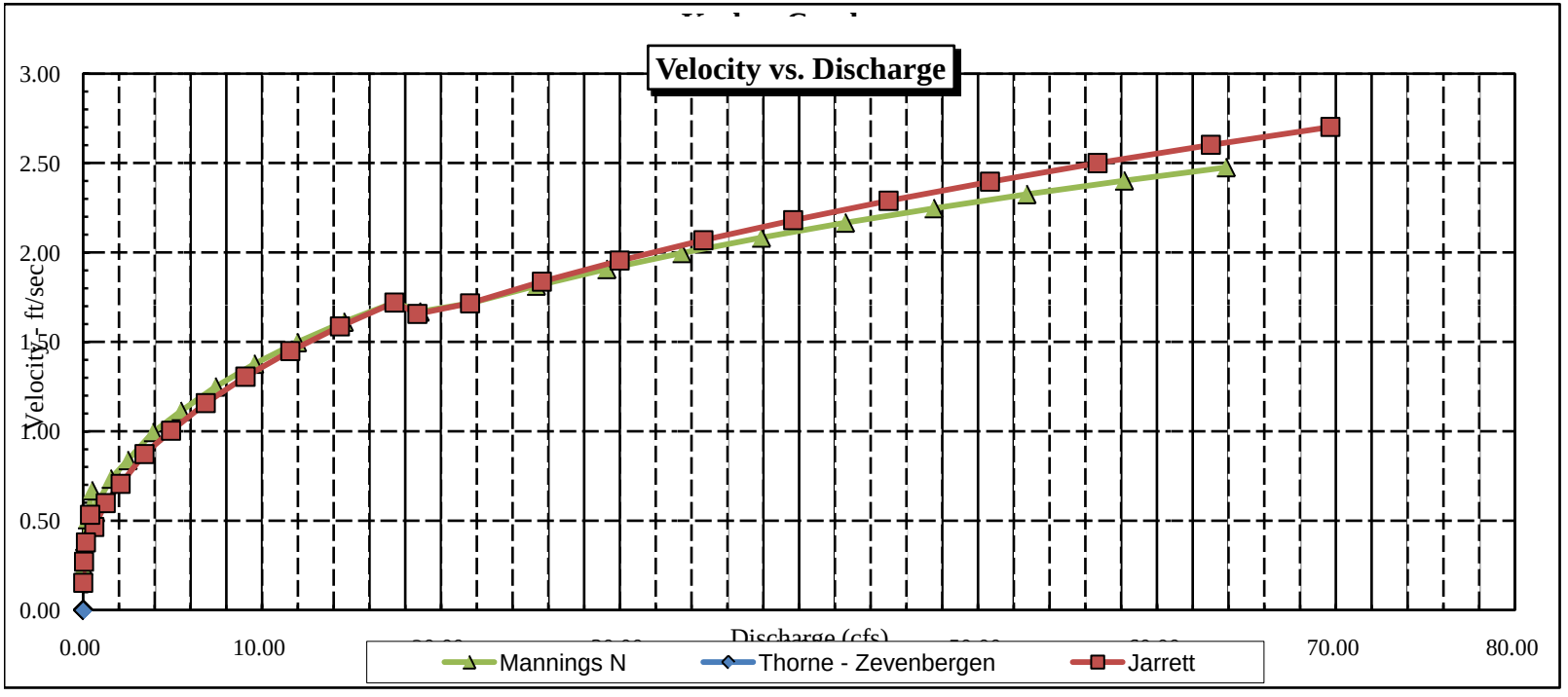
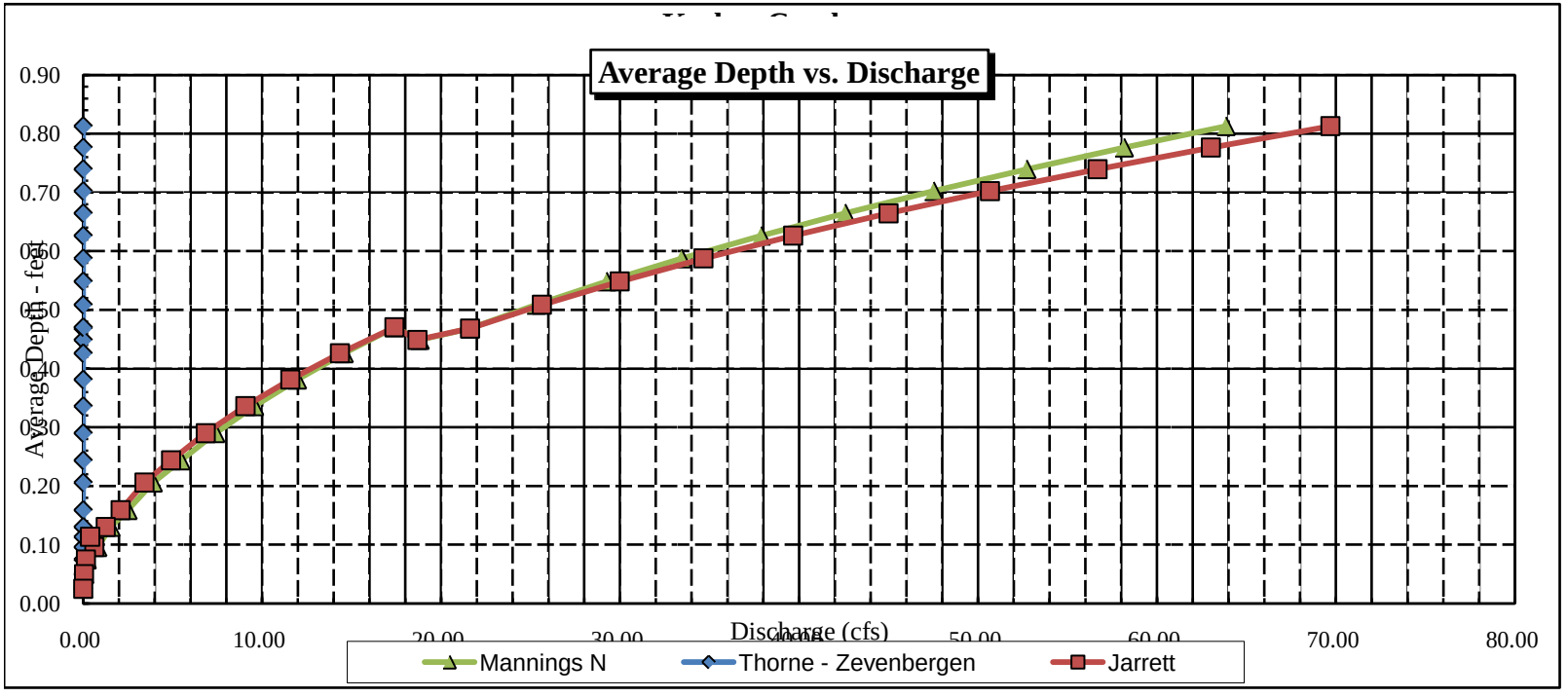
RECOMMENDATION BY: ………………....………..……............................... AGENCY..……………………......……....…....……...... DATE:......…...….......……………

