United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7210

In Reply Refer To:
7250 (CO-932)

Mr. Rob Viehl
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 an instream flow water rights on Piceance Creek, located in Water Division 6.

Location and Land Status. Piceance Creek originates on the east side of the Grand Hogback, approximately 20 miles northwest of Rifle. This instream flow recommendation focuses on two separate reaches of Piceance Creek. The first reach begins at the headwaters and extends downstream to unnamed tributary located immediately adjacent to State Highway 13, a distance of approximately 7.0 miles. The second reach begins at the unnamed tributary adjacent to State Highway 13 and extends downstream to the headgate of Piceance Ditch, approximately 3.65 miles. Within the first reach, the BLM manages approximately 0.6 miles, the U.S. Forest Service manages approximately 0.4 miles, and 6.0 miles are in private ownership. Within the second reach, BLM manages 1.1 miles, while 2.55 miles are in private ownership.

Biological Summary. This portion of Piceance Creek is a cold-water, high gradient stream. The first reach flows through a broad canyon with a valley floor approximately 1000 to 3000 feet in width. The stream cuts through alluvial deposits in the valley and is confined by bedrock in some locations. The second reach begins in a broad valley that is more than a mile in width, where several small tributaries converge. The second reach then enters a narrow valley approximately 1,000 feet in width. The stream reaches generally have small-sized substrate, consisting of gravels, small cobbles, and small boulders.

Fisheries surveys have revealed a self-sustaining native fish population comprised of speckled dace and mountain suckers. Intensive macro-invertebrate surveys have not been conducted, but spot samples have revealed various species of mayfly, caddisfly, and stonefly.

The riparian community is generally comprised of coyote willow, Geyer's willow, sedges and rushes. The riparian community is in good condition and provides shading and cover for fish

habitat. The stream has a good mix of pools, small riffles, and runs. While deep pool habitat is absent, the existing pools are sufficient for overwintering fish.

R2Cross Analysis. The BLM collected the following R2Cross data from Piceance Creek:

First Reach – Headwaters to unnamed tributary below Highway 13

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)
06/15/2015 #2	3.91 cfs	6.7 feet	0.52 cfs	1.78 cfs
06/15/2015 #3	3.73 cfs	7.0 feet	0.47 cfs	2.22 cfs
07/07/2015 #2	1.98 cfs	7.4 feet	0.84 cfs	1.35 cfs
07/20/2022 #1	0.11 cfs	4.1 feet	0.47 cfs	0.90 cfs
07/20/2022 #2	0.11 cfs	4.0 feet	0.31 cfs	1.03 cfs
		Averages:	0.52 cfs	1.46 cfs

Second Reach – Confluence with unnamed tributary below State Highway 13 to headgate of Piceance 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)
06/15/2015 #1	5.83 cfs	8.1 feet	1.4 cfs	2.50 cfs
07/072015 #1	3.25 cfs	12.5 feet	0.23 cfs	3.33 cfs
		Averages:	0.82cfs	2.92cfs

BLM's analysis of this data indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree. Please note that many of the flow rates recommended below are based on limited water availability that was documented during an extreme drought period. If flow data collected at a later time indicates that additional water is available during non-drought periods, BLM may submit a recommendation for an increase in the protected flow rates.

First Reach – Headwaters to unnamed tributary below State Highway 13

1.5 cubic feet per second is recommended during the beginning of the snowmelt runoff period from April 1 through April 30. This recommendation is variously driven by the mean depth criteria, mean velocity criteria, or wetted perimeter criteria, depending on the cross section surveyed. This portion of the creek is small and habitat availability is very susceptible to even small changes in flow from diversions. It is important to protect a flow rate that makes most of this habitat available to the fish population while they are completing critical life history functions during the warm weather months.

1.4 cubic feet per second is recommended from May 1 to May 31. The rationale for this flow rate is the same as the rationale for the April 1 to April 30 recommendation, except that the flow rate has been slightly reduced because of more limited water availability.

0.8 cubic feet per second is recommended during the conclusion of the snowmelt runoff period from June 1 through June 30. This flow rate doesn't meet all three instream flow criteria, but it exceeds two of three instream flow criteria and provides a transitional flow rate between maximum habitat availability during snowmelt runoff and limited habitat availability during the base flow period.

0.2 cubic feet per second is recommended during the base flow period from July 1 through February 29. This recommendation is driven by very limited water availability. This flow rate should maintain pool habitat during the late summer and fall and prevent pools from freezing during the extended cold weather period, allowing the fish population to successfully overwinter. Even though the base flow in this creek is small, it persists even during drought conditions, allowing the fishery to continue.

0.8 cubic feet per second is recommended during the low elevation snowmelt period from March 1 through March 31. This flow rate doesn't meet all three instream flow criteria, but it exceeds two of three instream flow criteria and provides a transitional flow rate between limited habitat availability during the winter and maximum habitat availability during peak snowmelt runoff.

<u>Second Reach – Confluence with unnamed tributary below State Highway 13 to headgate of Piceance Ditch</u>

2.9 cubic feet per second is recommended during the beginning of the snowmelt runoff period from April 1 through May 31. This recommendation is driven by the average velocity and wetted perimeter criteria. This portion of the creek is small and habitat availability is very susceptible to even small changes in flow from diversions. It is important to protect a flow rate that makes most of this habitat available to the fish population while they are completing critical life history functions during the warm weather months.

1.5 cubic feet per second is recommended during the conclusion of the snowmelt runoff period from June 1 through June 30. This flow rate doesn't meet all three instream flow criteria, but it exceeds two of three instream flow criteria and provides a transitional flow rate between maximum habitat availability during snowmelt runoff and limited habitat availability during the base flow period.

0.4 cubic feet per second is recommended during the base flow period from July 1 through February 29. This recommendation is driven by very limited water availability. This flow rate should maintain pool habitat during the late summer and fall and prevent pools from freezing during the extended cold weather period,

allowing the fish population to successfully overwinter. Even though the base flow in this creek is small, it can persist during drought periods, allowing the fishery to continue.

1.5 cubic feet per second is recommended during the low elevation snowmelt period from March 1 through March 31. This flow rate doesn't meet all three instream flow criteria, but it exceeds two of three instream flow criteria and provides a transitional flow rate between limited habitat availability during the winter and maximum habitat availability during peak snowmelt runoff.

Water Availability. The BLM does not recommend relying upon USGS Gage 09306200 for Piceance Creek below Ryan Gulch. This gage is heavily influenced by irrigation diversions and would not give an accurate picture of water availability higher in the watershed. Instead, BLM recommends reliance upon a temporary stream flow gage cooperatively installed and operated by BLM and CWCB staff, as well as review of spot discharge measurements collected by BLM and CWCB staff. BLM notes that flow data from this gage was collected during an extreme drought period and likely underestimates the amount of flow in the two stream reaches during more typical conditions.

The BLM is aware of the following water rights within the two proposed instream flow reaches:

Wilcoxson Ditch #1 – 0.39 cfs, absolute and 1.5 cfs conditional (1991 priority)
Wilcoxson Ditch #2 – 1.0 cfs conditional (1999 priority)
Larson Ditch – 2.5 cfs (1886 priority)
Morgan Ditch 1– 1.0 cfs (1883 priority)
Morgan Ditch 2 – 0.40 cfs (1886 priority)
Ryan S. Pond Feeder Ditch – 1.25 cfs (2001 priority)

Relationship to Land Management Plans. The BLM's management plan calls for protection and enhancement of native fish populations. In addition, the BLM calls for making instream flow recommendations to the Colorado Water Conservation Board to meet minimum instream flow requirements to maintain native fisheries. Finally, the plan calls for maintaining and improving the function of riparian areas to achieve advanced ecological stage for the riparian community. Establishing an instream flow water right would assist in meeting these objectives.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section have been previously provided to the CWCB staff. BLM thanks both Colorado Parks and Wildlife and the Colorado Water Conservation Board for their cooperation in this effort.

If you have any questions regarding our instream flow recommendation, please contact Roy Smith at 303-239-3940.

Sincerely,

Alan Bittner
Deputy State Director

Resources

Cc: Bill Mills, White River Field Office
Rob Hampson, White River Field Office
Elijah Waters, Northwest District

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek - Upper						CROSS-SECTION NO.: 1
CROSS-SECTION LOCATION: Adjacent to Piceance Creek Road - approx. 2.5 miles down from State Highway 13						
DATE: 6-15-15	OBSERVERS: R. Smith, K. Sauder					
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 6	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6th	
COUNTY: Rio Blanco	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE: 25343			
MAP(S): USGS:	Zone 13 243837 4402140					
USFS:						

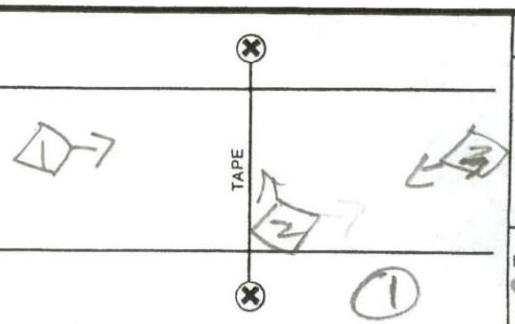
SUPPLEMENTAL DATA

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 & sand	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	5.95 / 5.95
② WS Upstream	5.10	5.92
③ WS Downstream	5.00	6.03
SLOPE	0.11 / 10.10 = .01	

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 = 8.38
Temp = 17.5° C
Cond = 840
Salinity = 0.4 ppt

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Piceance Creek - upper | CROSS-SECTION NO.: 1 | DATE: 6-15-15 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 2:20 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		5.04								
G	0.9		5.57								
W	1.1		5.95								
	1.4		6.35	.4				.16			
	1.7		6.6	.65				.49			
	2.0		6.6	.65				1.14			
	2.3		6.75	.80				1.51			
	2.6		6.75	.80				1.62			
	2.9		6.75	.80				1.72			
	3.2		6.85	.90				1.73			
	3.5		6.85	.90				1.81			
	3.8		6.75	.80				1.01			
	4.1		6.75	.80				1.44			
	4.4		6.75	.80				1.85			
	4.7		6.80	.85				1.64			
	5.0		6.85	.90				1.52			
	5.3		6.85	.90				1.59			
	5.6		6.85	.90				1.51			
	5.9		6.75	.80				1.35			
	6.2		6.80	.85				0.98			
	6.5		6.60	.65				0.42			
	6.8		6.25	.30				0.17			
	7.1		6.15	.20				0.00			
W	7.3		5.95								
G	9.0		5.57								
LS	10.0		5.10								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek – Upper						CROSS-SECTION NO.: 2
CROSS-SECTION LOCATION: Approx. 3/4 mile upstream from State Hwy 13						
DATE: 6-15-15	OBSERVERS: R. Smith, K. Sauder					
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 3	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6th	
COUNTY: Garfield	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE: 25343			
MAP(S): USGS:			248524			
USFS:			4402001			

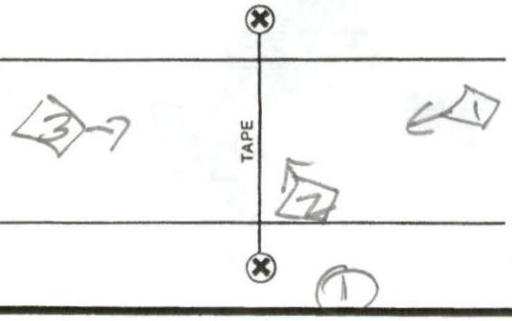
SUPPLEMENTAL DATA

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)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	7.15 / 7.15
② WS Upstream	19.5	7.05
③ WS Downstream	10.0	7.23
SLOPE	0.48 / 39.5 = .012	

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, caddisfly, stonefly, beetles

COMMENTS

Riparian = willow, sedges, rushes

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Piceance Creek – Upper	CROSS-SECTION NO.: 2	DATE: 6-15-15	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 3:45 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		5.60								
G	0.3		6.45								
W	1.0		7.15								
	1.3		7.65	.5				0.78			
	1.6		7.85	.7				1.01			
	1.9		8.0	.85				2.06			
	2.2		7.95	.80				2.20			
	2.5		7.85	.70				1.70			
	2.8		7.85	.70				1.78			
	3.1		7.75	.60				1.79			
	3.4		7.65	.50				1.62			
	3.7		7.70	.55				1.96			
	4.0		7.45	.30				1.79			
	4.3		7.55	.40				1.13			
	4.6		7.60	.45				1.53			
	4.9		7.50	.35				1.26			
	5.2		7.50	.35				1.01			
	5.5		7.50	.35				0.92			
	5.8		7.50	.35				0.58			
	6.1		7.40	.25				0.20			
W	6.2		7.15								
G	7.0		6.45								
LS	9.0		6.26								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Avearce Creek - Upper						CROSS-SECTION NO.: 3
CROSS-SECTION LOCATION: Approx. 3/4 mile upstream from State Hwy 13						
DATE: 6-15-15	OBSERVERS: R. Smith, K. Sauter					
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 3	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6th	
COUNTY: Garfield	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE: 25343			
MAP(S):	USGS:					
	USFS:					

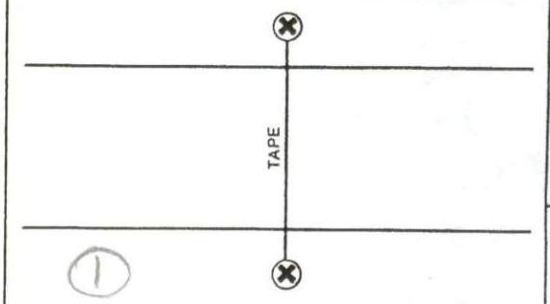
SUPPLEMENTAL DATA

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)
⊗ 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	11.2	6.24
③ WS Downstream	8.2	6.60
SLOPE	0.36 / 19.4 = 0.018	

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, caddisfly, stonefly

COMMENTS

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Piceance Creek - Upper	CROSS-SECTION NO.: 3	DATE: 6-15-15	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 4:15

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)
G & RS	0.0		5.61								
W	0.3		6.30								
	0.6		6.65	.35				.82			
	0.9		6.6	.30				1.04			
	1.2		6.8	.50				1.02			
	1.5		6.8	.50				1.34			
	1.8		6.85	.55				0.76			
	2.1		6.85	.55				1.48			
	2.4		6.8	.50				1.55			
	2.7		6.85	.55				1.49			
	3.0		7.0	.70				1.41			
	3.3		7.0	.70				1.62			
	3.6		7.0	.70				1.72			
	3.9		7.0	.70				1.53			
	4.2		6.9	.60				1.58			
	4.5		6.9	.60				1.33			
	4.8		6.65	.35				1.35			
	5.1		6.65	.35				1.23			
	5.4		6.60	.30				1.26			
	5.7		6.55	.25				1.04			
	6.0		6.5	.20				.78			
	6.3		6.5	.20				0			
W	6.5		6.30								
G	7.0		5.55								
LS	7.3		5.40								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek - Upper						CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION: Approx 2.5 miles downstream from State Highway 13 crossing							
DATE: 7-7-15	OBSERVERS: R. Smith, B. Logan, B. Epstein						
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 6	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6th		
COUNTY: Rio Blanco	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE: 25343				
MAP(S): USGS:				243913			
USFS:				4402157			

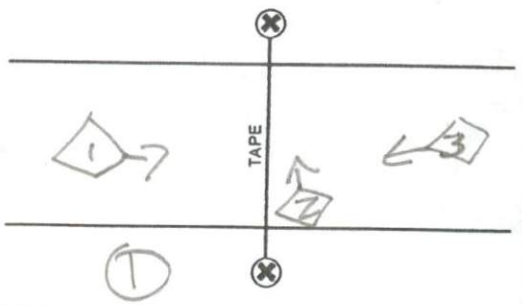
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: Flowmate			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 3" 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	5.10 / 5.10
② WS Upstream	29.0	5.01
③ WS Downstream	70.5	5.43
SLOPE	0.42 / 39.5 = 0.01	

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

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Piceance Creek-Upper	CROSS-SECTION NO.: 1	DATE: 7-7-15	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: LEFT / RIGHT (0.0 AT STAKE)	Gage Reading: _____ ft	TIME: 2 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		2.96								
G	1.5		4.33								
W	2.3		5.10								
	2.5		5.30	.20				1.18			
	2.7		5.33	.23				1.76			
	2.9		5.38	.28				1.36			
	3.1		5.36	.26				1.04			
	3.3		5.33	.23				1.83			
	3.5		5.33	.23				1.69			
	3.7		5.33	.23				1.51			
	3.9		5.36	.26				1.72			
	4.1		5.40	.30				1.65			
	4.3		5.45	.35				1.41			
	4.5		5.47	.37				1.66			
	4.7		5.50	.40				1.91			
	4.9		5.53	.43				2.02			
	5.1		5.58	.48				1.92			
	5.3		5.60	.50				1.92			
	5.5		5.55	.45				1.88			
	5.7		5.50	.40				2.02			
	5.9		5.50	.40				1.59			
	6.1		5.44	.34				1.89			
	6.3		5.41	.31				1.96			
	6.5		5.36	.26				1.97			
	6.7		5.35	.25				1.95			
	6.9		5.35	.25				1.83			
	7.1		5.36	.26				1.72			
	7.3		5.34	.24				1.86			
	7.5		5.34	.24				1.79			
	7.7		5.36	.26				1.82			
	7.9		5.33	.23				1.96			
	8.1		5.36	.26				1.71			
	8.3		5.40	.30				1.88			FTQ = 3.32
	8.5		5.30	.20				ϕ			
								ϕ			
W	8.7		5.10								
	10.6		4.80								
LSFG	14.2		4.30								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek - Upper

CROSS-SECTION NO.: 2

CROSS-SECTION LOCATION: 200 ft. downstream from Larson #1 Ditch headgate

DATE: 7-7-15

OBSERVERS: R. Smith, B. Logan, B. Epstein

LEGAL DESCRIPTION

¼ SECTION: NW

SECTION: 3

TOWNSHIP: 4 N/S

RANGE: 95 E/W

PM: 6th

COUNTY: Garfield

WATERSHED: White River

WATER DIVISION: 6

DOW WATER CODE: 25343

MAP(S):

USGS: 135 249550 7300 ft.

USFS: 4402022

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO

METER TYPE: FlowMate

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

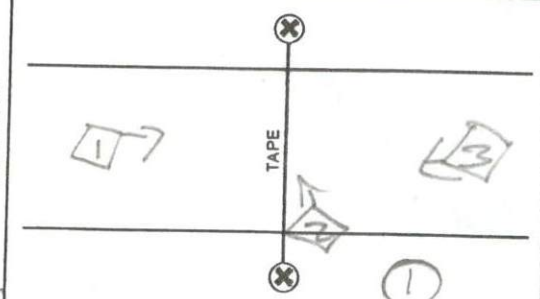
PHOTOGRAPHS TAKEN: YES/NO

NUMBER OF PHOTOGRAPHS: 3

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	7.30/7.30
② WS Upstream	6.2	7.10
③ WS Downstream	6.8	7.45
SLOPE	0.35/15.0 = 0.023	

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

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Piceance Creek - Upper | CROSS-SECTION NO.: 2 | DATE: 7-7 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 4:30 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		5,70								
G	1,7		6,38								
W	2,2		7,30					0			
	2,4		7,77	,47				,68			
	2,6		7,63	,33				1,11			
	2,8		7,71	,41				1,70			
	3,0		7,75	,45				1,67			
	3,2		7,69	,39				1,61			
	3,4		7,7	,40				1,67			
	3,6		7,72	,42				1,62			
	3,8		7,64	,34				2,00			
	4,0		7,64	,34				2,38			
	4,2		7,72	,42				2,23			
	4,4		7,70	,40				1,91			
	4,6		7,61	,31				2,61			
	4,8		7,62	,32				2,50			
	5,0		7,58	,28				0,91			
	5,2		7,60	,30				1,45			
	5,4		7,56	,26				0,92			
	5,6		7,50	,20				0,13			
	5,8		7,48	,18				0,08			
	6,0		7,41	,11				0			
W	6,2		7,30					0			FTQ = 1,975
	6,4		7,24								
	8,8		6,91								
G	9,1		6,45								
LS	11,0		5,74								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek – Upper						CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION: Approx. 3/4 mile upstream from State Highway 13							
DATE: 7-20-22	OBSERVERS: V.L. Smith, C. Brady						
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 3	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6		
COUNTY: Garfield	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE:				
MAP(S): USGS:				39.73104			
USFS:				-107.93398			

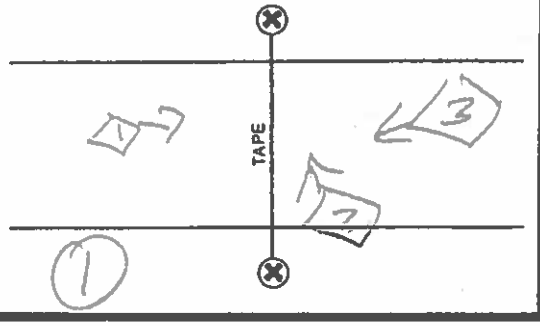
SUPPLEMENTAL DATA

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 18" 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	6.65 / 6.65
2 WS Upstream	13.4'	6.32
3 WS Downstream	16.6'	6.98
SLOPE	0.66 / 30.0' =	

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: Hydropsychidae (Trichoptera), Plecoptera, Ephemeroptera (x3 species), Simuliidae, water skippers

COMMENTS

Temp. 17.1°(C)
Spec. Cond. 1695
Salinity 0.4 parts/1000
pH 8.5
Riparian: Coyote willow, beaked sedge, gooseberry currant, wild rose, milkweed, equisetum, yellow sweet clover, thistles, snowberry, baltic rush, mullein, hawthorne, +/- larson ditch not operating, geranium, yarrow, twinberry, honeysuckle, another species of willow, dorrey's, mint, hound's tongue

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:	CROSS-SECTION NO:	DATE:	SHEET __ OF __
Piceance Creek	1	7-20-22	

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 12:06

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)		Area (ft^2)	Discharge (cfs)
								At Point	Mean in Vertical		
LS	0.0		5.02								
	1.2		5.37								
RB	3.0		6.00								
	3.2		6.27								
LW	3.5		6.65								
	3.9		6.7	0.05				0			
	4.1		6.7	0.05				0			
	4.3		6.7	0.05				0.09			
	4.5		6.75	0.1				0.10			
	4.7		6.75	0.1				0.17			
	4.9		6.75	0.1				0.20			
	5.1		6.7	0.05				0.18			
	5.3		6.75	0.1				0.17			
	5.5		6.75	0.1				0.17			
	5.7		6.8	0.15				0.44			
	5.9		6.8	0.15				0.50			
	6.1		6.85	0.2				0.26			
	6.3		6.80	0.15				0.23			
LW	6.7		6.65								
RB	7.1		5.90								
	7.6		5.26								
	8.3		5.04								
LS	8.8		4.84								
TOTALS:											

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

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Piceance Creek - Upper						CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: Approx. 3/4 mile upstream from State Highway 13							
DATE: 7-20-22	OBSERVERS: R. Smith, C. Brady						
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 3	TOWNSHIP: 4 N/S	RANGE: 95 E/W	PM: 6th		
COUNTY: Garfield	WATERSHED: White River	WATER DIVISION: 6	DOW WATER CODE:				
MAP(S): USGS:				39.73101			
USFS:				-107.93402			

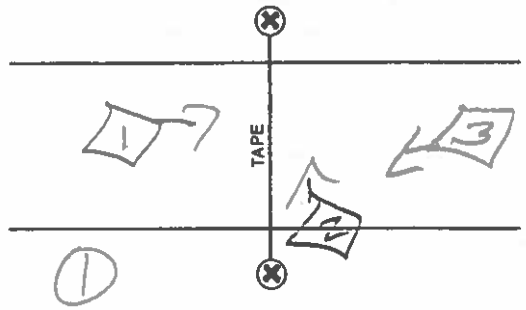
SUPPLEMENTAL DATA

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 18" 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	7.25/7.25
② WS Upstream	3.1	7.27
③ WS Downstream	13.9	7.04
SLOPE	0.23/17.0 =	

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

Riparian - riptap

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Pierce Creek	CROSS-SECTION NO:	DATE: 7-20-22	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: _____ ft	TIME: 12:50

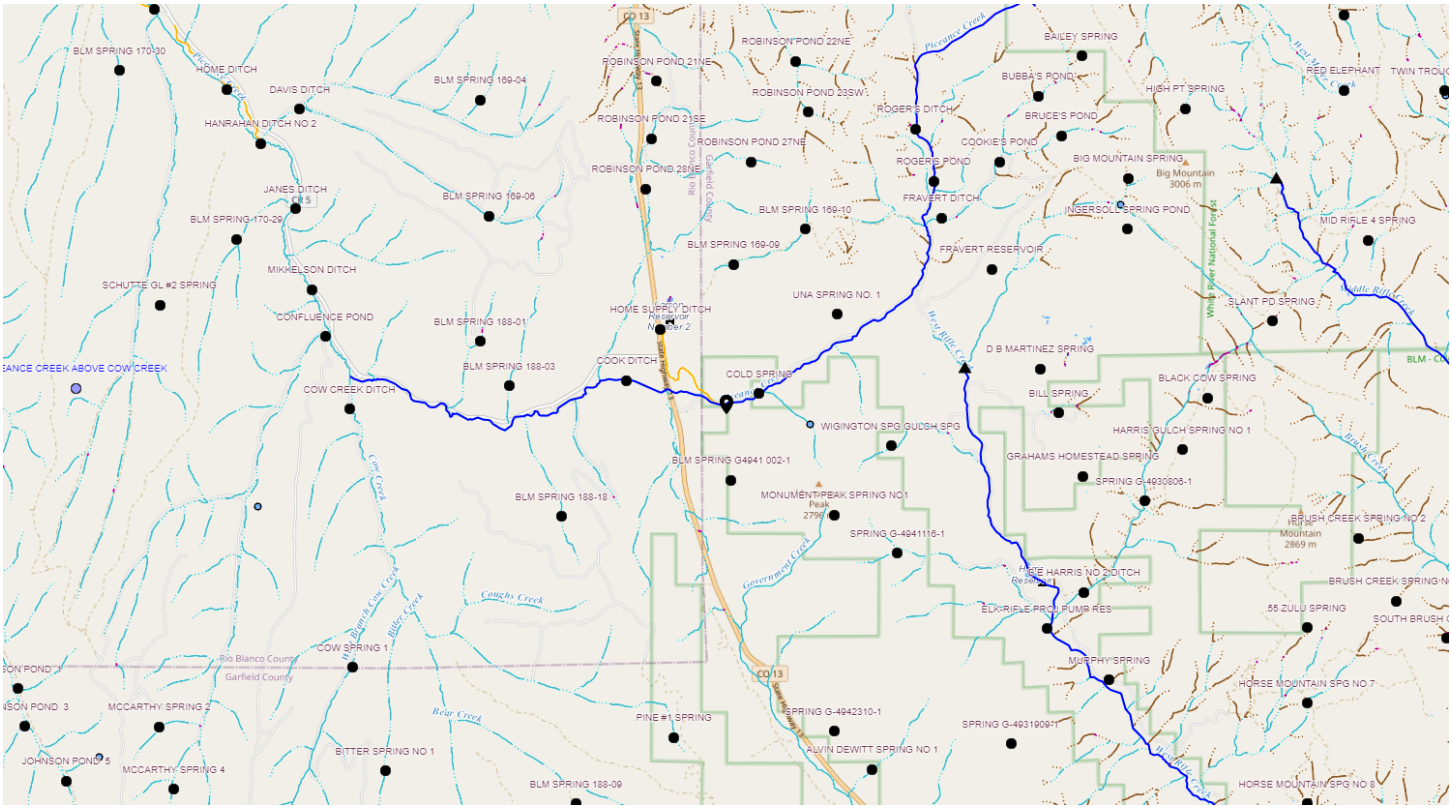
Features: Stake (S), Grassline (G), Waterline (W), Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RLS	0.0		5.92								
	0.9		6.55								
RBF	1.2		6.74								
	2.0		7.11								
	2.7		7.20								
RLW	3.0		7.25								
	3.2		7.35	0.1				0			
	3.4		7.45	0.2				0.33			
	3.6		7.45	0.2				0.32			
	3.8		7.45	0.2				0.56			
	4.0		7.45	0.2				0.54			
	4.2		7.45	0.2				0.58			
	4.4		7.45	0.2				0.36			
	4.6		7.35	0.1				0.13			
								0.11 cfs			
LW	4.8		7.25								
RBF	5.2		6.76								
	5.6		6.50								
	7.0		6.39								
	4.6		6.30								
LS	4.2		5.90								
TOTALS:											

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

R2Cross RESULTS

Stream Name: Piceance Creek
Stream Locations: Approx 0.75 mile us fr State Hwy 13
Fieldwork Date: 06/15/2015
Cross-section: R. Smith, K. Sauter
Observers: 2
Coordinate System: UTM Zone 13
X (easting): 248524
Y (northing): 4402001
Date Processed: 09/13/2022
Slope: 0.012
Discharge: R2Cross data file: 3.91 (cfs)
Computation method: Ferguson VPE
R2Cross data filename: Piceance Creek upper 6-15-15 #2.xlsx
R2Cross version: 2.0.0

LOCATION



ANALYSIS RESULTS

Habitat Criteria Results

Bankfull top width (ft) = 6.7

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.24
Percent Wetted Perimeter (%)	50.0	0.52
Mean Velocity (ft/s)	1.0	1.78

STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (sq ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Manning's n	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	6.45	6.7	1.01	1.55	6.75	8.0	100.0	0.84	0.04	3.29	22.23
	6.5	6.59	0.97	1.5	6.42	7.85	98.17	0.82	0.04	3.18	20.43
	6.55	6.49	0.94	1.45	6.09	7.71	96.34	0.79	0.05	3.07	18.7
	6.6	6.38	0.9	1.4	5.77	7.56	94.5	0.76	0.05	2.95	17.05
	6.65	6.27	0.87	1.35	5.45	7.42	92.67	0.74	0.05	2.84	15.47
	6.7	6.16	0.83	1.3	5.14	7.27	90.84	0.71	0.05	2.72	13.97
	6.75	6.06	0.8	1.25	4.84	7.12	89.0	0.68	0.05	2.59	12.55
	6.8	5.95	0.76	1.2	4.54	6.98	87.17	0.65	0.05	2.47	11.2
	6.85	5.84	0.73	1.15	4.24	6.83	85.34	0.62	0.05	2.34	9.93
	6.9	5.74	0.69	1.1	3.95	6.68	83.51	0.59	0.05	2.21	8.74
	6.95	5.63	0.65	1.05	3.67	6.54	81.67	0.56	0.05	2.08	7.62
	7.0	5.52	0.61	1.0	3.39	6.39	79.84	0.53	0.05	1.94	6.58
	7.05	5.41	0.58	0.95	3.12	6.24	78.01	0.5	0.06	1.8	5.61
	7.1	5.31	0.54	0.9	2.85	6.1	76.18	0.47	0.06	1.66	4.72
Waterline	7.15	5.2	0.5	0.85	2.59	5.95	74.34	0.43	0.06	1.51	3.91
	7.2	5.15	0.45	0.8	2.33	5.84	72.94	0.4	0.07	1.35	3.15
	7.25	5.1	0.41	0.75	2.07	5.72	71.54	0.36	0.07	1.19	2.47
	7.3	5.05	0.36	0.7	1.82	5.61	70.14	0.32	0.07	1.03	1.87
	7.35	5.0	0.31	0.65	1.57	5.5	68.74	0.28	0.08	0.86	1.35
	7.4	4.95	0.27	0.6	1.32	5.39	67.33	0.24	0.09	0.7	0.92
	7.45	4.77	0.23	0.55	1.07	5.17	64.63	0.21	0.1	0.56	0.6
	7.5	3.48	0.24	0.5	0.84	3.82	47.73	0.22	0.1	0.61	0.51
	7.55	3.09	0.22	0.45	0.68	3.37	42.07	0.2	0.1	0.53	0.36
	7.6	2.55	0.21	0.4	0.54	2.77	34.59	0.19	0.11	0.51	0.27
	7.65	2.46	0.17	0.35	0.41	2.63	32.88	0.16	0.13	0.37	0.15

	7.7	1.88	0.16	0.3	0.31	2.0	25.0	0.15	0.13	0.36	0.11
	7.75	1.65	0.13	0.25	0.22	1.75	21.9	0.12	0.15	0.26	0.06
	7.8	1.43	0.1	0.2	0.14	1.5	18.8	0.09	0.19	0.17	0.02
	7.85	0.9	0.08	0.15	0.08	0.96	11.95	0.08	0.22	0.13	0.01
	7.9	0.65	0.06	0.1	0.04	0.69	8.57	0.05	0.31	0.07	0.0
	7.95	0.4	0.03	0.05	0.01	0.42	5.2	0.02	0.59	0.02	0.0
	7.99	0.12	0.01	0.01	0.0	0.12	1.56	0.01	1.61	0.0	0.0

This Manning's roughness coefficient was calculated based on velocity estimates from the Ferguson VPE method

MODEL SUMMARY

Measured Flow (Qm) =	3.91	(cfs)
Calculated Flow (Qc) =	3.91	(cfs)
(Qm-Qc)/Qm * 100 =	-0.00%	
Measured Waterline (WLm) =	7.15	(ft)
Calculated Waterline (WLc) =	7.15	(ft)
(WLm-WLc)/WLm * 100 =	0.00%	
Max Measured Depth (Dm) =	0.85	(ft)
Max Calculated Depth (Dc) =	0.85	(ft)
(Dm-Dc)/Dm * 100 =	-0.00%	
Mean Velocity =	1.51	(ft/s)
Manning's n =	0.062	
0.4 * Qm =	1.56	(cfs)
2.5 * Qm =	9.78	(cfs)

FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.6		
Bankfull	0.3	6.45		
Waterline	1	7.15	0	0
	1.3	7.65	0.5	0.78
	1.6	7.85	0.7	1.01
	1.9	8	0.85	2.06
	2.2	7.95	0.8	2.2
	2.5	7.85	0.7	1.7
	2.8	7.85	0.7	1.78
	3.1	7.75	0.6	1.79
	3.4	7.65	0.5	1.62
	3.7	7.7	0.55	1.96
	4	7.45	0.3	1.79
	4.3	7.55	0.4	1.13
	4.6	7.6	0.45	1.53
	4.9	7.5	0.35	1.26
	5.2	7.5	0.35	1.01
	5.5	7.5	0.35	0.92
	5.8	7.5	0.35	0.58
	6.1	7.4	0.25	0.2
Waterline	6.2	7.15	0	0
Bankfull	7	6.45		
	9	6.26		

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (ft^2)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0.58	0.5	0.15	0.12	2.99
0.36	0.7	0.21	0.21	5.42
0.34	0.85	0.26	0.53	13.43
0.3	0.8	0.24	0.53	13.5
0.32	0.7	0.21	0.36	9.13
0.3	0.7	0.21	0.37	9.56
0.32	0.6	0.18	0.32	8.24
0.32	0.5	0.15	0.24	6.21
0.3	0.55	0.17	0.32	8.27
0.39	0.3	0.09	0.16	4.12
0.32	0.4	0.12	0.14	3.47
0.3	0.45	0.14	0.21	5.28
0.32	0.35	0.1	0.13	3.38
0.3	0.35	0.1	0.11	2.71
0.3	0.35	0.1	0.1	2.47
0.3	0.35	0.1	0.06	1.56
0.32	0.25	0.05	0.01	0.26
0.27	0	0	0	0
0	0	0	0	0
0	0	0	0	0

DISCLAIMER

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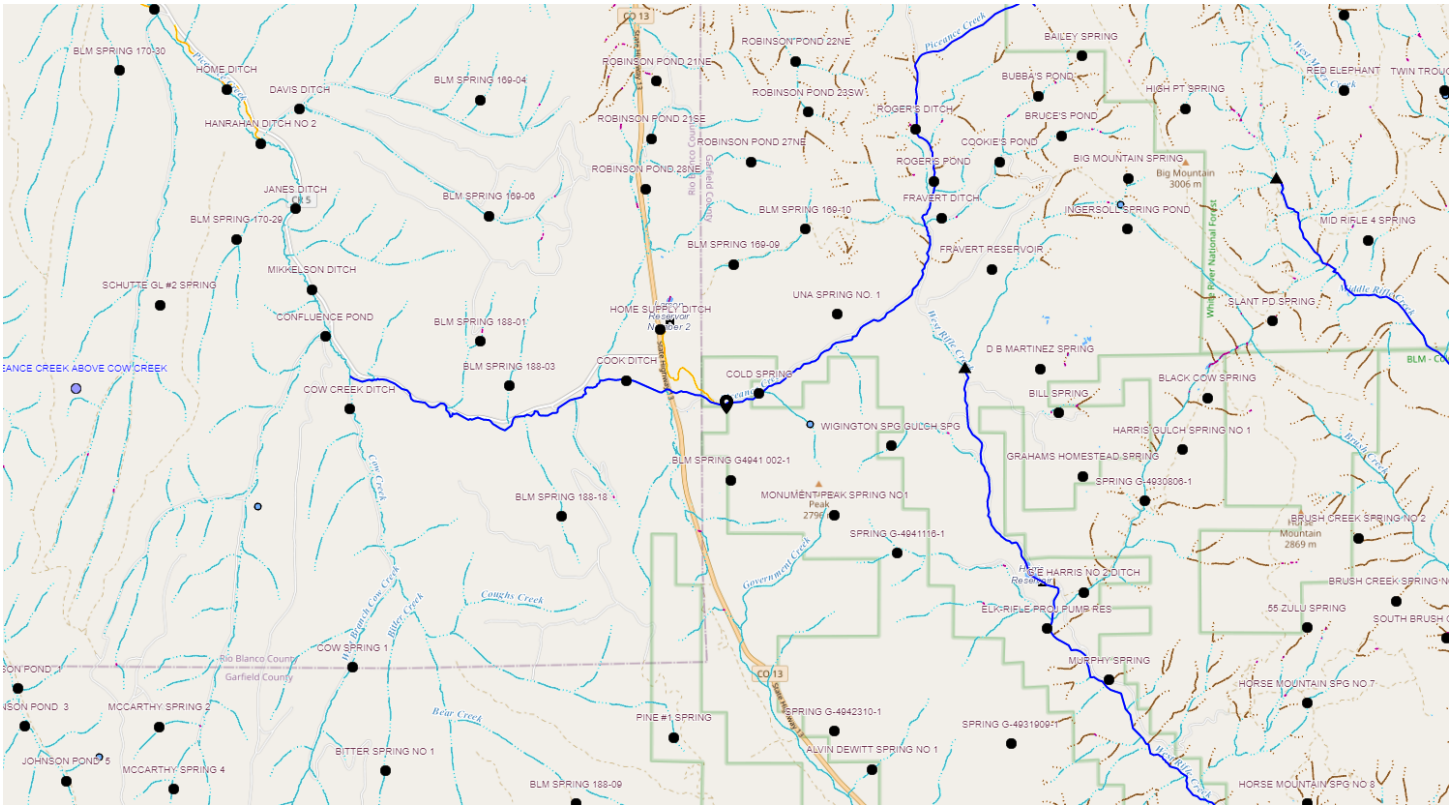
R2Cross RESULTS

Stream Name: Piceance Creek
Stream Locations: Approx 0.75 miles us fr State Hwy 13
Fieldwork Date: 06/15/2015
Cross-section: 3
Observers: R. Smith, K. Sauter
Coordinate System: UTM Zone 13
X (easting): 248524
Y (northing): 4402001
Date Processed: 09/13/2022
Slope: 0.018
Discharge: R2Cross data file: 3.73 (cfs)
Computation method: Ferguson VPE
R2Cross data filename: Piceance Creek upper 6-15-15 #3.xlsx
R2Cross version: 2.0.0

LOCATION



ANALYSIS RESULTS

Habitat Criteria Results

Bankfull top width (ft) = 6.96

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.32
Percent Wetted Perimeter (%)	50.0	0.47
Mean Velocity (ft/s)	1.0	2.22

STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (sq ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Manning's n	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	5.61	6.96	1.06	1.39	7.37	8.26	100.0	0.89	0.05	3.42	25.22
	5.65	6.92	1.02	1.35	7.09	8.17	98.89	0.87	0.05	3.32	23.5
	5.7	6.86	0.98	1.3	6.74	8.05	97.5	0.84	0.06	3.18	21.44
	5.75	6.81	0.94	1.25	6.4	7.94	96.11	0.81	0.06	3.04	19.45
	5.8	6.75	0.9	1.2	6.06	7.82	94.73	0.78	0.06	2.9	17.56
	5.85	6.7	0.86	1.15	5.73	7.71	93.34	0.74	0.06	2.75	15.75
	5.9	6.64	0.81	1.1	5.39	7.59	91.95	0.71	0.06	2.6	14.03
	5.95	6.59	0.77	1.05	5.06	7.48	90.56	0.68	0.06	2.45	12.41
	6.0	6.53	0.73	1.0	4.73	7.36	89.17	0.64	0.06	2.3	10.87
	6.05	6.48	0.68	0.95	4.41	7.25	87.79	0.61	0.07	2.14	9.43
	6.1	6.42	0.64	0.9	4.09	7.13	86.4	0.57	0.07	1.98	8.09
	6.15	6.37	0.59	0.85	3.77	7.02	85.01	0.54	0.07	1.82	6.85
	6.2	6.31	0.55	0.8	3.45	6.9	83.62	0.5	0.08	1.65	5.71
	6.25	6.26	0.5	0.75	3.14	6.79	82.23	0.46	0.08	1.49	4.67
Waterline	6.3	6.2	0.46	0.7	2.83	6.68	80.84	0.42	0.09	1.32	3.73
	6.35	6.11	0.41	0.65	2.52	6.54	79.19	0.38	0.09	1.16	2.92
	6.4	6.01	0.37	0.6	2.21	6.4	77.54	0.35	0.1	1.0	2.21
	6.45	5.92	0.32	0.55	1.92	6.27	75.88	0.31	0.11	0.84	1.61
	6.5	5.53	0.29	0.5	1.62	5.83	70.6	0.28	0.12	0.73	1.19
	6.55	5.19	0.26	0.45	1.35	5.46	66.12	0.25	0.13	0.62	0.84
	6.6	4.84	0.23	0.4	1.1	5.09	61.63	0.22	0.14	0.51	0.57
	6.65	3.83	0.23	0.35	0.88	4.02	48.75	0.22	0.14	0.52	0.46
	6.7	3.69	0.19	0.3	0.69	3.86	46.71	0.18	0.16	0.39	0.27
	6.75	3.56	0.14	0.25	0.51	3.69	44.67	0.14	0.2	0.27	0.14
	6.8	3.12	0.11	0.2	0.34	3.22	39.0	0.1	0.25	0.17	0.06

	6.85	1.86	0.11	0.15	0.2	1.93	23.37	0.11	0.25	0.18	0.04
	6.9	1.4	0.08	0.1	0.12	1.44	17.44	0.08	0.31	0.12	0.01
	6.95	1.15	0.04	0.05	0.05	1.17	14.17	0.04	0.52	0.05	0.0
	6.99	0.97	0.01	0.01	0.01	0.98	11.88	0.01	1.31	0.01	0.0

This Manning's roughness coefficient was calculated based on velocity estimates from the Ferguson VPE method

MODEL SUMMARY

Measured Flow (Qm) =	3.73	(cfs)
Calculated Flow (Qc) =	3.73	(cfs)
(Qm-Qc)/Qm * 100 =	-0.00%	
Measured Waterline (WLm) =	6.3	(ft)
Calculated Waterline (WLc) =	6.3	(ft)
(WLm-WLc)/WLm * 100 =	0.00%	
Max Measured Depth (Dm) =	0.7	(ft)
Max Calculated Depth (Dc) =	0.7	(ft)
(Dm-Dc)/Dm * 100 =	-0.00%	
Mean Velocity =	1.32	(ft/s)
Manning's n =	0.085	
0.4 * Qm =	1.49	(cfs)
2.5 * Qm =	9.33	(cfs)

FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
Bankfull	0	5.61		
Waterline	0.3	6.3	0	0
	0.6	6.65	0.35	0.82
	0.9	6.6	0.3	1.04
	1.2	6.8	0.5	1.02
	1.5	6.8	0.5	1.34
	1.8	6.85	0.55	0.76
	2.1	6.85	0.55	1.48
	2.4	6.8	0.5	1.55
	2.7	6.85	0.55	1.49
	3	7	0.7	1.41
	3.3	7	0.7	1.62
	3.6	7	0.7	1.72
	3.9	7	0.7	1.53
	4.2	6.9	0.6	1.58
	4.5	6.9	0.6	1.33
	4.8	6.65	0.35	1.35
	5.1	6.65	0.35	1.23
	5.4	6.6	0.3	1.26
	5.7	6.55	0.25	1.04
	6	6.5	0.2	0.78
	6.3	6.5	0.2	0
Waterline	6.5	6.3	0	0
Bankfull	7	5.55		
	7.3	5.4		

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (ft^2)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0.46	0.35	0.1	0.09	2.31
0.3	0.3	0.09	0.09	2.51
0.36	0.5	0.15	0.15	4.1
0.3	0.5	0.15	0.2	5.38
0.3	0.55	0.17	0.13	3.36
0.3	0.55	0.17	0.24	6.54
0.3	0.5	0.15	0.23	6.23
0.3	0.55	0.17	0.25	6.58
0.34	0.7	0.21	0.3	7.93
0.3	0.7	0.21	0.34	9.11
0.3	0.7	0.21	0.36	9.68
0.3	0.7	0.21	0.32	8.61
0.32	0.6	0.18	0.28	7.62
0.3	0.6	0.18	0.24	6.41
0.39	0.35	0.1	0.14	3.8
0.3	0.35	0.1	0.13	3.46
0.3	0.3	0.09	0.11	3.04
0.3	0.25	0.07	0.08	2.09
0.3	0.2	0.06	0.05	1.25
0.3	0.2	0.05	0	0
0.28	0	0	0	0
0	0	0	0	0
0	0	0	0	0

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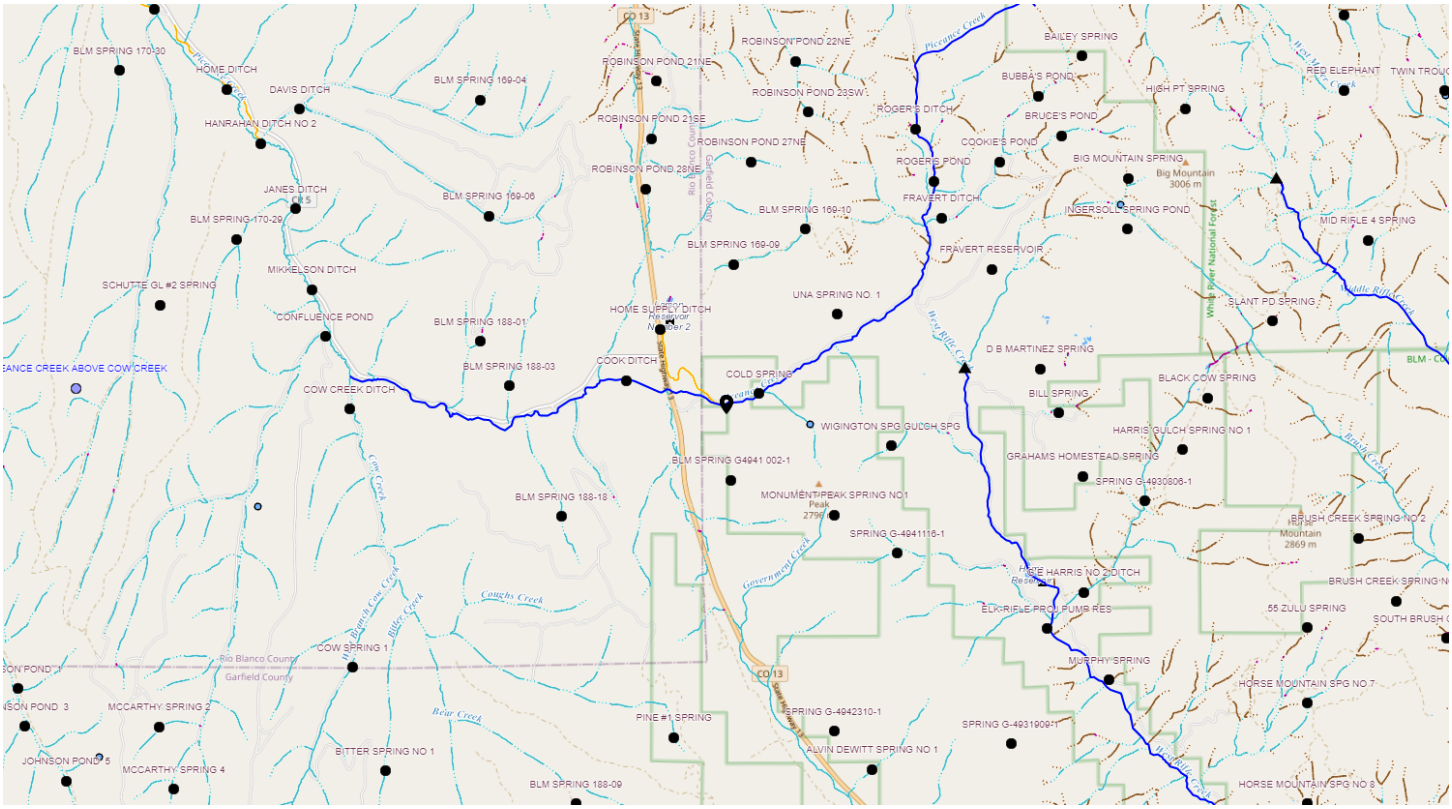
R2Cross RESULTS

Stream Name: Piceance Creek
Stream Locations: 200 ft dwnstr fr Larson #1 Ditch hdgt
Fieldwork Date: 07/07/2015
Cross-section: 2
Observers: R. Smith, B. Logan, B. Epstein
Coordinate System: UTM Zone 13
X (easting): 248550
Y (northing): 4402022
Date Processed: 09/13/2022
Slope: 0.023
Discharge: R2Cross data file: 1.98 (cfs)
Computation method: Ferguson VPE
R2Cross data filename: Piceance Creek upper #2 7-7-15.xlsx
R2Cross version: 2.0.0

LOCATION



ANALYSIS RESULTS

Habitat Criteria Results

Bankfull top width (ft) = 7.36

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.64
Percent Wetted Perimeter (%)	50.0	1.35
Mean Velocity (ft/s)	1.0	0.84

STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (sq ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Manning's n	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	6.45	7.36	0.9	1.32	6.6	8.64	100.0	0.76	0.04	4.9	32.32
	6.5	7.3	0.85	1.27	6.23	8.53	98.65	0.73	0.04	4.69	29.24
	6.55	7.24	0.81	1.22	5.87	8.41	97.3	0.7	0.04	4.48	26.28
	6.6	7.18	0.77	1.17	5.5	8.29	95.95	0.66	0.04	4.26	23.45
	6.65	7.12	0.72	1.12	5.15	8.18	94.6	0.63	0.04	4.03	20.75
	6.7	7.06	0.68	1.07	4.79	8.06	93.25	0.59	0.04	3.8	18.19
	6.75	7.0	0.63	1.02	4.44	7.94	91.91	0.56	0.04	3.55	15.78
	6.8	6.94	0.59	0.97	4.09	7.83	90.56	0.52	0.04	3.3	13.51
	6.85	6.88	0.54	0.92	3.75	7.71	89.21	0.49	0.05	3.04	11.39
	6.9	6.82	0.5	0.87	3.4	7.59	87.86	0.45	0.05	2.77	9.43
	6.95	6.5	0.47	0.82	3.07	7.23	83.66	0.42	0.05	2.6	7.98
	7.0	6.11	0.45	0.77	2.75	6.81	78.76	0.4	0.05	2.46	6.76
	7.05	5.72	0.43	0.72	2.46	6.38	73.85	0.39	0.05	2.31	5.69
	7.1	5.33	0.41	0.67	2.18	5.96	68.95	0.37	0.05	2.18	4.75
	7.15	4.94	0.39	0.62	1.93	5.53	64.04	0.35	0.05	2.04	3.93
	7.2	4.55	0.37	0.57	1.69	5.11	59.14	0.33	0.06	1.91	3.23
	7.25	4.19	0.35	0.52	1.47	4.73	54.68	0.31	0.06	1.77	2.61
Waterline	7.3	4.0	0.32	0.47	1.27	4.49	52.01	0.28	0.06	1.56	1.98
	7.35	3.89	0.27	0.42	1.07	4.34	50.18	0.25	0.07	1.31	1.4
	7.4	3.78	0.23	0.37	0.88	4.18	48.35	0.21	0.08	1.05	0.92
	7.45	3.62	0.19	0.32	0.69	3.98	46.08	0.17	0.09	0.81	0.56
	7.5	3.31	0.16	0.27	0.52	3.64	42.07	0.14	0.1	0.61	0.32
	7.55	3.13	0.11	0.22	0.36	3.41	39.43	0.1	0.13	0.39	0.14
	7.6	2.57	0.08	0.17	0.21	2.81	32.53	0.07	0.17	0.24	0.05
	7.65	1.83	0.05	0.12	0.1	2.02	23.32	0.05	0.24	0.12	0.01

7.7	1.02	0.02	0.07	0.02	1.11	12.88	0.02	0.54	0.03	0.0
7.75	0.04	0.01	0.02	0.0	0.06	0.66	0.01	1.24	0.01	0.0
7.75	0.03	0.01	0.01	0.0	0.04	0.49	0.0	1.58	0.0	0.0

This Manning's roughness coefficient was calculated based on velocity estimates from the Ferguson VPE method

MODEL SUMMARY

Measured Flow (Qm) =	1.98	(cfs)
Calculated Flow (Qc) =	1.98	(cfs)
(Qm-Qc)/Qm * 100 =	-0.01%	
Measured Waterline (WLm) =	7.3	(ft)
Calculated Waterline (WLc) =	7.3	(ft)
(WLm-WLc)/WLm * 100 =	0.00%	
Max Measured Depth (Dm) =	0.47	(ft)
Max Calculated Depth (Dc) =	0.47	(ft)
(Dm-Dc)/Dm * 100 =	-0.00%	
Mean Velocity =	1.56	(ft/s)
Manning's n =	0.062	
0.4 * Qm =	0.79	(cfs)
2.5 * Qm =	4.94	(cfs)

FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.7		
Bankfull	1.7	6.38		
Waterline	2.2	7.3	0	0
	2.4	7.77	0.47	0.68
	2.6	7.63	0.33	1.11
	2.8	7.71	0.41	1.7
	3	7.75	0.45	1.67
	3.2	7.69	0.39	1.61
	3.4	7.7	0.4	1.67
	3.6	7.72	0.42	1.62
	3.8	7.64	0.34	2
	4	7.64	0.34	2.38
	4.2	7.72	0.42	2.23
	4.4	7.7	0.4	1.91
	4.6	7.61	0.31	2.61
	4.8	7.62	0.32	2.5
	5	7.58	0.28	0.91
	5.2	7.6	0.3	1.45
	5.4	7.56	0.26	0.92
	5.6	7.5	0.2	0.13
	5.8	7.48	0.18	0.08
	6	7.41	0.11	0
Waterline	6.2	7.3	0	0
	6.4	7.24		
	8.8	6.91		
Bankfull	9.1	6.45		
	11	5.74		

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (ft^2)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0.51	0.47	0.09	0.06	3.23
0.24	0.33	0.07	0.07	3.71
0.22	0.41	0.08	0.14	7.05
0.2	0.45	0.09	0.15	7.61
0.21	0.39	0.08	0.13	6.36
0.2	0.4	0.08	0.13	6.76
0.2	0.42	0.08	0.14	6.89
0.22	0.34	0.07	0.14	6.88
0.2	0.34	0.07	0.16	8.19
0.22	0.42	0.08	0.19	9.48
0.2	0.4	0.08	0.15	7.73
0.22	0.31	0.06	0.16	8.19
0.2	0.32	0.06	0.16	8.1
0.2	0.28	0.06	0.05	2.58
0.2	0.3	0.06	0.09	4.4
0.2	0.26	0.05	0.05	2.42
0.21	0.2	0.04	0.01	0.26
0.2	0.18	0.04	0	0.15
0.21	0.11	0.02	0	0
0.23	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

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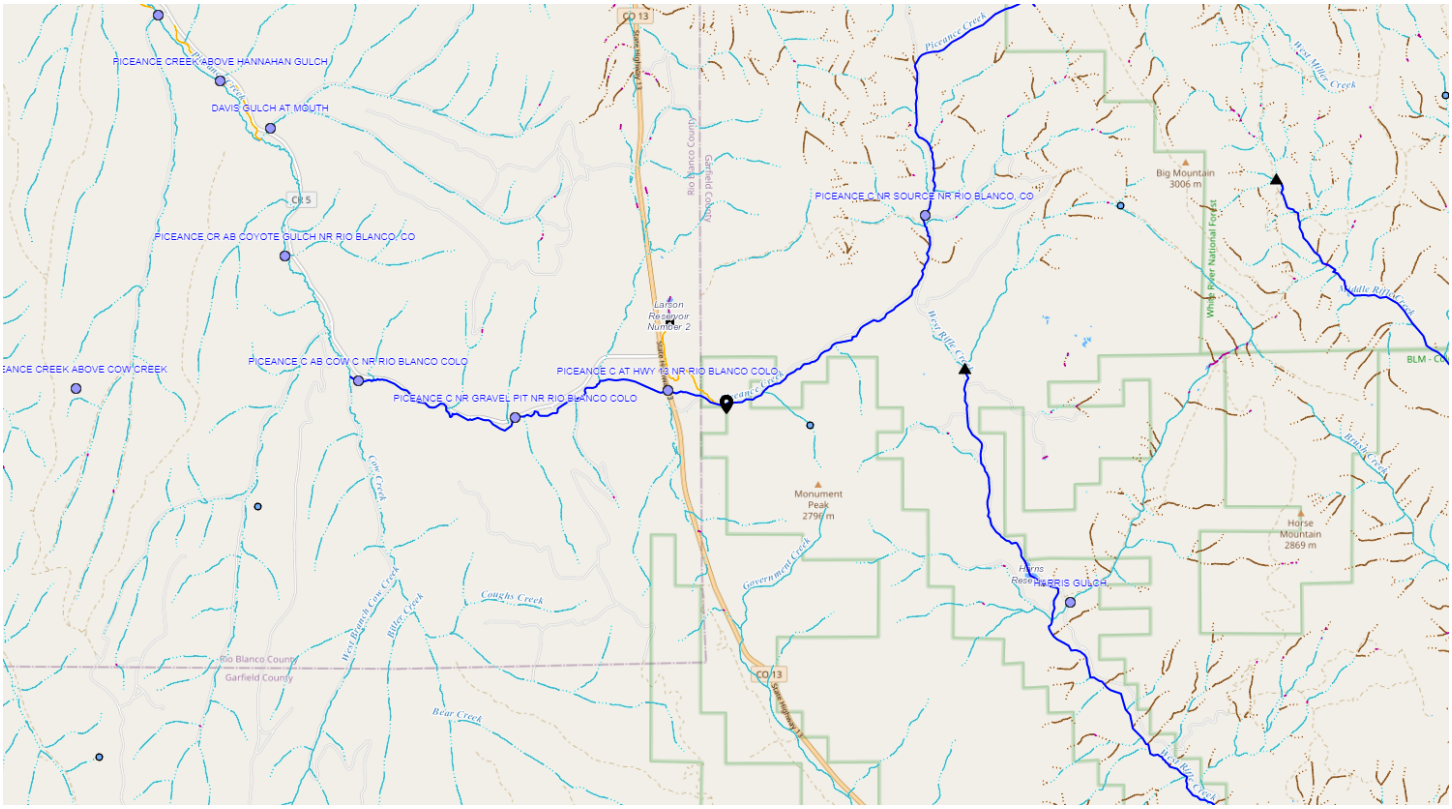
R2Cross RESULTS

Stream Name: Piceance Creek
Stream Locations: Approx 0.75 miles upstream from Highway 13
Fieldwork Date: 07/20/2022
Cross-section: 1
Observers: R. Smith, C. Brady
Coordinate System: Lat/Long
X (easting): -107.93398
Y (northing): 39.73104
Date Processed: 09/27/2022
Slope: 0.022
Discharge: R2Cross data file: 0.07 (cfs)
Computation method: Ferguson VPE
R2Cross data filename: Piceance Creek 7-20-22 #1 (1).xlsx
R2Cross version: 2.0.0

LOCATION



ANALYSIS RESULTS

Habitat Criteria Results

Bankfull top width (ft) = 4.05

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.47
Percent Wetted Perimeter (%)	50.0	0.02
Mean Velocity (ft/s)	1.0	0.9

STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (sq ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Manning's n	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	6.0	4.05	0.65	0.85	2.65	4.82	100.0	0.55	0.05	2.88	7.61
	6.02	4.02	0.64	0.83	2.56	4.77	98.95	0.54	0.05	2.8	7.17
	6.04	3.99	0.62	0.81	2.48	4.72	97.91	0.52	0.05	2.72	6.75
	6.06	3.97	0.6	0.79	2.39	4.67	96.86	0.51	0.05	2.65	6.33
	6.08	3.94	0.59	0.77	2.31	4.62	95.81	0.5	0.05	2.57	5.93
	6.11	3.91	0.57	0.74	2.22	4.57	94.76	0.49	0.05	2.49	5.54
	6.13	3.88	0.55	0.72	2.14	4.52	93.72	0.47	0.06	2.41	5.16
	6.15	3.86	0.53	0.7	2.06	4.47	92.67	0.46	0.06	2.33	4.79
	6.17	3.83	0.52	0.68	1.98	4.42	91.62	0.45	0.06	2.24	4.44
	6.19	3.8	0.5	0.66	1.9	4.37	90.57	0.43	0.06	2.16	4.1
	6.21	3.78	0.48	0.64	1.82	4.32	89.53	0.42	0.06	2.08	3.77
	6.23	3.75	0.46	0.62	1.74	4.27	88.48	0.41	0.06	1.99	3.45
	6.25	3.72	0.45	0.59	1.66	4.22	87.43	0.39	0.06	1.9	3.15
	6.28	3.69	0.43	0.57	1.58	4.17	86.38	0.38	0.06	1.81	2.86
	6.3	3.67	0.41	0.55	1.5	4.12	85.32	0.36	0.07	1.73	2.59
	6.32	3.64	0.39	0.53	1.42	4.06	84.26	0.35	0.07	1.64	2.33
	6.34	3.61	0.37	0.51	1.35	4.01	83.2	0.34	0.07	1.55	2.08
	6.36	3.58	0.35	0.49	1.27	3.96	82.14	0.32	0.07	1.46	1.85
	6.38	3.55	0.34	0.47	1.19	3.91	81.08	0.31	0.07	1.36	1.63
	6.4	3.53	0.32	0.45	1.12	3.86	80.02	0.29	0.08	1.27	1.42
	6.42	3.5	0.3	0.42	1.04	3.81	78.96	0.27	0.08	1.18	1.23
	6.45	3.47	0.28	0.4	0.97	3.76	77.9	0.26	0.08	1.09	1.05
	6.47	3.44	0.26	0.38	0.9	3.71	76.84	0.24	0.09	0.99	0.89
	6.49	3.41	0.24	0.36	0.82	3.66	75.78	0.23	0.09	0.9	0.74
	6.51	3.39	0.22	0.34	0.75	3.6	74.71	0.21	0.1	0.81	0.61

	6.53	3.36	0.2	0.32	0.68	3.55	73.65	0.19	0.1	0.71	0.48
	6.55	3.33	0.18	0.3	0.61	3.5	72.59	0.17	0.11	0.62	0.38
	6.57	3.3	0.16	0.28	0.54	3.45	71.53	0.16	0.12	0.53	0.29
	6.59	3.27	0.14	0.26	0.47	3.4	70.47	0.14	0.13	0.45	0.21
	6.62	3.24	0.12	0.23	0.4	3.35	69.41	0.12	0.15	0.36	0.14
	6.64	3.22	0.1	0.21	0.33	3.3	68.35	0.1	0.17	0.28	0.09
Waterline	6.65	3.2	0.09	0.2	0.29	3.27	67.73	0.09	0.19	0.23	0.07
	6.66	3.11	0.08	0.19	0.26	3.17	65.75	0.08	0.2	0.21	0.06
	6.68	2.88	0.07	0.17	0.2	2.94	60.94	0.07	0.23	0.16	0.03
	6.7	2.25	0.06	0.15	0.14	2.3	47.73	0.06	0.25	0.13	0.02
	6.72	1.94	0.05	0.13	0.1	1.98	41.03	0.05	0.31	0.1	0.01
	6.74	1.63	0.04	0.11	0.06	1.66	34.33	0.04	0.4	0.06	0.0
	6.76	0.83	0.04	0.09	0.04	0.86	17.75	0.04	0.35	0.07	0.0
	6.79	0.69	0.03	0.06	0.02	0.71	14.68	0.03	0.5	0.04	0.0
	6.81	0.34	0.02	0.04	0.01	0.35	7.26	0.02	0.62	0.03	0.0
	6.83	0.17	0.01	0.02	0.0	0.18	3.63	0.01	1.11	0.01	0.0

This Manning's roughness coefficient was calculated based on velocity estimates from the Ferguson VPE method

MODEL SUMMARY

Measured Flow (Qm) =	0.07	(cfs)
Calculated Flow (Qc) =	0.07	(cfs)
(Qm-Qc)/Qm * 100 =	-0.00%	
Measured Waterline (WLm) =	6.65	(ft)
Calculated Waterline (WLc) =	6.65	(ft)
(WLm-WLc)/WLm * 100 =	0.00%	
Max Measured Depth (Dm) =	0.2	(ft)
Max Calculated Depth (Dc) =	0.2	(ft)
(Dm-Dc)/Dm * 100 =	-0.00%	
Mean Velocity =	0.23	(ft/s)
Manning's n =	0.187	
0.4 * Qm =	0.03	(cfs)
2.5 * Qm =	0.17	(cfs)

FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.02		
	1.2	5.32		
Bankfull	3	6		
	3.2	6.27		
Waterline	3.5	6.65	0	0
	3.9	6.7	0.05	0
	4.1	6.7	0.05	0
	4.3	6.7	0.05	0.09
	4.5	6.75	0.1	0.1
	4.7	6.75	0.1	0.17
	4.9	6.75	0.1	0.2
	5.1	6.7	0.05	0.18
	5.3	6.75	0.1	0.17
	5.5	6.75	0.1	0.17
	5.7	6.8	0.15	0.44
	5.9	6.8	0.15	0.5
	6.1	6.85	0.2	0.26
	6.3	6.8	0.15	0.23
Waterline	6.7	6.65	0	0
Bankfull	7.1	5.9		
	7.6	5.36		
	8.3	5.04		
	8.8	4.84		

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (ft^2)	Discharge (cfs)	Percent Discharge
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
0.4	0.05	0.01	0	0
0.2	0.05	0.01	0	0
0.2	0.05	0.01	0	1.33
0.21	0.1	0.02	0	2.95
0.2	0.1	0.02	0	5.01
0.2	0.1	0.02	0	5.89
0.21	0.05	0.01	0	2.65
0.21	0.1	0.02	0	5.01
0.2	0.1	0.02	0	5.01
0.21	0.15	0.03	0.01	19.45
0.2	0.15	0.03	0.01	22.11
0.21	0.2	0.04	0.01	15.33
0.21	0.15	0.04	0.01	15.25
0.43	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

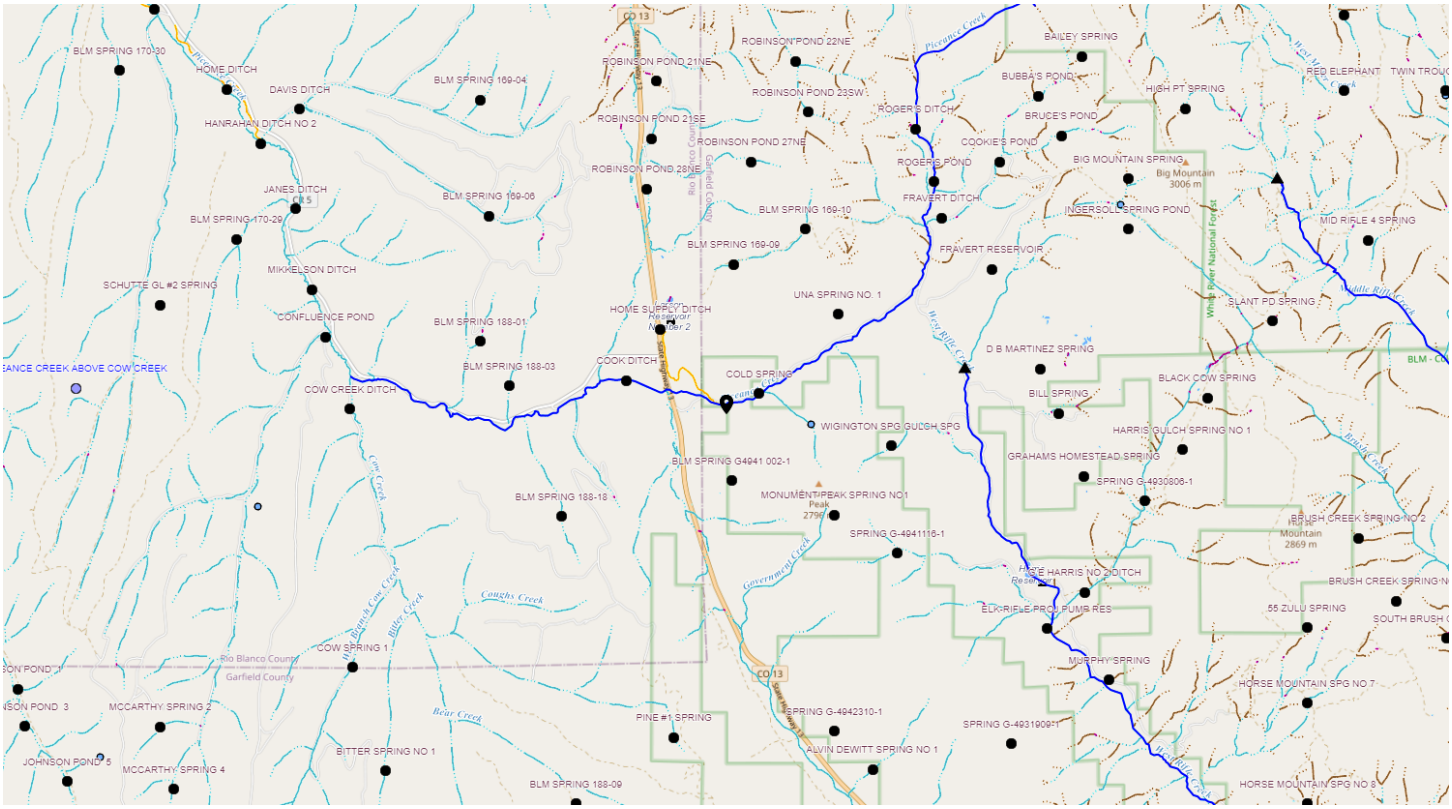
DISCLAIMER

"The Colorado Water Conservation Board makes no representations about the use of the software contained in the R2Cross platform for any purpose besides that for which it was designed. To the maximum extent permitted by applicable law, all information, modeling results, and software are provided “as is” without warranty or condition of any kind, including all implied warranties or conditions of merchantability, or fitness for a particular purpose. The user assumes all responsibility for the accuracy and suitability of this program for a specific application. In no event shall the Colorado Water Conservation Board or any state agency, official or employee be liable for any direct, indirect, punitive, incidental, special, consequential damages or any damages whatsoever including, without limitation, damages for loss of use, data, profits, or savings arising from the implementation, reliance on, or use of or inability to use the R2Cross platform.

R2Cross RESULTS

Stream Name: Piceance Creek
Stream Locations: Approx 0.75 mile upstream from State Highway 13
Fieldwork Date: 07/20/2022
Cross-section: 2
Observers: R.Smith, C. Brady
Coordinate System: Lat/Long
X (easting): -107.93404
Y (northing): 39.73101
Date Processed: 09/13/2022
Slope: 0.0135
Discharge: R2Cross data file: 0.11 (cfs)
Computation method: Ferguson VPE
R2Cross data filename: Piceance Creek 7-20-22 #2.xlsx
R2Cross version: 2.0.0

LOCATION



ANALYSIS RESULTS

Habitat Criteria Results

Bankfull top width (ft) = 3.96

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.31
Percent Wetted Perimeter (%)	50.0	0.16
Mean Velocity (ft/s)	1.0	1.03

STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (sq ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Manning's n	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	6.76	3.96	0.46	0.69	1.81	4.37	100.0	0.41	0.06	1.62	2.92
	6.78	3.91	0.45	0.67	1.74	4.31	98.55	0.4	0.06	1.57	2.73
	6.79	3.85	0.43	0.66	1.67	4.24	97.1	0.39	0.06	1.52	2.54
	6.81	3.8	0.42	0.64	1.61	4.18	95.65	0.38	0.06	1.47	2.37
	6.83	3.75	0.41	0.62	1.54	4.12	94.2	0.37	0.06	1.42	2.2
	6.85	3.7	0.4	0.6	1.48	4.05	92.75	0.36	0.06	1.37	2.03
	6.86	3.65	0.39	0.59	1.41	3.99	91.3	0.35	0.07	1.32	1.87
	6.88	3.6	0.38	0.57	1.35	3.93	89.85	0.34	0.07	1.28	1.72
	6.9	3.55	0.36	0.55	1.29	3.86	88.4	0.33	0.07	1.23	1.58
	6.92	3.49	0.35	0.53	1.23	3.8	86.95	0.32	0.07	1.17	1.45
	6.93	3.44	0.34	0.52	1.17	3.74	85.5	0.31	0.07	1.12	1.32
	6.95	3.39	0.33	0.5	1.11	3.67	84.05	0.3	0.07	1.07	1.19
	6.97	3.34	0.32	0.48	1.05	3.61	82.6	0.29	0.07	1.02	1.08
	6.98	3.29	0.3	0.47	1.0	3.55	81.15	0.28	0.08	0.97	0.97
	7.0	3.24	0.29	0.45	0.94	3.48	79.7	0.27	0.08	0.92	0.86
	7.02	3.19	0.28	0.43	0.88	3.42	78.25	0.26	0.08	0.87	0.77
	7.04	3.13	0.26	0.41	0.83	3.36	76.8	0.25	0.08	0.82	0.68
	7.05	3.08	0.25	0.4	0.78	3.29	75.36	0.24	0.09	0.76	0.59
	7.07	3.03	0.24	0.38	0.72	3.23	73.91	0.22	0.09	0.71	0.51
	7.09	2.98	0.23	0.36	0.67	3.17	72.46	0.21	0.09	0.66	0.44
	7.11	2.93	0.21	0.34	0.62	3.1	71.01	0.2	0.1	0.61	0.38
	7.12	2.81	0.2	0.33	0.57	2.97	68.03	0.19	0.1	0.57	0.33
	7.14	2.66	0.2	0.31	0.52	2.82	64.42	0.19	0.1	0.55	0.29
	7.16	2.51	0.19	0.29	0.48	2.66	60.82	0.18	0.11	0.52	0.25
	7.17	2.36	0.18	0.28	0.44	2.5	57.21	0.17	0.11	0.5	0.22

	7.19	2.22	0.18	0.26	0.4	2.34	53.61	0.17	0.11	0.48	0.19
	7.21	2.08	0.17	0.24	0.36	2.2	50.35	0.16	0.11	0.46	0.16
	7.23	1.97	0.17	0.22	0.33	2.07	47.44	0.16	0.12	0.43	0.14
	7.24	1.85	0.16	0.21	0.29	1.95	44.53	0.15	0.12	0.4	0.12
Waterline	7.25	1.8	0.16	0.2	0.28	1.89	43.34	0.15	0.12	0.39	0.11
	7.26	1.76	0.15	0.19	0.26	1.85	42.3	0.14	0.13	0.37	0.1
	7.28	1.69	0.14	0.17	0.23	1.77	40.53	0.13	0.13	0.33	0.08
	7.29	1.62	0.13	0.16	0.2	1.69	38.77	0.12	0.14	0.29	0.06
	7.31	1.55	0.11	0.14	0.18	1.62	37.0	0.11	0.16	0.25	0.04
	7.33	1.48	0.1	0.12	0.15	1.54	35.24	0.1	0.17	0.21	0.03
	7.35	1.41	0.09	0.1	0.12	1.46	33.47	0.09	0.19	0.18	0.02
	7.36	1.34	0.08	0.09	0.1	1.39	31.71	0.07	0.22	0.14	0.01
	7.38	1.28	0.06	0.07	0.08	1.31	29.94	0.06	0.25	0.1	0.01
	7.4	1.21	0.05	0.05	0.06	1.23	28.18	0.05	0.31	0.07	0.0
	7.42	1.14	0.03	0.03	0.04	1.15	26.41	0.03	0.43	0.04	0.0
	7.43	1.07	0.02	0.02	0.02	1.08	24.65	0.02	0.73	0.02	0.0

This Manning's roughness coefficient was calculated based on velocity estimates from the Ferguson VPE method

MODEL SUMMARY

Measured Flow (Qm) =	0.11	(cfs)
Calculated Flow (Qc) =	0.11	(cfs)
(Qm-Qc)/Qm * 100 =	0.01%	
Measured Waterline (WLm) =	7.25	(ft)
Calculated Waterline (WLc) =	7.25	(ft)
(WLm-WLc)/WLm * 100 =	-0.00%	
Max Measured Depth (Dm) =	0.2	(ft)
Max Calculated Depth (Dc) =	0.2	(ft)
(Dm-Dc)/Dm * 100 =	0.00%	
Mean Velocity =	0.39	(ft/s)
Manning's n =	0.123	
0.4 * Qm =	0.04	(cfs)
2.5 * Qm =	0.28	(cfs)

FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.92		
	0.9	6.55		
Bankfull	1.2	6.74		
	2	7.11		
	2.7	7.2		
Waterline	3	7.25	0	0
	3.2	7.35	0.1	0
	3.4	7.45	0.2	0.33
	3.6	7.45	0.2	0.32
	3.8	7.45	0.2	0.56
	4	7.45	0.2	0.54
	4.2	7.45	0.2	0.58
	4.4	7.45	0.2	0.36
	4.6	7.35	0.1	0.13
Waterline	4.8	7.25	0	0
Bankfull	5.2	6.76		
	5.6	6.5		
	7	6.39		
	8.6	6.3		
	9.2	5.9		

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (ft^2)	Discharge (cfs)	Percent Discharge
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
0.22	0.1	0.02	0	0
0.22	0.2	0.04	0.01	11.98
0.2	0.2	0.04	0.01	11.62
0.2	0.2	0.04	0.02	20.33
0.2	0.2	0.04	0.02	19.6
0.2	0.2	0.04	0.02	21.05
0.2	0.2	0.04	0.01	13.07
0.22	0.1	0.02	0	2.36
0.22	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

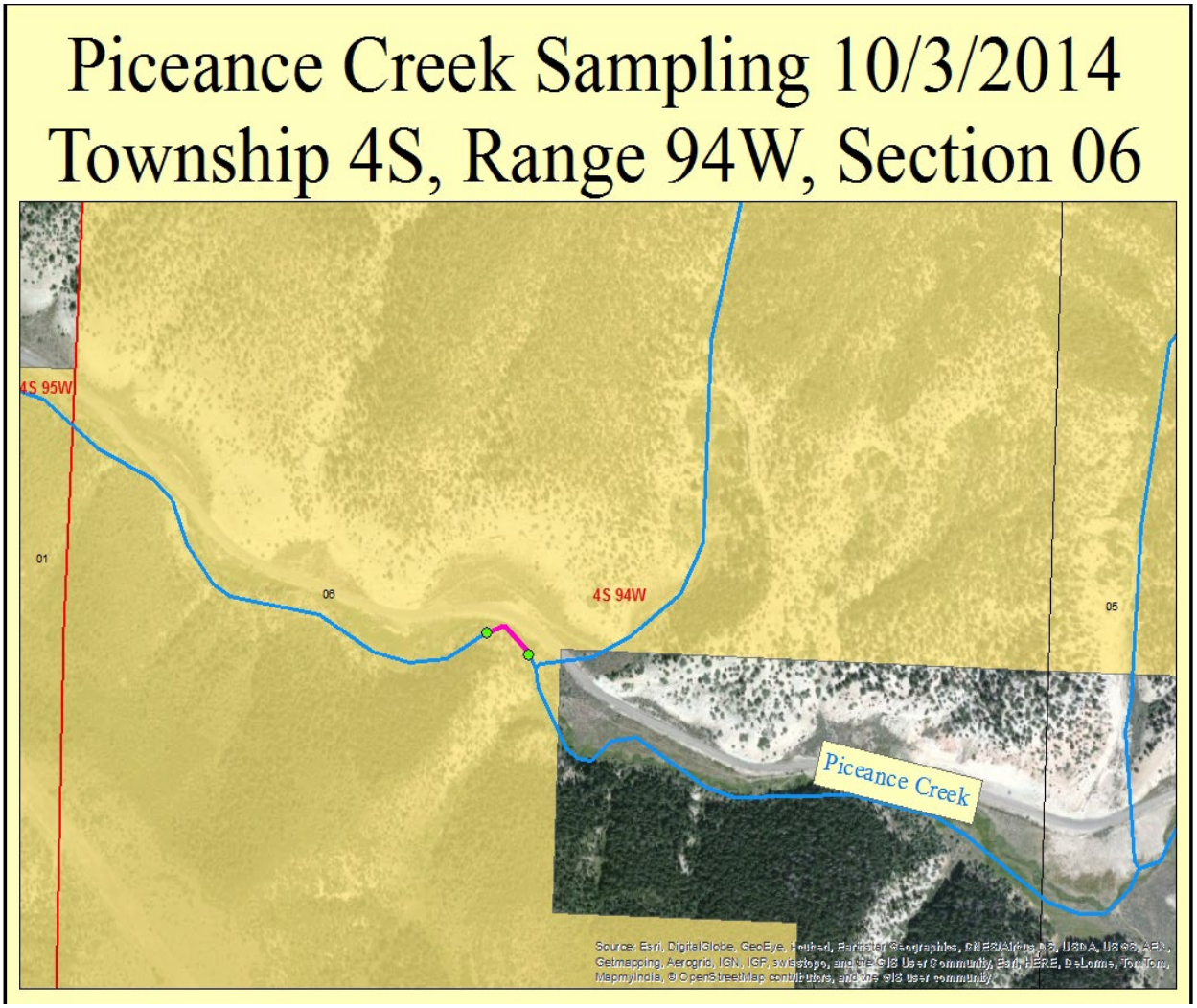
DISCLAIMER

"The Colorado Water Conservation Board makes no representations about the use of the software contained in the R2Cross platform for any purpose besides that for which it was designed. To the maximum extent permitted by applicable law, all information, modeling results, and software are provided “as is” without warranty or condition of any kind, including all implied warranties or conditions of merchantability, or fitness for a particular purpose. The user assumes all responsibility for the accuracy and suitability of this program for a specific application. In no event shall the Colorado Water Conservation Board or any state agency, official or employee be liable for any direct, indirect, punitive, incidental, special, consequential damages or any damages whatsoever including, without limitation, damages for loss of use, data, profits, or savings arising from the implementation, reliance on, or use of or inability to use the R2Cross platform.

White River Field Office Stream Surveys
October 2014

Piceance Creek (Upper Site) - Water Code: 25343

Piceance Creek, located on BLM lands managed by the White River Field Office, was sampled on October 3, 2014. Piceance Creek is tributary to the White River. A two-pass removal method was used to determine species presence as well as estimate population size. The stream was sampled using one backpack electroshocker. Mountain sucker (*Catostomas platyrhynchus*, MOS) and speckled dace (*Rhinichthys osculus*, SPD) were the only species seen or collected. Personnel present included Lisa Belmonte, Heather Stewart, Tom Fresques, and Kristen Doyle, BLM.



Mountain sucker

Piceance Creek within the sample reach

STREAM SURVEY FISH SAMPLING FORM 2014									
WATER: Piceance Creek				**DATE: 10/3/14**			**GEAR: 1 BPE**		
Crew: Belmonte, Stewart, Fresques, Doyle					**Location: Adjacent to CR-5 above Cow Creek Confluence**				
#	**Pass**	**Species**	**Length**	**Weight**	**#**	**Pass**	**Species**	**Length**	**Weight**
1	1	SPD	79	4.8	76	1	MOS	96	9.1
2	1	SPD	65	1.6	77	1	SPD	27	
3	1	SPD	69	1.8	78	1	SPD	94	10.8
4	1	SPD	69	1.9	79	1	MOS	117	15.3
5	1	SPD	71	1.9	80	1	MOS	97	10.4
6	1	SPD	92	5.2	81	1	MOS	107	13.2
7	1	MOS	134	18.2	82	1	SPD	81	6.7
8	1	SPD	104	12.4	83	1	MOS	114	13.2
9	1	MOS	111	12.7	84	1	MOS	126	19.5
10	1	SPD	77	3.7	85	1	MOS	107	11.8
11	1	MOS	105	11.7	86	1	SPD	71	6.1
12	1	MOS	116	15.6	87	1	MOS	99	11.2
13	1	MOS	104	11.1	88	1	MOS	107	13.2
14	1	MOS	149	31.5	89	1	MOS	89	7.1
15	1	MOS	143	28.7	90	1	MOS	87	10.1
16	1	SPD	87	7.1	91	1	SPD	71	5.3
17	1	MOS	112	15.4	92	1	SPD	63	2.9
18	1	SPD	104	12.4	93	1	SPD	93	8.8
19	1	SPD	72	3.8	94	1	SPD	72	3.1
20	1	MOS	124	17.2	95	1	SPD	77	3.7
21	1	MOS	129	21.7	96	1	MOS	107	13
22	1	MOS	109	13.7	97	1	MOS	85	6.4
23	1	MOS	106	11.5	98	1	MOS	92	8.3
24	1	MOS	113	13.2	99	1	SPD	67	5.5
25	1	MOS	116	14.2	100	1	MOS	92	12
26	1	MOS	136	25.4	101	1	MOS	90	11.8
27	1	MOS	122	16.7	102	1	MOS	111	12.9
28	1	MOS	109	12.7	103	1	MOS	102	9.6
29	1	MOS	101	12.7	104	1	MOS	93	7.5
30	1	MOS	115	13.5	105	1	MOS	82	4.2
31	1	SPD	59	1.9	106	1	MOS	86	5.4
32	1	MOS	99	10.8	107	1	MOS	101	10.2
33	1	MOS	117	15.6	108	1	MOS	99	10.1
34	1	MOS	138	26.2	109	1	MOS	59	3.1
35	1	MOS	112	16.3	110	1	MOS	86	8.2
36	1	MOS	95	8	111	1	MOS	97	10.9
37	1	MOS	95	8.2	112	1	MOS	31	-
38	1	MOS	101	9.7	113	1	MOS	87	6.7
39	1	MOS	103	10.2	114	1	MOS	93	7.4
40	1	MOS	116	14.5	115	1	MOS	95	10

41	1	MOS	109	11.7	116	1	MOS	39	-
42	1	MOS	115	15.9	117	1	MOS	33	-
43	1	MOS	106	11.5	118	1	MOS	39	-
44	1	MOS	113	15.1	119	2	MOS	143	26.1
45	1	MOS	97	8.1	120	2	MOS	129	20.2
46	1	MOS	83	4.9	121	2	MOS	118	16.7
47	1	SPD	86	7.7	122	2	MOS	122	18.6
48	1	MOS	124	20.8	123	2	MOS	101	9.5
49	1	MOS	89	7.8	124	2	MOS	98	8.3
50	1	MOS	107	12.4	125	2	MOS	90	6.2
51	1	MOS	105	10.2	126	2	MOS	87	6.2
52	1	MOS	109	11.1	127	2	MOS	98	8.9
53	1	MOS	115	17.1	128	2	MOS	102	10.1
54	1	MOS	99	13.1	129	2	MOS	97	9.7
55	1	SPD	107	16.1	130	2	MOS	99	9.1
56	1	MOS	107	16	131	2	MOS	94	7.6
57	1	SPD	73	8	132	2	MOS	97	9.7
58	1	MOS	93	7.4	133	2	MOS	99	9.1
59	1	MOS	92	7.4	134	2	MOS	109	13.2
60	1	MOS	87	6.6	135	2	MOS	112	13.2
61	1	SPD	64	2.4	136	2	MOS	97	8.8
62	1	SPD	95	6.8	137	2	MOS	96	8.1
63	1	SPD	50	1.5	138	2	MOS	92	7.8
64	1	MOS	93	10	139	2	MOS	93	8.4
65	1	MOS	129	18.5	140	2	MOS	93	8.6
66	1	MOS	90	7.1	141				
67	1	MOS	95	8.7	142				
68	1	SPD	71	8.5	143				
69	1	SPD	69	2.5	144				
70	1	MOS	80	6.2	145				
71	1	MOS	98	9	146				
72	1	MOS	99	10.7	147				
73	1	SPD	83	9.8	148				
74	1	SPD	80	7.9	149				
75	1	MS	112	13.6	150				

GPS Coordinates:

H2O Temp: 45.3°F	**Reach Length**: 300’	**Stream**	1.
Conductivity: 923µs	**Shocker Settings**: 135 volts	**Widths**:	2.
Habitat (Riparian): Coyote willow – dominant. Sedge, Geyer’s willow, Baltic rush, canary reed grass (dominant), some Canada thistle			3.
			4.
			5.
			Avg: 3’

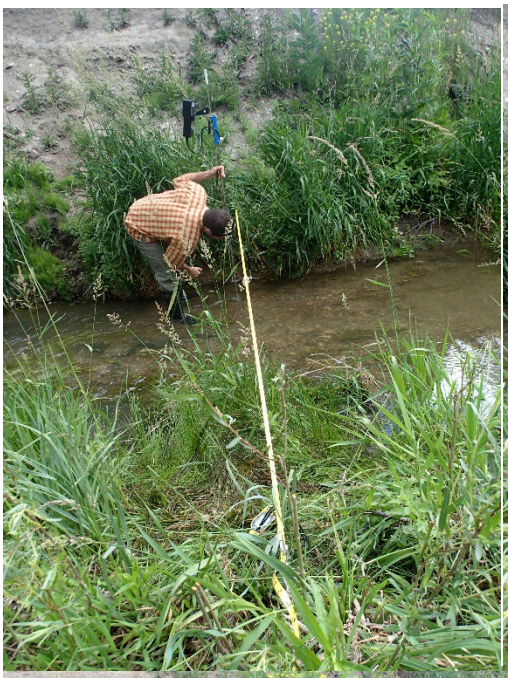
Habitat (Stream): Freshwater shrimp, freshwater snails, dragonfly larvae, good mix of riffles and runs, two pools about 3’ deep.

Discussion:
This site was sampled to monitor the known mountain sucker population. Habitat at the site was in good condition with a good mix of small riffles, larger runs, and deeper pools. Riparian vegetation was dense and robust and completely shaded the stream in most areas. Riparian vegetation consisted primarily of coyote willow, Geyer's willow, sedge, rush, canary reed grass, and some Canada thistle.

A two-pass population estimate was completed at the site. Based on the sample, the presumed adult population (fish $\geq$ to 100 mm) is 55 + or - 4 fish at the 95% confidence interval within the 300 foot sample reach, and extrapolated is 976 + or - 65 fish per mile at the 95% confidence interval. This is a robust population but probably somewhat misleading with regard to exptrapolation at the fish per mile scale as habitat both upstream and downstream for some distance on private lands is degraded with poor vegetative stream cover, overwidened channel, reduced depth, and reduced pool habitat.

Recommendations:

- Periodically monitor aquatic species and stream and riparian habitats



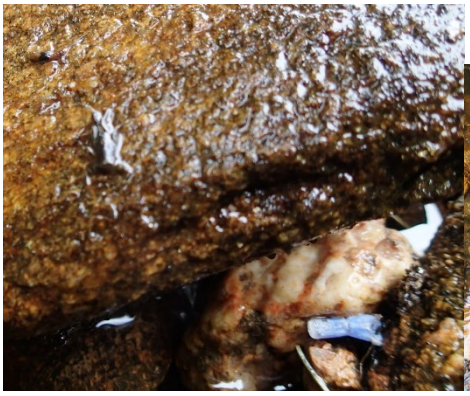




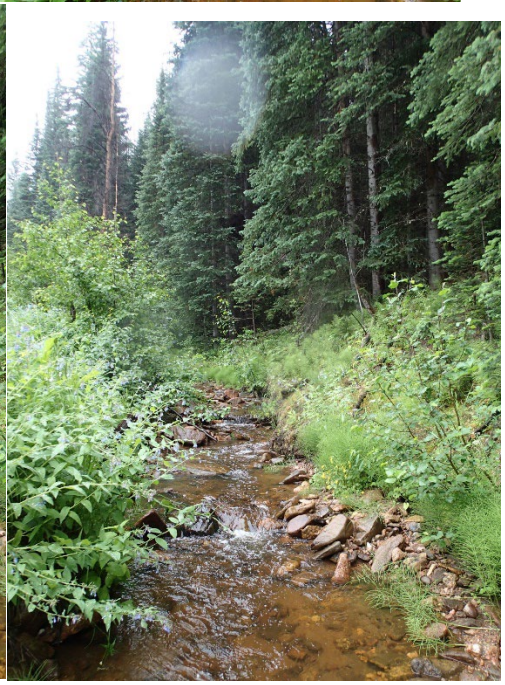










Discharge Measurment Field Visit Data Report *(Filters: Name begins with Piceance;)*

Div	Name	CWCB Case Number	Segment ID	Meas. Date	UTM	Location	Flow Amount (cfs)	Meas #	Rating	Station ID
6	Piceance Creek		17/6/A-002	07/07/2015	UTMx: 243913 UTMy: 4402156	Piceance Creek blw Hwy13 and 0.9 miles upstream of Cow Creek	3.33	1	f	
6	Piceance Creek		17/6/A-002	08/03/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.81	2	f	UPPPICD6
6	Piceance Creek		17/6/A-002	08/09/2016	UTMx: 735676 UTMy: 4440004	Piceance Creek at CR253 road	0.06	3	p	UPPPICD6
6	Piceance Creek		17/6/A-002	08/29/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	3.28	4	f	UPPPICD6
6	Piceance Creek		17/6/A-002	09/21/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.44	5	f	UPPPICD6
6	Piceance Creek		17/6/A-002	11/21/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	1.26	6	f	UPPPICD6
6	Piceance Creek		17/6/A-002	12/16/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	3.28	7	f	UPPPICD6
6	Piceance Creek		17/6/A-002	12/16/2016	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	3.28	8	f	UPPPICD6
6	Piceance Creek		17/6/A-002	02/16/2017	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	3.53	9	f	UPPPICD6
6	Piceance Creek		17/6/A-002	06/22/2017	UTMx: 244109 UTMy: 4404085	Piceance Creek at BLM gage location	0.5	10	f	UPPPICD6
6	Piceance Creek		17/6/A-002	07/12/2017	UTMx: 244109 UTMy: 4404085	Piceance Creek at BLM gage location	0.11	11	f	UPPPICD6
6	Piceance Creek		17/6/A-002	08/22/2018	UTMx: 244175 UTMy: 4401941	Piceance Creek at BLM gage location	0.07	12	f	UPPPICD6
6	Piceance Creek		17/6/A-002	09/14/2018	UTMx: 244093 UTMy: 4402055	Piceance Creek at BLM gage location	0.06	13	f	UPPPICD6
6	Piceance Creek		17/6/A-002	09/14/2018	UTMx: 244093 UTMy: 4402055	Piceance Creek at BLM gage location	0.05	14	f	UPPPICD6
6	Piceance Creek		17/6/A-002	05/07/2019	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	7.7	15	f	UPPPICD6
6	Piceance Creek		17/6/A-002	07/09/2019	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	13.98	16	f	UPPPICD6
6	Piceance Creek		17/6/A-002	10/16/2019	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.6	17	p	UPPPICD6
6	Piceance Creek		17/6/A-002	12/04/2019	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.64	18	p	UPPPICD6
6	Piceance Creek		17/6/A-002	01/16/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.53	19	f	UPPPICD6
6	Piceance Creek		17/6/A-002	02/11/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.62	20	f	UPPPICD6
6	Piceance Creek		17/6/A-002	03/03/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.9	21	p	UPPPICD6
6	Piceance Creek		17/6/A-002	05/28/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.93	22	f	UPPPICD6

6	Piceance Creek		17/6/A-002	06/29/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.08	23	f	UPPPICD6
6	Piceance Creek		17/6/A-002	09/21/2020	UTMx: 244109 UTMy: 4402085	Piceance Creek at BLM gage location	0.16	24	f	UPPPICD6
6	Piceance Creek		17/6/A-002	11/02/2022	UTMx: 243419 UTMy: 4402411	Piceance Creek roughly 2452ft downstream from BLM gage location	0.23	25	p	

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Colorado Water Conservation Board
Department of Natural Resources

Discharge Measurement Summary

Date Generated: Fri Jul 10 2015

File Information

File Name	PICR2X02.002.WAD
Start Date and Time	2015/07/07 16:26:30

Site Details

Site Name	PICEANCE CR B LARSON
Operator(s)	BRIAN EPSTEIN

System Information

Sensor Type	FlowTracker
Serial #	P2354
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.4%	2.5%
Velocity	1.1%	5.1%
Width	0.1%	0.1%
Method	2.0%	-
# Stations	2.5%	-
Overall	**3.6%**	**5.7%**

Summary

Averaging Int.	40	# Stations	21
Start Edge	REW	Total Width	3.996
Mean SNR	45.5 dB	Total Area	1.265
Mean Temp	61.51 °F	Mean Depth	0.316
Disch. Equation	Mid-Section	Mean Velocity	1.5616
		Total Discharge	**1.9749**

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	16:26	2.20	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	16:26	2.40	0.6	0.470	0.6	0.188	0.6788	1.00	0.6788	0.094	0.0638	3.2
2	16:27	2.60	0.6	0.330	0.6	0.132	1.1142	1.00	1.1142	0.066	0.0735	3.7
3	16:29	2.80	0.6	0.410	0.6	0.164	1.6998	1.00	1.6998	0.082	0.1393	7.1
4	16:30	3.00	0.6	0.450	0.6	0.180	1.6686	1.00	1.6686	0.090	0.1501	7.6
5	16:31	3.20	0.6	0.390	0.6	0.156	1.6093	1.00	1.6093	0.078	0.1254	6.4
6	16:32	3.40	0.6	0.400	0.6	0.160	1.6680	1.00	1.6680	0.080	0.1333	6.7
7	16:34	3.60	0.6	0.420	0.6	0.168	1.6168	1.00	1.6168	0.084	0.1357	6.9
8	16:35	3.80	0.6	0.340	0.6	0.136	2.0043	1.00	2.0043	0.068	0.1361	6.9
9	16:36	4.00	0.6	0.340	0.6	0.136	2.3757	1.00	2.3757	0.068	0.1613	8.2
10	16:37	4.20	0.6	0.420	0.6	0.168	2.2293	1.00	2.2293	0.084	0.1871	9.5
11	16:38	4.40	0.6	0.400	0.6	0.160	1.9131	1.00	1.9131	0.080	0.1529	7.7
12	16:40	4.60	0.6	0.310	0.6	0.124	2.6106	1.00	2.6106	0.062	0.1617	8.2
13	16:41	4.80	0.6	0.320	0.6	0.128	2.5033	1.00	2.5033	0.064	0.1600	8.1
14	16:44	5.00	0.6	0.280	0.6	0.112	0.9065	1.00	0.9065	0.056	0.0507	2.6
15	16:45	5.20	0.6	0.300	0.6	0.120	1.4508	1.00	1.4508	0.060	0.0869	4.4
16	16:46	5.40	0.6	0.260	0.6	0.104	0.9150	1.00	0.9150	0.052	0.0475	2.4
17	16:47	5.60	0.6	0.200	0.6	0.080	0.1276	1.00	0.1276	0.040	0.0051	0.3
18	*16:48*	*5.80*	*0.6*	*0.180*	*0.6*	*0.072*	*0.0807*	*1.00*	*0.0807*	*0.036*	*0.0029*	*0.1*
19	16:48	6.00	None	0.110	0.0	0.0	0.0000	1.00	0.0807	0.022	0.0018	0.1
20	16:48	6.20	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

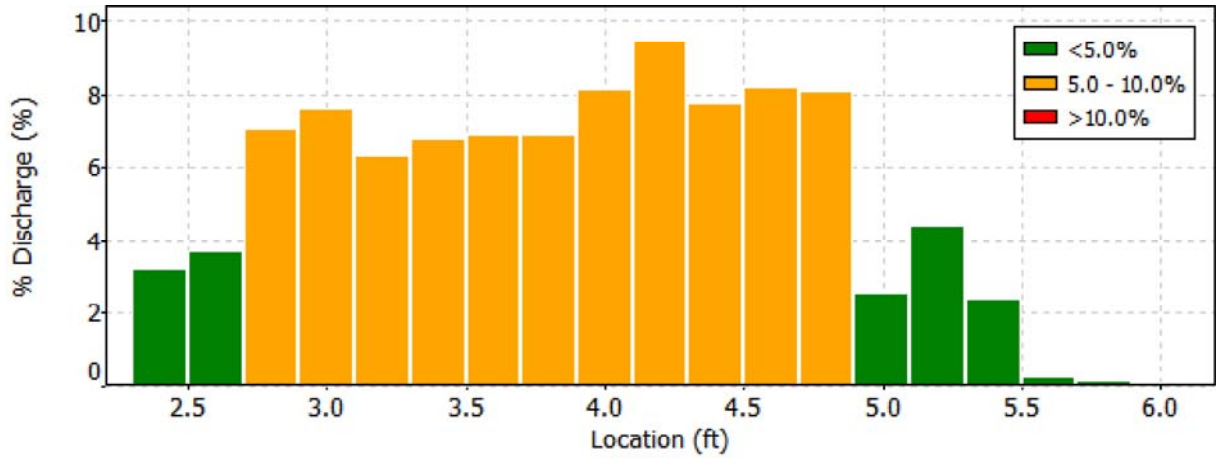
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

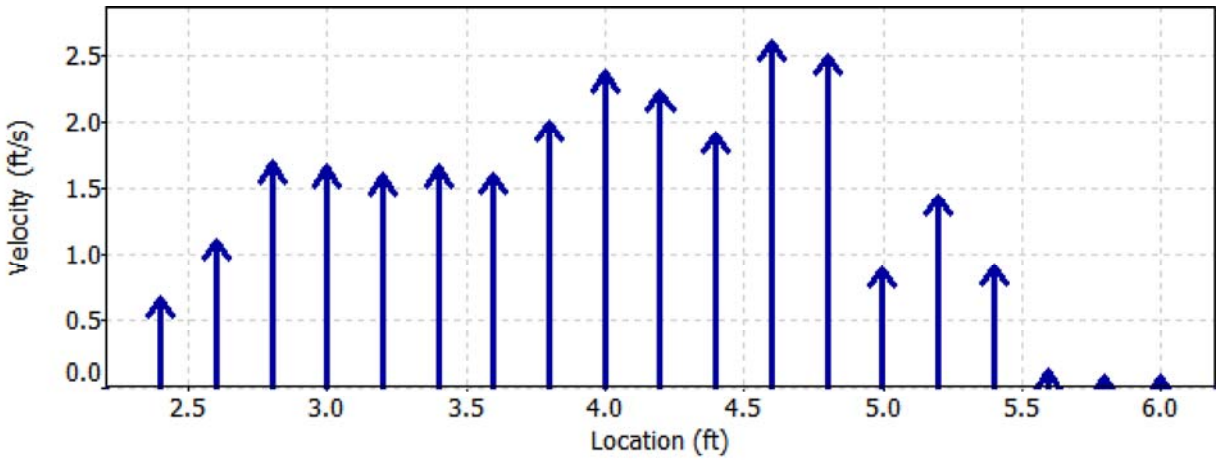
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

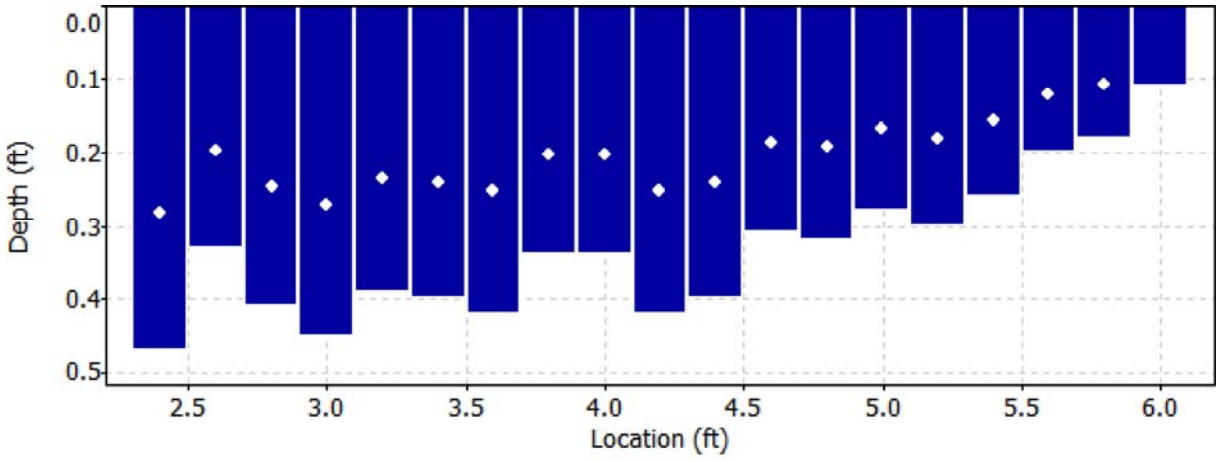
Discharge Measurement Summary

Date Generated: Fri Jul 10 2015

File Information		Site Details	
File Name	PICR2X02.002.WAD	Site Name	PICEANCE CR B LARSON
Start Date and Time	2015/07/07 16:26:30	Operator(s)	BRIAN EPSTEIN







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Colorado Water Conservation Board
Department of Natural Resources

Discharge Measurement Summary

Date Generated: Fri Jul 10 2015

File Information

File Name	PICR2X02.002.WAD
Start Date and Time	2015/07/07 16:26:30

Site Details

Site Name	PICEANCE CR B LARSON
Operator(s)	BRIAN EPSTEIN

Quality Control

St	Loc	%Dep	Message
18	5.80	0.6	High angle: 37

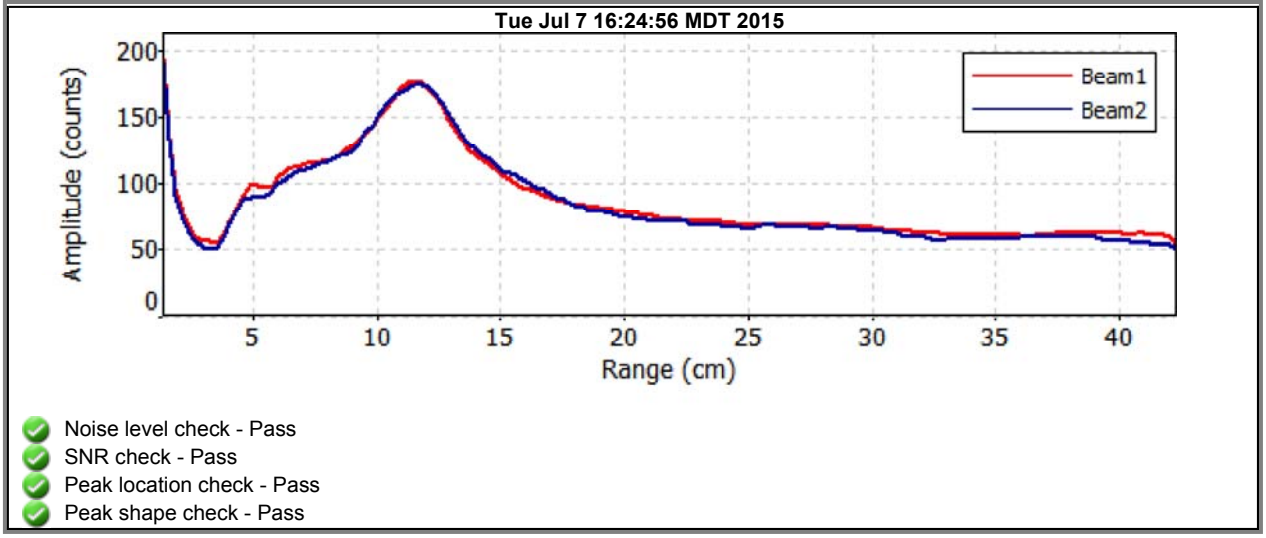
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Discharge Measurement Summary

Date Generated: Fri Jul 10 2015

File Information		Site Details	
File Name	PICR2X02.002.WAD	Site Name	PICEANCE CR B LARSON
Start Date and Time	2015/07/07 16:26:30	Operator(s)	BRIAN EPSTEIN

Automatic Quality Control Test (BeamCheck)



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Pass
- Peak shape check - Pass

Discharge Measurement Summary

Site name	PICEANCE CR AT CR253
Site number	
Operator(s)	BRIAN EPSTEIN
File name	PCRAT253.002.FlowTracker2.ft
Comment	

Start time	8/9/2016 12:52 PM
End time	8/9/2016 12:59 PM
Start location latitude	-
Start location longitude	-
Calculations engine	FlowTracker2

Sensor type	Unknown
Handheld serial number	n/a
Probe serial number	P2354
Probe firmware	3.90
Handheld software	n/a

# Stations	Avg interval (s)	Total discharge (ft³/s)
6	40	0.0585

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
1.600	0.3155	1.770

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
31	0.197	0.1855

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
64.391	0.310	0.4427

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.8%	17.2%
Velocity	5.6%	18.1%
Width	0.3%	0.3%
Method	4.1%	
# Stations	9.4%	
Overall	**11.8%**	**25.0%**

Discharge equation	Mid Section
Discharge uncertainty	ISO
Discharge reference	Measured

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

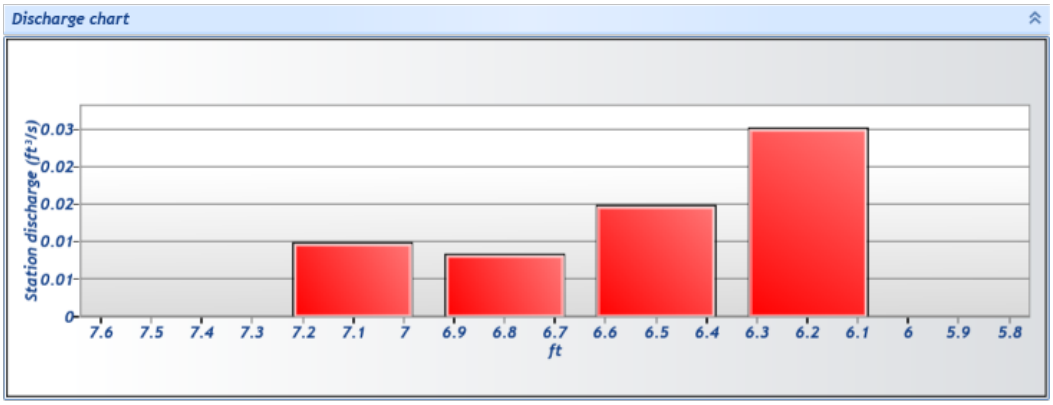
Summary overview

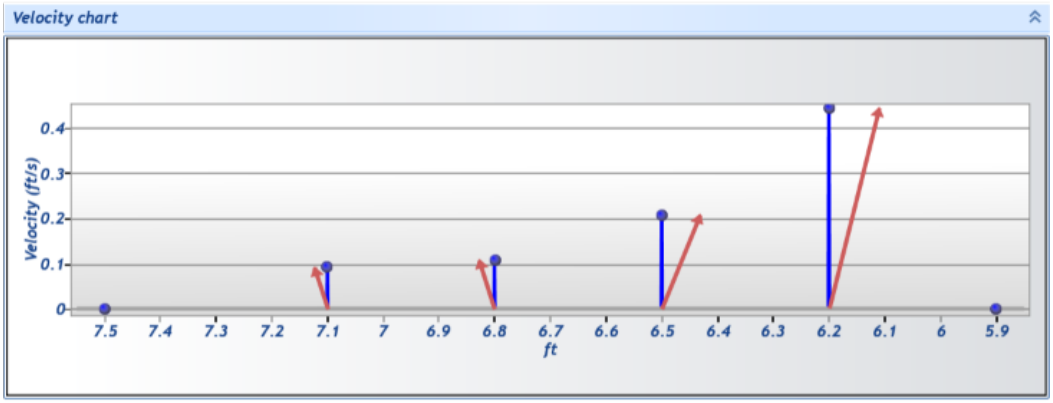
No changes were made to this file
Quality control warnings

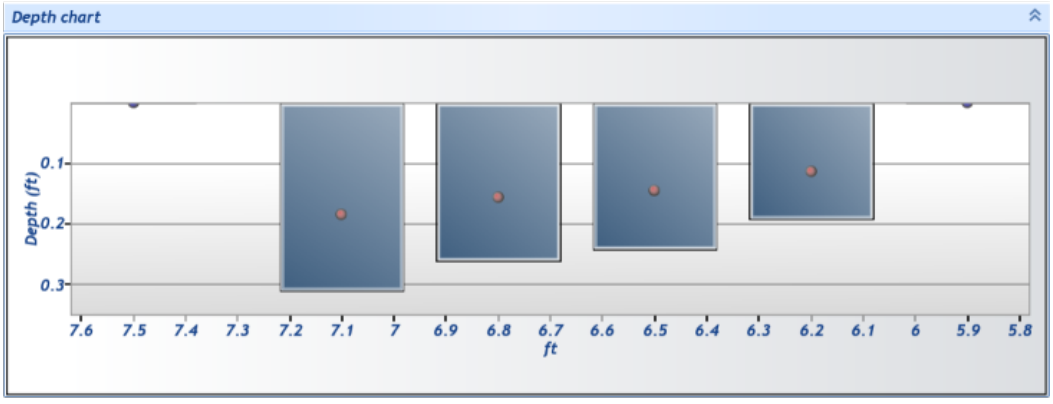
Discharge Measurement Summary

Site name	PICEANCE CR AT CR253
Site number	
Operator(s)	BRIAN EPSTEIN
File name	PCRAT253.002.FlowTracker2.ft
Comment	

Station Warning Settings		
Station discharge OK	Station discharge < 2.50%	
Station discharge caution	2.50% >= Station discharge < 5.00%	
Station discharge warning	Station discharge >= 5.00%	







Discharge Measurement Summary

Site name	PICEANCE CR AT CR253
Site number	
Operator(s)	BRIAN EPSTEIN
File name	PCRAT253.002.FlowTracker2.ft
Comment	

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	12:52 PM	5.900	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.4427	0.0000	0.0000	0.00	✓
1	12:53 PM	6.200	0.6	0.190	0.6000	0.114	40	0.4427	1.0000	0.4427	0.0570	0.0252	43.12	✓
2	12:55 PM	6.500	0.6	0.240	0.6000	0.144	40	0.2072	1.0000	0.2072	0.0720	0.0149	25.51	✓
3	12:58 PM	6.800	0.6	0.260	0.6000	0.156	40	0.1077	1.0000	0.1077	0.0779	0.0084	14.34	✓
4	12:59 PM	7.100	0.6	0.310	0.6000	0.186	40	0.0918	1.0000	0.0918	0.1085	0.0100	17.03	✓
5	12:59 PM	7.500	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0918	0.0000	0.0000	0.00	✓

Discharge Measurement Summary

Site name	PICEANCE CR AT CR253
Site number	
Operator(s)	BRIAN EPSTEIN
File name	PCRAT253.002.FlowTracker2.ft
Comment	

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	4 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	12:53 PM	6.200	0.6	0.190	0.6000	0.114	SNR Threshold Variation,High Stn % Discharge
2	12:55 PM	6.500	0.6	0.240	0.6000	0.144	SNR Threshold Variation,High Stn % Discharge
3	12:58 PM	6.800	0.6	0.260	0.6000	0.156	High Stn % Discharge
4	12:59 PM	7.100	0.6	0.310	0.6000	0.186	Beam SNRs Not Similar,Large SNR Variation,SNR Threshold Variation,High Stn % Discharge

Discharge Measurement Summary

Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

Start time	8/22/2018 10:19 AM
End time	8/22/2018 10:27 AM
Start location latitude	39.732
Start location longitude	-107.939
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H1747037
Probe serial number	FT2P1747048
Probe firmware	1.23
Handheld software	1.4

# Stations	Avg interval (s)	Total discharge (ft³/s)
8	40	0.3365

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
4.100	0.5200	4.133

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
39	0.127	0.6470

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
54.796	0.200	0.7880

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.7%	28.3%
Velocity	0.7%	9.3%
Width	0.2%	0.2%
Method	3.4%	
# Stations	6.6%	
Overall	**7.6%**	**29.8%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

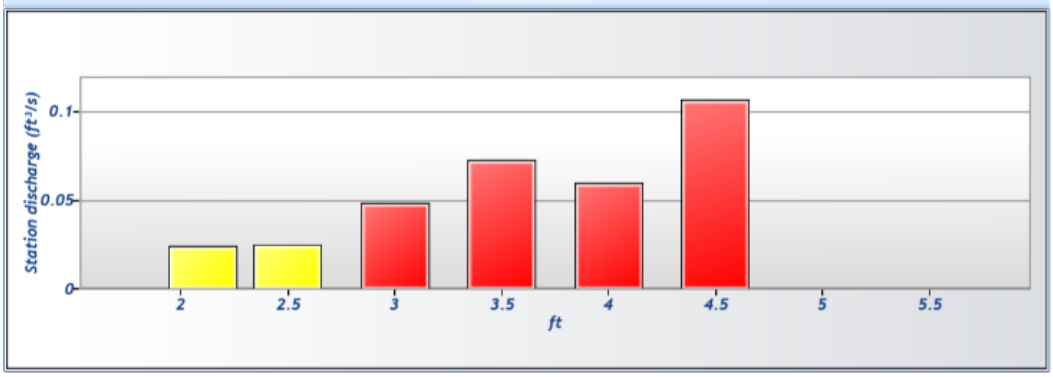
No changes were made to this file
Quality control warnings

Discharge Measurement Summary

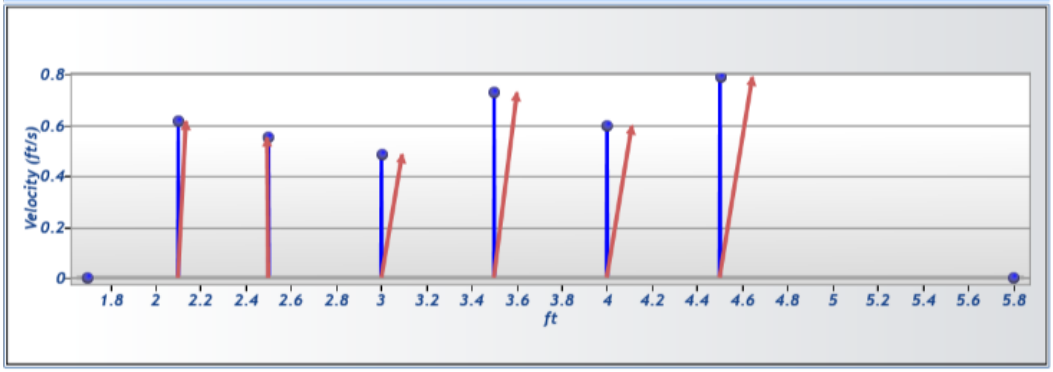
Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

Station Warning Settings		
Station discharge OK	Station discharge < 5.00%	
Station discharge caution	5.00% >= Station discharge < 10.00%	
Station discharge warning	Station discharge >= 10.00%	

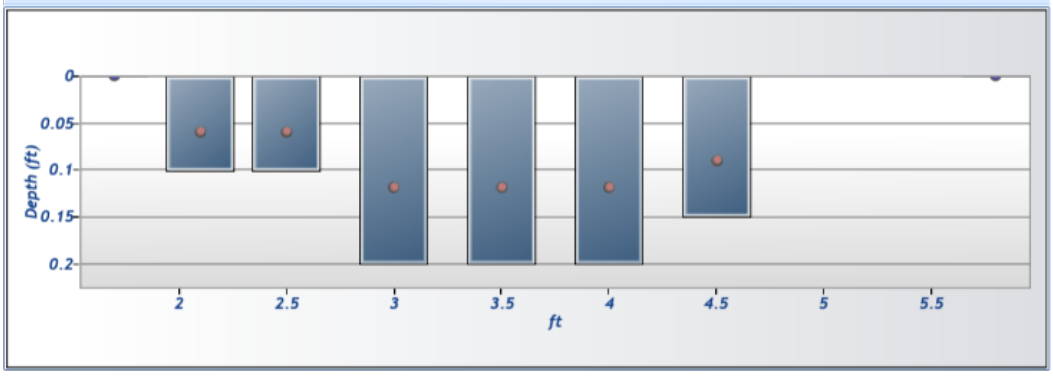
Discharge chart



Velocity chart



Depth chart



Discharge Measurement Summary

Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	10:19 AM	1.700	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.6154	0.0000	0.0000	0.00	✓
1	10:19 AM	2.100	0.6	0.100	0.6000	0.060	80	0.6154	1.0000	0.6154	0.0400	0.0246	7.32	✓
2	10:21 AM	2.500	0.6	0.100	0.6000	0.060	80	0.5509	1.0000	0.5509	0.0450	0.0248	7.37	✓
3	10:22 AM	3.000	0.6	0.200	0.6000	0.120	80	0.4849	1.0000	0.4849	0.1000	0.0485	14.41	✓
4	10:24 AM	3.500	0.6	0.200	0.6000	0.120	80	0.7264	1.0000	0.7264	0.1000	0.0726	21.59	✓
5	10:25 AM	4.000	0.6	0.200	0.6000	0.120	80	0.5954	1.0000	0.5954	0.1000	0.0595	17.70	✓
6	10:26 AM	4.500	0.6	0.150	0.6000	0.090	80	0.7880	1.0000	0.7880	0.1350	0.1064	31.62	✓
7	10:27 AM	5.800	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.7880	0.0000	0.0000	0.00	✓

Discharge Measurement Summary

Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
3	10:22 AM	3.000	0.6	0.200	0.6000	0.120	Boundary Interference,High Stn % Discharge
4	10:24 AM	3.500	0.6	0.200	0.6000	0.120	High Stn % Discharge
5	10:25 AM	4.000	0.6	0.200	0.6000	0.120	High Stn % Discharge
6	10:26 AM	4.500	0.6	0.150	0.6000	0.090	High Stn % Discharge
7	10:27 AM	5.800	None	0.000	0.0000	0.000	Stn Spacing > QC

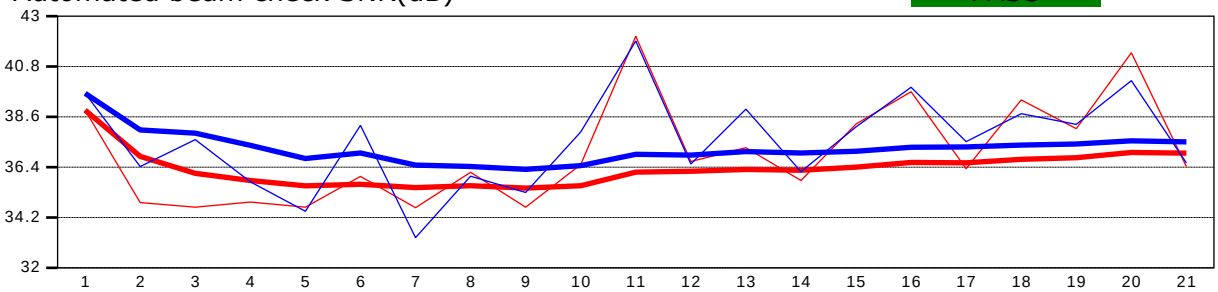
Discharge Measurement Summary

Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

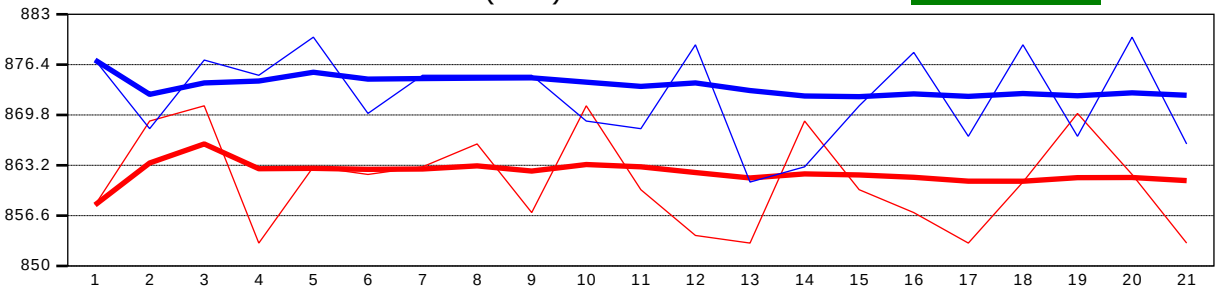
Beam 1	
Beam 2	

Automated beam check Start time 8/22/2018 10:18:58 AM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

Peak Shape > QC

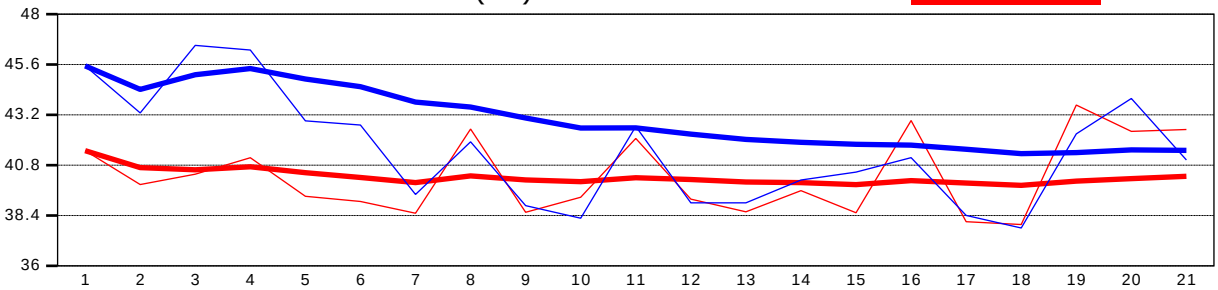
Discharge Measurement Summary

Site name	Upper Piceance abv hwy 13
Site number	01
Operator(s)	JEL
File name	Upper Piceance abv hwy 13_20180822-102845.ft
Comment	UPPIC2D6

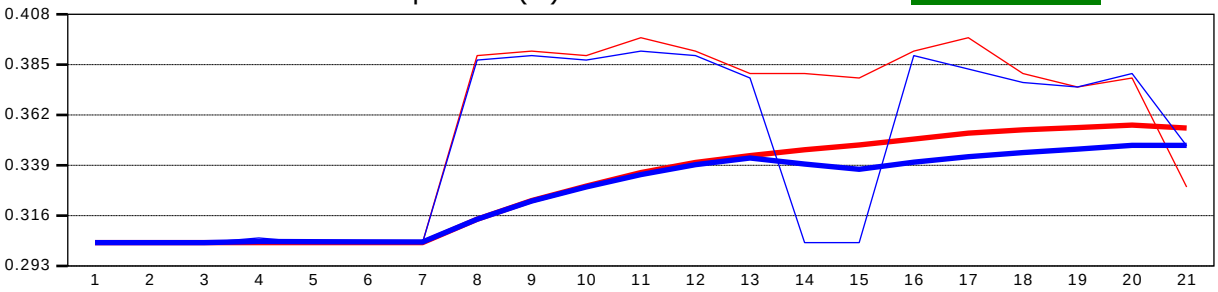
Beam 1	
Beam 2	

Automated beam check Start time 8/22/2018 10:18:58 AM

Automated beam check Peak level(dB) FAIL



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

Peak Shape > QC

Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

Start time	5/7/2019 3:41 PM
End time	5/7/2019 3:52 PM
Start location latitude	39.731
Start location longitude	-107.933
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H1747037
Probe serial number	FT2P1747048
Probe firmware	1.23
Handheld software	1.4

# Stations	Avg interval (s)	Total discharge (ft³/s)
12	40	7.4753

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
4.200	3.3100	5.460

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
50	0.788	2.2584

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
53.744	1.000	3.1614

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.5%	4.2%
Velocity	0.7%	8.6%
Width	0.2%	0.2%
Method	2.7%	
# Stations	4.2%	
Overall	**5.2%**	**9.6%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

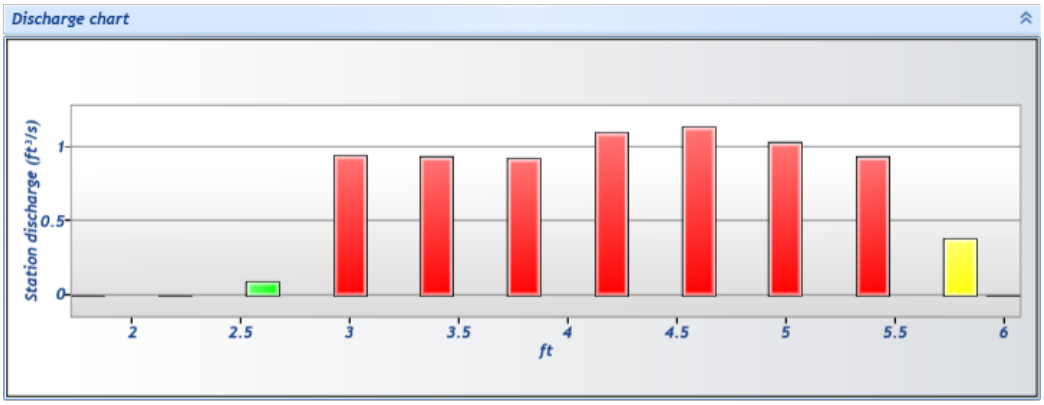
Summary overview

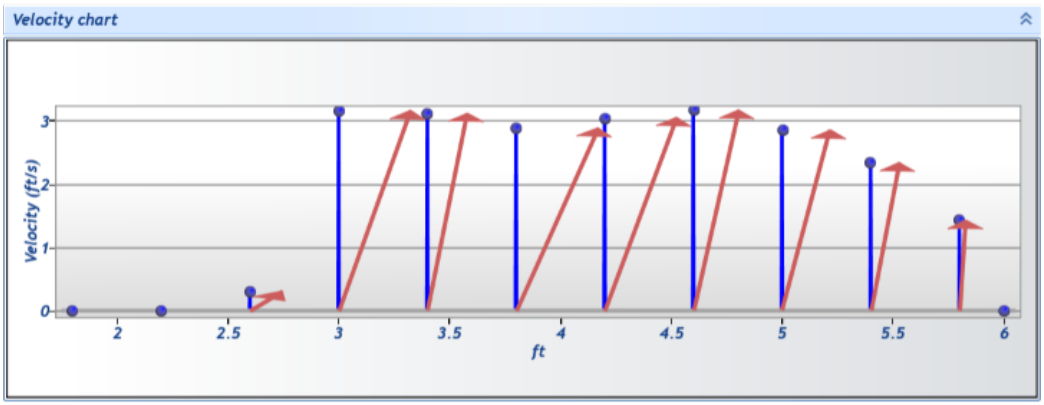
No changes were made to this file
Quality control warnings

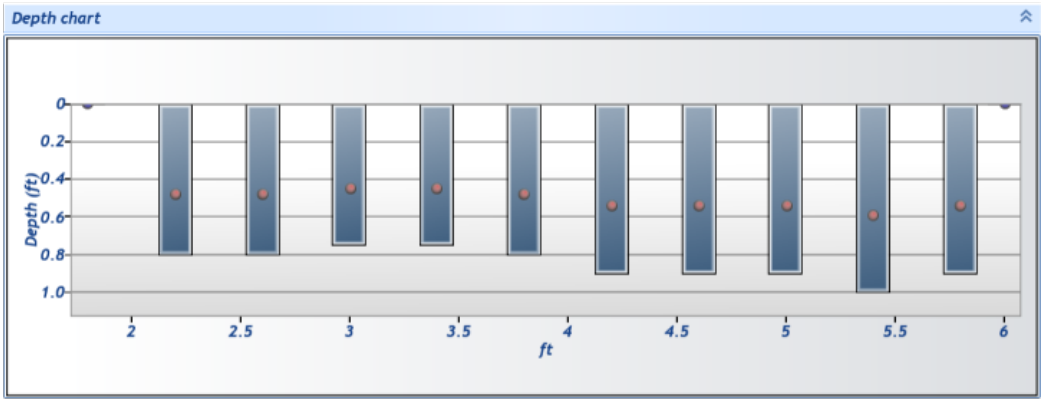
Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

Station Warning Settings	
Station discharge OK	Station discharge < 5.00%
Station discharge caution	5.00% >= Station discharge < 10.00%
Station discharge warning	Station discharge >= 10.00%







Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	3:41 PM	1.800	None	0.000	0.0000	0.000	0	0.0000	1.0000	-0.0002	0.0000	0.0000	0.00	✓
1	3:41 PM	2.200	0.6	0.800	0.6000	0.480	80	-0.0002	1.0000	-0.0002	0.3200	-0.0001	0.00	✓
2	3:42 PM	2.600	0.6	0.800	0.6000	0.480	80	0.3048	1.0000	0.3048	0.3200	0.0975	1.30	✓
3	3:44 PM	3.000	0.6	0.750	0.6000	0.450	80	3.1560	1.0000	3.1560	0.3000	0.9468	12.67	✓
4	3:45 PM	3.400	0.6	0.750	0.6000	0.450	80	3.1089	1.0000	3.1089	0.3000	0.9327	12.48	✓
5	3:46 PM	3.800	0.6	0.800	0.6000	0.480	80	2.8721	1.0000	2.8721	0.3200	0.9191	12.29	✓
6	3:47 PM	4.200	0.6	0.900	0.6000	0.540	80	3.0438	1.0000	3.0438	0.3600	1.0958	14.66	✓
7	3:48 PM	4.600	0.6	0.900	0.6000	0.540	80	3.1614	1.0000	3.1614	0.3600	1.1381	15.22	✓
8	3:49 PM	5.000	0.6	0.900	0.6000	0.540	80	2.8487	1.0000	2.8487	0.3600	1.0255	13.72	✓
9	3:50 PM	5.400	0.6	1.000	0.6000	0.600	80	2.3372	1.0000	2.3372	0.4000	0.9349	12.51	✓
10	3:51 PM	5.800	0.6	0.900	0.6000	0.540	80	1.4260	1.0000	1.4260	0.2700	0.3850	5.15	✓
11	3:52 PM	6.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	1.4260	0.0000	0.0000	0.00	✓

Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	3:41 PM	2.200	0.6	0.800	0.6000	0.480	SNR Threshold Variation
2	3:42 PM	2.600	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC
3	3:44 PM	3.000	0.6	0.750	0.6000	0.450	Standard Error > QC,High Stn % Discharge
4	3:45 PM	3.400	0.6	0.750	0.6000	0.450	Standard Error > QC,High Stn % Discharge
5	3:46 PM	3.800	0.6	0.800	0.6000	0.480	Standard Error > QC,High Stn % Discharge
6	3:47 PM	4.200	0.6	0.900	0.6000	0.540	Standard Error > QC,High Stn % Discharge
7	3:48 PM	4.600	0.6	0.900	0.6000	0.540	Standard Error > QC,High Stn % Discharge
8	3:49 PM	5.000	0.6	0.900	0.6000	0.540	Standard Error > QC,High Stn % Discharge
9	3:50 PM	5.400	0.6	1.000	0.6000	0.600	Standard Error > QC,High Stn % Discharge
10	3:51 PM	5.800	0.6	0.900	0.6000	0.540	Standard Error > QC
11	3:52 PM	6.000	None	0.000	0.0000	0.000	Water Depth > QC

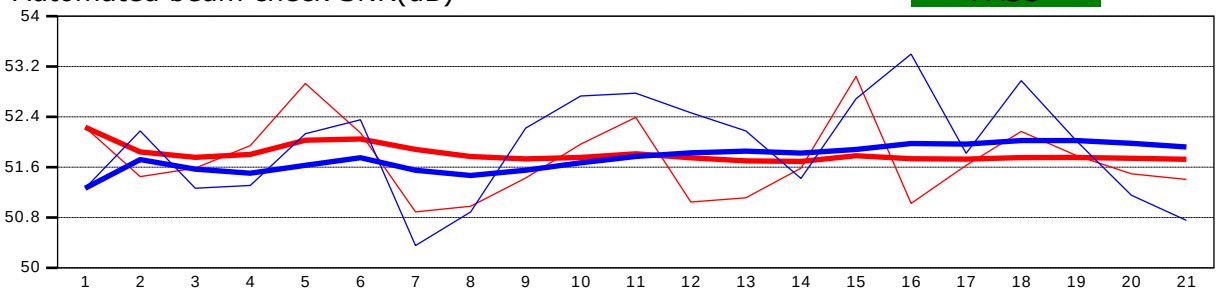
Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

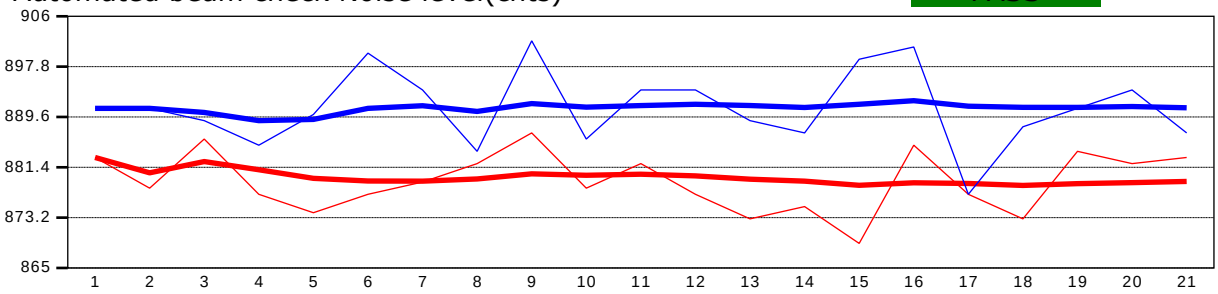
Beam 1	
Beam 2	

Automated beam check Start time 5/7/2019 3:41:02 PM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

No quality control warnings

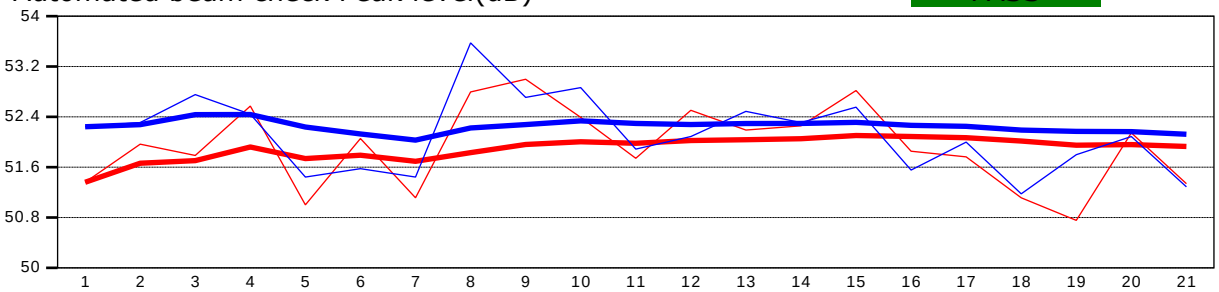
Discharge Measurement Summary

Site name	Upper Piceance Creek - D6
Site number	001
Operator(s)	Jack Landers
File name	PiceanceUpperDivision6_2019May07 (2).ft
Comment	Abv hwy and Larson Ditch

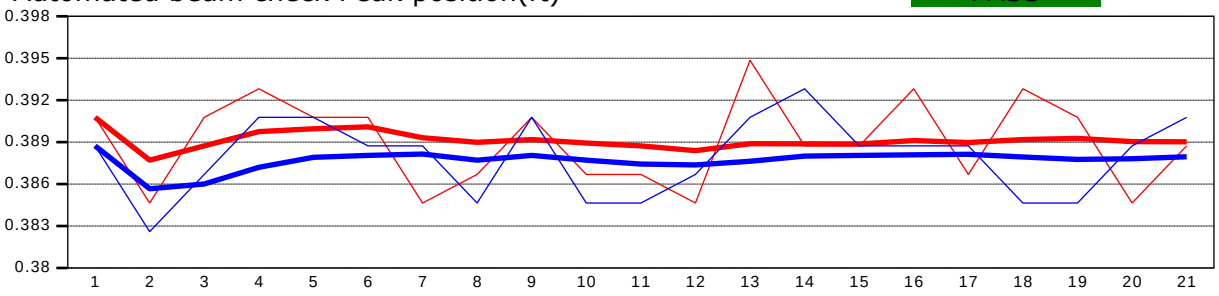
Beam 1	
Beam 2	

Automated beam check Start time 5/7/2019 3:41:02 PM

Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

No quality control warnings

Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

Start time	12/4/2019 3:56 PM
End time	12/4/2019 4:07 PM
Start location latitude	39.732
Start location longitude	-107.937
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H1747037
Probe serial number	FT2P1747048
Probe firmware	1.23
Handheld software	1.4

# Stations	Avg interval (s)	Total discharge (ft³/s)
11	40	1.3663

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
3.300	3.2440	4.871

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
39	0.983	0.4212

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
34.930	1.280	0.8170

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.2%	3.7%
Velocity	1.7%	5.4%
Width	0.2%	0.2%
Method	3.2%	
# Stations	4.6%	
Overall	**6.0%**	**6.6%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

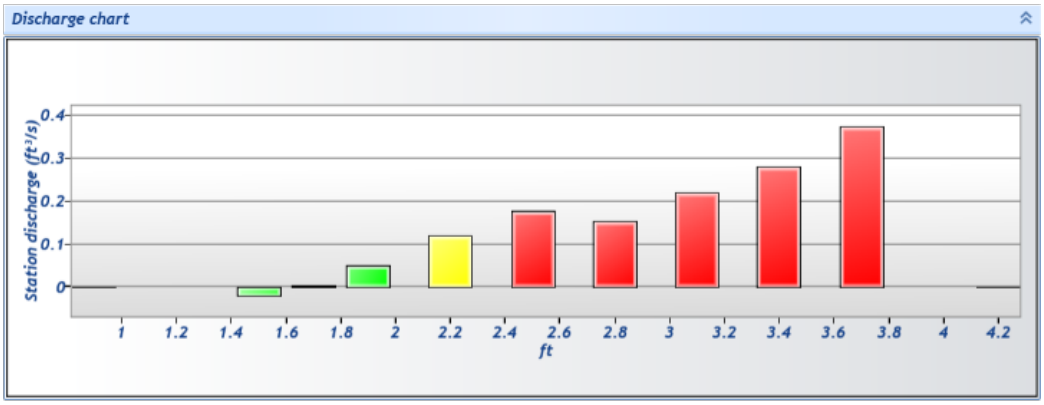
Summary overview

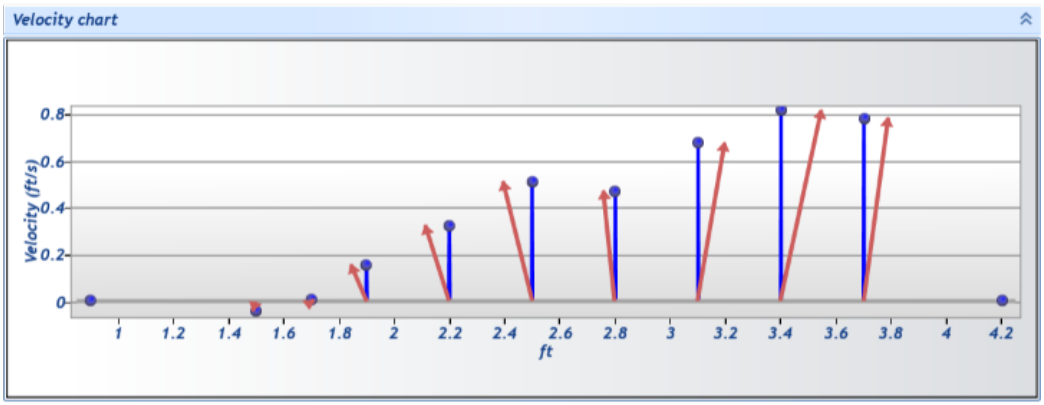
No changes were made to this file
Quality control warnings

Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

Station Warning Settings		
Station discharge OK	Station discharge < 5.00%	
Station discharge caution	5.00% >= Station discharge < 10.00%	
Station discharge warning	Station discharge >= 10.00%	





Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	3:56 PM	0.900	None	0.000	0.0000	0.000	0	0.0000	1.0000	-0.0413	0.0000	0.0000	0.00	✓
1	3:57 PM	1.500	0.6	1.170	0.6000	0.702	80	-0.0413	1.0000	-0.0413	0.4680	-0.0193	-1.42	✓
2	3:58 PM	1.700	0.6	1.270	0.6000	0.762	80	0.0070	1.0000	0.0070	0.2540	0.0018	0.13	✓
3	3:59 PM	1.900	0.6	1.280	0.6000	0.768	80	0.1573	1.0000	0.1573	0.3200	0.0503	3.68	✓
4	4:01 PM	2.200	0.6	1.250	0.6000	0.750	80	0.3246	1.0000	0.3246	0.3750	0.1217	8.91	✓
5	4:02 PM	2.500	0.6	1.150	0.6000	0.690	80	0.5124	1.0000	0.5124	0.3450	0.1768	12.94	✓
6	4:03 PM	2.800	0.6	1.100	0.6000	0.660	80	0.4711	1.0000	0.4711	0.3300	0.1555	11.38	✓
7	4:04 PM	3.100	0.6	1.090	0.6000	0.654	80	0.6768	1.0000	0.6768	0.3270	0.2213	16.20	✓
8	4:05 PM	3.400	0.6	1.150	0.6000	0.690	80	0.8170	1.0000	0.8170	0.3450	0.2819	20.63	✓
9	4:06 PM	3.700	0.6	1.200	0.6000	0.720	80	0.7842	1.0000	0.7842	0.4800	0.3764	27.55	✓
10	4:07 PM	4.200	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.7842	0.0000	0.0000	0.00	✓

Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	3:57 PM	1.500	0.6	1.170	0.6000	0.702	Beam SNRs Not Similar
3	3:59 PM	1.900	0.6	1.280	0.6000	0.768	Stn Spacing > QC,Large SNR Variation,Velocity Angle > QC
5	4:02 PM	2.500	0.6	1.150	0.6000	0.690	High Stn % Discharge
6	4:03 PM	2.800	0.6	1.100	0.6000	0.660	High Stn % Discharge
7	4:04 PM	3.100	0.6	1.090	0.6000	0.654	High Stn % Discharge
8	4:05 PM	3.400	0.6	1.150	0.6000	0.690	High Stn % Discharge
9	4:06 PM	3.700	0.6	1.200	0.6000	0.720	High Stn % Discharge
10	4:07 PM	4.200	None	0.000	0.0000	0.000	Water Depth > QC

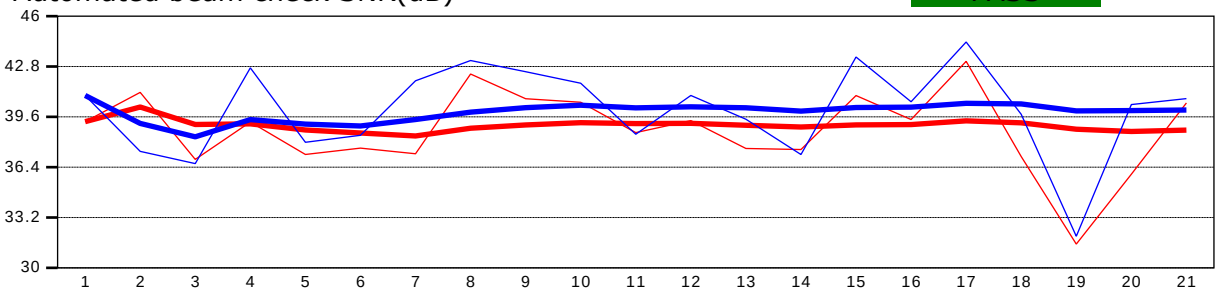
Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

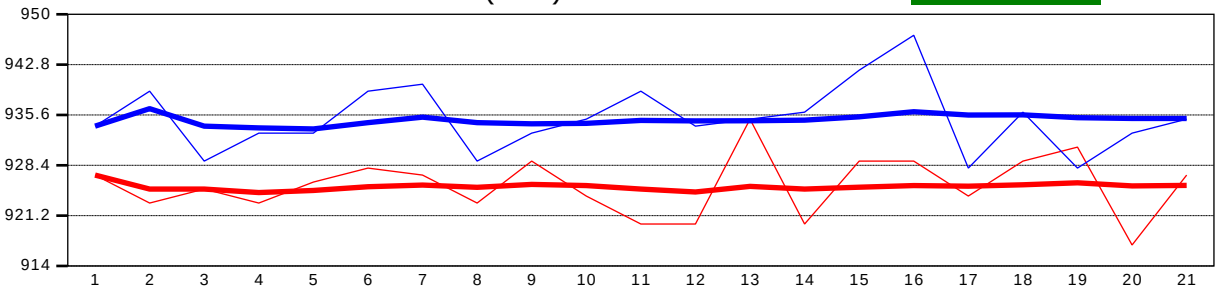
Beam 1	
Beam 2	

Automated beam check Start time 12/4/2019 3:56:05 PM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

No quality control warnings

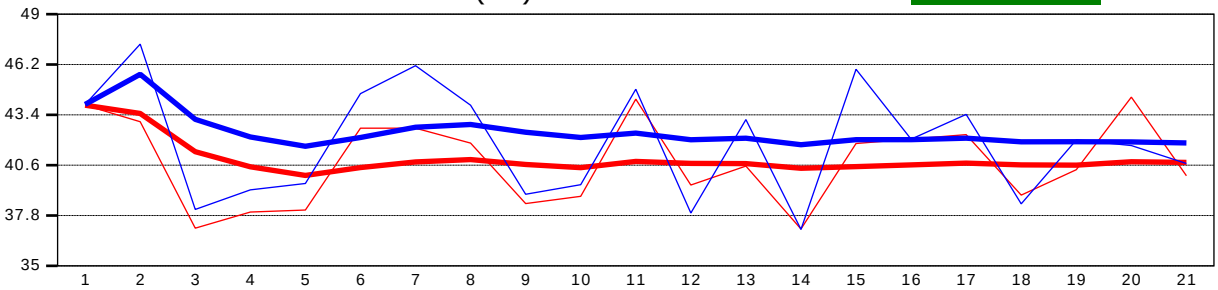
Discharge Measurement Summary

Site name	Piceance upper segment nr LT
Site number	124
Operator(s)	JEL
File name	Piceance upper segment nr LT_20191204-160842.ft
Comment	Spot meas

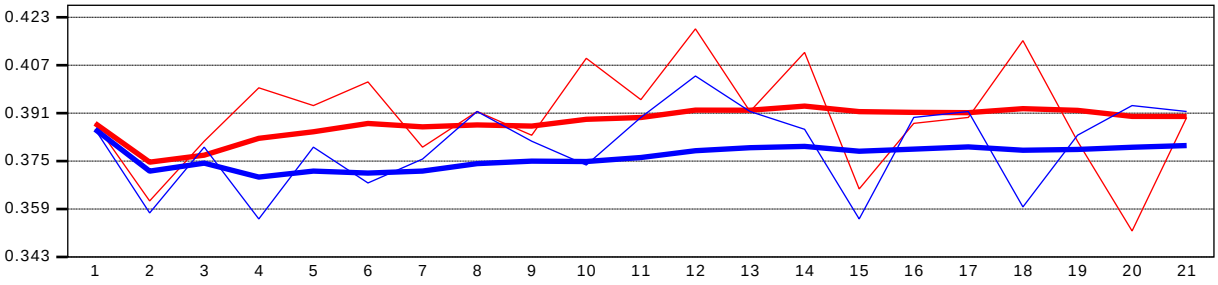
Beam 1	
Beam 2	

Automated beam check Start time 12/4/2019 3:56:05 PM

Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

No quality control warnings

Discharge Measurement Summary

Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

Start time	11/2/2022 9:54 AM
End time	11/2/2022 10:10 AM
Start location latitude	39.731
Start location longitude	-107.935
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H1747037
Probe serial number	FT2P1747048
Probe firmware	1.30
Handheld software	1.7

# Stations	Avg interval (s)	Total discharge (ft³/s)
14	40	0.4547

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
5.600	4.4159	6.522

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
36	0.789	0.1030

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
37.797	1.090	0.1613

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.3%	3.5%
Velocity	7.6%	7.9%
Width	0.2%	0.2%
Method	2.4%	
# Stations	3.6%	
Overall	**8.8%**	**8.7%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

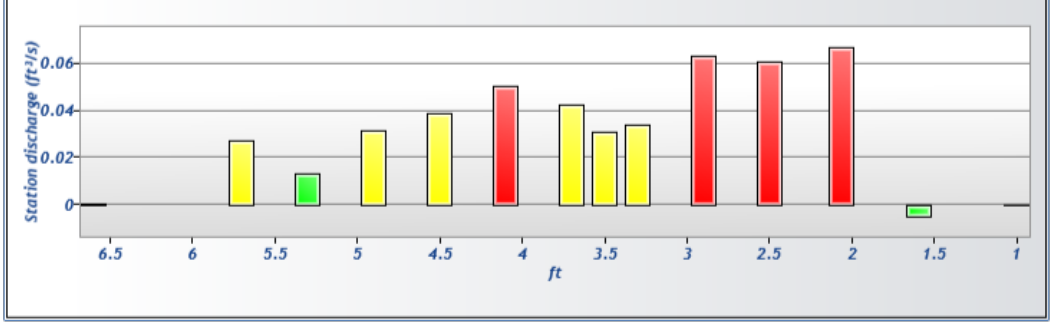
No changes were made to this file
Quality control warnings

Discharge Measurement Summary

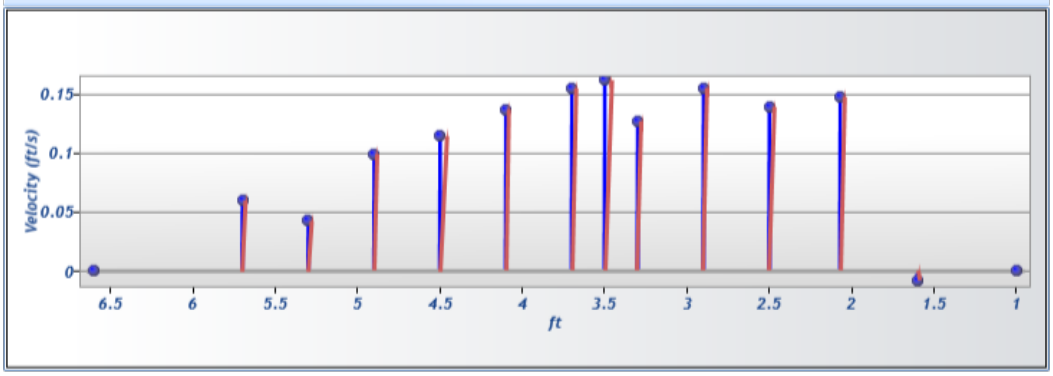
Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

Station Warning Settings		
Station discharge OK	Station discharge < 5.00%	
Station discharge caution	5.00% >= Station discharge < 10.00%	
Station discharge warning	Station discharge >= 10.00%	

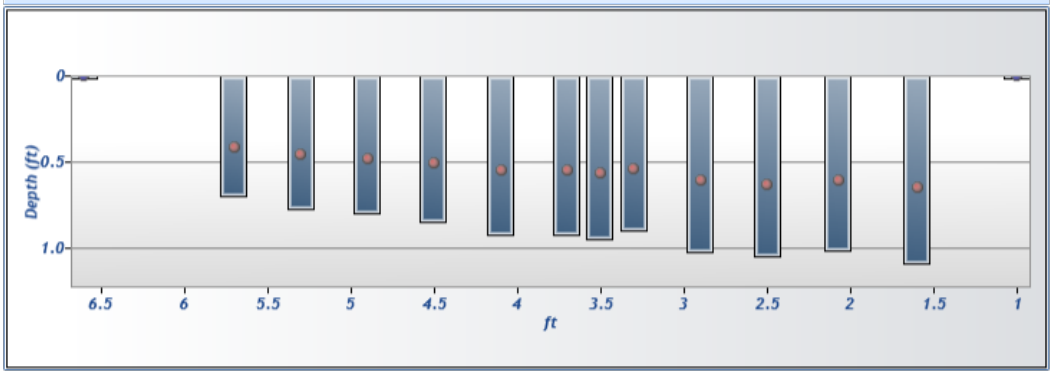
Discharge chart



Velocity chart



Depth chart



Discharge Measurement Summary

Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
13	10:06 AM	1.000	None	0.010	0.0000	0.000	0	0.0000	1.0000	-0.0082	0.0030	0.0000	-0.01	✓
12	10:06 AM	1.600	0.6	1.090	0.6000	0.654	80	-0.0082	1.0000	-0.0082	0.5832	-0.0048	-1.05	✓
11	10:10 AM	2.070	0.6	1.010	0.6000	0.606	80	0.1472	1.0000	0.1472	0.4545	0.0669	14.71	✓
10	10:04 AM	2.500	0.6	1.050	0.6000	0.630	80	0.1388	1.0000	0.1388	0.4358	0.0605	13.30	✓
9	10:03 AM	2.900	0.6	1.020	0.6000	0.612	80	0.1547	1.0000	0.1547	0.4080	0.0631	13.88	✓
8	10:02 AM	3.300	0.6	0.900	0.6000	0.540	80	0.1266	1.0000	0.1266	0.2700	0.0342	7.52	✓
7	10:08 AM	3.500	0.6	0.950	0.6000	0.570	80	0.1613	1.0000	0.1613	0.1900	0.0306	6.74	✓
6	10:01 AM	3.700	0.6	0.920	0.6000	0.552	80	0.1545	1.0000	0.1545	0.2760	0.0426	9.38	✓
5	10:00 AM	4.100	0.6	0.920	0.6000	0.552	80	0.1367	1.0000	0.1367	0.3680	0.0503	11.06	✓
4	9:59 AM	4.500	0.6	0.850	0.6000	0.510	80	0.1139	1.0000	0.1139	0.3400	0.0387	8.52	✓
3	9:58 AM	4.900	0.6	0.800	0.6000	0.480	80	0.0989	1.0000	0.0989	0.3200	0.0316	6.96	✓
2	9:57 AM	5.300	0.6	0.770	0.6000	0.462	80	0.0429	1.0000	0.0429	0.3080	0.0132	2.91	✓
1	9:55 AM	5.700	0.6	0.700	0.6000	0.420	80	0.0603	1.0000	0.0603	0.4550	0.0274	6.03	✓
0	9:54 AM	6.600	None	0.010	0.0000	0.000	0	0.0000	1.0000	0.0603	0.0045	0.0003	0.06	✓

Discharge Measurement Summary

Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	*Time*	*Location (ft)*	*Method*	*Depth (ft)*	*%Depth*	*Measured Depth (ft)*	*Warnings*
12	10:06 AM	1.600	0.6	1.090	0.6000	0.654	Large SNR Variation,SNR Threshold Variation
11	10:10 AM	2.070	0.6	1.010	0.6000	0.606	High Stn % Discharge
10	10:04 AM	2.500	0.6	1.050	0.6000	0.630	High Stn % Discharge
9	10:03 AM	2.900	0.6	1.020	0.6000	0.612	High Stn % Discharge
5	10:00 AM	4.100	0.6	0.920	0.6000	0.552	High Stn % Discharge
1	9:55 AM	5.700	0.6	0.700	0.6000	0.420	Boundary Interference,Standard Error > QC
0	9:54 AM	6.600	None	0.010	0.0000	0.000	Stn Spacing > QC,Water Depth > QC

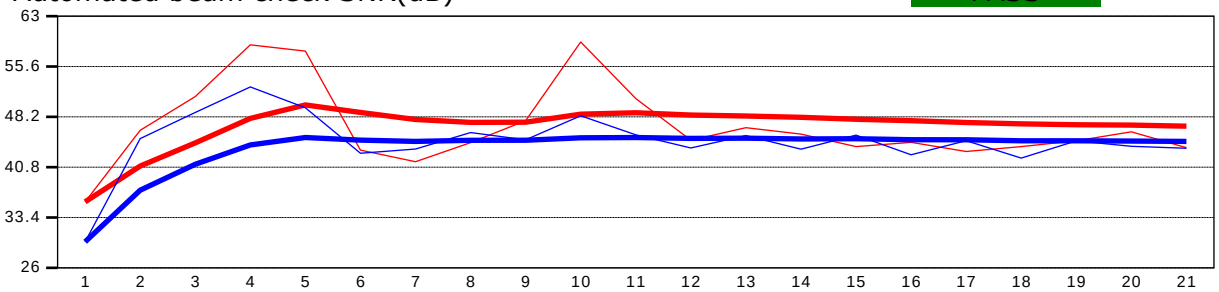
Discharge Measurement Summary

Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

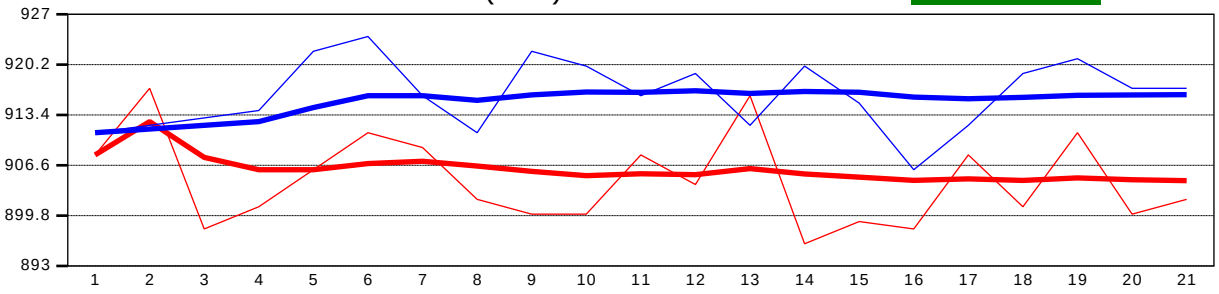
Beam 1	
Beam 2	

Automated beam check Start time 11/2/2022 9:54:20 AM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

No quality control warnings

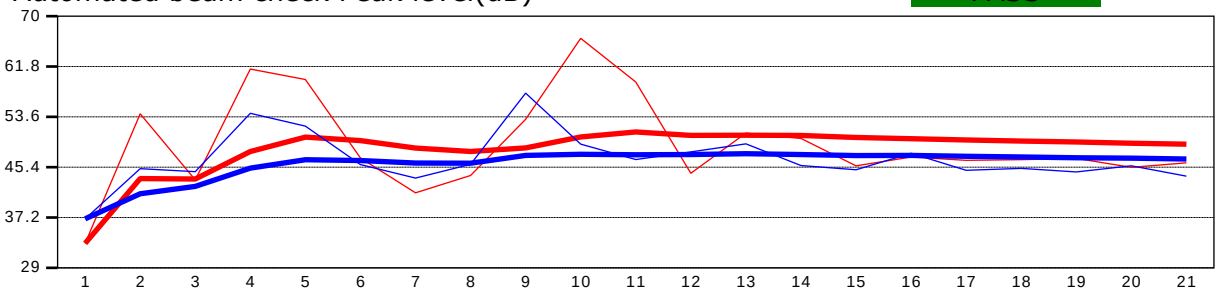
Discharge Measurement Summary

Site name	Piceanceup
Site number	1122022B
Operator(s)	Lfs
File name	Piceanceup_20221102-101132.ft
Comment	

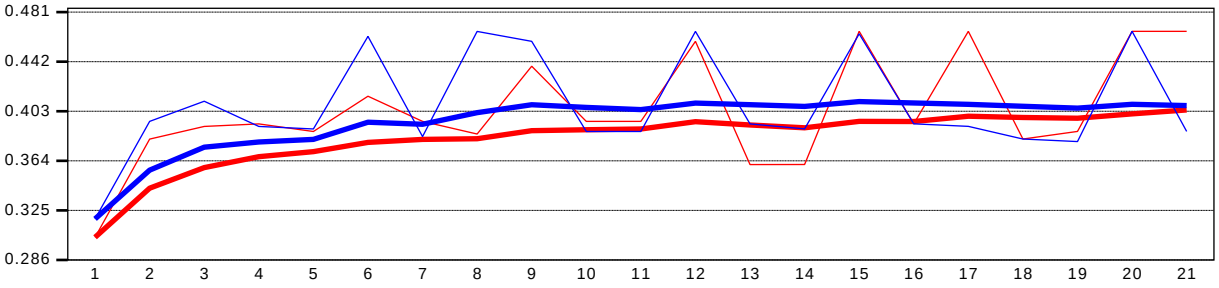
Beam 1	
Beam 2	

Automated beam check Start time 11/2/2022 9:54:20 AM

Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



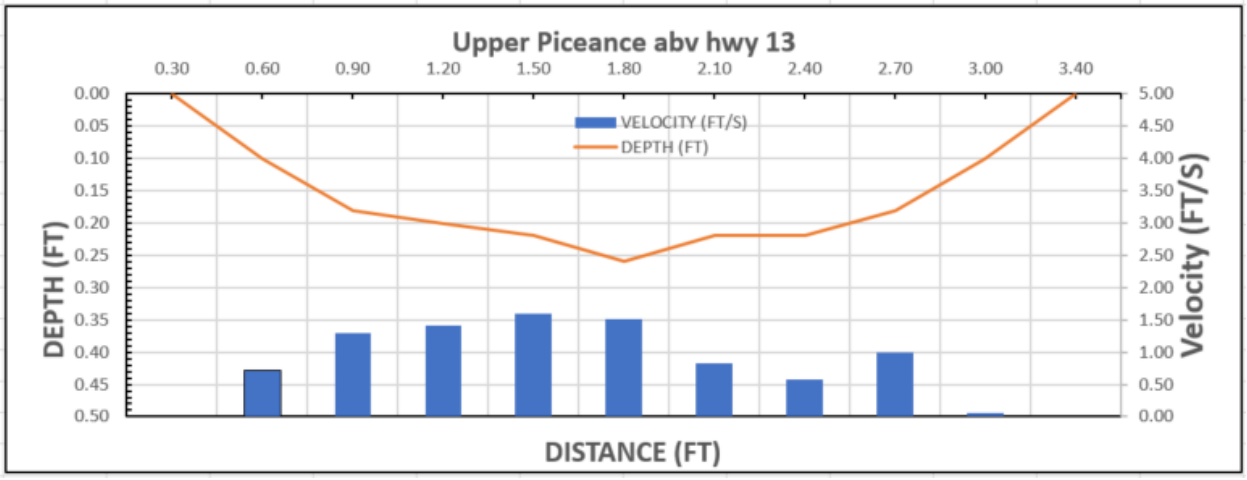
Automated beam check Quality control warnings

No quality control warnings

LATITUDE	LONGTIUDE
39.732699	-107.987918

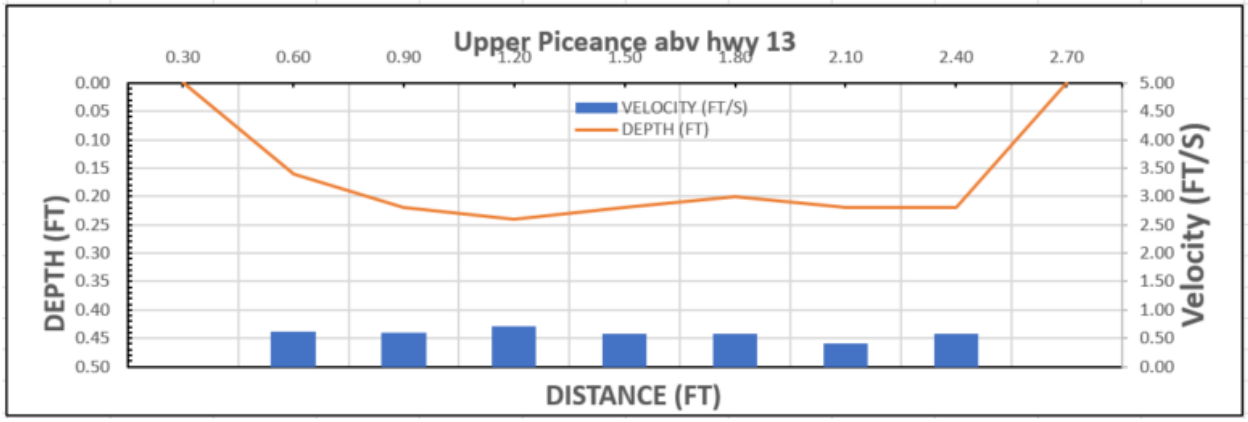
LOCATION	**Upper Piceance abv hwy 13**	**TOTAL Q (CFS)**	0.55
DATE/TIME	11/03/222 9:31AM	**STAFF (FT)**	NA

	TAPE (FT)	DEPTH (FT)	VELOCITY (FT/S)	Q(CFS)	% of Total Q
LEW	0.30	0.00	0.00	0.000	0%
1	0.60	0.10	0.72	0.022	4%
2	0.90	0.18	1.30	0.070	13%
3	1.20	0.20	1.42	0.085	16%
4	1.50	0.22	1.60	0.106	19%
5	1.80	0.26	1.51	0.118	21%
6	2.10	0.22	0.82	0.054	10%
7	2.40	0.22	0.58	0.038	7%
8	2.70	0.18	1.00	0.054	10%
9	3.00	0.10	0.05	0.002	0%
REW	3.40	0.00	0.00	0.000	0%



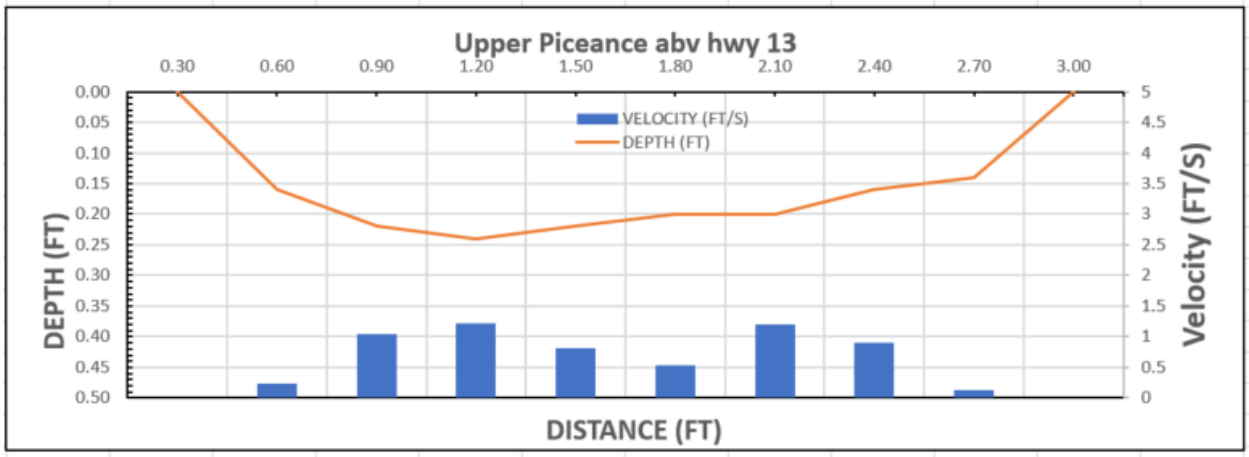
LOCATION	Upper Piceance abv hwy 13			TOTAL Q (CFS)	0.26
DATE/TIME	11/16/2022 16:10PM			STAFF (FT)	NA

	TAPE (FT)	DEPTH (FT)	VELOCITY (FT/S)	Q(CFS)	% of Total Q
REW	1.50	0.00	0.00	0.000	0%
1	1.80	0.16	0.62	0.030	12%
2	2.10	0.22	0.59	0.039	15%
3	2.40	0.24	0.72	0.052	20%
4	2.70	0.22	0.57	0.038	15%
5	3.00	0.20	0.58	0.035	14%
6	3.30	0.22	0.41	0.027	11%
7	3.60	0.22	0.57	0.038	15%
REW	4.00	0	0	0.000	0%



LOCATION	Upper Piceance abv hwy 13			TOTAL Q (CFS)	0.36
DATE/TIME	11/28/2022 15:05PM			STAFF (FT)	NA

	TAPE (FT)	DEPTH (FT)	VELOCITY (FT/S)	Q(CFS)	% of Total Q
REW	1.50	0.00	0	0.000	0%
1	1.80	0.16	0.24	0.050	14%
2	2.10	0.22	1.05	0.080	22%
3	2.40	0.24	1.21	0.059	17%
4	2.70	0.22	0.82	0.036	10%
5	3.00	0.20	0.54	0.072	20%
6	3.30	0.20	1.20	0.054	15%
7	3.60	0.16	0.90	0.006	2%
8	3.90	0.14	0.13	0.000	0%
REW	4.20	0.00	0	0.000	0%



Piceance Creek BLM Temporary Streamgage

Location: 13N 244109 4402085

Installation Date: 6/10/2016

Equipment: Pressure transducer, staff gage, GOES telemetry equipment, rain gauge

Description: The streamgage consists of a data logger, pressure transducer, telemetry equipment and a rain gage. The pressure transducer is protected in a 2 inch pvc pipe and buried flexible conduit secured to the bank with metal drivers. The data logger and telemetry equipment is protected in weatherproofed housing. The gage was installed and maintained by hydrographers at the Bureau of Land Management. Water level was set to readings on a co-located staff gage.