Colorado Water Conservation Board

Stapleton Brothers Ditch Acquisition

NOTEBOOK #2

Rebuttal Statements, Motions & Orders
for
November 16, 2009 Hearing

Colorado Water Conservation Board
Department of Natural Resources

2009

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Stapleton Brothers Ditch Acquisition
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Tab 1

BEFORE THE COLORADO WATER CONSERVATION BOARD

STATE OF COLORADO

Rebuttal Statement of Staff of Colorado Water Conservation Board

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IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION
DIVISION 5: STAPLETON BROTHERS DITCH

Pursuant to Rule 6m.(5)(e) of the Rules Concerning the Colorado Instream Flow and Natural Lake Level, 2 CCR 408-2 ("ISF Rules"), the Staff of the Colorado Water Conservation Board ("CWCB") hereby submits its rebuttal statement regarding the CWCB's proposed acquisition of water on the Maroon Creek and the Roaring Fork River.

I. SUMMARY OF THE CASE

Pitkin County ("Pitkin") has offered to donate pursuant to a trust agreement, attached as **Exhibit 1** hereto, a portfolio of approximately 34 valuable senior water rights to the CWCB. Staff presents this Rebuttal Statement in an effort to impart to the CWCB the importance of accepting this donation of valuable water rights. This case involves only one water right of the portfolio. This first proposed acquisition involves the Stapleton Brothers Ditch water right ("SBD"), which was changed from irrigation to add augmentation as a decreed use in addition to the right to use the water at the originally decreed location for irrigation in 2005, and will be changed again to include instream flow ("ISF") uses if the Board accepts this donation. The water right is for 4.3 cfs for use on Maroon Creek and the Roaring Fork River.

There should be no controversy surrounding the donation to the CWCB of a valuable pre-1992 water right. Nonetheless, a few water users in the basin seek to prevent the acquisition in an effort to gain access to the water themselves, arguing that "the CWCB is ultimately better off simply retiring the right which will ensure that it is not requantified to a lesser flow rate amount." Prehearing Statement ("PHS") of Willow Creek Ditch and Herrick Ditch Company ("Ditch Company") and Roaring Fork Land and Cattle Company ("Cattle Company"), (collectively, "the Companies"). Companies' PHS, p. 2.

The Objectors have made no valid arguments for the CWCB to reject Pitkin's donation of the SBD water right for instream flow uses. The donation would protect Colorado's compact entitlements and would prevent the potential abandonment or "retirement" of a valuable pre-1922 right. The donation would achieve both preservation and improvement of the natural environment, would promote maximum utilization by allowing potential multiple uses of this valuable water right, and would be a benefit to the State as a whole. Because the arguments against this acquisition have no merit in law or policy, the Board should reject them and approve this proposed acquisition.

II. DISPUTED FACTUAL AND LEGAL CLAIMS

1) **There will be no injury to any existing water rights from this acquisition.**

The most important consideration for the CWCB and the water court is that the acquisition and ISF use of the Stapleton Ditch Right will not cause injury to existing decreed water rights. The Basalt Water Conservancy District ("Basalt"), Starwood Metropolitan District ("Starwood") (collectively, "the Districts") and the Companies (collectively, "the Objectors") argue that there will be injury or potential injury to their water rights. However, no injury to the Objectors' water rights will result from this acquisition.

The Objectors will not be injured by any use of this changed water right because the water court already has quantified the historical consumptive use ("HCU") of the rights, determined how much water could be put to beneficial use without injuring any water users, and imposed terms and conditions to prevent any injury. The subsequent change of this water right to ISF use also will not result in injury because the CWCB only would use water that was unavailable for use by anyone except Pitkin or its assigns. The portion of the water right subject to this acquisition was originally appropriated and used by Pitkin and was not available for the Objectors or other water users to appropriate from the stream even if Pitkin was not using it. "The transfer of senior priorities to other uses and locations is a very important feature of Colorado water law." High Plains A & M, LLC v. Southeastern Colorado Water Conservancy Dist., 120 P.3d 710, 721 (Colo. 2005). Pitkin, like any other water user, has the right to determine the manner in which to put its senior changed water right to beneficial use, and the Objectors will not be injured by the transfer of that senior right to another use in another location (e.g., instream flows). Despite the fact that the Objectors would like to claim Pitkin's senior water for themselves, they will not be injured by the CWCB's acquisition and use of Pitkin's water.

Both the Districts and the Companies argue, and the CWCB Staff agrees, that in "a change of water right proceeding, junior users are entitled to maintenance of stream conditions at the time their appropriations were made." Companies' PHS, p. 2; Districts' PHS, p. 6. However, none of the Objectors are entitled to claim the SBD water as their own because it is the property of Pitkin and was not part of the stream condition that they were entitled to rely on or claim. The Objectors are not entitled to the maintenance and use of senior water rights that were in the stream and not put to beneficial use at that particular moment in time. The fundamental tenets of water law dictate that the Objectors are not entitled to rely on or appropriate Pitkin's water and that they cannot be injured by Pitkin's intended use of that senior water. Pitkin, like other water users changing their rights, conducted an HCU analysis precisely so that it could rely on putting a portion of its water right to beneficial use at some point in time without having to relinquish it to junior water users on the stream.

Basalt wrongly argues that it could be injured because its contracts with 119 water users could be curtailed when its exchanges, dated 1987 and later, "could be curtailed when BWCD or associated private exchanges are called out of priority for the delivery of instream flow rights." District's PHS, p. 2. Basalt argues that "a requirement that an additional 0.52 c.f.s. of SBD HCU credits be delivered through the BWCD's exchange reach without depletion by BWCD's existing

exchange rights would materially injure the BWCD by limiting the times when those exchanges can operate." District's PHS, p. 2. Pitkin has the absolute legal right to require that .52 c.f.s. of its HCU credits be delivered through the BWCD's exchange reach without depletion by BWCD's existing exchange rights. Colorado water law dictates that Basalt's exchanges can be limited by that delivery --this does not constitute injury. "The change application process is intended to facilitate transfers that are calculated to result in a continued application of the appropriated water to specified beneficial uses at different identified locations from the current decree under conditions to prevent injury to other water rights." High Plains, 120 P.3d at 721. If Pitkin transferred the water right to a consumptive use, Basalt's exchanges would also be curtailed by any use of the senior SBD right. This is the nature of the prior appropriation system, and Basalt's argument that this constitutes injury is meritless.

Starwood makes the same faulty argument that it would be materially injured by the delivery of the SBD water through its reach because it would limit the times when its exchange can occur. Districts' PHS, p. 3. Again, if Pitkin exercised its right to put its water to a consumptive use, instead of allowing the CWCB to use it, Starwood would similarly be limited by the priority system as to the times when its exchange can occur. This is not injury and Starwood has no legal right to claim injury because a senior priority decides not to abandon its water right for Starwood's benefit. This is a well-established feature of every change application and simply results in an application of the senior appropriated water to different beneficial uses at different identified locations. High Plains, *supra*. Neither Starwood nor Basalt has the right to seek to prevent Pitkin's or the CWCB's use of that changed water for a legal beneficial use.

The Companies argue that there is *potential* for injury. They argue that the "'stacking' concept will result in injury and is unlawful to the extent the senior right could call at any time it is satisfied based on measured flows at the headgate." The SBD right would not be called, as the Companies argue, when the SBD right is fully satisfied at the headgate, but water available at the SBD headgate would be protected from diversion to allow it to be put to the changed beneficial use of instream flow – whether for preservation or improvement.

The CWCB, like any other water user, is entitled to lease this water, and pursuant to its exclusive statutory authority, to put it to beneficial use to preserve and improve the natural environment to a reasonable degree through a water court decree. "Instream flow or lake level rights are no different in concept from other appropriative rights." Colorado Water Conservation Board v. Central City, 125 P.3d 424, 437-8 (Colo. 2005). No injury will occur by putting the Stapleton Ditch Rights to ISF uses because Objectors have never had the right to claim Pitkin County's changed water right or rely on that changed right as water subject to their appropriation.

Finally, the water court will also ensure that no water rights are injured. A change of water right "shall be approved if such change or plan will not injuriously affect the owner of or persons entitled to use water under a vested water right or a decreed conditional water right." § 37-92-305(3), C.R.S. (2008). Consequently, no injury to any water user will occur as a result of the CWCB's acquisition and ISF use of the Stapleton Ditch Right.

2) **The evidence shows that there is a need for more water to preserve and/or improve the natural environment to a reasonable degree.**

The Objectors argue that the CWCB has not demonstrated a need for the additional water to preserve the natural environment and that the acquisition is not appropriate. On the contrary, Mark Uppendahl, Instream Flow Coordinator for the Colorado Division of Wildlife ("CDOW"), conducted a detailed analysis and opined that the natural environment on Maroon Creek and the Roaring Fork will be preserved and/or improved by the proposed acquisition, thereby establishing a scientific basis for acquisition of the water. **Exhibit 2** to this Rebuttal and **Exhibit 8** to Staff's Prehearing Statement.

Mr. Uppendahl's analysis provides scientific evidence refuting the Objectors' claims that the water is not needed for instream flows. The acquired water will preserve the natural environments of Maroon Creek and the Roaring Fork River to the extent that the decreed ISF water rights are not met. The acquired water will improve the natural environment in these reaches when the existing decreed ISF water rights are met, by providing flows above the existing decreed amounts.

Mr. Uppendahl's research indicates that adding an additional 4.3 cfs of ISF protection to Maroon Creek would increase protection of approximately an additional 1.6 feet of wetted width, 0.1 feet of depth, 2.0 square feet of cross sectional area, and would add 3% of wetted perimeter and 0.2 ft/s in velocity in critical riffle areas. Adding an additional 4.3 cfs of ISF protection to the Roaring Fork River would increase protection of approximately an additional 1.3 feet of wetted width, 2.2 square feet of cross sectional area, and would add 1% of wetted perimeter in critical riffle areas. The analysis indicates that the natural environments of Maroon Creek and the Roaring Fork River will be improved significantly by adding an additional 4.3 cfs of protection to the existing 14 cfs ISF water right on Maroon Creek, and the existing 55 cfs ISF water right on the Roaring Fork River. The greatest improvement would result from increasing the wetted width of the stream channel and increasing the amount of useable area, which will provide additional fish habitat during the warmer irrigation season (deeper runs and pools), increase protection from harmful water quality parameters (high temperatures and low oxygen levels) and provide better connectivity for fish passage to different habitats (deeper riffles). See **Exhibit 2** to this Rebuttal and **Exhibit 8** to Staff's Prehearing Statement.

Mr. Uppendahl also analyzed the amount of improvement of the natural environment that will be achieved by acquiring up to 0.52 cfs from the Stapleton Brothers Ditch (SBD) water right for ISF use below the point of return flow. The data contained in Exhibit 2 indicates that adding an additional 0.52 cfs of ISF protection to the Roaring Fork River would increase protection of approximately an additional 0.2 feet of wetted width, 0.2 square feet of cross sectional area and add 0.25% of wetted perimeter in critical riffle areas. Mr. Uppendahl opined that this data indicates that the natural environment of this reach will be slightly improved by adding an additional 0.52 cfs of protection to the existing 55 cfs ISF water right. While a slight improvement still constitutes improvement, the CWCB Staff recommends that because the portfolio of water rights proposed to be donated includes more increments of water to add to the .52 cfs, the Board should acquire the .52 cfs to preserve and improve the natural environment on the Roaring Fork River.

The Districts argue that the historical flow conditions show that there is already adequate flow available on the Roaring Fork River above its confluence with the Fryingpan River. The Companies argue that because the CWCB has never placed a call for the existing ISF rights, the acquisition is inappropriate. Data from the gage on Maroon Creek above Aspen shows that Maroon Creek has dropped below 14 cfs in more than half the years in the period of record. Consequently, it appears that the acquired water is needed to meet the decreed Maroon Creek ISF amount in some below average years.

Even if the Objectors' claims were true, neither of these arguments are a proper basis to prevent Pitkin from exercising its right to change its water right to add ISF use by the CWCB, or for the CWCB to reject this offer. The CWCB is entitled to accept a donated water right to ensure the continued viability of its ISF water rights. An irrigator is allowed to buy a changed senior water right to ensure better availability of its supply of water even if it has operated under free river conditions. Similarly, the CWCB is entitled to seek additional sources of water to enhance its current priority or to augment (by improvement) its current claimed amount. The current availability of water is not a basis to prevent someone from filing to ensure continued availability of that water.

3) **The CWCB instream flow appropriation on the Roaring Fork River did not include the SBD water right because the historical consumptive use portion of that right belongs to Pitkin and the return flows belonged to the next senior water right on the stream.**

The Districts argue that at the time of the CWCB's appropriation of 55 cfs on the Roaring Fork River, the SBD water rights were in the stream and not diverted, resulting in a "double counting" of that water when the CWCB stacks the SBD water right with its existing ISF water right. Districts' PHS, p. 6. For this argument to make sense, the CWCB would have had to appropriate or claim a portion of the SBD right as of the date of the ISF appropriation. However, as discussed above, neither the CWCB nor any other junior appropriator, such as the Districts, were entitled to rely on or claim that water because the HCU belongs to Pitkin and the return flow must be shepherded to the next senior water right on the stream. The Districts' arguments have no merit.

The Districts also argue that the "CWCB's use of the subject water rights is subject to the limitations of C.R.S. § 37-92-102(3)(b)." Districts' PHS, p. 6. This argument is erroneous. Section 37-92-102(3)(b) expressly applies to appropriations of ISF water rights, not to acquisitions of water for ISF use. Only appropriations are subject to practices and uses of water in existence at the time of the appropriation. Donations of water to the CWCB have a senior priority and that senior priority is maintained and not subject to pre-existing uses.

The Districts also claim that this proposed water acquisition does not comply with section 37-92-102(3) because the CWCB will not truly "acquire" or own the Stapleton Ditch Right under this proposal. Districts' PHS, p. 6. This claim is also without merit because the statute expressly provides that the CWCB can acquire water or an "interest in water" by a lease "or other contractual arrangement" and does not require the CWCB to become the owner of an acquired water right.

4) **It is in the State's interests to put this pre-1922 water right to beneficial use in order to protect compact entitlements.**

Citing section 37-61-101, Art. VIII, the Districts argue that the conversion of the SBD right to non-consumptive use would eliminate the pre-1922 status and thereby impair compact development. Districts' PHS, p. 6. The law is clear that conversion of the SBD right to non-consumptive use would protect, not eliminate, the pre-1922 status. Consequently, the CWCB should put this valuable pre-1922 water right to beneficial ISF use to prevent abandonment or diminution of the right.

Section 37-61-101, Art. VIII simply states that present perfected water rights are not impaired by the Colorado Compacts. Section 37-92-102(3), on the other hand, specifies that applying this pre-1922 water right to ISF use preserves its status, prevents a reduction of the historical consumptive use of the right, and thus, prevents abandonment of the right. The Companies argue that the "the CWCB is ultimately better off simply retiring the right which will ensure that it is not requantified to a lesser flow rate amount." Companies' PHS, p. 2. Simply retiring the right means the pre-1922 water right would be subject to abandonment. This is not an approach that maximizes beneficial use or protects compact entitlements and should be rejected.

The Companies argue that prior to acceptance and use of the SBD right, "the CWCB should impose a term and condition requiring the quantification of the delayed irrigation return flows and a requirement to replace such depletions to prevent injury." Companies' PHS, p. 2. This argument must be rejected because, even if the CWCB could impose a term and condition on a water court, such term would violate the original change case decree in Case No. 99CW306. In that case, the Water Court held that the "quantification of the historic consumptive use of the Stapleton Brothers' Ditch water right in this Decree shall be *res judicata* as to the conditions existing prior to the entry of this Decree." **Exhibit 5** to Staff's Prehearing Statement, p. 6. The Court also held that the historical consumptive use calculations set forth in 99CW306 "shall be *res judicata* as to the historic consumptive use of the Stapleton Brothers' Ditch water right from 1904 through 2004 in any subsequent proceeding of this Court involving a change of all or a portion of the Stapleton Brothers' Ditch water right." **Exhibit 5**, p. 7. Thus, the Companies' argument that the historical consumptive use calculation of the SBD water right must be re-quantified to include return flows or to determine Historic User Protected status *)* protection is expressly prohibited by the 99CW306 decree.

Further, since the change decree in Case No. 99CW306 is only 4 years old, any change to the historical consumptive use calculation of the SBD water right would only include 4 additional years of non-use and would be minimal. Additionally, it is the Division Engineer's practice not to require re-calculation of historical consumptive uses and return flow data when an additional change of the water right is sought within 10 years of a change of water right. If the CWCB acquires this water right now, there will likely be no further reduction of this pre-1922 water right from non-use either through abandonment or through a re-quantification of the historical consumptive use available for downstream in-state uses.

5) **It is in the State's interests to put this pre-1922 water right to beneficial use in order to promote maximum utilization.**

The Companies argue that the CWCB will be unable to enforce the SBD right during times of downstream senior calls because it will not receive Green Mountain Reservoir protection as an historic user protected water right ("HUP-protected water right"). Companies' PHS, p. 3. The Districts assert that any potential Compact benefit from the use of the SBD right would be lessened because the SBD right, when put to ISF use, will not receive HUP protection because it would no longer qualify as a "preferred use" not called out by the downstream senior calls. Districts' PHS, p. 4. This speculative argument is not a valid basis to reject the SBD water rights. Further, since Pitkin intends to exercise its right to put the historical consumptive use portion of the water right to consumptive beneficial use downstream of the ISF reaches as contemplated by section 37-92-102(3), it will still be entitled to HUP protection. The Districts' argument that the SBD water right will not be entitled to HUP protection is also not a proper basis for rejecting the use of this pre-1922 water right.

The CWCB's use of the SBD right for ISFs will not impact Green Mountain Reservoir operations to the detriment of other HUP beneficiaries or other water users. The addition of ISF use to the SBD right does not require HUP-protection, and Green Mountain Reservoir does not have to release the HUP water. The senior calling rights downstream still will be satisfied because ISF use is non-consumptive and the depletions associated with the historical use of the SBD right will not be occurring. To exercise the SBD right for ISF use, all the CWCB will need is the ability to call upstream juniors, and the ability to protect the flows from diversion within the ISF reaches. However, it is highly likely that the SBD right will be put to a beneficial use downstream of the ISF reaches that will qualify as a preferred use and maintain the SBD right's status as an HUP- protected water right. Regardless, protection of pre-1922 water rights is an important consideration, since pre-1922 water rights cannot be curtailed in the event of compact administration that necessitates the curtailment of water rights, and the acquisition and ISF use of the pre-1922 SBD right will protect that right.

6) **The water right is administrable.**

Alan Martellaro, the Division Engineer, has advised Staff that the SBD right would be administrable if changed to add ISF use and a subsequent downstream consumptive use as decreed by the water court.

7) **The water right can be used to preserve or improve the natural environments of Maroon Creek and the Roaring Fork River.**

The Districts argue that "stacking is not legal under relevant statutes" and that any increase to an ISF water right must be accomplished by new, junior ISF appropriations. Districts' PHS, p. 5. This argument ignores the plain language of the statute which allows the CWCB to acquire water "in such amount as the board determines is *appropriate* to preserve *or improve* the natural environment to a reasonable degree" (emphasis added). § 37-92-102(3), C.R.S. (2009).

The Districts argue that the State Engineer's Seniors First policy and section 37-92-102(3) prevents the CWCB from exercising the 1933 SBD water right priority to improve the natural environment to a reasonable degree. The Districts claim that the SBD water right must first be exercised to preserve the natural environment, and only then can the 1976 or 1985 ISF water rights be exercised to the extent available to preserve the natural environment. Districts' PHS, p. 5. This argument has no merit because either the water rights are being used simultaneously or the senior water right is being used first. Neither the Seniors First policy nor section 37-92-102(3) prevent the use of the senior water right for one beneficial use (improvement of the natural environment) while also using the junior right to the extent available for a different beneficial use (preservation of the natural environment to a reasonable degree).

The Staff and the CDOW recommend that the Board use the acquired SBD water right to preserve the natural environment when the 1976 or 1985 ISF water rights are not in priority or are partially met, and to improve the natural environment to a reasonable degree when the 1987 or 1985 ISF water rights are in priority and fully met.

8) **Response to Districts' proposed stipulations.**

The CWCB staff agrees with the Districts' proposed stipulations #1 and #2 that the Stapleton Brothers Ditch water right is a Green Mountain Reservoir HUP beneficiary and is a pre-Compact right, and that the Basalt District exchanges are junior to the Stapleton Brothers Ditch water rights. The CWCB staff does not agree to the Districts' proposed stipulations #3 through #5. The CWCB staff agrees that the Districts' proposed stipulation #6 is a fact, but that stipulation is not relevant to this proceeding.

III. Additional Exhibits to be Introduced at Hearing

1) Proposed acquisition agreement between Pitkin County and the CWCB entitled "Declaration of a Revocable Trust," draft, dated October 1, 2009.

2) Letter from Mark Uppendahl, Instream Flow Coordinator, Colorado Division of Wildlife, to Linda Bassi of CWCB Staff, dated October 14, 2009.

Respectfully submitted this 15th day of October 2009.

_____/s/_____
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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Rebuttal Statement of Staff of Colorado Water Conservation Board was served on this 15th day of October, 2009 upon the following via electronic mail:

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EXHIBIT 1

Declaration of a Revocable Trust
(The Pitkin County Water Rights Revocable Trust)

RECITALS

WHEREAS, this Declaration of a Revocable Trust ("Trust Agreement") is made and executed this _____ day of _____, 20____, by and between the Board of County Commissioners for the County of Pitkin ("Settlor") and the Colorado Water Conservation Board ("Trustee" or "CWCB") (collectively, the "Parties").

WHEREAS, the Trustee is a Colorado administrative agency that was created by statute in 1937 for the purpose of aiding in the protection and development of the waters of the state. It is responsible for water project planning and finance, stream and lake protection, flood hazard identification and mitigation, weather modification, river restoration, water conservation and drought planning, water information, and water supply protection. Pursuant to Colorado law, it has the exclusive authority to hold instream flows in the state of Colorado.

WHEREAS, the Trustee is authorized by Section 37-92-102(3), C.R.S. (2008), to acquire from any person, including any governmental entity, such water, water rights or interests in water as it determines may be required for instream flows to preserve or improve the natural environment to a reasonable degree and to take whatever action may be needed to ensure such instream flows remain in the river.

WHEREAS, the Trustee holds numerous instream flow water rights in the Roaring Fork and Crystal Rivers, and their tributaries ("Roaring Fork River Basin"). In dry years, these instream flow water rights have been known to suffer shortages to varying degrees, with some shorted in the extreme.

WHEREAS, Settlor owns various water rights in the Roaring Fork River Basin, which it holds to manage for the citizens of Pitkin County. Settlor may also acquire various water rights through lease or other contractual arrangements or acquisitions. Some of Settlor's water rights were acquired through Settlor's Open Space and Trails Department with restricted funds and may not be converted or sold without voter approval. Some of Settlor's water rights were acquired through Settlor's Airport Enterprise Fund pursuant to the Taxpayers' Bill of Rights ("TABOR"), under Article X, Section 20 of the Colorado Constitution, and must be managed in a manner consistent with the nature of such enterprise.

WHEREAS, Settlor desires to create a revocable trust of the water rights described in **Exhibits A-1 and A-2**, attached hereto and incorporated herein by reference (collectively, the "Trust Estate") for the purposes hereinafter set forth. Creation of the revocable trust is intended to assist in providing more water when needed for the Trustee's instream flow reaches in the Roaring Fork River Basin.

WHEREAS, Section 37-92-102(3), C.R.S., allows the Trustee to use water rights acquired through leases, loans and other arrangements for instream flow purposes pursuant to amendments to Sections 37-92-102(3), 37-92-103(2), and 37-92-305(3), C.R.S. House Bill 08-1280, signed by Governor Ritter on April 21, 2008, provides certain protections for water rights provided to the CWCB for use in the Instream Flow Program, pursuant to amendments to Sections 37-92-102(3), 37-92-103(2) and 37-92-305(3), C.R.S. It is specifically contemplated that each of those protections shall apply to the Trust Estate and a description of those protections shall be included in each of the water court decrees obtained pursuant to this Trust Agreement.

WHEREAS, the Settlor agrees to execute such further instruments as shall be necessary to vest the Trustee with full authority to manage the Trust Estate, and the Trustee agrees to hold the Trust Estate for the following uses and purposes set forth herein and subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the promises and mutual covenants herein contained, it is agreed as follows:

REVOCABLE TRUST

I. Purpose of the Trust. The purpose of the Trust is to preserve and improve the natural environment to a reasonable degree by providing water rights to supplement instream flows in the Roaring Fork River Basin. In accordance with the entrustment by Settlor and the provisions of this Trust Agreement, Trustee will hold, manage, and operate the Trust Estate in a manner that maximizes the purpose of the Trust.

II. Beneficiary of the Trust.

The Trust is a self-benefited trust, with the Board of County Commissioners of Pitkin County being the beneficiary of the Trust.

III. Delivery of the Trust Estate.

A. Ownership of the Trust Estate shall not be transferred from the Settlor to the Trustee as a result of the entrustment contemplated by this Trust Agreement.

B. The Settlor and Trustee shall, within six (6) months of the execution of this Trust Agreement, file an application, as co-applicants, with the District Court in and for Water Division 5 (the "Water Court") to change the use of the Stapleton Brothers Ditch water rights identified in **Exhibit A-1** to add instream flows as a beneficial use (the "Stapleton Water Court case"). The Stapleton Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Stapleton Water Court case. The Settlor shall have the right to dismiss the Stapleton Brothers Water Court case if it appears likely to the Settlor that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Settlor or (ii) substantially decrease the value of the

Stapleton Brothers Ditch water rights. The Settlor shall consult with the Trustee prior to taking any action to dismiss the Stapleton Water Court case. The Stapleton Brothers Ditch water rights identified in **Exhibit A-1** shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in the Stapleton Water Court case.

C. The Settlor and Trustee's staff shall, within twelve (12) months after receipt of a final decree in the Stapleton Water Court case begin the process to obtain approval of the CWCB to add the water rights identified in **Exhibit A-2** to the Trust Estate in accordance with the procedures set forth in Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, or any other applicable Rule duly promulgated by the CWCB and in effect at the time of such addition. The Trustee and Settlor shall not be obligated to proceed with such addition if CWCB approval requires terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the water rights. After obtaining such approval, the Settlor and Trustee shall file a Water Court application, as co-applicants, with the Water Court to change the use of the water rights identified in **Exhibit A-2** to add instream flows as a beneficial use (the "Remainder Water Court case"). The Remainder Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Remainder Water Court case. The Trustee or the Settlor shall have the right to dismiss the Remainder Water Court case if it appears likely to the Settlor that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the remaining water rights. The Parties shall consult with each other prior to taking any action to dismiss the Remainder Water Court case. The water rights changed in the Remainder Water Court case shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in the Remainder Water Court case.

D. Each Party shall bear its own costs and expenses in the Water Court cases. The Parties shall each bear one-half of the responsibility for any services of an engineer or other consultant necessary to file and prosecute the Water Court cases.

IV. Settlor's Warranties, Rights, and Obligations.

A. The Settlor warrants that it has the legal status and legal capacity to execute, deliver, and perform all requirements of this Trust Agreement and that it has full power and authority to execute and deliver this Trust Agreement and all other documents to be entered into in relation to this Trust Agreement, and it has full power and authority to operate under the entrustment provided for herein.

B. The Settlor reserves the exclusive right at any time and from time to time by instrument in writing signed by the Settlor and delivered to the Trustee to modify or alter this Trust Agreement, in whole or in part, without the consent of the Trustee provided that the duties, powers, and liabilities of the Trustee under this Trust Agreement shall not be changed without its consent; and the Settlor reserves and shall have the right, by instrument in writing, signed by the Settlor and delivered to the

Trustee, to cancel and annul this Trust Agreement, as provided in Section XIV of this Trust Agreement.

C. After the expiration of the Initial Period defined in Section XIV.B, the Settlor may from time to time withdraw all or part of the water rights in the Trust Estate by delivering an instrument in writing duly signed by the Settlor to the Trustee substantially similar to that attached hereto as **Exhibit B**. Such instrument shall describe the property or portion thereof desired to be withdrawn. Upon receipt of such instrument, the Trustee shall thereupon immediately cease the use of the water rights described therein. At least thirty (30) days prior to any such withdrawal, the Settlor shall consult with the Trustee regarding the circumstances and timing of the intended withdrawal.

D. The Settlor may at any time and from time to time add water rights to the Trust Estate by providing written notice to the Trustee of such intent, describing the property or portion thereof desired to be added to the Trust Estate, in a form substantially similar to that attached hereto as **Exhibit C**. The Settlor may add water rights to which it holds title or in which it has a contractual or other interest. The Settlor and the Trustee's staff must obtain approval of the CWCB to add such water rights to the Trust Estate in accordance with the procedures set forth in Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, or any other applicable Rule duly promulgated by the CWCB and in effect at the time of such addition. Neither the Trustee nor the Settlor shall be obligated to proceed with such addition if CWCB approval requires terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the water rights. After obtaining such approval, the Settlor and Trustee shall file a Water Court application to add instream flow uses as a beneficial use ("Supplemental Water Court case"). Any Supplemental Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Supplemental Water Court case. The Trustee or the Settlor shall have the right to dismiss any Supplemental Water Court case if it appears likely that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the supplemental water rights. The Parties shall consult with each other prior to taking any action to dismiss any Supplemental Water Court case. The water rights changed in any Supplemental Water Court case shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in such Supplemental Water Court case.

E. The Settlor shall arbitrate, sue upon, defend against, or otherwise deal with and settle claims in favor of or against the Trust Estate as it deems best and the Settlor's decisions regarding and ultimate resolution of any such claims shall be binding and conclusive.

F. Nothing herein shall limit the Settlor's ability to protect the Trust Estate by filing statements of opposition in water court cases that may potentially injure the

Trust Estate; provided, however, that the Settlor shall consult with the Trustee regarding any such statements of opposition prior to filing.

G. The Settlor may bring about beneficial use of the historical consumptive use of the Trust Estate downstream of the instream flow reach benefited by the Trust Estate as fully consumable reusable water or in any other manner allowed by law.

V. Trustee's Warranties, Rights, and Obligations.

A. The Trustee warrants that it has the legal status and legal capacity to execute, deliver, and perform all requirements of this Trust Agreement and that it has full power and authority to execute and deliver this Trust Agreement and all the other documents to be entered into by it in relation to this Trust Agreement, and it has full power and authority to operate under the entrustment provided for herein.

B. The Trustee shall use the Trust Estate for the purposes of preserving or improving the natural environment to a reasonable degree by protecting streamflows in the state of Colorado under Section 37-92-102(3), C.R.S., as amended by House Bill 08-1280, at all times as allowed by all applicable water court decrees and Colorado law, so long as this Trust Agreement is in effect.

C. The Trustee shall be responsible for all administration, monitoring and measuring required by the Division Engineer to use the Trust Estate for instream flow purposes. To the extent that the Division Engineer requires installation of stream gages or other measuring devices in connection with such use, the Trustee shall be responsible for such installation, subject to the availability of funds for such installation.. The Trustee shall be responsible for maintaining all records required by the Division Engineer for administration of the Trust Estate for instream flow purposes. The Trustee and Settlor shall coordinate on whether the Settlor may provide assistance with the operation and maintenance of any such required stream gages or other measuring devices.

D. On January 15 of each year that the Trust Agreement is in force, the Trustee shall provide an annual update to the Settlor regarding use of the Trust Estate for instream flow purposes, including but not limited to flow data from the preceding year, any enforcement activities from the previous year, and planned operations and other considerations for the forthcoming year.

E. The Trustee agrees to undertake such acts as are reasonably required to carry out the tenor, purpose, and intent of this Trust Agreement. To that end, the Trustee shall place a call to enforce the seniority of the Trust Estate in the event the instream flow water right being benefited by all or a portion of the Trust Estate is injured or is presumed to be injured by other water users. If such activities include filing statements of opposition to water court cases, the Trustee shall identify this Trust Agreement in any such statement of opposition. Nothing herein shall diminish the CWCB's right to exercise its discretion regarding enforcement of instream flow water

rights; however, the CWCB acknowledges that the intended use of the Trust Estate is to preserve or improve the natural environment to a reasonable degree.

F. The Trustee shall not assign, pledge, sell, or transfer in any manner any part of the Trust Estate, nor shall it have the power to encumber any part of the Trust Estate.

G. The Trustee shall not engage in any activity that will harm the Settlor's interest the Trust Estate.

VI. Covenant. This Trust Agreement shall be a covenant which runs with the Trust Estate. This Trust Agreement shall be recorded by the Settlor with the Clerk and Recorder of Pitkin County, Colorado and of Garfield County, Colorado.

VII. Notice. Any notice, request, demand and other correspondence made as required by or in accordance with this Trust Agreement shall be made in writing and delivered to the relevant Party at the contact information set out below. Such notice or other correspondence shall be deemed to have been delivered when it is transmitted if transmitted by facsimile, when it is delivered if delivered in person, and three (3) days after posting the same if posted by mail.

To Settlor:

John M. Ely, Esq.
Pitkin County Attorney
530 East Main Street, Suite 302
Aspen, Colorado 81611-1948
Fax: (970) 920-5198

To Trustee:

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

VIII. Interpretation. This Trust Agreement shall be construed, regulated, and governed by and in accordance with the laws of the State of Colorado and shall be interpreted broadly to effect its purpose.

IX. Integration Clause. This Trust Agreement shall supersede all previous agreements between the Parties, and shall be binding upon the Parties and their respective heirs, executors, administrators, successors, and assigns.

X. Dispute Resolution; Jurisdiction and Venue. Pursuant to Section 37-92-102(3) C.R.S., the terms of this Trust Agreement shall be enforceable by each party as a water matter in the District Court for Water Division 5; provided, however, that before

commencing any action for enforcement of this Agreement, the party alleging a breach shall notify the other party in writing of the alleged breach and the parties shall make a good faith effort to resolve their differences through informal consultation.

XI. **No Waiver**. Any failure or delay by a Party in exercising any of its rights, powers and remedies hereunder or in accordance with laws (the "Party's Rights") shall not lead to a waiver of such rights, and the waiver of any single or partial exercise of the Party's Rights shall not preclude such Party from exercising such rights in any other way and exercising the remaining part of the Party's Rights.

XII. **Severability**. Each provision contained herein shall be severable and independent from each of other provisions, and if at any time any one or more provisions herein are found to be invalid, illegal, or unenforceable, the validity, legality, or enforceability of the remaining provisions herein shall not be affected as a result thereof.

XIII. **Amendments**. Any amendments or supplements to this Trust Agreement shall be made in writing and shall take effect only when properly signed by the Parties to this Agreement.

XIV. **Term and Termination of the Trust**. This Trust Agreement shall become effective upon its execution.

A. The term of this Trust Agreement is perpetual unless terminated as allowed by this Section XIV.

B. This Trust Agreement may not be terminated during the initial ten (10) years after this Trust Agreement is executed ("Initial Period").

B. After the expiration of the Initial Period, this Trust Agreement may be terminated upon at least six (6) months prior notice in writing by either Party to the other Party to terminate the Trust hereunder, after which the Trust hereunder shall terminate at the expiration of such six (6) month period or at a later date specified in the termination notice. At least thirty (30) working days prior to providing such notice, the Party initiating the termination shall consult with the other Party regarding its intent to terminate the Trust Agreement.

D. The Trust Agreement shall also be terminated upon occurrence of any event that leads to such termination in accordance with the laws of the State of Colorado.

E. Upon termination of the Trust Agreement, the Trust Estate shall belong to the Settlor and the Trustee shall act at the instruction of Settlor to take all reasonable actions immediately necessary to return the Trust Estate and management thereof to the Settlor.

XV. Rule Against Perpetuities. If it shall be determined that any provisions of the Trust Agreement violates any rule against perpetuities or remoteness of vesting now or hereafter in effect in a governing jurisdiction, the affected portion of the Trust Estate shall be administered as provided in this Trust Agreement until the termination of the maximum period allowed by law at which time and forthwith such part of the Trust Estate shall be removed from the Trust and returned to the quiet possession of the Settlor.

I certify that I have read the foregoing Trust Agreement and it correctly states the terms and conditions under which the Trust Estate is to be held and managed by the Trustee.

Dated as of the date set forth above.

SETTLOR, BOARD OF COUNTY COMMISSIONERS
OF PITKIN COUNTY:

_____
By: _____
Its: _____

ATTEST:

_____
By: _____
Its: Secretary

_____
[Trustee]

Exhibit A-1
Description of Trust Estate – Stapleton Brothers Ditch Water Rights

Name	Decree	Source	Amount
Stapleton Brothers Ditch	99CW306	Roaring Fork River	4.3 cfs (119.25 AF/yr)

Exhibit A-2
Description of Trust Estate – Remaining Water Rights

Name	Decree	Source	Amount
Cramer Ditch, Original Construction	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, First Enlargement	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, Second Enlargement	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, Third Enlargement	C.A. No. 3082	Sopris Creek	0.143 cfs
Cramer Ditch (aka Beard Ditch)	W-867	Sopris Creek	0.143 cfs
Cramer Ditch (aka Beard Ditch) (appropriation date 8/25/1961)	W-867	Sopris Creek	0.143 cfs
Cramer Ditch, Fourth Enlargement	W-3414	Sopris Creek	0.143 cfs
Home Supply Ditch, Original Construction	C.A. No. 132	Roaring Fork River	0.5 cfs
Home Supply Ditch, First Enlargement	C.A. No. 2811	Roaring Fork River	0.5 cfs
Home Supply Ditch, Second Enlargement	C.A. No. 3082	Roaring Fork River	0.5 cfs
Home Supply Ditch (alternate point of diversion)	W-1801	Roaring Fork River	0.5 cfs
U.S. Green Ditch No. 2	C.A. No. 4033	Unnamed tributary of the Roaring Fork River	1.0 cfs[1]
U.S. Green Ditch No. 1	C.A. No. 4033	Wheel Barrow Gulch	1.0 cfs[2]
J.H. Smith, Warren Creek Ditch No. 1	C.A. No. 4033	Warren Creek	1.5 cfs[3]
U.S. Green Ditch No. 1	C.A. No. 4033	Wheel Barrow Gulch	2.0 cfs[4]
Wilke Ditch	C.A. No. 2136	Crystal River	1.2 cfs
Crystal River Hot Spring Cooling Water Diversion and Pipeline	87CW202	Crystal River	0.5 cfs

[1] May require cooperation with Aspen Center for Endowment Studies.
[2] 1.0 acre-foot per year of historic consumptive use leased to James Hunting until 2038.
[3] Owned in joint tenancy with City of Aspen.
[4] Owned in joint tenancy with City of Aspen.

Name	Decree	Source	Amount
Crystal River Hot Spring and Pool (aka Granite Hot Springs Nos. 1-4)	87CW202	Geothermal groundwater and surface water tributary to the Crystal River	0.01 AF
Low Line Ditch, Original Construction	C.A. No. 1007	Crystal River	1.538088 cfs
Mautz Spring and Mautz Ditch Nos. 1 and 2	C.A. No. 4033	Mautz Spring is the source for the Mautz Ditch Nos. 1 and 2, along with snow, rain and waste water that run into said spring and ditches	2.0 cfs
John Stern Ditch No. 1	C.A. No. 5884 W-3103	Waste and seepage water	0.5 cfs
Jote Smith Ditch, Original Construction	C.A. No. 132	Brush Creek	0.72 cfs
Jote Smith Ditch, First Enlargement	C.A. No. 132	Brush Creek	0.25 cfs
Cozy Point Ditch, Original Construction	C.A. No. 132 92CW007	Brush Creek	0.19 cfs
Cozy Point Ditch, First Enlargement	C.A. No. 3723 92CW007	Brush Creek	0.24 cfs
Upper Wiese Ditch	C.A. No. 2689 92CW007	Brush Creek	0.20 cfs
Upper Wiese Ditch (appropriation date 9/1/1936)	C.A. No. 3723 92CW007	Brush Creek	0.62 cfs
Cozy Point Pond	88CW479 93CW003	Brush Creek	2.0 AF
Stapleton Ditch	C.A. No. 132	Owl Creek	2.0 cfs
Stapleton Ditch, First Enlargement	C.A. No. 132	Owl Creek	0.8 cfs
Bivert Ditch	C.A. No. 132	Owl Creek	0.5 cfs
Bivert Ditch, First Enlargement	C.A. No. 132	Owl Creek	1.0 cfs
Walthen Ditch	C.A. No. 132	Woody Creek	3.0 cfs
Walthen Ditch, First Enlargement	C.A. No. 132	Woody Creek	3.2 cfs

Exhibit B
Notice of Withdrawal

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

Re: Pitkin County Revocable Water Rights Trust – Notice of Withdrawal

Dear Linda:

Pursuant to Section IV.C. of the Pitkin County Revocable Water Rights Trust Agreement, Pitkin County is hereby providing notice of its intent to withdrawal water rights from the Trust Estate. The following water rights will be withdrawn from the Trust Estate:

Name	Decree	Source	Amount

As required by Section IV.C. of the Trust Agreement, Pitkin County contacted the CWCB at least 30 days prior to this notice to discuss the withdrawal of the water rights specified above. Upon receipt of this letter, the CWCB shall immediately cease the use of the water rights specified above for instream flow purposes.

Sincerely,

John M. Ely
Pitkin County Attorney

Exhibit C
Notice of Addition

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

Re: Pitkin County Revocable Water Rights Trust – Notice of Addition

Dear Linda:

Pursuant to Section IV.D. of the Pitkin County Revocable Water Rights Trust Agreement, Pitkin County is hereby providing notice of its intent to add water rights from the Trust Estate. The County wishes to add the following water rights to the Trust Estate:

Name	Decree	Source	Amount

As required by Section IV.D. of the Trust Agreement, we must obtain CWCB approval to acquire the water rights specified above as required by Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program. Please contact me at your convenience to begin the approval process.

Sincerely,

John M. Ely
Pitkin County Attorney

EXHIBIT 2

STATE OF COLORADO

Bill Ritter, Jr., Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER

Thomas E. Remington, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192
wildlife.state.co.us

For Wildlife-
For People

October 14, 2009

Ms. Linda Bassi
Colorado Water Conservation Board
1313 Sherman Street, Room 723
Denver, CO 80203

Dear Linda,

The following is a supplemental report to the Colorado Division of Wildlife's (CDOW) August 26, 2009 analysis and recommendation regarding the possible donation of the Stapleton Brothers' Ditch (SBD) Water Right for instream flow purposes.

General Information

The Colorado Water Conservation Board (CWCB) requested the CDOW to evaluate the benefits and possible impacts associated with accepting the proposed donation of a portion of the Stapleton Brothers' Ditch Water Right, up to 4.3 cfs, to the fisheries in Maroon Creek and the Roaring Fork River. The CWCB currently holds the following instream flow water rights to preserve the natural environment to a reasonable degree that might benefit from this acquisition:

Case No.	Stream	Reach	Amount (cfs)	Approp. Date
5-76W2945	Maroon Creek (CDOW # 21078)	East & West Maroon Creek to Roaring Fork River	14 (Jan1 – Dec 31)	1-14-1976
5-85CW646	Roaring Fork River (CDOW #21713)	Maroon Creek to Frying Pan River	55(Apr 1 – Sept 30) 30 (Oct 1 – Mar 31)	11-8-1985
5-85CW639	Roaring Fork River	Frying Pan River to Crystal River	145(Apr 1 – Sept 30) 75 (Oct 1 – Mar 31)	11-8-1985

Maroon Creek is a tributary of the Roaring Fork River, and both are located in Pitkin County approximately 1.5 miles west of the Town of Aspen (see Figure 1).

R2Cross Data Analysis

CDOW has collected R2Cross data at several locations downstream of the SBD headgate on Maroon Creek (3 sites) and on the Roaring Fork River (3 Sites) (see attached). This data was used to determine the amount of measured improvement to the natural environment from the possible donation of additional water from the SBD. Maroon Creek and the Roaring Fork River downstream from Maroon Creek to the location of the point of return flow near the Aspen Airport (approximately at or above Galvin Gulch) would benefit from approximately 4.3 cfs of additional water. The Roaring Fork River downstream of the point of return flow to the confluence with the Frying Pan River would benefit from an additional 0.52 cfs.

The R2Cross Model has the ability to model several physical and hydraulic parameters including: wetted width (ft), average depth (ft), maximum depth (ft), cross sectional area (ft^2), wetted perimeter (ft), percent wetted perimeter (% of bankfull wetted perimeter), hydraulic radius (ft), discharge (ft^3/s) and velocity (ft/s). The R2Cross Model uses the physical and hydraulic characteristics measured in the field to model those same characteristics for different levels of stage using a constant value for streambed roughness (a constant Manning's n coefficient).[1]

Amount of Improvement Upstream of Point of Return Flow

The following analysis estimates the amount of improvement of the natural environment that will be attained by acquiring up to 4.3 cfs from the Stapleton Brothers Ditch (SBD) water right for instream flow purposes above the historic point of return flow. The data below was obtained from the R2Cross Data collected on Maroon Creek (3 sites) and the Roaring Fork River (1 Site) upstream of the historic point of return flow (see attached map). The bottom highlighted row of the Tables below indicates the amount of improvement that could be expected from increasing the instream flow protection from 14 cfs to 18.3 cfs on Maroon Creek and from 55 cfs to 59.3 cfs on the Roaring Fork River for all physical and hydraulic parameters measured within the R2Cross Model:

8/12/2009 - Maroon Creek below SBD Diversion

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
21.53	0.47	0.75	10.2	21.7	48.6	0.47	18.3	1.81
20.78	0.41	0.67	8.5	20.95	46.9	0.41	14	1.64
0.75	0.06	0.08	1.7	0.75	1.7	0.06	4.3	0.17

8/5/1985 - Maroon Creek 300' upstream of Highway 82

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
23.69	0.4	0.69	9.45	23.86	43	0.4	18.3	1.93
22.24	0.36	0.62	7.95	22.38	40.4	0.35	14	1.8
1.45	0.04	0.07	1.5	1.48	2.6	0.05	4.3	0.13

8/12/2009 - Maroon Creek at Highway 82 Bridge (Split Channel)

East Channel (75% of Flow)

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
26.43	0.33	0.53	8.6	26.53	52.3	0.32	13.7	1.59
25.95	0.28	0.48	7.28	26.05	51.3	0.28	10.5	1.44
0.48	0.05	0.05	1.32	0.48	1	0.04	3.2	0.15

1 It should be noted that because the R2Cross model uses a constant roughness coefficient, it is assumed that the model accurately predicts the hydraulic criteria, velocity and discharge within a range of 250% to 40% of the field measured stream discharge. Outside of this 250% to 40% range, it is assumed that the model may over-estimate velocity and discharge below 40% of the field measured discharge and underestimate velocity and discharge over 250% of the field measured discharge. What this means is that when comparing physical and hydraulic characteristics outside the acceptable range of 250% to 40%, the level of stage for a specific discharge may be higher than estimated by the model, specifically when modeling below the field measured discharge. However, because for this analysis it is assumed the amount of change in each modeled parameter is relative, it does not matter if the modeled discharge and stage falls within or outside the acceptable range of 250% to 40% of the field measured discharge.

West Channel (25% of Flow)

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
26.43	0.24	0.42	6.43	26.51	56.7	0.24	4.6	0.73
24.43	0.21	0.37	5.23	24.5	52.3	0.21	3.5	0.67
2	0.03	0.05	1.2	2.01	4.4	0.03	1.1	0.06

East & West Channels (100% of Flow)

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
52.86	0.57	0.95	15.03	53.04	109	0.56	18.3	2.32
50.38	0.49	0.85	12.51	50.55	103.6	0.49	14	2.11
2.48	0.08	0.1	2.52	2.49	5.4	0.07	4.3	0.21

Total Average Gain - 3 Sites

1.56	**0.06**	**0.08**	**1.91**	**1.57**	**3.23**	**0.06**	**4.30**	**0.17**

8/12/2009 – Roaring Fork River below Maroon Creek Confluence

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
58.85	0.75	1.44	44.55	59.16	53.6	0.75	59.3	1.33
57.6	0.73	1.4	42.31	57.89	52.4	0.73	55	1.3
1.25	0.02	0.04	2.24	1.27	1.2	0.02	4.3	0.03

The data above indicates that adding an additional 4.3 cfs of instream flow protection to Maroon Creek would increase protection of approximately an additional 1.6 feet of wetted width, 0.1 feet of depth, 2.0 square feet of cross sectional area, and would add 3% of wetted perimeter and 0.2 ft/s in velocity in critical riffle areas. Adding an additional 4.3 cfs of instream flow protection to the Roaring Fork River would increase protection of approximately an additional 1.3 feet of wetted width, 2.2 square feet of cross sectional area, and would add 1% of wetted perimeter in critical riffle areas. The above information only reflects the improvement directly measured across the measured riffle transects; additional improvement would occur throughout the entire length of the reach in all habitat types (riffles, pools and runs) from the SBD Diversion to the historic point of return flow. The above data indicates that the natural environment of this reach will be improved significantly by adding an additional 4.3 cfs of protection to the existing 14 cfs instream flow water right. The greatest improvement would result from increasing the wetted width of the stream channel and increasing the amount of useable area, which will provide additional fish habitat during the warmer irrigation season (deeper runs and pools), increase protection from harmful water quality parameters (high temperatures and low oxygen levels) and provide better connectivity for fish passage to different habitats (deeper riffles). CDOW recommends acquiring this water to preserve and improve the natural environment.

Amount of Improvement Downstream of Point of Return Flow

The following analysis estimates the amount of improvement of the natural environment that will be protected by acquiring up to 0.52 cfs from the Stapleton Brothers Ditch (SBD) water right for instream flow purposes below the point of return flow. The data below was obtained from the R2Cross data collected on the Roaring Fork River (2 Sites) downstream of the historic point of return flow (see attached map). The bottom highlighted row of the following Tables indicates the amount of improvement that could be expected from increasing the instream flow protection from 55 cfs to 55.52

cfs on the Roaring Fork River for all physical and hydraulic parameters measured within the R2Cross Model:

4/14/1977 - Roaring Fork River above confluence with the Frying Pan River.

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
43.94	0.65	1.19	28.49	44.92	61.1	0.63	55.52	1.95
43.76	0.65	1.18	28.29	44.74	60.9	0.63	55	1.94
0.18	0	0.01	0.2	0.18	0.2	0	0.52	0.01

4/14/1977 - Roaring Fork River above confluence with the Frying Pan River.

Wetted Width	Average Depth	Max Depth	Area	Wetted Perimeter	% WP	Hydraulic Radius	Discharge	Velocity
50.85	0.64	1.35	32.58	52.24	81.1	0.63	55.52	1.7
50.66	0.64	1.35	32.35	52.05	80.8	0.62	55	1.7
0.19	0	0	0.23	0.19	0.3	0.01	0.52	0
Total Average Gain - 2 Sites								
0.19	**0.00**	**0.01**	**0.21**	**0.19**	**0.25**	**0.01**	**0.52**	**0.01**

The above data indicates that adding an additional 0.52 cfs of instream flow protection to the Roaring Fork River would increase protection of approximately an additional 0.2 feet of wetted width, 0.2 square feet of cross sectional area and add 0.25% of wetted perimeter in critical riffle areas. The above information only reflects the improvement directly measured across the measured riffle transects; additional improvement would occur throughout the entire length of the reach in all habitat types (riffles, pools and runs) from the historic point of return flow downstream to the confluence with the Frying Pan River. The above data indicates that the natural environment of this reach will be slightly improved by adding an additional 0.52 cfs of protection to the existing 55 cfs instream flow water right. However, because this additional water could be combined with additional acquired water in the future, CDOW recommends acquiring this water to preserve and improve the natural environment.

CDOW Recommendation

The CDOW recommends the CWCB accept the donation of the water rights associated with the Stapleton Brothers Ditch. Accepting this senior water right will preserve the natural environment by increasing the amount of time the existing instream flow water rights on Maroon Creek and the Roaring Fork River will be fully satisfied and would provide protection to an additional 4.3 cfs of the natural Maroon Creek and Roaring Fork River hydrographs. The ability to use this water to improve the environment on both Maroon Creek (14 cfs + 4.3 cfs), downstream of the Stapleton Brothers Ditch, the Roaring Fork River (55 cfs + 4.3 cfs), from the confluence of Maroon Creek downstream to the point of return flow near the Aspen Airport (approximately at or above Galvin Gulch), and the Roaring Fork River (55 cfs + 0.52 cfs), from the point of return flow near the Aspen Airport (approximately at or above Galvin Gulch) to the confluence with the Fryingpan River will provide instream flow protection for additional fish habitat during the warmer irrigation season (deeper runs and pools), additional protection from harmful water quality parameters (high temperatures and low oxygen levels) and better connectivity for fish passage to different habitats (deeper riffles).

If you have any questions regarding the above recommendation, please contact me at (303)-291-7267.

Sincerely,

Mark Uppendahl
Colorado Division of Wildlife
Instream Flow Program Coordinator

Cc: Jay Skinner, CDOW Water Unit Program Manager
Sherman Hebein, CDOW Senior Fish Biologist – Northwest Region
Kendall Ross, CDOW Aquatic Biologist

3/3 = 28

2/3 = 15

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

LOCATION INFORMATION

STREAM NAME:	Maroon Creek
XS LOCATION:	100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER:	2
DATE:	12-Aug-09
OBSERVERS:	Uppendahl & Graf
1/4 SEC:	0
SECTION:	0
TWP:	0
RANGE:	0
PM:	0
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	5
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

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

TAPE WT:	0.0106
TENSION:	99999

CHANNEL PROFILE DATA

SLOPE:	0.01501104

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

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

STREAM NAME: Maroon Creek
XS LOCATION: 100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER: 2

DATA POINTS= 34

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
TS	0.00	4.91		
BS	0.01	5.52		
	3.00	6.84		
1 BF	5.00	6.82		
	7.00	8.00		
	8.20	8.32		
	9.00	8.17		
	10.20	8.23		
SWL	10.80	9.13	0.00	0.00
	12.00	9.56	0.35	0.34
	14.00	9.36	0.15	0.34
	16.00	10.09	0.80	1.56
	17.50	10.23	1.00	3.66
	19.00	10.43	1.10	3.90
	20.50	10.55	1.45	2.06
	22.00	10.67	1.50	4.02
	23.50	10.68	1.55	4.34
	25.00	10.81	1.70	3.89
	26.50	10.79	1.70	4.20
	28.00	10.63	1.40	2.78
	29.50	10.39	1.20	2.93
	31.00	10.46	1.40	3.92
	32.50	10.80	1.50	2.71
	34.00	10.54	1.50	2.53
	35.50	10.39	1.45	2.06
	37.00	10.28	1.30	2.94
	38.50	9.53	0.50	4.19
	40.00	9.89	0.60	1.53
SWL	42.20	9.14	0.00	0.00
	43.40	8.88		
	44.00	7.45		
1 BF	45.00	6.77		
	48.00	6.33		
BS	48.90	6.09		

TOTALS ----------

VALUES COMPUTED FROM RAW FIELD DATA

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
1.27	0.35	0.56	0.19	0.2%
2.01	0.15	0.30	0.10	0.1%
2.13	0.80	1.40	2.18	2.1%
1.51	1.00	1.50	5.49	5.2%
1.51	1.10	1.65	6.44	6.1%
1.50	1.45	2.18	4.48	4.3%
1.50	1.50	2.25	9.05	8.6%
1.50	1.55	2.33	10.09	9.6%
1.51	1.70	2.55	9.92	9.5%
1.50	1.70	2.55	10.71	10.2%
1.51	1.40	2.10	5.84	5.6%
1.52	1.20	1.80	5.27	5.0%
1.50	1.40	2.10	8.23	7.9%
1.54	1.50	2.25	6.10	5.8%
1.52	1.50	2.25	5.69	5.4%
1.51	1.45	2.18	4.48	4.3%
1.50	1.30	1.95	5.73	5.5%
1.68	0.50	0.75	3.14	3.0%
1.54	0.60	1.11	1.70	1.6%
2.32		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
32.09	1.7 (Max.)	33.75	104.84	100.0%

Manning's n = 0.0606
Hydraulic Radius= 1.05144131

STREAM NAME: Maroon Creek
XS LOCATION: 100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	33.75	34.43	2.0%
8.89	33.75	42.45	25.8%
8.91	33.75	41.80	23.9%
8.93	33.75	41.15	21.9%
8.95	33.75	40.50	20.0%
8.97	33.75	39.85	18.1%
8.99	33.75	39.21	16.2%
9.01	33.75	38.56	14.3%
9.03	33.75	37.92	12.4%
9.05	33.75	37.28	10.5%
9.07	33.75	36.65	8.6%
9.09	33.75	36.01	6.7%
9.10	33.75	35.69	5.8%
9.11	33.75	35.38	4.8%
9.12	33.75	35.06	3.9%
9.13	33.75	34.75	3.0%
9.14	33.75	34.43	2.0%
9.15	33.75	34.12	1.1%
9.16	33.75	33.81	0.2%
9.17	33.75	33.49	-0.7%
9.18	33.75	33.18	-1.7%
9.19	33.75	32.87	-2.6%
9.21	33.75	32.25	-4.4%
9.23	33.75	31.63	-6.3%
9.25	33.75	31.01	-8.1%
9.27	33.75	30.40	-9.9%
9.29	33.75	29.79	-11.7%
9.31	33.75	29.18	-13.5%
9.33	33.75	28.57	-15.3%
9.35	33.75	27.97	-17.1%
9.37	33.75	27.36	-18.9%
9.39	33.75	26.77	-20.7%

WATERLINE AT ZERO
AREA ERROR = 9.157

STREAM NAME: Maroon Creek
XS LOCATION: 100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER: 2

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.82	41.97	2.80	3.99	117.57	44.70	100.0%	2.63	673.07	5.72
	8.16	36.11	1.85	2.65	66.76	37.84	84.6%	1.76	292.91	4.39
	8.21	34.97	1.86	2.60	64.98	36.65	82.0%	1.77	286.01	4.40
	8.26	34.02	1.86	2.55	63.26	35.63	79.7%	1.78	278.68	4.41
	8.31	33.51	1.84	2.50	61.57	35.05	78.4%	1.76	269.32	4.37
	8.36	33.33	1.80	2.45	59.90	34.82	77.9%	1.72	258.42	4.31
	8.41	33.28	1.75	2.40	58.24	34.70	77.6%	1.68	247.10	4.24
	8.46	33.23	1.70	2.35	56.58	34.59	77.4%	1.64	235.98	4.17
	8.51	33.17	1.66	2.30	54.92	34.48	77.1%	1.59	225.05	4.10
	8.56	33.12	1.61	2.25	53.26	34.36	76.9%	1.55	214.31	4.02
	8.61	33.06	1.56	2.20	51.60	34.25	76.6%	1.51	203.79	3.95
	8.66	33.01	1.51	2.15	49.95	34.13	76.4%	1.46	193.46	3.87
	8.71	32.95	1.47	2.10	48.30	34.02	76.1%	1.42	183.34	3.80
	8.76	32.90	1.42	2.05	46.66	33.90	75.8%	1.38	173.44	3.72
	8.81	32.85	1.37	2.00	45.01	33.79	75.6%	1.33	163.74	3.64
	8.86	32.79	1.32	1.95	43.37	33.68	75.3%	1.29	154.26	3.56
	8.91	32.62	1.28	1.90	41.74	33.46	74.9%	1.25	145.29	3.48
	8.96	32.36	1.24	1.85	40.11	33.17	74.2%	1.21	136.80	3.41
	9.01	32.10	1.20	1.80	38.50	32.87	73.5%	1.17	128.53	3.34
	9.06	31.83	1.16	1.75	36.90	32.57	72.9%	1.13	120.48	3.27
	9.11	31.57	1.12	1.70	35.32	32.28	72.2%	1.09	112.67	3.19
WL	9.16	31.27	1.08	1.65	33.74	31.96	71.5%	1.06	105.12	3.12
	9.21	30.99	1.04	1.60	32.19	31.66	70.8%	1.02	97.79	3.04
	9.26	30.70	1.00	1.55	30.65	31.36	70.1%	0.98	90.68	2.96
	9.31	30.42	0.96	1.50	29.12	31.05	69.5%	0.94	83.81	2.88
	9.36	30.13	0.92	1.45	27.60	30.75	68.8%	0.90	77.18	2.80
	9.41	29.25	0.89	1.40	26.12	29.84	66.7%	0.88	71.81	2.75
	9.46	28.32	0.87	1.35	24.68	28.89	64.6%	0.85	66.77	2.71
	9.51	27.40	0.85	1.30	23.29	27.93	62.5%	0.83	61.97	2.66
	9.56	26.31	0.83	1.25	21.94	26.81	60.0%	0.82	57.69	2.63
	9.61	25.68	0.80	1.20	20.64	26.14	58.5%	0.79	52.99	2.57
	9.66	25.09	0.77	1.15	19.37	25.51	57.1%	0.76	48.45	2.50
	9.71	24.50	0.74	1.10	18.13	24.89	55.7%	0.73	44.12	2.43
	9.76	23.90	0.71	1.05	16.92	24.26	54.3%	0.70	40.00	2.36
	9.81	23.31	0.68	1.00	15.74	23.63	52.9%	0.67	36.08	2.29
	9.86	22.72	0.64	0.95	14.59	23.01	51.5%	0.63	32.37	2.22
	9.91	22.25	0.61	0.90	13.47	22.50	50.3%	0.60	28.75	2.13
	9.96	22.01	0.56	0.85	12.37	22.25	49.8%	0.56	25.11	2.03
	10.01	21.77	0.52	0.80	11.27	21.99	49.2%	0.51	21.69	1.92
	10.06	21.54	0.47	0.75	10.19	21.73	48.6%	0.47	18.47	1.81
	10.11	21.16	0.43	0.70	9.12	21.34	47.7%	0.43	15.54	1.70
	10.16	20.53	0.39	0.65	8.08	20.69	46.3%	0.39	12.96	1.60
	10.21	19.89	0.36	0.60	7.07	20.04	44.8%	0.35	10.59	1.50
	10.26	19.34	0.31	0.55	6.09	19.48	43.6%	0.31	8.42	1.38
	10.31	18.56	0.28	0.50	5.13	18.68	41.8%	0.27	6.52	1.27
	10.36	17.50	0.24	0.45	4.23	17.62	39.4%	0.24	4.91	1.16
	10.41	16.03	0.21	0.40	3.39	16.15	36.1%	0.21	3.59	1.06
	10.46	13.64	0.19	0.35	2.64	13.74	30.7%	0.19	2.65	1.00
	10.51	11.93	0.17	0.30	2.01	12.02	26.9%	0.17	1.83	0.91
	10.56	10.34	0.14	0.25	1.45	10.42	23.3%	0.14	1.17	0.81
	10.61	8.90	0.11	0.20	0.97	8.95	20.0%	0.11	0.66	0.68
	10.66	7.37	0.08	0.15	0.56	7.41	16.6%	0.08	0.30	0.54
	10.71	4.41	0.06	0.10	0.28	4.44	9.9%	0.06	0.13	0.47
	10.76	2.86	0.03	0.05	0.10	2.87	6.4%	0.03	0.03	0.31
	10.81	0.26	0.00	0.00	0.00	0.26	0.6%	0.00	0.00	0.04

3/3 = 28
2/3 = 15

STREAM NAME: Maroon Creek
XS LOCATION: 100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER: 2

Thorne-Zevenbergen D84 Correction Applied
Estimated D84 = 0.66

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

Velocity based on test of R/D84>1

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.82	41.97	2.80	3.99	117.57	44.70	100.0%	2.63	874.42	7.44
	8.16	36.11	1.85	2.65	66.76	37.84	84.6%	1.76	345.35	5.17
	8.21	34.97	1.86	2.60	64.98	36.65	82.0%	1.77	336.55	5.18
	8.26	34.02	1.86	2.55	63.26	35.63	79.7%	1.78	327.09	5.17
	8.31	33.51	1.84	2.50	61.57	35.05	78.4%	1.76	314.77	5.11
	8.36	33.33	1.80	2.45	59.90	34.82	77.9%	1.72	300.30	5.01
	8.41	33.28	1.75	2.40	58.24	34.70	77.6%	1.68	285.28	4.90
	8.46	33.23	1.70	2.35	56.58	34.59	77.4%	1.64	270.59	4.78
	8.51	33.17	1.66	2.30	54.92	34.48	77.1%	1.59	256.22	4.67
	8.56	33.12	1.61	2.25	53.26	34.36	76.9%	1.55	242.19	4.55
	8.61	33.06	1.56	2.20	51.60	34.25	76.6%	1.51	228.50	4.43
	8.66	33.01	1.51	2.15	49.95	34.13	76.4%	1.46	215.15	4.31
	8.71	32.95	1.47	2.10	48.30	34.02	76.1%	1.42	202.14	4.18
	8.76	32.90	1.42	2.05	46.66	33.90	75.8%	1.38	189.48	4.06
	8.81	32.85	1.37	2.00	45.01	33.79	75.6%	1.33	177.18	3.94
	8.86	32.79	1.32	1.95	43.37	33.68	75.3%	1.29	165.23	3.81
	8.91	32.62	1.28	1.90	41.74	33.46	74.9%	1.25	154.03	3.69
	8.96	32.36	1.24	1.85	40.11	33.17	74.2%	1.21	143.53	3.58
	9.01	32.10	1.20	1.80	38.50	32.87	73.5%	1.17	133.39	3.46
	9.06	31.83	1.16	1.75	36.90	32.57	72.9%	1.13	123.59	3.35
	9.11	31.57	1.12	1.70	35.32	32.28	72.2%	1.09	114.15	3.23
WL	9.16	31.27	1.08	1.65	33.74	31.96	71.5%	1.06	105.12	3.12
	9.21	30.99	1.04	1.60	32.19	31.66	70.8%	1.02	96.42	3.00
	9.26	30.70	1.00	1.55	30.65	31.36	70.1%	0.98	88.07	2.87
	9.31	30.42	0.96	1.50	29.12	31.05	69.5%	0.94	80.09	2.75
	9.36	30.13	0.92	1.45	27.60	30.75	68.8%	0.90	72.46	2.63
	9.41	29.25	0.89	1.40	26.12	29.84	66.7%	0.88	66.52	2.55
	9.46	28.32	0.87	1.35	24.68	28.89	64.6%	0.85	60.99	2.47
	9.51	27.40	0.85	1.30	23.29	27.93	62.5%	0.83	55.80	2.40
	9.56	26.31	0.83	1.25	21.94	26.81	60.0%	0.82	51.25	2.34
	9.61	25.68	0.80	1.20	20.64	26.14	58.5%	0.79	46.18	2.24
	9.66	25.09	0.77	1.15	19.37	25.51	57.1%	0.76	41.33	2.13
	9.71	24.50	0.74	1.10	18.13	24.89	55.7%	0.73	36.77	2.03
	9.76	23.90	0.71	1.05	16.92	24.26	54.3%	0.70	32.50	1.92
	9.81	23.31	0.68	1.00	15.74	23.63	52.9%	0.67	28.50	1.81
	9.86	22.72	0.64	0.95	14.59	23.01	51.5%	0.63	30.05	2.06
	9.91	22.25	0.61	0.90	13.47	22.50	50.3%	0.60	25.44	1.89
	9.96	22.01	0.56	0.85	12.37	22.25	49.8%	0.56	20.89	1.69
	10.01	21.77	0.52	0.80	11.27	21.99	49.2%	0.51	16.93	1.50
	10.06	21.54	0.47	0.75	10.19	21.73	48.6%	0.47	13.53	1.33
	10.11	21.16	0.43	0.70	9.12	21.34	47.7%	0.43	10.72	1.18
	10.16	20.53	0.39	0.65	8.08	20.69	46.3%	0.39	8.49	1.05
	10.21	19.89	0.36	0.60	7.07	20.04	44.8%	0.35	6.59	0.93
	10.26	19.34	0.31	0.55	6.09	19.48	43.6%	0.31	4.96	0.81
	10.31	18.56	0.28	0.50	5.13	18.68	41.8%	0.27	3.66	0.71
	10.36	17.50	0.24	0.45	4.23	17.62	39.4%	0.24	2.64	0.62
	10.41	16.03	0.21	0.40	3.39	16.15	36.1%	0.21	1.86	0.55
	10.46	13.64	0.19	0.35	2.64	13.74	30.7%	0.19	1.31	0.49
	10.51	11.93	0.17	0.30	2.01	12.02	26.9%	0.17	0.86	0.43
	10.56	10.34	0.14	0.25	1.45	10.42	23.3%	0.14	0.52	0.36
	10.61	8.90	0.11	0.20	0.97	8.95	20.0%	0.11	0.28	0.29
	10.66	7.37	0.08	0.15	0.56	7.41	16.6%	0.08	0.13	0.23
	10.71	4.41	0.06	0.10	0.28	4.44	9.9%	0.06	0.04	0.15
	10.76	2.86	0.03	0.05	0.10	2.87	6.4%	0.03	0.01	0.10
	10.81	0.26	0.00	0.00	0.00	0.26	0.6%	0.00	0.00	0.02

STREAM NAME: Maroon Creek
XS LOCATION: 100' d's of diversion - 39 11' 20.9" 106 51' 06.7"
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	104.84	cfs
CALCULATED FLOW (Qc)=	105.12	cfs
(Qm-Qc)/Qm * 100 =	-0.3	%
MEASURED WATERLINE (WLm)=	9.14	ft
CALCULATED WATERLINE (WLc)=	9.16	ft
(WLm-WLc)/WLm * 100 =	-0.2	%
MAX MEASURED DEPTH (Dm)=	1.70	ft
MAX CALCULATED DEPTH (Dc)=	1.65	ft
(Dm-Dc)/Dm * 100	2.8	%
MEAN VELOCITY=	3.12	ft/sec
MANNING'S N=	0.061	
SLOPE=	0.01501104	ft/ft
.4 * Qm =	41.9	cfs
2.5 * Qm=	262.1	cfs

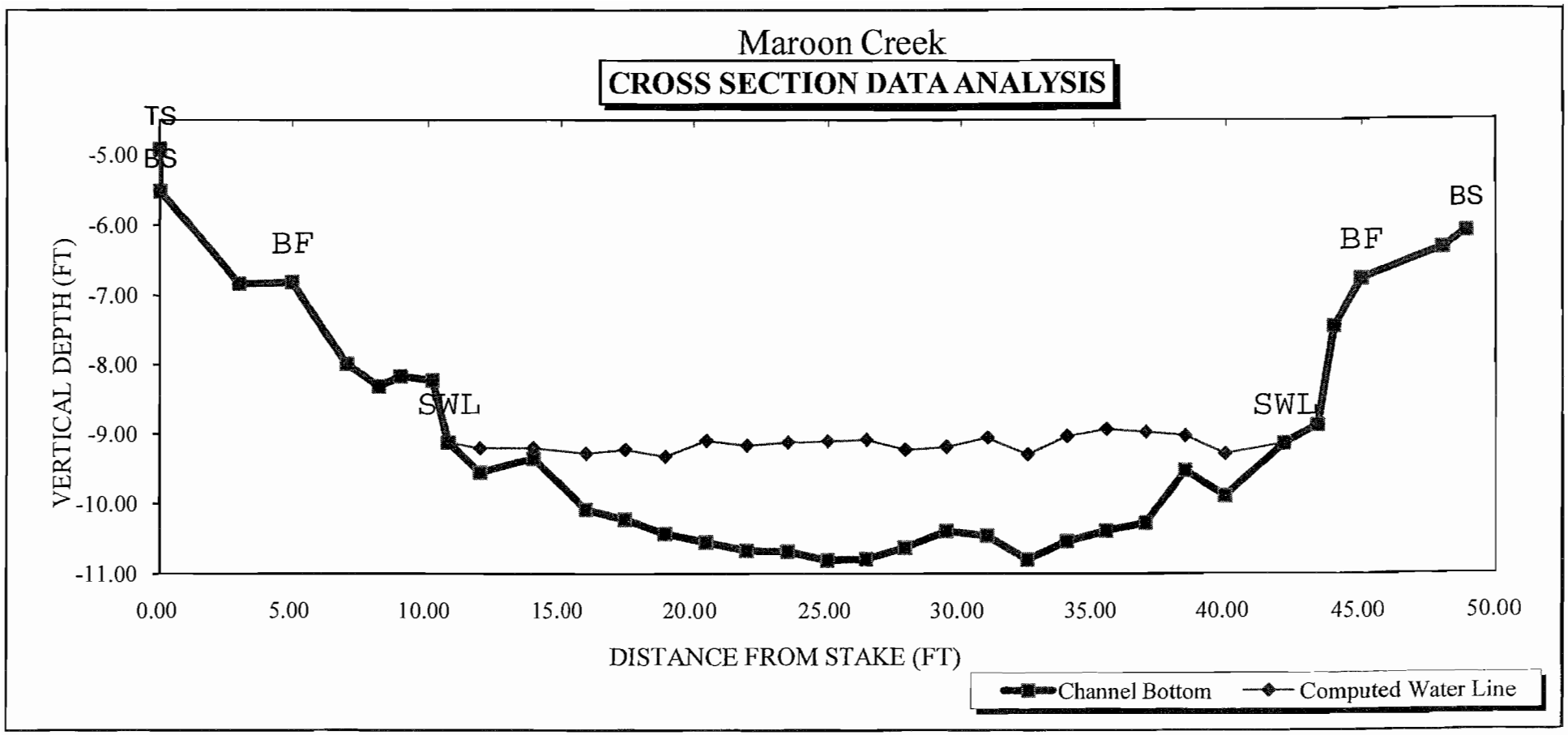
RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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


Maroon Creek
CROSS SECTION DATA ANALYSIS
TS
BS
BF
SWL
SWL
BF
BS
-5.00
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
VERTICAL DEPTH (FT)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

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

LOCATION INFORMATION

STREAM NAME:	Maroon Creek (note: high flow)
XS LOCATION:	100 yds upstream of highway crossing 1.5 m SW of Aspen
XS NUMBER:	2
DATE:	5-Aug-85
OBSERVERS:	Puttman, Hodgson
1/4 SEC:	SE
SECTION:	15
TWP:	10 S
RANGE:	85 W
PM:	0
COUNTY:	Pitkin
WATERSHED:	Roaring Fork-Colo Riv
DIVISION:	5
DOW CODE:	0
USGS MAP:	Aspen
USFS MAP:	White River

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	22	

CHANNEL PROFILE DATA

SLOPE:	0.0168

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

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

STREAM NAME: Maroon Creek (note: high flow)
XS LOCATION: 100 yds upstream of highway crossing 1.5 m SW of Aspen
XS NUMBER: 2

DATA POINTS= 22

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
1 SRB	0.00	0.40			0.00		0.00	0.00	0.0%
	3.00	0.95			0.00		0.00	0.00	0.0%
WL	3.20	1.00	0.00	0.00	0.00		0.00	0.00	0.0%
	6.00	1.25	0.30	2.30	2.81	0.30	0.87	2.00	1.1%
	9.00	1.40	0.50	1.80	3.00	0.50	1.50	2.70	1.5%
	12.00	1.50	0.60	2.40	3.00	0.60	1.80	4.32	2.4%
	15.00	1.70	1.00	2.80	3.01	1.00	3.00	8.40	4.8%
	18.00	2.20	1.50	2.60	3.04	1.50	4.50	11.70	6.6%
	21.00	1.70	1.00	3.30	3.04	1.00	3.00	9.90	5.6%
	24.00	2.20	1.50	4.30	3.04	1.50	4.50	19.35	10.9%
	27.00	2.50	1.80	4.20	3.01	1.80	5.40	22.68	12.8%
	30.00	2.40	1.70	5.50	3.00	1.70	5.10	28.05	15.9%
	33.00	2.30	1.60	2.60	3.00	1.60	4.80	12.48	7.1%
	36.00	2.20	1.40	4.80	3.00	1.40	4.20	20.16	11.4%
	39.00	2.30	1.20	4.50	3.00	1.20	3.60	16.20	9.2%
	42.00	1.60	1.00	4.00	3.08	1.00	3.00	12.00	6.8%
	45.00	1.30	0.60	2.60	3.01	0.60	1.80	4.68	2.6%
	48.00	1.40	0.50	0.90	3.00	0.50	1.50	1.35	0.8%
	51.00	1.45	0.45	0.60	3.00	0.45	1.28	0.77	0.4%
WL	53.70	1.05	0.00	0.00	2.73		0.00	0.00	0.0%
	54.00	0.50			0.00		0.00	0.00	0.0%
1 SLB	55.00	0.35			0.00		0.00	0.00	0.0%
TOTALS ----------					50.80	1.8 (Max.)	49.85	176.74	100.0%

Manning's n = 0.0537
Hydraulic Radius= 0.98142412

STREAM NAME: Maroon Creek (note: high flow)
XS LOCATION: 100 yds upstream of highway crossing 1.5 m SW of Aspen
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	49.85	44.08	-11.6%
0.80	49.85	56.85	14.0%
0.82	49.85	55.82	12.0%
0.84	49.85	54.79	9.9%
0.86	49.85	53.76	7.8%
0.88	49.85	52.73	5.8%
0.90	49.85	51.70	3.7%
0.92	49.85	50.68	1.7%
0.94	49.85	49.66	-0.4%
0.96	49.85	48.64	-2.4%
0.98	49.85	47.62	-4.5%
1.00	49.85	46.61	-6.5%
1.01	49.85	46.10	-7.5%
1.02	49.85	45.60	-8.5%
1.03	49.85	45.09	-9.6%
1.04	49.85	44.59	-10.6%
1.05	49.85	44.08	-11.6%
1.06	49.85	43.58	-12.6%
1.07	49.85	43.08	-13.6%
1.08	49.85	42.58	-14.6%
1.09	49.85	42.08	-15.6%
1.10	49.85	41.58	-16.6%
1.12	49.85	40.59	-18.6%
1.14	49.85	39.61	-20.6%
1.16	49.85	38.63	-22.5%
1.18	49.85	37.66	-24.5%
1.20	49.85	36.70	-26.4%
1.22	49.85	35.74	-28.3%
1.24	49.85	34.79	-30.2%
1.26	49.85	33.85	-32.1%
1.28	49.85	32.91	-34.0%
1.30	49.85	31.98	-35.9%

WATERLINE AT ZERO
AREA ERROR = 0.940

STREAM NAME: Maroon Creek (note: high flow)
XS LOCATION: 100 yds upstream of highway crossing 1.5 m SW of Aspen
XS NUMBER: 2

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	0.40	54.69	1.43	2.28	78.24	55.41	100.0%	1.41	353.51	4.52
	0.44	54.25	1.40	2.24	76.08	54.96	99.2%	1.38	339.24	4.46
	0.49	53.69	1.37	2.19	73.38	54.39	98.2%	1.35	321.66	4.38
	0.54	53.27	1.33	2.14	70.71	53.95	97.4%	1.31	304.00	4.30
	0.59	52.99	1.28	2.09	68.05	53.64	96.8%	1.27	286.32	4.21
	0.64	52.71	1.24	2.04	65.41	53.32	96.2%	1.23	269.10	4.11
	0.69	52.43	1.20	1.99	62.78	53.00	95.7%	1.18	252.32	4.02
	0.74	52.14	1.15	1.94	60.17	52.68	95.1%	1.14	235.99	3.92
	0.79	51.86	1.11	1.89	57.57	52.37	94.5%	1.10	220.13	3.82
	0.84	51.58	1.07	1.84	54.98	52.05	93.9%	1.06	204.72	3.72
	0.89	51.30	1.02	1.79	52.41	51.73	93.4%	1.01	189.78	3.62
WL	0.94	51.01	0.98	1.74	49.85	51.42	92.8%	0.97	175.31	3.52
	0.99	50.73	0.93	1.69	47.31	51.10	92.2%	0.93	161.32	3.41
	1.04	50.52	0.89	1.64	44.78	50.85	91.8%	0.88	147.68	3.30
	1.09	49.86	0.85	1.59	42.27	50.17	90.5%	0.84	135.33	3.20
	1.14	49.05	0.81	1.54	39.79	49.36	89.1%	0.81	123.74	3.11
	1.19	48.24	0.77	1.49	37.36	48.54	87.6%	0.77	112.64	3.01
	1.24	47.43	0.74	1.44	34.97	47.72	86.1%	0.73	102.03	2.92
	1.29	46.62	0.70	1.39	32.62	46.91	84.7%	0.70	91.90	2.82
	1.34	45.68	0.66	1.34	30.31	45.96	82.9%	0.66	82.42	2.72
	1.39	44.53	0.63	1.29	28.05	44.81	80.9%	0.63	73.70	2.63
	1.44	41.82	0.62	1.24	25.88	42.08	75.9%	0.61	67.18	2.60
	1.49	37.08	0.64	1.19	23.88	37.33	67.4%	0.64	63.66	2.67
	1.54	33.83	0.65	1.14	22.14	34.08	61.5%	0.65	59.63	2.69
	1.59	32.16	0.64	1.09	20.49	32.41	58.5%	0.63	54.20	2.64
	1.64	30.65	0.62	1.04	18.93	30.90	55.8%	0.61	49.00	2.59
	1.69	29.51	0.59	0.99	17.42	29.75	53.7%	0.59	43.78	2.51
	1.74	28.40	0.56	0.94	15.98	28.64	51.7%	0.56	38.86	2.43
	1.79	27.51	0.53	0.89	14.58	27.74	50.1%	0.53	34.08	2.34
	1.84	26.62	0.50	0.84	13.22	26.84	48.4%	0.49	29.61	2.24
	1.89	25.88	0.46	0.79	11.91	26.08	47.1%	0.46	25.35	2.13
	1.94	24.77	0.43	0.74	10.64	24.96	45.0%	0.43	21.64	2.03
	1.99	23.67	0.40	0.69	9.43	23.84	43.0%	0.40	18.25	1.93
	2.04	22.57	0.37	0.64	8.28	22.72	41.0%	0.36	15.15	1.83
	2.09	21.47	0.33	0.59	7.18	21.60	39.0%	0.33	12.35	1.72
	2.14	20.36	0.30	0.54	6.13	20.48	37.0%	0.30	9.85	1.61
	2.19	19.26	0.27	0.49	5.14	19.36	34.9%	0.27	7.62	1.48
	2.24	18.16	0.23	0.44	4.20	18.24	32.9%	0.23	5.67	1.35
	2.29	17.06	0.19	0.39	3.32	17.12	30.9%	0.19	4.00	1.20
	2.34	15.95	0.16	0.34	2.50	16.00	28.9%	0.16	2.60	1.04
	2.39	13.64	0.13	0.29	1.74	13.66	24.7%	0.13	1.58	0.91
	2.44	9.82	0.12	0.24	1.15	9.83	17.7%	0.12	0.99	0.86
	2.49	7.51	0.10	0.19	0.73	7.52	13.6%	0.10	0.55	0.76
	2.54	5.59	0.07	0.14	0.40	5.60	10.1%	0.07	0.25	0.62
	2.59	3.67	0.05	0.09	0.17	3.68	6.6%	0.05	0.08	0.46
	2.64	1.70	0.02	0.04	0.04	1.70	3.1%	0.02	0.01	0.28

3/3 - 38

2/3 - 34

STREAM NAME: Maroon Creek (note: high flow)
XS LOCATION: 100 yds upstream of highway crossing 1.5 m SW of Aspen
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	176.74	cfs
CALCULATED FLOW (Qc)=	175.31	cfs
(Qm-Qc)/Qm * 100 =	0.8	%
MEASURED WATERLINE (WLm)=	1.05	ft
CALCULATED WATERLINE (WLc)=	0.94	ft
(WLm-WLc)/WLm * 100 =	10.8	%
MAX MEASURED DEPTH (Dm)=	1.80	ft
MAX CALCULATED DEPTH (Dc)=	1.74	ft
(Dm-Dc)/Dm * 100	3.2	%
MEAN VELOCITY=	3.52	ft/sec
MANNING'S N=	0.054	
SLOPE=	0.0168	ft/ft
.4 * Qm =	70.7	cfs
2.5 * Qm=	441.9	cfs

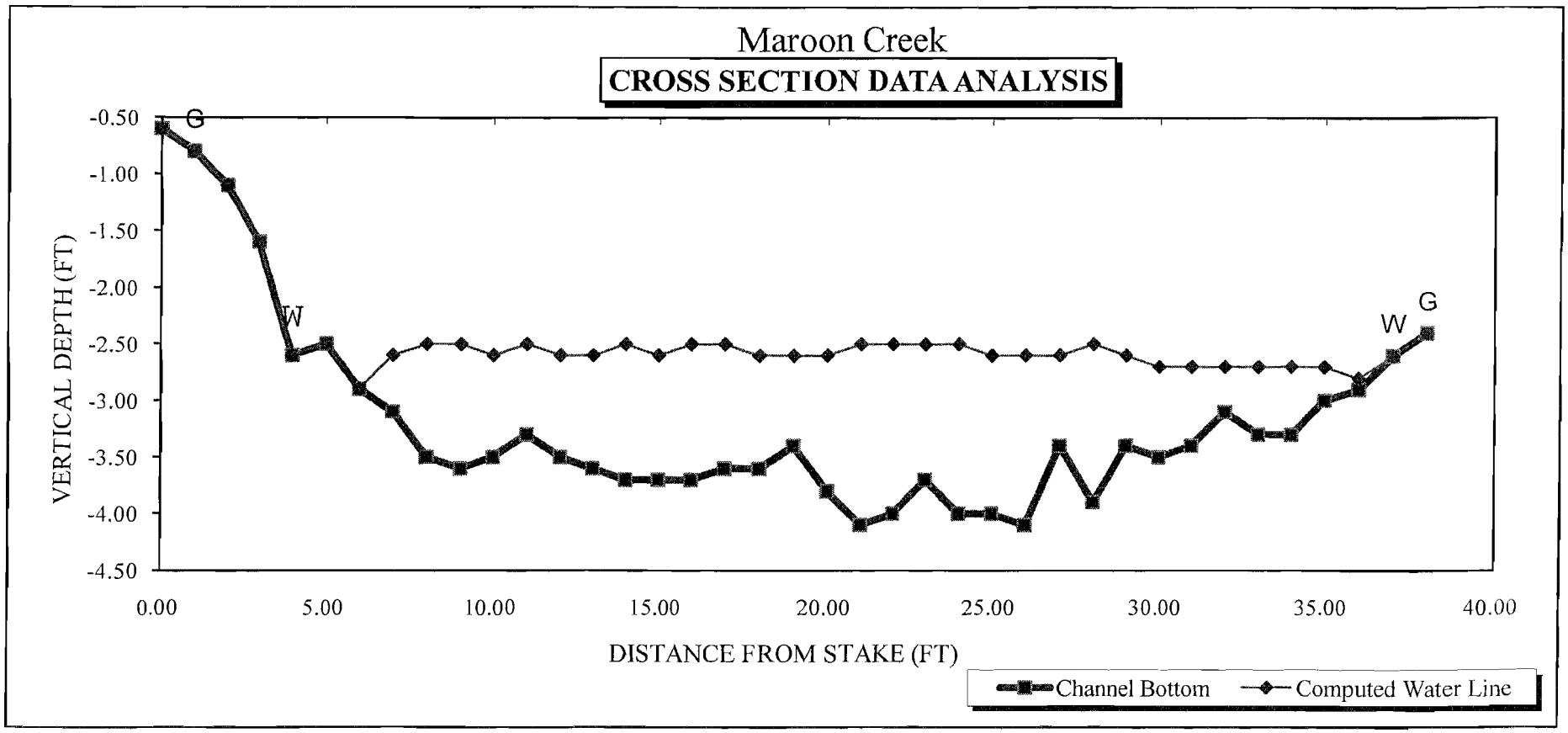
RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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


Maroon Creek
CROSS SECTION DATA ANALYSIS
VERTICAL DEPTH (FT)
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
G
W
W
G
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

3/3 = 16.8

2/3 = 12.4

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

LOCATION INFORMATION

STREAM NAME:	Maroon Creek (Right channel / looking u/s)
XS LOCATION:	below Highway 82 Bridge
XS NUMBER:	1
DATE:	12-Aug-09
OBSERVERS:	Uppendahl & Graf
1/4 SEC:	0
SECTION:	0
TWP:	0
RANGE:	0
PM:	0
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	5
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

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

TAPE WT:	0.0106
TENSION:	99999

CHANNEL PROFILE DATA

SLOPE:	0.01484716

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

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

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

DATA POINTS= 24

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
Pin	76.50	5.40			0.00		0.00	0.00	0.0%
	89.40	5.88			0.00		0.00	0.00	0.0%
	99.00	6.21			0.00		0.00	0.00	0.0%
1 GL	103.20	6.84			0.00		0.00	0.00	0.0%
	104.20	7.95			0.00		0.00	0.00	0.0%
SWL	106.30	8.37	0.00	0.00	0.00		0.00	0.00	0.0%
	109.00	8.49	0.15	0.24	2.70	0.15	0.43	0.10	0.4%
	112.00	8.62	0.25	1.41	3.00	0.25	0.75	1.06	3.9%
	115.00	8.98	0.50	0.53	3.02	0.50	1.50	0.80	2.9%
	118.00	9.21	0.80	1.17	3.01	0.80	2.40	2.81	10.4%
	121.00	9.04	0.80	0.80	3.00	0.80	2.40	1.92	7.1%
	124.00	8.80	0.55	2.60	3.01	0.55	1.65	4.29	15.9%
	127.00	8.76	0.45	1.05	3.00	0.45	1.35	1.42	5.3%
	130.00	9.20	1.00	1.45	3.03	1.00	3.00	4.35	16.1%
	133.00	9.14	0.70	1.88	3.00	0.70	2.10	3.95	14.6%
	136.00	9.08	0.90	1.38	3.00	0.90	2.70	3.73	13.8%
	139.00	9.02	0.60	1.31	3.00	0.60	1.80	2.36	8.7%
	142.00	8.91	0.45	0.16	3.00	0.45	1.13	0.18	0.7%
SWL	144.00	8.35	0.00	0.00	2.08		0.00	0.00	0.0%
	148.50	7.12			0.00		0.00	0.00	0.0%
1 GL	149.20	6.77			0.00		0.00	0.00	0.0%
	152.00	6.26			0.00		0.00	0.00	0.0%
BS	153.40	5.68			0.00		0.00	0.00	0.0%
TS	153.41	4.96			0.00		0.00	0.00	0.0%
TOTALS ----------					37.86	1 (Max.)	21.20	26.95	100.0%

Manning's n = 0.0968
Hydraulic Radius= 0.55997492

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	21.20	20.50	-3.3%
8.11	21.20	30.20	42.4%
8.13	21.20	29.40	38.7%
8.15	21.20	28.61	34.9%
8.17	21.20	27.82	31.2%
8.19	21.20	27.04	27.5%
8.21	21.20	26.25	23.8%
8.23	21.20	25.48	20.2%
8.25	21.20	24.70	16.5%
8.27	21.20	23.93	12.9%
8.29	21.20	23.16	9.2%
8.31	21.20	22.40	5.6%
8.32	21.20	22.02	3.8%
8.33	21.20	21.64	2.0%
8.34	21.20	21.26	0.3%
8.35	21.20	20.88	-1.5%
8.36	21.20	20.50	-3.3%
8.37	21.20	20.12	-5.1%
8.38	21.20	19.75	-6.9%
8.39	21.20	19.38	-8.6%
8.40	21.20	19.01	-10.4%
8.41	21.20	18.64	-12.1%
8.43	21.20	17.91	-15.5%
8.45	21.20	17.20	-18.9%
8.47	21.20	16.49	-22.2%
8.49	21.20	15.80	-25.5%
8.51	21.20	15.11	-28.7%
8.53	21.20	14.44	-31.9%
8.55	21.20	13.77	-35.0%
8.57	21.20	13.12	-38.1%
8.59	21.20	12.48	-41.1%
8.61	21.20	11.85	-44.1%

WATERLINE AT ZERO
AREA ERROR = 8.341

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.84	45.86	1.86	2.37	85.24	46.79	100.0%	1.82	237.89	2.79
	7.34	44.04	1.42	1.87	62.65	44.65	95.4%	1.40	146.92	2.35
	7.39	43.81	1.38	1.82	60.45	44.39	94.9%	1.36	138.97	2.30
	7.44	43.58	1.34	1.77	58.27	44.14	94.3%	1.32	131.20	2.25
	7.49	43.35	1.29	1.72	56.09	43.88	93.8%	1.28	123.63	2.20
	7.54	43.13	1.25	1.67	53.93	43.62	93.2%	1.24	116.24	2.16
	7.59	42.90	1.21	1.62	51.78	43.36	92.7%	1.19	109.05	2.11
	7.64	42.67	1.16	1.57	49.64	43.11	92.1%	1.15	102.05	2.06
	7.69	42.44	1.12	1.52	47.51	42.85	91.6%	1.11	95.24	2.00
	7.74	42.21	1.08	1.47	45.40	42.59	91.0%	1.07	88.63	1.95
	7.79	41.99	1.03	1.42	43.29	42.34	90.5%	1.02	82.22	1.90
	7.84	41.76	0.99	1.37	41.20	42.08	89.9%	0.98	76.01	1.84
	7.89	41.53	0.94	1.32	39.12	41.82	89.4%	0.94	70.00	1.79
	7.94	41.30	0.90	1.27	37.04	41.57	88.8%	0.89	64.19	1.73
	7.99	40.90	0.86	1.22	34.99	41.15	88.0%	0.85	58.76	1.68
	8.04	40.47	0.81	1.17	32.95	40.71	87.0%	0.81	53.56	1.63
	8.09	40.04	0.77	1.12	30.94	40.26	86.1%	0.77	48.57	1.57
	8.14	39.61	0.73	1.07	28.95	39.82	85.1%	0.73	43.80	1.51
	8.19	39.17	0.69	1.02	26.98	39.38	84.2%	0.69	39.24	1.45
	8.24	38.74	0.65	0.97	25.03	38.93	83.2%	0.64	34.90	1.39
	8.29	38.31	0.60	0.92	23.11	38.49	82.3%	0.60	30.77	1.33
WL	8.34	37.87	0.56	0.87	21.20	38.04	81.3%	0.56	26.87	1.27
	8.39	37.07	0.52	0.82	19.32	37.23	79.6%	0.52	23.35	1.21
	8.44	35.77	0.49	0.77	17.50	35.92	76.8%	0.49	20.28	1.16
	8.49	34.46	0.46	0.72	15.75	34.60	74.0%	0.46	17.43	1.11
	8.54	33.13	0.42	0.67	14.06	33.26	71.1%	0.42	14.81	1.05
	8.59	31.80	0.39	0.62	12.43	31.92	68.2%	0.39	12.41	1.00
	8.64	30.78	0.35	0.57	10.87	30.90	66.0%	0.35	10.14	0.93
	8.69	30.19	0.31	0.52	9.35	30.29	64.7%	0.31	7.99	0.85
	8.74	29.59	0.27	0.47	7.86	29.69	63.4%	0.26	6.06	0.77
	8.79	26.43	0.24	0.42	6.43	26.51	56.7%	0.24	4.68	0.73
	8.84	24.33	0.21	0.37	5.17	24.40	52.1%	0.21	3.44	0.67
	8.89	22.77	0.18	0.32	4.00	22.82	48.8%	0.18	2.34	0.59
	8.94	20.46	0.14	0.27	2.91	20.50	43.8%	0.14	1.48	0.51
	8.99	17.66	0.11	0.22	1.95	17.69	37.8%	0.11	0.84	0.43
	9.04	14.19	0.08	0.17	1.15	14.21	30.4%	0.08	0.40	0.35
	9.09	9.81	0.06	0.12	0.55	9.83	21.0%	0.06	0.15	0.27
	9.14	5.44	0.03	0.07	0.17	5.44	11.6%	0.03	0.03	0.19
	9.19	1.06	0.01	0.02	0.01	1.06	2.3%	0.01	0.00	0.07

3/3 = 16.8
2/3 = 12.4

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

Thorne-Zevenbergen D84 Correction Applied
Estimated D84 = 0.92

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

Velocity based on test of R/D84>1

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.84	45.86	1.86	2.37	85.24	46.79	100.0%	1.82	383.95	4.50
	7.34	44.04	1.42	1.87	62.65	44.65	95.4%	1.40	214.93	3.43
	7.39	43.81	1.38	1.82	60.45	44.39	94.9%	1.36	200.76	3.32
	7.44	43.58	1.34	1.77	58.27	44.14	94.3%	1.32	187.03	3.21
	7.49	43.35	1.29	1.72	56.09	43.88	93.8%	1.28	173.75	3.10
	7.54	43.13	1.25	1.67	53.93	43.62	93.2%	1.24	160.93	2.98
	7.59	42.90	1.21	1.62	51.78	43.36	92.7%	1.19	148.56	2.87
	7.64	42.67	1.16	1.57	49.64	43.11	92.1%	1.15	136.65	2.75
	7.69	42.44	1.12	1.52	47.51	42.85	91.6%	1.11	125.20	2.64
	7.74	42.21	1.08	1.47	45.40	42.59	91.0%	1.07	114.21	2.52
	7.79	41.99	1.03	1.42	43.29	42.34	90.5%	1.02	103.69	2.40
	7.84	41.76	0.99	1.37	41.20	42.08	89.9%	0.98	93.64	2.27
	7.89	41.53	0.94	1.32	39.12	41.82	89.4%	0.94	84.07	2.15
	7.94	41.30	0.90	1.27	37.04	41.57	88.8%	0.89	85.75	2.31
	7.99	40.90	0.86	1.22	34.99	41.15	88.0%	0.85	75.73	2.16
	8.04	40.47	0.81	1.17	32.95	40.71	87.0%	0.81	66.63	2.02
	8.09	40.04	0.77	1.12	30.94	40.26	86.1%	0.77	58.29	1.88
	8.14	39.61	0.73	1.07	28.95	39.82	85.1%	0.73	50.69	1.75
	8.19	39.17	0.69	1.02	26.98	39.38	84.2%	0.69	43.77	1.62
	8.24	38.74	0.65	0.97	25.03	38.93	83.2%	0.64	37.52	1.50
	8.29	38.31	0.60	0.92	23.11	38.49	82.3%	0.60	31.90	1.38
WL	8.34	37.87	0.56	0.87	21.20	38.04	81.3%	0.56	26.87	1.27
	8.39	37.07	0.52	0.82	19.32	37.23	79.6%	0.52	22.66	1.17
	8.44	35.77	0.49	0.77	17.50	35.92	76.8%	0.49	19.21	1.10
	8.49	34.46	0.46	0.72	15.75	34.60	74.0%	0.46	16.12	1.02
	8.54	33.13	0.42	0.67	14.06	33.26	71.1%	0.42	13.37	0.95
	8.59	31.80	0.39	0.62	12.43	31.92	68.2%	0.39	10.93	0.88
	8.64	30.78	0.35	0.57	10.87	30.90	66.0%	0.35	8.73	0.80
	8.69	30.19	0.31	0.52	9.35	30.29	64.7%	0.31	6.75	0.72
	8.74	29.59	0.27	0.47	7.86	29.69	63.4%	0.26	5.10	0.65
	8.79	26.43	0.24	0.42	6.43	26.51	56.7%	0.24	3.85	0.60
	8.84	24.33	0.21	0.37	5.17	24.40	52.1%	0.21	2.81	0.54
	8.89	22.77	0.18	0.32	4.00	22.82	48.8%	0.18	1.95	0.49
	8.94	20.46	0.14	0.27	2.91	20.50	43.8%	0.14	1.26	0.43
	8.99	17.66	0.11	0.22	1.95	17.69	37.8%	0.11	0.75	0.38
	9.04	14.19	0.08	0.17	1.15	14.21	30.4%	0.08	0.38	0.33
	9.09	9.81	0.06	0.12	0.55	9.83	21.0%	0.06	0.14	0.26
	9.14	5.44	0.03	0.07	0.17	5.44	11.6%	0.03	0.03	0.18
	9.19	1.06	0.01	0.02	0.01	1.06	2.3%	0.01	0.00	0.05

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	26.95	cfs
CALCULATED FLOW (Qc)=	26.87	cfs
(Qm-Qc)/Qm * 100 =	0.3	%
MEASURED WATERLINE (WLm)=	8.36	ft
CALCULATED WATERLINE (WLc)=	8.34	ft
(WLm-WLc)/WLm * 100 =	0.2	%
MAX MEASURED DEPTH (Dm)=	1.00	ft
MAX CALCULATED DEPTH (Dc)=	0.87	ft
(Dm-Dc)/Dm * 100	13.1	%
MEAN VELOCITY=	1.27	ft/sec
MANNING'S N=	0.097	
SLOPE=	0.01484716	ft/ft
.4 * Qm =	10.8	cfs
2.5 * Qm=	67.4	cfs

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

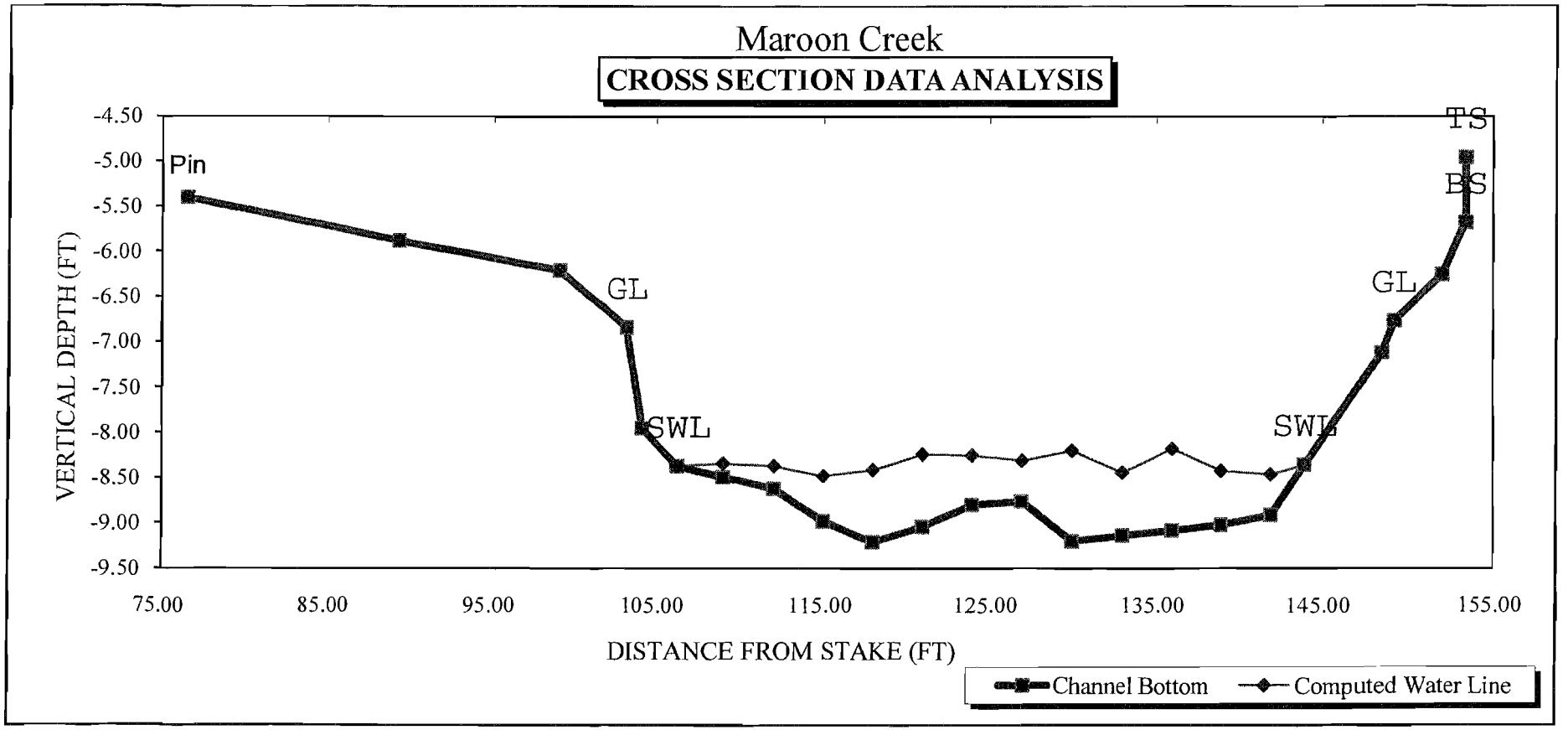
FLOW (CFS)	PERIOD
==========	========
_____	_____
_____	_____
_____	_____
_____	_____

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

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

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

105 S 25%


Maroon Creek
CROSS SECTION DATA ANALYSIS
VERTICAL DEPTH (FT)
-4.50
-5.00
-5.50
-6.00
-6.50
-7.00
-7.50
-8.00
-8.50
-9.00
-9.50
Pin
GL
SWL
SWL
GL
TS
BS
75.00
85.00
95.00
105.00
115.00
125.00
135.00
145.00
155.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

3/3 = 30.5

2/3 ~ 8.3

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

LOCATION INFORMATION

STREAM NAME:	Maroon Creek (Left channel/looking u/s)
XS LOCATION:	below Highway 82 Bridge
XS NUMBER:	1
DATE:	12-Aug-09
OBSERVERS:	Uppendahl & Graf
1/4 SEC:	0
SECTION:	0
TWP:	0
RANGE:	0
PM:	0
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	5
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

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

TAPE WT:	0.0106
TENSION:	99999

CHANNEL PROFILE DATA

SLOPE:	0.01484716

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

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

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

DATA POINTS= 28

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	TS	0.00	2.26			0.00		0.00	0.00	0.0%
	BS	0.01	2.27			0.00		0.00	0.00	0.0%
		4.00	3.59			0.00		0.00	0.00	0.0%
		6.50	3.99			0.00		0.00	0.00	0.0%
		14.00	4.85			0.00		0.00	0.00	0.0%
1	GL	20.00	5.48			0.00		0.00	0.00	0.0%
		23.00	6.08			0.00		0.00	0.00	0.0%
	SWL	24.10	6.56	0.00	0.00	0.00		0.00	0.00	0.0%
		26.00	6.90	0.60	0.75	1.93	0.60	1.17	0.88	1.1%
		28.00	7.15	0.75	2.06	2.02	0.75	1.50	3.09	3.9%
		30.00	7.46	0.90	1.31	2.02	0.90	1.80	2.36	3.0%
		32.00	7.67	1.20	2.66	2.01	1.20	2.40	6.38	8.2%
		34.00	7.62	1.10	2.20	2.00	1.10	2.20	4.84	6.2%
		36.00	7.48	0.90	3.76	2.00	0.90	1.80	6.77	8.6%
		38.00	7.64	0.95	4.07	2.01	0.95	1.90	7.73	9.9%
		40.00	7.71	1.00	4.30	2.00	1.00	2.00	8.60	11.0%
		42.00	7.72	1.15	3.75	2.00	1.15	2.30	8.63	11.0%
		44.00	7.50	0.85	3.41	2.01	0.85	1.70	5.80	7.4%
		46.00	7.51	1.00	3.48	2.00	1.00	2.00	6.96	8.9%
		48.00	7.49	0.75	4.24	2.00	0.75	1.50	6.36	8.1%
		50.00	7.31	0.80	3.19	2.01	0.80	1.60	5.10	6.5%
		52.00	7.30	0.70	2.02	2.00	0.70	1.40	2.83	3.6%
		54.00	7.42	0.60	1.44	2.00	0.60	1.35	1.94	2.5%
	SWL	56.50	6.55	0.00	0.00	2.65		0.00	0.00	0.0%
		65.00	6.52			0.00		0.00	0.00	0.0%
		67.80	6.34			0.00		0.00	0.00	0.0%
	GL	70.50	5.53			0.00		0.00	0.00	0.0%
	PIN	76.00	5.40			0.00		0.00	0.00	0.0%
	TOTALS ----------					32.66	1.2 (Max.)	26.62	78.27	100.0%

Manning's n = 0.0537
Hydraulic Radius= 0.81494627

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	26.62	27.31	2.6%
6.31	26.62	37.79	42.0%
6.33	26.62	36.90	38.6%
6.35	26.62	36.02	35.3%
6.37	26.62	35.14	32.0%
6.39	26.62	34.27	28.7%
6.41	26.62	33.40	25.5%
6.43	26.62	32.55	22.3%
6.45	26.62	31.70	19.1%
6.47	26.62	30.85	15.9%
6.49	26.62	30.02	12.8%
6.51	26.62	29.19	9.6%
6.52	26.62	28.78	8.1%
6.53	26.62	28.37	6.6%
6.54	26.62	27.99	5.1%
6.55	26.62	27.64	3.8%
6.56	26.62	27.31	2.6%
6.57	26.62	26.98	1.4%
6.58	26.62	26.66	0.2%
6.59	26.62	26.34	-1.1%
6.60	26.62	26.02	-2.3%
6.61	26.62	25.70	-3.5%
6.63	26.62	25.06	-5.9%
6.65	26.62	24.42	-8.2%
6.67	26.62	23.79	-10.6%
6.69	26.62	23.17	-13.0%
6.71	26.62	22.54	-15.3%
6.73	26.62	21.92	-17.7%
6.75	26.62	21.30	-20.0%
6.77	26.62	20.69	-22.3%
6.79	26.62	20.08	-24.6%
6.81	26.62	19.47	-26.9%

WATERLINE AT ZERO
AREA ERROR = 6.576

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

Constant Manning's n

STAGING TABLE

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	5.53	50.25	1.48	2.19	74.30	50.79	100.0%	1.46	322.66	4.34
	5.58	49.86	1.44	2.14	71.98	50.40	99.2%	1.43	307.66	4.27
	5.63	49.45	1.41	2.09	69.50	49.97	98.4%	1.39	291.84	4.20
	5.68	49.03	1.37	2.04	67.04	49.54	97.5%	1.35	276.39	4.12
	5.73	48.61	1.33	1.99	64.60	49.11	96.7%	1.32	261.33	4.05
	5.78	48.20	1.29	1.94	62.18	48.68	95.8%	1.28	246.66	3.97
	5.83	47.78	1.25	1.89	59.78	48.25	95.0%	1.24	232.36	3.89
	5.88	47.36	1.21	1.84	57.40	47.82	94.2%	1.20	218.46	3.81
	5.93	46.95	1.17	1.79	55.04	47.39	93.3%	1.16	204.93	3.72
	5.98	46.53	1.13	1.74	52.70	46.97	92.5%	1.12	191.80	3.64
	6.03	46.11	1.09	1.69	50.39	46.54	91.6%	1.08	179.05	3.55
	6.08	45.70	1.05	1.64	48.09	46.11	90.8%	1.04	166.69	3.47
	6.13	45.41	1.01	1.59	45.81	45.80	90.2%	1.00	154.43	3.37
	6.18	45.12	0.97	1.54	43.55	45.50	89.6%	0.96	142.54	3.27
	6.23	44.84	0.92	1.49	41.30	45.20	89.0%	0.91	131.06	3.17
	6.28	44.56	0.88	1.44	39.07	44.90	88.4%	0.87	119.99	3.07
	6.33	44.28	0.83	1.39	36.85	44.60	87.8%	0.83	109.32	2.97
	6.38	43.56	0.80	1.34	34.65	43.86	86.4%	0.79	99.77	2.88
	6.43	42.66	0.76	1.29	32.49	42.96	84.6%	0.76	90.89	2.80
	6.48	41.77	0.73	1.24	30.38	42.06	82.8%	0.72	82.43	2.71
	6.53	39.19	0.72	1.19	28.32	39.46	77.7%	0.72	76.49	2.70
WL	6.58	32.23	0.83	1.14	26.62	32.49	64.0%	0.82	78.54	2.95
	6.63	31.81	0.79	1.09	25.02	32.06	63.1%	0.78	71.47	2.86
	6.68	31.39	0.75	1.04	23.44	31.62	62.3%	0.74	64.70	2.76
	6.73	30.96	0.71	0.99	21.88	31.18	61.4%	0.70	58.22	2.66
	6.78	30.54	0.67	0.94	20.34	30.75	60.5%	0.66	52.05	2.56
	6.83	30.12	0.63	0.89	18.83	30.31	59.7%	0.62	46.18	2.45
	6.88	29.69	0.58	0.84	17.33	29.88	58.8%	0.58	40.62	2.34
	6.93	29.21	0.54	0.79	15.86	29.38	57.8%	0.54	35.43	2.23
	6.98	28.66	0.50	0.74	14.41	28.82	56.7%	0.50	30.59	2.12
	7.03	28.12	0.46	0.69	12.99	28.27	55.7%	0.46	26.07	2.01
	7.08	27.58	0.42	0.64	11.60	27.71	54.6%	0.42	21.87	1.89
	7.13	27.03	0.38	0.59	10.23	27.16	53.5%	0.38	17.99	1.76
	7.18	26.53	0.34	0.54	8.89	26.64	52.5%	0.33	14.42	1.62
	7.23	26.06	0.29	0.49	7.58	26.16	51.5%	0.29	11.18	1.48
	7.28	25.60	0.25	0.44	6.29	25.68	50.6%	0.24	8.29	1.32
	7.33	22.51	0.23	0.39	5.07	22.59	44.5%	0.22	6.31	1.24
	7.38	20.66	0.19	0.34	3.99	20.71	40.8%	0.19	4.48	1.12
	7.43	18.93	0.16	0.29	3.00	18.97	37.3%	0.16	2.96	0.99
	7.48	18.00	0.12	0.24	2.08	18.03	35.5%	0.12	1.66	0.80
	7.53	11.89	0.11	0.19	1.32	11.92	23.5%	0.11	1.03	0.78
	7.58	9.62	0.08	0.14	0.79	9.64	19.0%	0.08	0.50	0.63
	7.63	7.19	0.05	0.09	0.36	7.20	14.2%	0.05	0.17	0.46
	7.68	3.36	0.03	0.04	0.10	3.36	6.6%	0.03	0.03	0.33

3/3 = 30.5

2/3 = 8.3

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	78.27	cfs
CALCULATED FLOW (Qc)=	78.54	cfs
(Qm-Qc)/Qm * 100 =	-0.4	%
MEASURED WATERLINE (WLm)=	6.56	ft
CALCULATED WATERLINE (WLc)=	6.58	ft
(WLm-WLc)/WLm * 100 =	-0.3	%
MAX MEASURED DEPTH (Dm)=	1.20	ft
MAX CALCULATED DEPTH (Dc)=	1.14	ft
(Dm-Dc)/Dm * 100	4.7	%
MEAN VELOCITY=	2.95	ft/sec
MANNING'S N=	0.054	
SLOPE=	0.01484716	ft/ft
.4 * Qm =	31.3	cfs
2.5 * Qm=	195.7	cfs

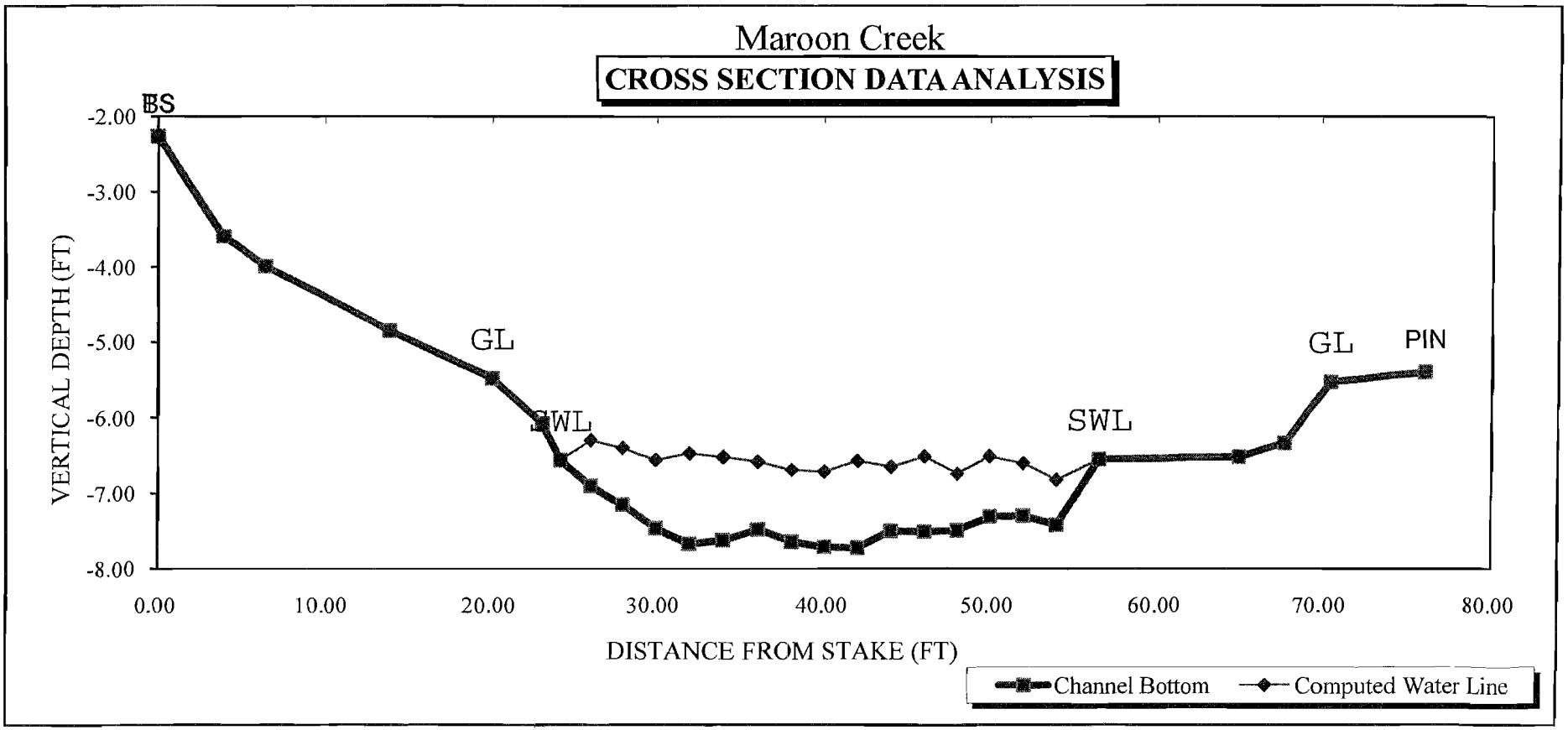
RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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


Maroon Creek
CROSS SECTION DATA ANALYSIS
BS
GL
SWL
SWL
GL
PIN
-2.00
-3.00
-4.00
-5.00
-6.00
-7.00
-8.00
VERTICAL DEPTH (FT)
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

Data Input & Proofing

STREAM NAME: Maroon Creek
XS LOCATION: below Highway 82 Bridge
XS NUMBER: 1
DATE: 8/12/2009
OBSERVERS: Uppendahl & Graf

1/4 SEC:
SECTION:
TWP:
RANGE:
PM:

COUNTY: Pitkin
WATERSHED: Roaring Fork River
DIVISION: 5
DOW CODE:
USGS MAP:
USFS MAP:

Level and Rod Survey

TAPE WT: 0.0106 lbs / ft
TENSION: 99999 lbs

SLOPE: 0.014847162 ft / ft

CHECKED BY:.....DATE.....

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

Total Data Points = 28

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
	TS	0.00	2.26			0.00	0.00	0.00
	BS	0.01	2.27			0.00	0.00	0.00
		4.00	3.59			0.00	0.00	0.00
		6.50	3.99			0.00	0.00	0.00
		14.00	4.85			0.00	0.00	0.00
1	GL	20.00	5.48			0.00	0.00	0.00
		23.00	6.08			0.00	0.00	0.00
	SWL	24.10	6.56	0.00	0.00	0.00	0.00	0.00
		26.00	6.90	0.60	0.75	1.17	0.88	6.30
		28.00	7.15	0.75	2.06	1.50	3.09	6.40
		30.00	7.46	0.90	1.31	1.80	2.36	6.56
		32.00	7.67	1.20	2.66	2.40	6.38	6.47
		34.00	7.62	1.10	2.20	2.20	4.84	6.52
		36.00	7.48	0.90	3.76	1.80	6.77	6.58
		38.00	7.64	0.95	4.07	1.90	7.73	6.69
		40.00	7.71	1.00	4.30	2.00	8.60	6.71
		42.00	7.72	1.15	3.75	2.30	8.63	6.57
		44.00	7.50	0.85	3.41	1.70	5.80	6.65
		46.00	7.51	1.00	3.48	2.00	6.96	6.51
		48.00	7.49	0.75	4.24	1.50	6.36	6.74
		50.00	7.31	0.80	3.19	1.60	5.10	6.51
		52.00	7.30	0.70	2.02	1.40	2.83	6.60
		54.00	7.42	0.60	1.44	1.35	1.94	6.82
	SWL	56.50	6.55	0.00	0.00	0.00	0.00	0.00
		65.00	6.52			0.00	0.00	0.00
		67.80	6.34			0.00	0.00	0.00
1	GL	70.50	5.53			0.00	0.00	0.00
	PIN	76.00	5.40			0.00	0.00	0.00
					Totals	26.62	78.27	

3/3 = 140
2/3 = 80

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

LOCATION INFORMATION

STREAM NAME:	Roaring Fork River
XS LOCATION:	50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER:	1
DATE:	13-Aug-09
OBSERVERS:	Uppendahl & Graf
1/4 SEC:	0
SECTION:	0
TWP:	0
RANGE:	0
PM:	0
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	5
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

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

TAPE WT:	0.0106
TENSION:	99999

CHANNEL PROFILE DATA

SLOPE:	0.01765957

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

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

STREAM NAME: Roaring Fork River
XS LOCATION: 50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER: 1

DATA POINTS= 49

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	BS	0.00	5.37			0.00		0.00	0.00	0.0%
		5.00	6.60			0.00		0.00	0.00	0.0%
1	BF	9.00	7.21			0.00		0.00	0.00	0.0%
		12.00	5.96			0.00		0.00	0.00	0.0%
		13.70	9.63			0.00		0.00	0.00	0.0%
	SWL	17.00	10.29	0.00	0.00	0.00		0.00	0.00	0.0%
		17.20	11.13	0.75	0.10	0.86	0.75	1.13	0.11	0.0%
	BR	20.00	11.23	0.90	0.00	2.80	0.90	2.61	0.00	0.0%
		23.00	11.04	0.70	1.64	3.01	0.70	2.10	3.44	1.4%
		26.00	11.15	0.80	1.23	3.00	0.80	2.40	2.95	1.2%
		29.00	11.27	0.95	1.10	3.00	0.95	2.85	3.14	1.3%
		32.00	11.20	0.85	1.87	3.00	0.85	2.55	4.77	2.0%
		35.00	11.42	0.95	2.40	3.01	0.95	2.85	6.84	2.8%
		38.00	11.63	1.30	2.74	3.01	1.30	3.90	10.69	4.4%
		41.00	11.83	1.50	2.86	3.01	1.50	4.50	12.87	5.3%
		44.00	11.64	1.40	2.83	3.01	1.40	4.20	11.89	4.9%
		47.00	11.36	1.10	2.22	3.01	1.10	3.30	7.33	3.0%
		50.00	11.30	0.80	1.05	3.00	0.80	2.40	2.52	1.0%
		53.00	11.02	0.60	1.03	3.01	0.60	1.80	1.85	0.8%
		56.00	10.60	0.25	1.20	3.03	0.25	0.75	0.90	0.4%
	BR	59.00	11.09	0.70	0.00	3.04	0.70	2.10	0.00	0.0%
		62.00	11.74	1.30	2.56	3.07	1.30	3.25	8.32	3.4%
		64.00	11.96	1.60	1.95	2.01	1.60	3.20	6.24	2.6%
		66.00	12.01	1.60	2.62	2.00	1.60	3.20	8.38	3.5%
		68.00	11.97	1.70	2.43	2.00	1.70	3.40	8.26	3.4%
		70.00	11.91	1.60	3.14	2.00	1.60	3.20	10.05	4.2%
		72.00	12.23	1.70	2.94	2.03	1.70	3.40	10.00	4.1%
		74.00	12.43	1.90	2.89	2.01	1.90	3.80	10.98	4.5%
		76.00	12.41	2.00	2.08	2.00	2.00	4.00	8.32	3.4%
		78.00	12.12	1.70	2.09	2.02	1.70	3.40	7.11	2.9%
		80.00	12.49	1.90	2.17	2.03	1.90	3.80	8.25	3.4%
		82.00	12.56	2.10	1.52	2.00	2.10	4.20	6.38	2.6%
		84.00	12.79	2.40	1.24	2.01	2.40	4.80	5.95	2.5%
		86.00	12.79	2.40	1.77	2.00	2.40	4.80	8.50	3.5%
		88.00	12.83	2.40	1.82	2.00	2.40	4.80	8.74	3.6%
		90.00	12.73	2.20	2.48	2.00	2.20	4.40	10.91	4.5%
		92.00	12.50	2.00	2.28	2.01	2.00	4.00	9.12	3.8%
		94.00	12.31	1.70	2.08	2.01	1.70	4.25	8.84	3.7%
		97.00	12.38	1.70	1.70	3.00	1.70	5.10	8.67	3.6%
		100.00	12.36	1.70	2.36	3.00	1.70	5.10	12.04	5.0%
		103.00	12.26	1.60	1.00	3.00	1.60	4.80	4.80	2.0%
		106.00	11.77	1.20	0.71	3.04	1.20	3.60	2.56	1.1%
		109.00	10.88	0.30	0.30	3.13	0.30	0.46	0.14	0.1%
	SWL	109.10	10.54	0.00	0.00	0.35		0.00	0.00	0.0%
		111.50	9.72			0.00		0.00	0.00	0.0%
		113.40	8.90			0.00		0.00	0.00	0.0%
1	BF	115.50	7.22			0.00		0.00	0.00	0.0%
	BS	118.50	8.07			0.00		0.00	0.00	0.0%
	TS	118.51	7.59			0.00		0.00	0.00	0.0%
	TOTALS ----------					93.54	2.4 (Max.)	124.40	241.84	100.0%

Manning's n = 0.1228
Hydraulic Radius= 1.32991726

STREAM NAME: Roaring Fork River
XS LOCATION: 50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	124.40	126.04	1.3%
10.17	124.40	149.28	20.0%
10.19	124.40	147.41	18.5%
10.21	124.40	145.54	17.0%
10.23	124.40	143.67	15.5%
10.25	124.40	141.80	14.0%
10.27	124.40	139.94	12.5%
10.29	124.40	138.08	11.0%
10.31	124.40	136.22	9.5%
10.33	124.40	134.37	8.0%
10.35	124.40	132.52	6.5%
10.37	124.40	130.66	5.0%
10.38	124.40	129.74	4.3%
10.39	124.40	128.81	3.5%
10.40	124.40	127.89	2.8%
10.41	124.40	126.96	2.1%
10.42	124.40	126.04	1.3%
10.43	124.40	125.11	0.6%
10.44	124.40	124.19	-0.2%
10.45	124.40	123.27	-0.9%
10.46	124.40	122.34	-1.7%
10.47	124.40	121.42	-2.4%
10.49	124.40	119.57	-3.9%
10.51	124.40	117.73	-5.4%
10.53	124.40	115.89	-6.8%
10.55	124.40	114.05	-8.3%
10.57	124.40	112.21	-9.8%
10.59	124.40	110.37	-11.3%
10.61	124.40	108.53	-12.8%
10.63	124.40	106.69	-14.2%
10.65	124.40	104.86	-15.7%
10.67	124.40	103.03	-17.2%