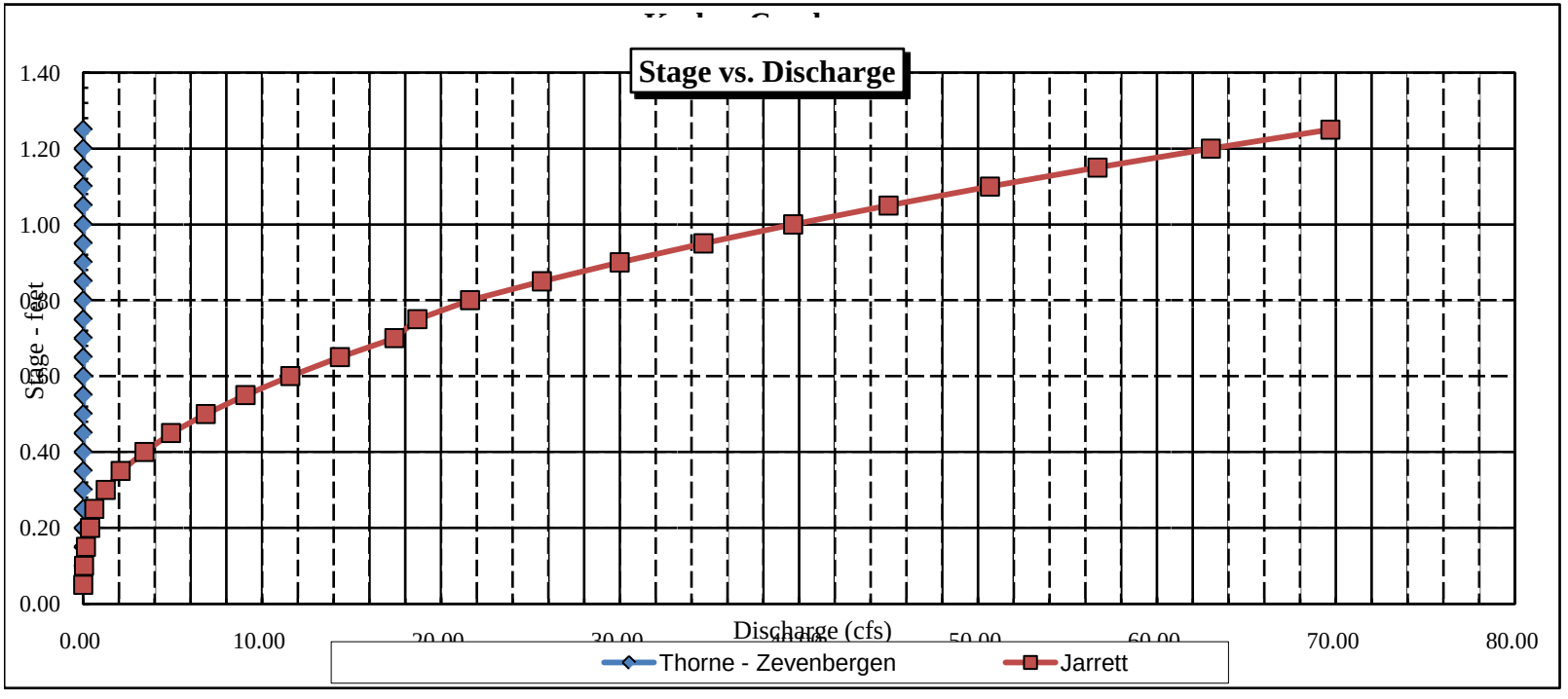
CWCB REVIEW BY: ..…………………………....…………………………………………………..…............. DATE:.................…………….....


CROSS SECTION DATA ANALYSIS
RS
G
W
W
G
LS
-5.00
-5.50
-6.00
-6.50
-7.00
-7.50
VERTICAL DEPTH (FT)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
10.00
20.00
80.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Velocity vs. Discharge
Velocity - ft/sec
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
10.00
70.00
80.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Average Depth vs. Discharge
Average Depth - feet
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


Stage vs. Discharge
Stage - feet
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.00
10.00
70.00
80.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett