

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

Dear Ms. Bassi:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its recommendation for an instream flow water right on Spruce Creek, located in Water Division 5.

Location and Land Status. Spruce Creek originates from an unnamed peak on the crest of the Gore Range, approximately six miles west of Green Mountain and Green Mountain Reservoir. Spruce Creek flows into the Blue River approximately eight miles south of Kremmling. This recommendation addresses the portion of Spruce Creek that starts at the headwaters and extends downstream to the headgate of the Hoagland Canal, a distance of approximately 4.7 miles. The BLM manages 1.3 miles of this reach, the U.S. Forest Service manages 1.0 miles, and approximately 2.6 miles are in private ownership.

Existing Instream Flow Water Right. In 1985, the Colorado Water Conservation Board (CWCB) appropriated an instream flow water right for 0.5 cubic feet per second, year-round. The purpose of this recommendation is to request an increase to the existing instream flow water right.

Biological Summary. Spruce Creek is a cold water, high gradient stream. The reach that is the subject of this recommendation flows through a valley that ranges from ¼ to ½ mile in width. The reach begins on densely forested USFS-managed lands, flow through BLM lands comprised of mixed forests and meadows, and then flows through private lands primarily used for recreation and hunting. Substrate is generally from small to medium in size, ranging from gravels to four-inch cobbles. Water quality is excellent for supporting cold water species.

Fish surveys have documented a self-supporting population of Colorado River Cutthroat Trout – Green Lineage. BLM works with partners, including Colorado Parks and Wildlife as well as Blue Valley Ranch, to manage the fishery in Spruce Creek as a conservation population. BLM and its partners have invested in habitat improvements, such as reconstruction of road crossings and changes in diversion practices. These projects are designed to improve habitat conditions, fish passage, habitat connectivity, and increase fish populations lower in the stream reach. Surveys have indicated robust populations of stonefly and caddisfly, indicating high water quality.

The creek supports a healthy riparian community comprised of spruce and willow species. Bank stability appears to be good, except in areas of high livestock usage.

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

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)

07/14/2020 #1	0.44 cfs	5.20 feet	0.44 cfs	0.92 cfs
07/14/2020 #2	0.32 cfs	7.36 feet	0.49 cfs	Out of range
		Averages:	0.47 cfs	0.92 cfs

BLM's analysis of this data indicates that the following flows are needed to protect the natural environment to a reasonable degree.

0.90 cubic feet per second is recommended during the snowmelt runoff period and summer, from May 1 through August 31. This recommendation is driven by the average velocity criteria. Spruce Creek has limited riffle habitat, so protecting this flow rate will ensure that the limited habitat can be fully utilized during the spring and summer period, when fish are spawning and moving actively between pools. Implementing this recommendation would require appropriating an increase of 0.4 cfs to the current instream water right.

Water Availability. The BLM recommends using a variety of data sources to confirm water availability, because BLM is not aware of any historical gage data on this creek. Use of Streamstats can provide an estimate of natural hydrology. One nearby gage may provide an estimate of the seasonality of flows, because it is located on a watershed with similar characteristics. USGS Gage 09055300, on Cataract Creek west of Green Mountain Reservoir, is located on a larger watershed but appears to be relatively unaffected by diversion and storage operations. Analysis of diversion records for the Hoagland Canal would also provide some documentation of flows available in Spruce Creek

The BLM is not aware of any actively exercised water rights within the instream flow reach.

Relationship to Land Management Plans. The Colorado River Cutthroat Trout population in Spruce Creek has been identified as a core conservation population in the Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming (2007). In addition, BLM's management plan calls for actions to maintain and enhance habitat that supports sensitive fish species. Specifically, the BLM plan 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, and it also calls for protecting riparian and wetland systems from activities that could degrade those habitats. 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 were included with BLM's draft recommendation in February 2021. 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,

Deputy State Director
Resources

Cc: Bill Mills, Kremmling FO
Paula Belcher, Kremmling Field Office
Northwest District Manager

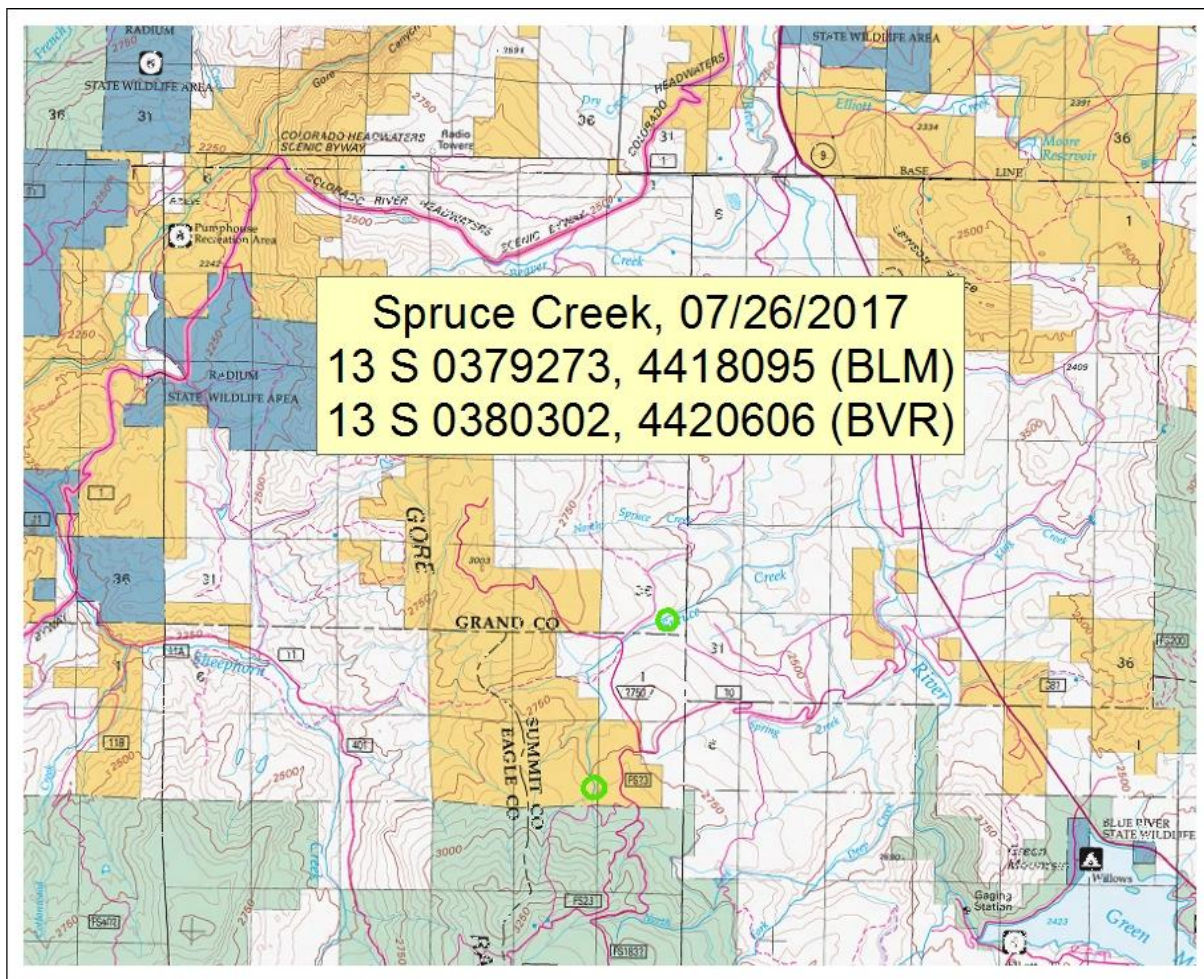
Kremmling Field Office

Stream Sampling July 2017

Spruce Creek - Water Code #22997

Introduction:

Spruce Creek, located southwest of Kremmling, CO on public lands managed by the Kremmling Field Office, was sampled on July 26, 2017. Specifically, two established monitoring sites were sampled to collect and assess macroinvertebrate populations. One site (lower) is located on Blue Valley Ranch property and the second (upper) is located on BLM land. Spruce Creek is home to a conservation population of Colorado River Cutthroat Trout – Green Linage. Invertebrate samples are used to help assess stream health and productivity, and data from this sampling will help inform flow improvement work being conducted on Blue Valley Ranch (BVR) as a water diversion on the stream has been moved to increase flow and improve habitat and population connectivity. Sampling was conducted by: Austin Wenke and Tom Fresques, BLM, and Brien Rose and Crew, BVR.



0 0.45 0.9 1.8 2.7 3.6 Miles



Spruce Creek on BLM lands



Healthy Riparian on Spruce Creek



Spruce trees providing shade and thermal regulation

Discussion:

Spruce Creek contains a cooperatively managed conservation population of Colorado River Cutthroat Trout. Recent work to improve habitat and population connectivity has been completed by Blue Valley Ranch. The ranch changed a point of diversion on the stream to provide better flow further downstream. This reach had been previously impacted by low flows which resulted in reduced habitat and population connectivity.

Both invertebrate samples were comprised of a composite of eight 1 ft² samples from 8 different riffles within each 500 foot sample reach using a Surber Sampler. Macroinvertebrate samples were sent to the BLM's National Aquatic Monitoring Center at Utah State University to be processed. Once samples are processed, and the data is received, it can be compared to 2015 and 2016 data to determine the health of invertebrates present and any differences or changes in species composition or densities amongst sites and years.

Other habitat work to be completed includes the replacement of the culverted stream crossing by BLM. This effort should further improve population connectivity in the stream. This work is planned for the summer of 2018.

Recommendations:

- Continue to monitor Spruce Creek Cutthroat populations over time to determine success of habitat improvement work
- Compare invertebrate data before and after flow improvement efforts on the lower BVR site

BLM/USU National Aquatic Monitoring Center (NAMC)

Department of Watershed Sciences (WATS) - Utah State University 5210 Old Main Hill Logan, UT 84322-5210 <http://www.usu.edu/buglab/>

Report prepared by:
Scott Miller: 435.797.2612 / scott.miller@usu.edu
Jennifer Courtwright: 985.502.7530 / jennifer.courtwright@usu.edu

Report prepared for:

Customer contact: Tom Fresques
BLM - CO - Colorado River Valley Office
Customer: 50629 Hwy. 6 And 24, P.o. Box 1009
Customer Address : Glenwood Springs, CO 81602
Customer City, State, Zip:
Customer Phone: 970-876-9078
Customer Email: t1fresqu@blm.gov

Sample ID	Station (NAMC)	Latitude	Longitude	Collection Date	Estimated MMI Score	Biological Condition
155742	SPRUCE_CK	39.89971	-106.415	7/29/2015	61.7	Not Impaired
155743	SPRUCE_CK-02	39.92328	-106.409	7/29/2015	89.7	Not Impaired

Taxa List

Taxa	Present at SPRUCE_CK	Present at SPRUCE_CK-02
Annelida Clitellata (Phylum Class)	no	Yes
Trombidiformes (Order)	Yes	Yes
Lebertiidae Lebertia (Trombidiformes-Order)	Yes	Yes
Sperchonidae Sperchon (Trombidiformes-Order)	Yes	Yes
Coleoptera Dytiscidae Agabinae Agabus	No	Yes
Coleoptera Elmidae Spp	No	Yes
Coleoptera Elmidae Cleptelmis addenda	No	Yes

Coleoptera Elmidae Heterlimnius corpulentus	Yes	Yes
Coleoptera Elmidae Optioservus Spp	No	Yes
Coleoptera Elmidae Optioservus quadrimaculatus	No	Yes
Coleoptera Elmidae Zaitzevia parvulus	No	Yes
Coleoptera Helophoridae Helophorus	No	Yes
Coleoptera Hydrophilidae Spp	No	Yes
Coleoptera Hydrophilidae Ametor Spp	No	Yes
Diptera Ceratopogonidae Ceratopogoninae Probezzia Spp	Yes	Yes
Diptera Chironomidae Spp	Yes	No
Diptera Chironomidae Chironominae	Yes	Yes
Diptera Chironomidae Chironominae Paratendipes	No	Yes
Diptera Chironomidae Chironominae Polypedilum	Yes	No
Diptera Chironomidae Diamesinae Diamesa Spp	No	Yes
Diptera Chironomidae Diamesinae Pagastia Spp	Yes	Yes
Diptera Chironomidae Orthocladiinae Spp	Yes	Yes
Diptera Chironomidae Orthocladiinae Brullia Spp	Yes	Yes
Diptera Chironomidae Orthocladiinae Cricotopus Spp	Yes	Yes
Diptera Chironomidae Orthocladiinae Eukiefferiella Spp	Yes	Yes
Diptera Chironomidae Orthocladiinae Parametriocnemus Spp	Yes	No
Diptera Chironomidae Orthocladiinae Rheocricotopus Spp	Yes	No
Diptera Chironomidae Orthocladiinae Thienemanniella Spp	Yes	No
Diptera Chironomidae Orthocladiinae Tvetenia Spp	Yes	Yes

Diptera Chironomidae Prodiamesinae Prodiamesa	No	Yes
Diptera Chironomidae Tanypodinae Spp	Yes	No
Diptera Dixidae Dixa Spp	No	Yes
Diptera Empididae Clinocera Spp	Yes	No
Diptera Empididae Wiedemannia Spp	Yes	No
Diptera Empididae Hemerodromiinae Chelifera Spp	Yes	No
Diptera Psychodidae Pericoma Spp	No	Yes
Diptera Ptychopteridae Ptychoptera Spp	No	Yes
Diptera Simuliidae Simuliinae Simulium Spp	Yes	Yes
Diptera Tipulidae Dicranota	Yes	Yes
Ephemeroptera Ameletidae Ameletus Spp	No	Yes
Ephemeroptera Baetidae Spp	Yes	No
Ephemeroptera Baetidae Baetis Spp	Yes	Yes
Ephemeroptera Baetidae Dipheter hageni	No	Yes
Ephemeroptera Ephemerellidae Spp	Yes	Yes
Ephemeroptera Ephemerellidae Drunella doddsii	Yes	No
Ephemeroptera Ephemerellidae Drunella grandis	No	Yes
Ephemeroptera Ephemerellidae Ephemerella tibialis	No	Yes
Ephemeroptera Heptageniidae Spp	No	Yes
Ephemeroptera Heptageniidae Cinygmula Spp	Yes	Yes
Ephemeroptera Heptageniidae Epeorus Spp	No	Yes
Ephemeroptera Letophlebiidae Paraleptophlebia Spp	Yes	Yes
Plecoptera Spp	Yes	Yes
Plecoptera Chloroperlidae Sweltsa Spp	Yes	Yes
Plecoptera Chloroperlidae Chloroperlinae Spp	No	Yes

Plecoptera Chloroperlidae Chloroperlinae Suwallia Spp	No	Yes
Plecoptera Nemouridae Spp	Yes	No
Plecoptera Nemouridae Zapada Spp	Yes	No
Plecoptera Nemouridae Zapada cinctipes	Yes	Yes
Plecoptera Nemouridae Amphinemurinae Amphinemura Spp	Yes	Yes
Plecoptera Perlidae Hesperoperla pacifica	Yes	No
Plecoptera Perlodidae Spp	Yes	Yes
Plecoptera Perlodidae Megarcys signata	No	Yes
Plecoptera Perlodidae Isoperlinae Isoperla Spp	No	Yes
Plecoptera Pteronarcyidae Pteronarcyinae Pteronarcella badia	Yes	Yes
Trichoptera Glossosomatidae Agapetinae Agapetus Spp	Yes	Yes
Trichoptera Hydropsychidae Arctopsychinae Parapsyche elsis	Yes	No
Trichoptera Lepidostomatidae Lepidostomatinae Lepidostoma Spp	No	Yes
Trichoptera Limnephilidae Dicosmoecinae Dicosmoecus Spp	Yes	No
Trichoptera Philopotamidae Spp	Yes	No
Trichoptera Rhyacophilidae Rhyacophila Spp	Yes	Yes
Trichoptera Rhyacophilidae Rhyacophila brunnea/vemna group	Yes	Yes
Trichoptera Rhyacophilidae Rhyacophila vofixa group	Yes	No
Trichoptera Uenoidae Neothremma Spp	Yes	No
Trichoptera Uenoidae Oligophlebodes Spp	No	Yes
Amphipoda Hyalellidae Hyalella Spp	Yes	No
Veneroida Pisidiidae Pisidiinae Pisidium Spp	Yes	No



FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



COLORADO WATER
CONSERVATION BOARD

LOCATION INFORMATION

STREAM NAME: <u>Spruce Creek</u>		CROSS-SECTION NO.: <u>1</u>	
CROSS-SECTION LOCATION: <u>Approx. 200' downstream from Spruce Creek Rd.</u>			
DATE: <u>7-14-20</u>	OBSERVERS: <u>R. Smith, A. Williams</u>		
LEGAL DESCRIPTION	% SECTION: <u>SE</u>	SECTION: <u>11</u>	TOWNSHIP: <u>2N/S</u> RANGE: <u>81 E/W</u> PM: <u>6H</u>
COUNTY: <u>Grand</u>	WATERSHED: <u>Blue River</u>	WATER DIVISION: <u>5</u>	DOW WATER CODE: <u>32997</u>
MAP(S):	USGS: <u>Zone 135 379024</u> USFS: <u>4417444</u>		

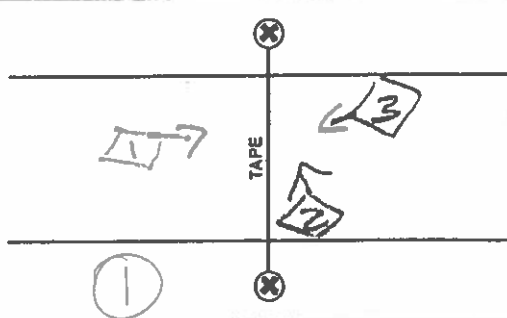
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES/NO	METER TYPE: <u>M-M</u>			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: <u>Surveyed</u> lbs/foot	TAPE TENSION: <u>Surveyed</u> lbs
CHANNEL BED MATERIAL SIZE RANGE: <u>gravel to 4-inch cobbles</u>		PHOTOGRAPHS TAKEN: <u>YES/NO</u>	NUMBER OF PHOTOGRAPHS: <u>3</u>	

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	<u>Surveyed</u>
⊗ Tape @ Stake RB	0.0	<u>Surveyed</u>
① WS @ Tape LB/RB	0.0	<u>5.8 / 5.8</u>
② WS Upstream	<u>18.0</u>	<u>5.24</u>
③ WS Downstream	<u>3.2</u>	<u>6.14</u>
SLOPE	<u>0.9 / 21.2 = 0.045</u>	

SKETCH



LEGEND:
Stake ⊗
Station ①
Photo ①
Direction of Flow →

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO <u>NO</u>	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:																	
<u>caddisfly, stonefly</u>																	

COMMENTS

<u>Temp = 8.7°C</u>	<u>Spruce-Willow Riparian</u>
<u>Salinity = 0.0 ppt</u>	
<u>Cond = 38</u>	
<u>pH = 6.58</u>	



COLORADO WATER
CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



LOCATION INFORMATION

STREAM NAME: <u>Spruce Creek</u>		CROSS-SECTION NO.: <u>2</u>	
CROSS-SECTION LOCATION: <u>Approx. 250' downstream from Spruce Creek Road</u>			
DATE: <u>7-14-20</u>	OBSERVERS: <u>R. Smith, A. Williams</u>		
LEGAL DESCRIPTION:	% SECTION: <u>8E</u>	SECTION: <u>11</u>	TOWNSHIP: <u>2 N 5</u>
COUNTY: <u>Grand</u>	WATERSHED:	WATER DIVISION:	RANGE: <u>81 E W</u> PM: <u>6H</u>
USGS: <u>Zone 13 379038</u>		DOW WATER CODE: <u>22997</u>	
USFS: <u>4417445</u>			

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: <u>YES/NO</u>	METER TYPE: <u>M-M</u>		
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: <u>Surveyed</u> lbs/foot
CHANNEL BED MATERIAL SIZE RANGE: <u>gravel to 4" cobbles</u>		TAPE TENSION: <u>Surveyed</u> lbs	NUMBER OF PHOTOGRAPHS: <u>3</u>
PHOTOGRAPHS TAKEN <u>YES/NO</u>			

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
① Tape @ Stake LB	0.0	<u>Surveyed</u>
② Tape @ Stake RB	0.0	<u>Surveyed</u>
③ WS @ Tape LB/RB	0.0	<u>5.3 / 5.3</u>
④ WS Upstream	<u>4.7</u>	<u>5.26</u>
⑤ WS Downstream	<u>10.0</u>	<u>5.70</u>
SLOPE: <u>0.44 / 14.7 = .0299</u>		

SKETCH

LEGEND:
Stake ①
Station ②
Photo ③
Direction of Flow →

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: <u>YES/NO</u>	DISTANCE ELECTROFISHED: _____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: <u>YES/NO</u>															
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:																		
<u>caddisfly, stonefly</u>																		

COMMENTS

STREAM NAME: Spruce Creek
XS LOCATION: UTM Zone 13S 379024 4417444
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.44 cfs
CALCULATED FLOW (Qc)=	0.44 cfs
(Qm-Qc)/Qm * 100 =	0.0 %