WATERLINE AT ZERO
AREA ERROR = 10.433

STREAM NAME: Roaring Fork River
XS LOCATION: 50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER: 1

Constant Manning's n

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

STAGING TABLE

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	7.22	105.93	4.20	5.61	444.66	110.45	100.0%	4.03	1809.00	4.07
	9.43	98.56	2.23	3.40	220.00	100.38	90.9%	2.19	596.70	2.71
	9.48	98.42	2.19	3.35	215.07	100.20	90.7%	2.15	575.30	2.67
	9.53	98.28	2.14	3.30	210.16	100.02	90.6%	2.10	554.21	2.64
	9.58	98.14	2.09	3.25	205.25	99.84	90.4%	2.06	533.44	2.60
	9.63	97.99	2.04	3.20	200.34	99.65	90.2%	2.01	513.03	2.56
	9.68	97.62	2.00	3.15	195.45	99.27	89.9%	1.97	493.59	2.53
	9.73	97.25	1.96	3.10	190.58	98.88	89.5%	1.93	474.49	2.49
	9.78	96.85	1.92	3.05	185.73	98.47	89.1%	1.89	455.79	2.45
	9.83	96.46	1.88	3.00	180.90	98.06	88.8%	1.84	437.40	2.42
	9.88	96.06	1.83	2.95	176.08	97.65	88.4%	1.80	419.35	2.38
	9.93	95.66	1.79	2.90	171.29	97.24	88.0%	1.76	401.62	2.34
	9.98	95.27	1.75	2.85	166.52	96.83	87.7%	1.72	384.22	2.31
	10.03	94.87	1.71	2.80	161.76	96.42	87.3%	1.68	367.15	2.27
	10.08	94.47	1.66	2.75	157.03	96.01	86.9%	1.64	350.41	2.23
	10.13	94.08	1.62	2.70	152.32	95.60	86.6%	1.59	334.01	2.19
	10.18	93.68	1.58	2.65	147.62	95.19	86.2%	1.55	317.94	2.15
	10.23	93.29	1.53	2.60	142.95	94.78	85.8%	1.51	302.20	2.11
	10.28	92.89	1.49	2.55	138.29	94.37	85.4%	1.47	286.81	2.07
	10.33	92.70	1.44	2.50	133.65	94.14	85.2%	1.42	271.41	2.03
	10.38	92.54	1.39	2.45	129.02	93.93	85.0%	1.37	256.29	1.99
WL	10.43	92.38	1.35	2.40	124.40	93.72	84.9%	1.33	241.52	1.94
	10.48	92.22	1.30	2.35	119.78	93.52	84.7%	1.28	227.11	1.90
	10.53	92.06	1.25	2.30	115.18	93.31	84.5%	1.23	213.05	1.85
	10.58	92.02	1.20	2.25	110.58	93.19	84.4%	1.19	199.22	1.80
	10.63	91.56	1.16	2.20	105.98	92.65	83.9%	1.14	186.34	1.76
	10.68	90.87	1.12	2.15	101.42	91.88	83.2%	1.10	174.14	1.72
	10.73	90.18	1.07	2.10	96.90	91.10	82.5%	1.06	162.29	1.67
	10.78	89.49	1.03	2.05	92.40	90.33	81.8%	1.02	150.81	1.63
	10.83	88.80	0.99	2.00	87.95	89.56	81.1%	0.98	139.68	1.59
	10.88	88.10	0.95	1.95	83.52	88.77	80.4%	0.94	128.92	1.54
	10.93	87.26	0.91	1.90	79.14	87.88	79.6%	0.90	118.64	1.50
	10.98	86.41	0.87	1.85	74.80	86.98	78.7%	0.86	108.73	1.45
	11.03	85.52	0.82	1.80	70.50	86.04	77.9%	0.82	99.24	1.41
	11.08	82.66	0.80	1.75	66.29	83.12	75.3%	0.80	91.64	1.38
	11.13	79.48	0.78	1.70	62.23	79.88	72.3%	0.78	84.70	1.36
	11.18	75.07	0.78	1.65	58.37	75.45	68.3%	0.77	79.07	1.35
	11.23	68.96	0.79	1.60	54.76	69.33	62.8%	0.79	75.21	1.37
	11.28	64.81	0.79	1.55	51.43	65.16	59.0%	0.79	70.60	1.37
	11.33	61.92	0.78	1.50	48.25	62.24	56.4%	0.78	65.45	1.36
	11.38	59.22	0.76	1.45	45.23	59.54	53.9%	0.76	60.54	1.34
	11.43	57.60	0.73	1.40	42.31	57.89	52.4%	0.73	55.18	1.30
	11.48	55.95	0.71	1.35	39.47	56.23	50.9%	0.70	50.12	1.27
	11.53	54.30	0.68	1.30	36.72	54.56	49.4%	0.67	45.32	1.23
	11.58	52.65	0.65	1.25	34.04	52.90	47.9%	0.64	40.79	1.20
	11.63	51.00	0.62	1.20	31.45	51.23	46.4%	0.61	36.52	1.16
	11.68	49.10	0.59	1.15	28.95	49.31	44.6%	0.59	32.63	1.13
	11.73	47.16	0.56	1.10	26.54	47.36	42.9%	0.56	29.00	1.09
	11.78	44.99	0.54	1.05	24.24	45.18	40.9%	0.54	25.72	1.06
	11.83	42.77	0.52	1.00	22.04	42.95	38.9%	0.51	22.72	1.03
	11.88	42.01	0.47	0.95	19.92	42.18	38.2%	0.47	19.43	0.97
	11.93	40.36	0.44	0.90	17.85	40.52	36.7%	0.44	16.62	0.93
	11.98	36.71	0.43	0.85	15.91	36.86	33.4%	0.43	14.61	0.92
	12.03	33.63	0.42	0.80	14.18	33.77	30.6%	0.42	12.79	0.90
	12.08	33.01	0.38	0.75	12.52	33.14	30.0%	0.38	10.51	0.84
	12.13	32.23	0.34	0.70	10.88	32.36	29.3%	0.34	8.46	0.78
	12.18	31.00	0.30	0.65	9.30	31.11	28.2%	0.30	6.69	0.72

3/3 = 142.46

2/3 = 81.5

140/80

STREAM NAME: Roaring Fork River
XS LOCATION: 50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	241.84	cfs
CALCULATED FLOW (Qc)=	241.52	cfs
(Qm-Qc)/Qm * 100 =	0.1	%
MEASURED WATERLINE (WLm)=	10.42	ft
CALCULATED WATERLINE (WLc)=	10.43	ft
(WLm-WLc)/WLm * 100 =	-0.2	%
MAX MEASURED DEPTH (Dm)=	2.40	ft
MAX CALCULATED DEPTH (Dc)=	2.40	ft
(Dm-Dc)/Dm * 100	0.1	%
MEAN VELOCITY=	1.94	ft/sec
MANNING'S N=	0.123	
SLOPE=	0.01765957	ft/ft
.4 * Qm =	96.7	cfs
2.5 * Qm=	604.6	cfs

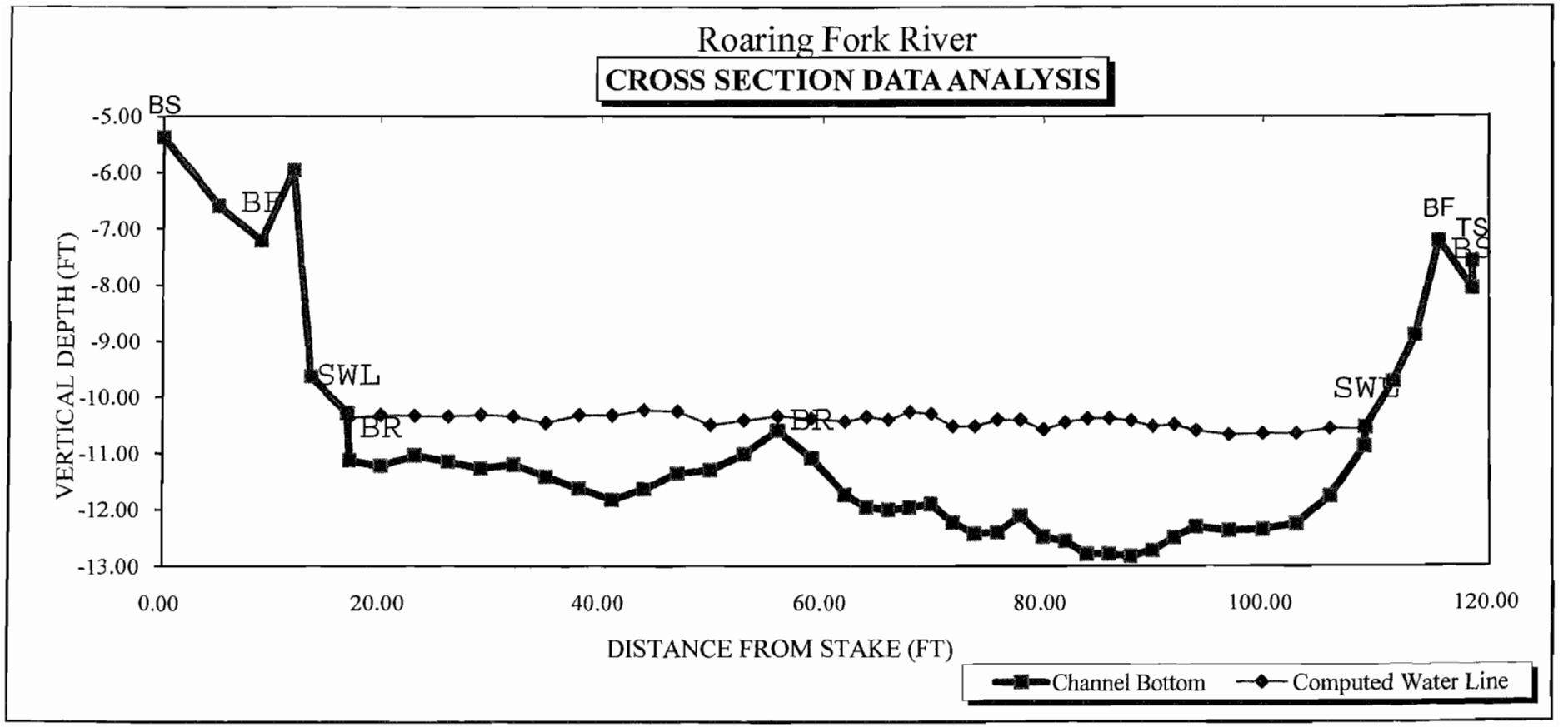
RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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


Roaring Fork River
CROSS SECTION DATA ANALYSIS
BS
BF
SWL
BR
BR
SWL
BF
TS
-5.00
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
-12.00
-13.00
VERTICAL DEPTH (FT)
0.00
20.00
40.00
60.00
80.00
100.00
120.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

Data Input & Proofing

STREAM NAME: Roaring Fork River
XS LOCATION: 50' d/s bridge - 39 13' 04.6" 106 51' 17.9"
XS NUMBER: 1
DATE: 8/13/2009
OBSERVERS: Uppendahl & Graf

1/4 SEC:
SECTION:
TWP:
RANGE:
PM:

COUNTY: Pitkin
WATERSHED: Roaring Fork River
DIVISION: 5
DOW CODE:
USGS MAP:
USFS MAP:

Level and Rod Survey
TAPE WT: 0.0106 lbs / ft
TENSION: 99999 lbs

SLOPE: 0.017659574 ft / ft

CHECKED BY:.....DATE.....

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

Total Data Points = 49

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
	BS	0.00	5.37			0.00	0.00	0.00
		5.00	6.60			0.00	0.00	0.00
1	BF	9.00	7.21			0.00	0.00	0.00
		12.00	5.96			0.00	0.00	0.00
		13.70	9.63			0.00	0.00	0.00
	SWL	17.00	10.29	0.00	0.00	0.00	0.00	0.00
		17.20	11.13	0.75	0.10	1.13	0.11	10.38
	BR	20.00	11.23	0.90	0.00	2.61	0.00	10.33
		23.00	11.04	0.70	1.64	2.10	3.44	10.34
		26.00	11.15	0.80	1.23	2.40	2.95	10.35
		29.00	11.27	0.95	1.10	2.85	3.14	10.32
		32.00	11.20	0.85	1.87	2.55	4.77	10.35
		35.00	11.42	0.95	2.40	2.85	6.84	10.47
		38.00	11.63	1.30	2.74	3.90	10.69	10.33
		41.00	11.83	1.50	2.86	4.50	12.87	10.33
		44.00	11.64	1.40	2.83	4.20	11.89	10.24
		47.00	11.36	1.10	2.22	3.30	7.33	10.26
		50.00	11.30	0.80	1.05	2.40	2.52	10.50
		53.00	11.02	0.60	1.03	1.80	1.85	10.42
		56.00	10.60	0.25	1.20	0.75	0.90	10.35
	BR	59.00	11.09	0.70	0.00	2.10	0.00	10.39
		62.00	11.74	1.30	2.56	3.25	8.32	10.44
		64.00	11.96	1.60	1.95	3.20	6.24	10.36
		66.00	12.01	1.60	2.62	3.20	8.38	10.41
		68.00	11.97	1.70	2.43	3.40	8.26	10.27
		70.00	11.91	1.60	3.14	3.20	10.05	10.31
		72.00	12.23	1.70	2.94	3.40	10.00	10.53
		74.00	12.43	1.90	2.89	3.80	10.98	10.53
		76.00	12.41	2.00	2.08	4.00	8.32	10.41
		78.00	12.12	1.70	2.09	3.40	7.11	10.42
		80.00	12.49	1.90	2.17	3.80	8.25	10.59
		82.00	12.56	2.10	1.52	4.20	6.38	10.46
		84.00	12.79	2.40	1.24	4.80	5.95	10.39
		86.00	12.79	2.40	1.77	4.80	8.50	10.39
		88.00	12.83	2.40	1.82	4.80	8.74	10.43
		90.00	12.73	2.20	2.48	4.40	10.91	10.53
		92.00	12.50	2.00	2.28	4.00	9.12	10.50
		94.00	12.31	1.70	2.08	4.25	8.84	10.61
		97.00	12.38	1.70	1.70	5.10	8.67	10.68
		100.00	12.36	1.70	2.36	5.10	12.04	10.66
		103.00	12.26	1.60	1.00	4.80	4.80	10.66
		106.00	11.77	1.20	0.71	3.60	2.56	10.57
		109.00	10.88	0.30	0.30	0.46	0.14	10.58
	SWL	109.10	10.54	0.00	0.00	0.00	0.00	0.00
		111.50	9.72			0.00	0.00	0.00
		113.40	8.90			0.00	0.00	0.00
1	BF	115.50	7.22			0.00	0.00	0.00
	BS	118.50	8.07			0.00	0.00	0.00
	TS	118.51	7.59			0.00	0.00	0.00
					Totals	124.40	241.84	

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

LOCATION INFORMATION

STREAM NAME:	Roaring Fork #3
XS LOCATION:	1/4 m. above Woody Crk Confl
XS NUMBER:	3
DATE:	14-Apr-77
OBSERVERS:	Bennett, Ward
1/4 SEC:	NW
SECTION:	16
TWP:	9 S
RANGE:	85 W
PM:	0.5
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	0
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE *** Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod
TAPE WT:	0.0225	
TENSION:	24	

CHANNEL PROFILE DATA

SLOPE:	0.008

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

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

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/4 m. above Woody Crk Confl
XS NUMBER: 3

DATA POINTS= 72

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
1 G	0.00	0.20			0.00		0.00	0.00	0.0%
	1.00	0.90			0.00		0.00	0.00	0.0%
	2.00	0.60			0.00		0.00	0.00	0.0%
	3.00	0.70			0.00		0.00	0.00	0.0%
	4.00	1.10			0.00		0.00	0.00	0.0%
	5.00	1.20			0.00		0.00	0.00	0.0%
	6.00	1.20			0.00		0.00	0.00	0.0%
	7.00	1.30			0.00		0.00	0.00	0.0%
	8.00	1.40			0.00		0.00	0.00	0.0%
	9.00	1.70			0.00		0.00	0.00	0.0%
W	10.00	1.70	0.00	0.00	0.00		0.00	0.00	0.0%
	11.00	1.80	0.10	0.00	1.00	0.10	0.10	0.00	0.0%
	12.00	1.40	0.00	0.00	1.08		0.00	0.00	0.0%
	13.00	1.70	0.00	0.40	0.00		0.00	0.00	0.0%
	14.00	2.00	0.30	0.40	1.04	0.30	0.30	0.12	0.1%
	15.00	1.90	0.20	0.00	1.00	0.20	0.20	0.00	0.0%
	16.00	1.70	0.00	0.00	1.02		0.00	0.00	0.0%
	17.00	1.80	0.10	0.40	1.00	0.10	0.10	0.04	0.0%
	18.00	1.70	0.00	0.40	1.00		0.00	0.00	0.0%
	19.00	2.00	0.30	0.00	1.04	0.30	0.30	0.00	0.0%
	20.00	1.90	0.20	0.00	1.00	0.20	0.20	0.00	0.0%
	21.00	1.80	0.10	4.00	1.00	0.10	0.10	0.40	0.5%
	22.00	1.80	0.10	4.00	1.00	0.10	0.10	0.40	0.5%
	23.00	1.80	0.10	2.93	1.00	0.10	0.10	0.29	0.3%
	24.00	1.90	0.20	2.93	1.00	0.20	0.20	0.59	0.7%
	25.00	2.00	0.30	1.43	1.00	0.30	0.30	0.43	0.5%
	26.00	2.10	0.40	1.43	1.00	0.40	0.40	0.57	0.7%
	27.00	2.10	0.40	3.00	1.00	0.40	0.40	1.20	1.4%
	28.00	1.80	0.10	3.00	1.04	0.10	0.10	0.30	0.3%
	29.00	1.90	0.20	2.17	1.00	0.20	0.20	0.43	0.5%
	30.00	2.10	0.40	2.17	1.02	0.40	0.40	0.87	1.0%
	31.00	2.20	0.50	1.73	1.00	0.50	0.50	0.87	1.0%
	32.00	2.30	0.60	1.73	1.00	0.60	0.60	1.04	1.2%
	33.00	2.20	0.50	4.09	1.00	0.50	0.50	2.05	2.3%
	34.00	2.10	0.40	4.09	1.00	0.40	0.40	1.64	1.9%
	35.00	2.20	0.50	2.80	1.00	0.50	0.50	1.40	1.6%
	36.00	2.10	0.40	2.80	1.00	0.40	0.40	1.12	1.3%
	37.00	2.20	0.50	2.06	1.00	0.50	0.50	1.03	1.2%
	38.00	2.60	0.90	2.06	1.08	0.90	0.90	1.85	2.1%
	39.00	2.70	1.00	2.08	1.00	1.00	1.00	2.08	2.4%
	40.00	2.60	0.90	2.08	1.00	0.90	0.90	1.87	2.1%
	41.00	2.50	0.80	2.60	1.00	0.80	0.80	2.08	2.4%
	42.00	2.60	0.90	2.60	1.00	0.90	0.90	2.34	2.7%
	43.00	2.80	1.10	1.22	1.02	1.10	1.10	1.34	1.5%
	44.00	2.40	0.70	1.22	1.08	0.70	0.70	0.85	1.0%
	45.00	2.90	1.20	1.00	1.12	1.20	1.20	1.20	1.4%
	46.00	2.90	1.20	1.00	1.00	1.20	1.20	1.20	1.4%
	47.00	2.90	1.20	1.73	1.00	1.20	1.20	2.08	2.4%
	48.00	2.90	1.20	1.73	1.00	1.20	1.20	2.08	2.4%
	49.00	2.90	1.20	2.87	1.00	1.20	1.20	3.44	3.9%
	50.00	2.80	1.10	2.87	1.00	1.10	1.10	3.16	3.6%
	51.00	2.60	0.90	3.50	1.02	0.90	0.90	3.15	3.6%
	52.00	2.40	0.70	3.50	1.02	0.70	0.70	2.45	2.8%
	53.00	2.90	1.20	2.72	1.12	1.20	1.20	3.26	3.7%
	54.00	3.00	1.30	2.72	1.00	1.30	1.30	3.54	4.0%
	55.00	3.10	1.40	2.50	1.00	1.40	1.40	3.50	4.0%
	56.00	3.10	1.40	2.50	1.00	1.40	1.40	3.50	4.0%
	57.00	2.80	1.10	2.40	1.04	1.10	1.10	2.64	3.0%
	58.00	3.10	1.40	2.40	1.04	1.40	1.40	3.36	3.8%
	59.00	3.10	1.40	2.20	1.00	1.40	1.40	3.08	3.5%
	60.00	3.30	1.60	2.20	1.02	1.60	1.60	3.52	4.0%
	61.00	3.10	1.40	2.02	1.02	1.40	1.40	2.83	3.2%
	62.00	2.80	1.10	2.02	1.04	1.10	1.10	2.22	2.5%
	63.00	2.80	1.10	1.00	1.00	1.10	1.10	1.10	1.3%
	64.00	3.00	1.30	1.00	1.02	1.30	1.30	1.30	1.5%
	65.00	2.80	1.10	1.47	1.02	1.10	1.10	1.62	1.8%
	66.00	3.00	1.30	1.47	1.02	1.30	1.30	1.91	2.2%
	67.00	2.90	1.30	2.32	1.00	1.30	1.30	3.02	3.4%
	68.00	2.40	0.70	2.32	1.12	0.70	0.70	1.62	1.8%
W	69.00	1.70	0.00	0.00	1.22		0.00	0.00	0.0%
	70.00	1.00			0.00		0.00	0.00	0.0%
1 G	71.00	0.20			0.00		0.00	0.00	0.0%
TOTALS ----------					59.39	1.6 (Max.)	42.00	87.97	100.0%