MEASURED WATERLINE (WLm)=	5.80 ft
CALCULATED WATERLINE (WLc)=	5.80 ft
(WLm-WLc)/WLm * 100 =	0.0 %

MAX MEASURED DEPTH (Dm)=	0.20 ft
MAX CALCULATED DEPTH (Dc)=	0.20 ft
(Dm-Dc)/Dm * 100	0.0 %

MEAN VELOCITY= 0.77 ft/sec
MANNING'S N= 0.120
SLOPE= 0.045 ft/ft

.4 * Qm =	0.2 cfs
2.5 * Qm=	1.1 cfs

RECOMMENDED INSTREAM FLOW:
=====

FLOW (CFS)	PERIOD
=====	=====
_____	_____
_____	_____
_____	_____

RATIONALE FOR RECOMMENDATION:
=====

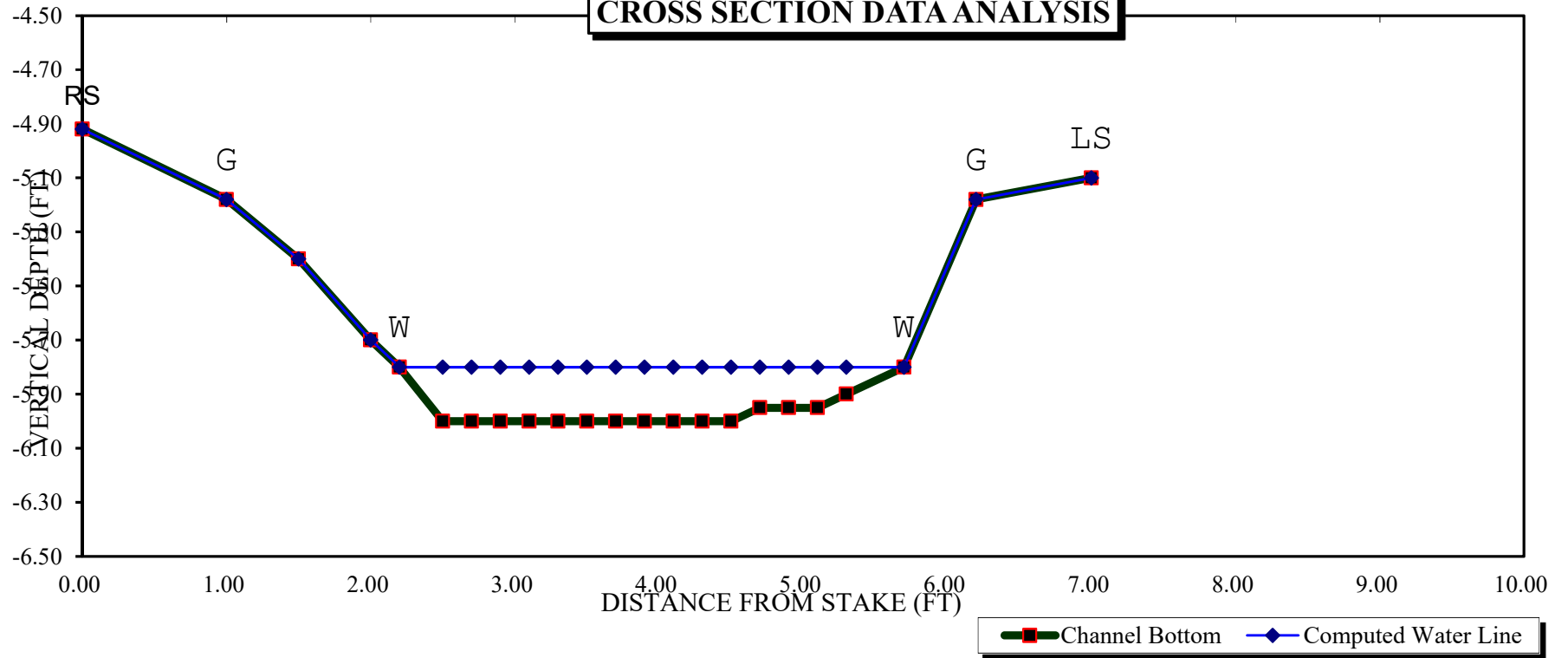
[illegible]

RECOMMENDATION BY: AGENCY DATE:

CWCB REVIEW BY: _____ DATE: _____

Spruce Creek

CROSS SECTION DATA ANALYSIS



STREAM NAME: Spruce Creek
XS LOCATION: UTM Zone 13 379038 4417445
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.32 cfs
CALCULATED FLOW (Qc)=	0.32 cfs
(Qm-Qc)/Qm * 100 =	0.0 %

MEASURED WATERLINE (WLm)=	5.30 ft
CALCULATED WATERLINE (WLc)=	5.30 ft
(WLm-WLc)/WLm * 100 =	0.0 %

MAX MEASURED DEPTH (Dm)=	0.40 ft
MAX CALCULATED DEPTH (Dc)=	0.40 ft
(Dm-Dc)/Dm * 100	0.0 %

MEAN VELOCITY= 0.50 ft/sec
MANNING'S N= 0.166
SLOPE= 0.0299 ft/ft

.4 * Qm =	0.1 cfs
2.5 * Qm =	0.8 cfs

RECOMMENDED INSTREAM FLOW:
=====

FLOW (CFS)	PERIOD
=====	=====
_____	_____
_____	_____
_____	_____

RATIONALE FOR RECOMMENDATION:
=====

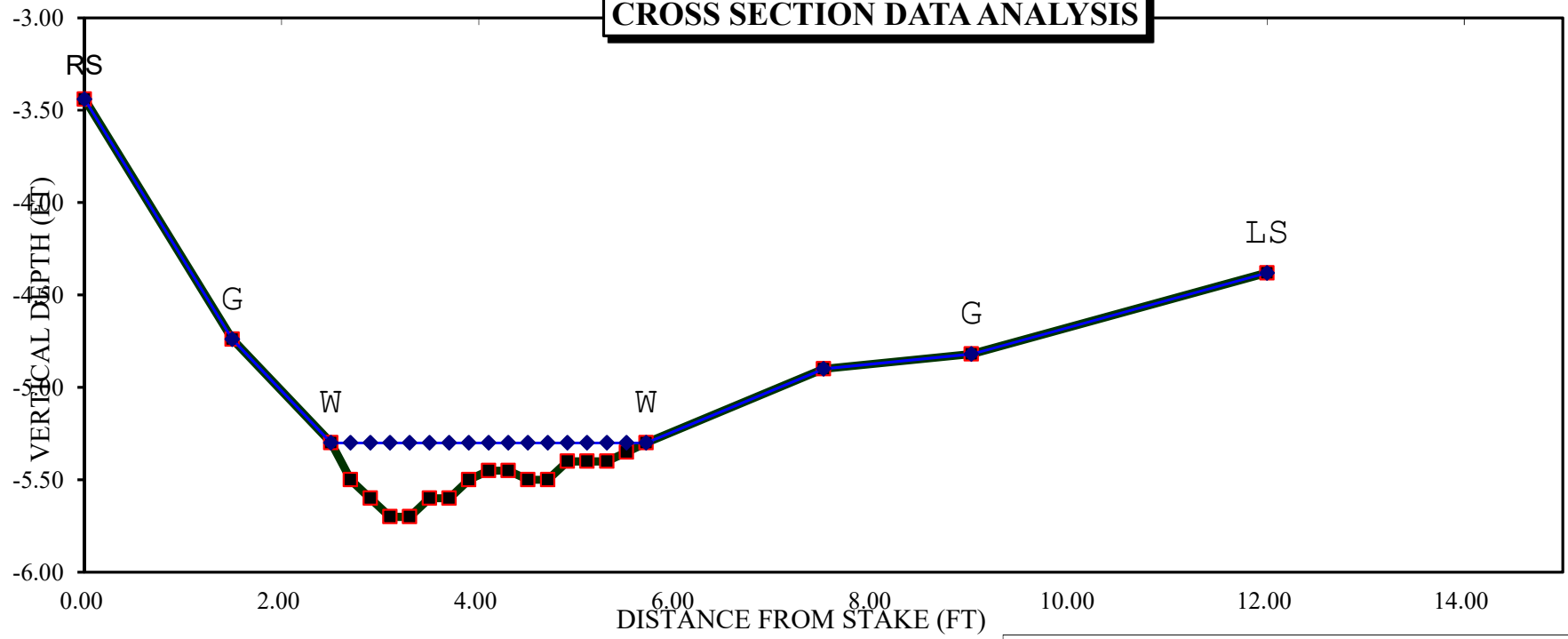
[illegible]

RECOMMENDATION BY: AGENCY DATE:

CWCB REVIEW BY: _____ DATE: _____

Spruce Creek

CROSS SECTION DATA ANALYSIS



Channel Bottom Computed Water Line