Manning's n = 0.0504
Hydraulic Radius= 0.7071568

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/4 m. above Woody Crk Confl
XS NUMBER: 3

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	42.00	42.29	0.7%
1.90	42.00	56.52	34.6%
1.92	42.00	55.34	31.8%
1.94	42.00	54.16	29.0%
1.96	42.00	52.99	26.2%
1.98	42.00	51.83	23.4%
2.00	42.00	50.68	20.7%
2.02	42.00	49.54	18.0%
2.04	42.00	48.41	15.3%
2.06	42.00	47.29	12.6%
2.08	42.00	46.17	9.9%
2.10	42.00	45.05	7.3%
2.11	42.00	44.50	5.9%
2.12	42.00	43.94	4.6%
2.13	42.00	43.39	3.3%
2.14	42.00	42.84	2.0%
2.15	42.00	42.29	0.7%
2.16	42.00	41.75	-0.6%
2.17	42.00	41.21	-1.9%
2.18	42.00	40.67	-3.2%
2.19	42.00	40.13	-4.4%
2.20	42.00	39.60	-5.7%
2.22	42.00	38.55	-8.2%
2.24	42.00	37.51	-10.7%
2.26	42.00	36.47	-13.2%
2.28	42.00	35.45	-15.6%
2.30	42.00	34.42	-18.0%
2.32	42.00	33.44	-20.4%
2.34	42.00	32.48	-22.7%
2.36	42.00	31.54	-24.9%
2.38	42.00	30.61	-27.1%
2.40	42.00	29.70	-29.3%

WATERLINE AT ZERO
AREA ERROR = 2.153

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/4 m. above Woody Crk Confl
XS NUMBER: 3

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	0.20	71.00	2.38	3.41	168.67	73.47	100.0%	2.30	774.63	4.59
	1.15	66.00	1.56	2.46	103.07	67.77	92.3%	1.52	359.68	3.49
	1.20	65.82	1.52	2.41	99.77	67.56	92.0%	1.48	341.42	3.42
	1.25	65.49	1.47	2.36	96.49	67.21	91.5%	1.44	324.03	3.36
	1.30	65.03	1.43	2.31	93.23	66.73	90.8%	1.40	307.43	3.30
	1.35	64.58	1.39	2.26	89.99	66.26	90.2%	1.36	291.21	3.24
	1.40	63.34	1.37	2.21	86.79	65.00	88.5%	1.34	277.73	3.20
	1.45	62.88	1.33	2.16	83.64	64.52	87.8%	1.30	262.40	3.14
	1.50	62.41	1.29	2.11	80.51	64.04	87.2%	1.26	247.46	3.07
	1.55	61.95	1.25	2.06	77.40	63.55	86.5%	1.22	232.91	3.01
	1.60	61.49	1.21	2.01	74.31	63.07	85.8%	1.18	218.75	2.94
	1.65	61.10	1.17	1.96	71.25	62.67	85.3%	1.14	204.81	2.87
	1.70	60.88	1.12	1.91	68.20	62.42	85.0%	1.09	190.91	2.80
	1.75	60.54	1.08	1.86	65.16	62.05	84.5%	1.05	177.66	2.73
	1.80	60.03	1.04	1.81	62.15	61.50	83.7%	1.01	165.15	2.66
	1.85	59.52	0.99	1.76	59.16	60.94	83.0%	0.97	153.05	2.59
	1.90	59.01	0.95	1.71	56.20	60.39	82.2%	0.93	141.34	2.52
	1.95	58.50	0.91	1.66	53.26	59.84	81.5%	0.89	130.03	2.44
	2.00	56.98	0.88	1.61	50.37	58.29	79.3%	0.86	120.61	2.39
	2.05	56.22	0.85	1.56	47.54	57.49	78.3%	0.83	110.54	2.32
	2.10	55.46	0.81	1.51	44.75	56.69	77.2%	0.79	100.87	2.25
WL	2.15	54.52	0.77	1.46	42.00	55.72	75.8%	0.75	91.80	2.19
	2.20	52.83	0.74	1.41	39.32	53.99	73.5%	0.73	83.97	2.14
	2.25	51.60	0.71	1.36	36.71	52.73	71.8%	0.70	76.10	2.07
	2.30	49.97	0.68	1.31	34.15	51.06	69.5%	0.67	68.93	2.02
	2.35	46.86	0.68	1.26	31.75	47.91	65.2%	0.66	63.69	2.01
	2.40	44.78	0.66	1.21	29.46	45.78	62.3%	0.64	57.95	1.97
	2.45	42.87	0.64	1.16	27.27	43.84	59.7%	0.62	52.44	1.92
	2.50	41.69	0.60	1.11	25.16	42.63	58.0%	0.59	46.72	1.86
	2.55	40.73	0.57	1.06	23.10	41.64	56.7%	0.55	41.16	1.78
	2.60	39.76	0.53	1.01	21.09	40.64	55.3%	0.52	35.93	1.70
	2.65	38.34	0.50	0.96	19.13	39.20	53.4%	0.49	31.28	1.64
	2.70	36.86	0.47	0.91	17.25	37.69	51.3%	0.46	27.02	1.57
	2.75	34.28	0.45	0.86	15.47	35.09	47.8%	0.44	23.64	1.53
	2.80	32.03	0.43	0.81	13.82	32.81	44.7%	0.42	20.48	1.48
	2.85	30.81	0.40	0.76	12.25	31.57	43.0%	0.39	17.19	1.40
	2.90	29.68	0.36	0.71	10.74	30.40	41.4%	0.35	14.16	1.32
	2.95	29.13	0.32	0.66	9.27	29.80	40.6%	0.31	11.22	1.21
	3.00	28.16	0.28	0.61	7.83	28.77	39.2%	0.27	8.68	1.11
	3.05	25.94	0.25	0.56	6.46	26.49	36.1%	0.24	6.66	1.03
	3.10	23.08	0.23	0.51	5.24	23.56	32.1%	0.22	5.07	0.97
	3.15	20.05	0.21	0.46	4.16	20.44	27.8%	0.20	3.80	0.91
	3.20	17.53	0.18	0.41	3.22	17.85	24.3%	0.18	2.71	0.84
	3.25	15.16	0.16	0.36	2.40	15.40	21.0%	0.16	1.84	0.76
	3.30	13.16	0.13	0.31	1.70	13.34	18.2%	0.13	1.14	0.67
	3.35	11.58	0.09	0.26	1.08	11.70	15.9%	0.09	0.58	0.54
	3.40	9.84	0.06	0.21	0.55	9.91	13.5%	0.06	0.21	0.38
	3.45	3.43	0.06	0.16	0.20	3.48	4.7%	0.06	0.08	0.39
	3.50	1.71	0.04	0.11	0.06	1.73	2.4%	0.03	0.02	0.28
	3.55	0.57	0.03	0.06	0.02	0.58	0.8%	0.03	0.00	0.24
	3.60	0.06	0.00	0.01	0.00	0.07	0.1%	0.00	0.00	0.06

3/3 = 76.1
2/3 = 70.5

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/4 m. above Woody Crk Confl
XS NUMBER: 3

SUMMARY SHEET

MEASURED FLOW (Qm)=	87.97	cfs
CALCULATED FLOW (Qc)=	91.80	cfs
(Qm-Qc)/Qm * 100 =	-4.3	%
MEASURED WATERLINE (WLm)=	2.15	ft
CALCULATED WATERLINE (WLc)=	2.15	ft
(WLm-WLc)/WLm * 100 =	-0.3	%
MAX MEASURED DEPTH (Dm)=	1.60	ft
MAX CALCULATED DEPTH (Dc)=	1.46	ft
(Dm-Dc)/Dm * 100	9.0	%
MEAN VELOCITY=	2.19	ft/sec
MANNING'S N=	0.050	
SLOPE=	0.008	ft/ft
.4 * Qm =	35.2	cfs
2.5 * Qm=	219.9	cfs

RECOMMENDED INSTREAM FLOW:

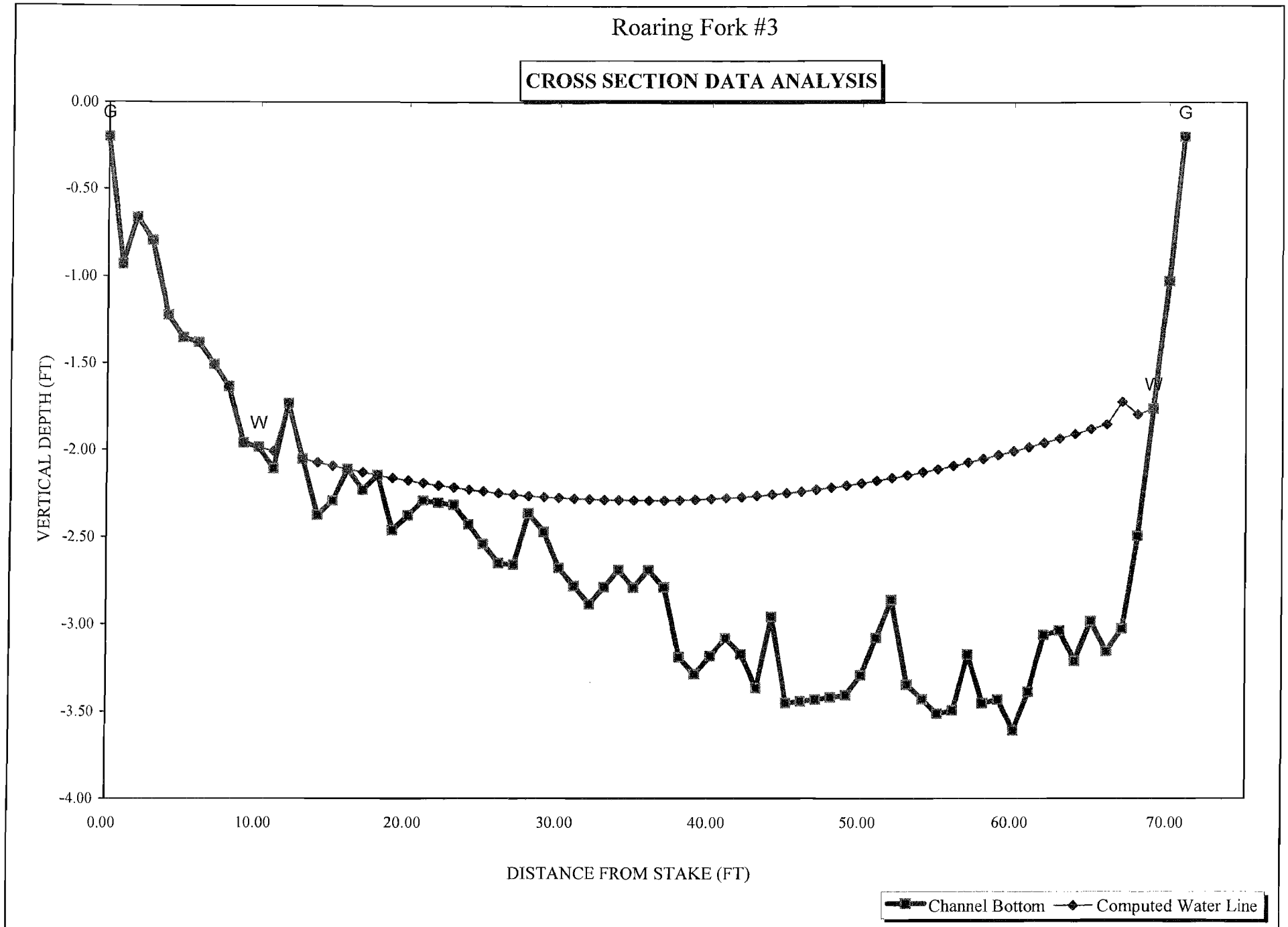
FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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

Roaring Fork #3



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

LOCATION INFORMATION

STREAM NAME:	Roaring Fork #3
XS LOCATION:	1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER:	2
DATE:	14-Apr-77
OBSERVERS:	Bennett, Siebirg
1/4 SEC:	W 1/2
SECTION:	17
TWP:	8 S
RANGE:	86 W
PM:	0.41666667
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	0
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0225	with a survey level and rod
TENSION:	32	

CHANNEL PROFILE DATA

SLOPE:	0.005

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

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

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

DATA POINTS= 35

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 G	0.00	1.10		
	1.00	1.50		
W	2.00	2.20	0.00	0.00
	3.00	2.40	0.20	0.20
	5.00	2.50	0.30	0.80
	7.00	2.80	0.60	0.70
	9.00	2.80	0.60	0.80
	11.00	2.80	0.60	1.00
	13.00	2.90	0.70	1.30
	15.00	2.60	0.40	1.70
	17.00	2.90	0.70	1.40
	19.00	3.20	1.10	1.10
	21.00	3.20	1.10	2.00
	23.00	3.00	0.80	2.20
	25.00	3.40	1.30	2.20
	27.00	3.20	1.10	3.00
	29.00	3.00	0.80	2.40
	31.00	3.90	1.70	1.50
	33.00	3.70	1.50	2.40
	35.00	3.20	1.00	4.00
	37.00	3.90	1.70	3.00
	39.00	3.70	1.50	3.00
	41.00	3.30	1.10	2.60
	43.00	3.80	1.60	2.80
	45.00	3.10	0.90	3.30
	47.00	3.30	1.10	2.70
	49.00	3.70	1.50	2.60
	51.00	3.00	0.80	2.70
	53.00	4.00	1.80	1.90
	55.00	3.10	0.90	2.40
	57.00	3.00	0.80	2.30
	59.00	2.70	0.50	0.80
W	61.00	2.20	0.00	0.00
	63.00			
1 G	65.00			

VALUES COMPUTED FROM RAW FIELD DATA

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
1.02	0.20	0.30	0.06	0.0%
2.00	0.30	0.60	0.48	0.4%
2.02	0.60	1.20	0.84	0.7%
2.00	0.60	1.20	0.96	0.7%
2.00	0.60	1.20	1.20	0.9%
2.00	0.70	1.40	1.82	1.4%
2.02	0.40	0.80	1.36	1.1%
2.02	0.70	1.40	1.96	1.5%
2.02	1.10	2.20	2.42	1.9%
2.00	1.10	2.20	4.40	3.4%
2.01	0.80	1.60	3.52	2.7%
2.04	1.30	2.60	5.72	4.4%
2.01	1.10	2.20	6.60	5.1%
2.01	0.80	1.60	3.84	3.0%
2.19	1.70	3.40	5.10	4.0%
2.01	1.50	3.00	7.20	5.6%
2.06	1.00	2.00	8.00	6.2%
2.12	1.70	3.40	10.20	7.9%
2.01	1.50	3.00	9.00	7.0%
2.04	1.10	2.20	5.72	4.4%
2.06	1.60	3.20	8.96	6.9%
2.12	0.90	1.80	5.94	4.6%
2.01	1.10	2.20	5.94	4.6%
2.04	1.50	3.00	7.80	6.0%
2.12	0.80	1.60	4.32	3.3%
2.24	1.80	3.60	6.84	5.3%
2.19	0.90	1.80	4.32	3.3%
2.00	0.80	1.60	3.68	2.9%
2.02	0.50	1.00	0.80	0.6%
2.06		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS ----------

60.48	1.8 (Max.)	57.30	129.00	100.0%

Manning's n = 0.0450
Hydraulic Radius= 0.9473924

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	57.30	68.53	19.6%
2.01	57.30	83.35	45.5%
2.03	57.30	82.15	43.4%
2.05	57.30	80.96	41.3%
2.07	57.30	79.78	39.2%
2.09	57.30	78.59	37.2%
2.11	57.30	77.40	35.1%
2.13	57.30	76.21	33.0%
2.15	57.30	75.03	30.9%
2.17	57.30	73.84	28.9%
2.19	57.30	72.66	26.8%
2.21	57.30	71.48	24.7%
2.22	57.30	70.89	23.7%
2.23	57.30	70.30	22.7%
2.24	57.30	69.71	21.7%
2.25	57.30	69.12	20.6%
2.26	57.30	68.53	19.6%
2.27	57.30	67.94	18.6%
2.28	57.30	67.35	17.5%
2.29	57.30	66.76	16.5%
2.30	57.30	66.18	15.5%
2.31	57.30	65.59	14.5%
2.33	57.30	64.42	12.4%
2.35	57.30	63.25	10.4%
2.37	57.30	62.09	8.4%
2.39	57.30	60.93	6.3%
2.41	57.30	59.77	4.3%
2.43	57.30	58.62	2.3%
2.45	57.30	57.47	0.3%
2.47	57.30	56.32	-1.7%
2.49	57.30	55.18	-3.7%
2.51	57.30	54.05	-5.7%

WATERLINE AT ZERO
AREA ERROR = 2.458

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	1.10	62.06	2.24	3.17	138.88	64.43	100.0%	2.16	540.89	3.89
	1.46	60.89	1.92	2.81	116.88	63.03	97.8%	1.85	411.72	3.52
	1.51	60.73	1.87	2.76	113.84	62.84	97.5%	1.81	394.84	3.47
	1.56	60.60	1.83	2.71	110.80	62.67	97.3%	1.77	378.12	3.41
	1.61	60.49	1.78	2.66	107.78	62.52	97.0%	1.72	361.65	3.36
	1.66	60.37	1.74	2.61	104.76	62.37	96.8%	1.68	345.47	3.30
	1.71	60.26	1.69	2.56	101.74	62.22	96.6%	1.64	329.59	3.24
	1.76	60.14	1.64	2.51	98.73	62.06	96.3%	1.59	314.01	3.18
	1.81	60.03	1.59	2.46	95.73	61.91	96.1%	1.55	298.74	3.12
	1.86	59.92	1.55	2.41	92.73	61.76	95.8%	1.50	283.77	3.06
	1.91	59.80	1.50	2.36	89.73	61.61	95.6%	1.46	269.11	3.00
	1.96	59.69	1.45	2.31	86.75	61.45	95.4%	1.41	254.77	2.94
	2.01	59.58	1.41	2.26	83.76	61.30	95.1%	1.37	240.74	2.87
	2.06	59.46	1.36	2.21	80.79	61.15	94.9%	1.32	227.03	2.81
	2.11	59.35	1.31	2.16	77.82	61.00	94.7%	1.28	213.64	2.75
	2.16	59.23	1.26	2.11	74.85	60.84	94.4%	1.23	200.59	2.68
	2.21	59.12	1.22	2.06	71.90	60.69	94.2%	1.18	187.86	2.61
	2.26	58.96	1.17	2.01	68.94	60.50	93.9%	1.14	175.55	2.55
	2.31	58.63	1.13	1.96	66.00	60.14	93.3%	1.10	163.89	2.48
	2.36	58.22	1.08	1.91	63.08	59.72	92.7%	1.06	152.70	2.42
	2.41	57.81	1.04	1.86	60.18	59.30	92.0%	1.01	141.85	2.36
WL	2.46	57.39	1.00	1.81	57.30	58.87	91.4%	0.97	131.34	2.29
	2.51	56.57	0.96	1.76	54.45	58.04	90.1%	0.94	121.79	2.24
	2.56	55.67	0.93	1.71	51.64	57.13	88.7%	0.90	112.68	2.18
	2.61	54.79	0.89	1.66	48.88	56.24	87.3%	0.87	103.90	2.13
	2.66	54.31	0.85	1.61	46.15	55.75	86.5%	0.83	94.98	2.06
	2.71	53.82	0.81	1.56	43.45	55.26	85.8%	0.79	86.40	1.99
	2.76	53.34	0.76	1.51	40.77	54.76	85.0%	0.74	78.17	1.92
	2.81	52.86	0.72	1.46	38.12	54.27	84.2%	0.70	70.29	1.84
	2.86	52.30	0.68	1.41	35.49	53.70	83.3%	0.66	62.84	1.77
	2.91	51.11	0.64	1.36	32.90	52.50	81.5%	0.63	56.23	1.71
	2.96	49.05	0.62	1.31	30.38	50.42	78.3%	0.60	50.58	1.66
	3.01	44.98	0.62	1.26	28.03	46.34	71.9%	0.60	46.79	1.67
	3.06	43.23	0.60	1.21	25.82	44.57	69.2%	0.58	41.89	1.62
	3.11	41.48	0.57	1.16	23.71	42.81	66.4%	0.55	37.31	1.57
	3.16	40.19	0.54	1.11	21.67	41.51	64.4%	0.52	32.79	1.51
	3.21	39.15	0.50	1.06	19.69	40.47	62.8%	0.49	28.42	1.44
	3.26	38.06	0.47	1.01	17.76	39.36	61.1%	0.45	24.37	1.37
	3.31	36.94	0.43	0.96	15.88	38.22	59.3%	0.42	20.65	1.30
	3.36	35.99	0.39	0.91	14.06	37.23	57.8%	0.38	17.14	1.22
	3.41	34.04	0.36	0.86	12.30	35.22	54.7%	0.35	14.24	1.16
	3.46	31.39	0.34	0.81	10.67	32.52	50.5%	0.33	11.84	1.11
	3.51	28.57	0.32	0.76	9.16	29.62	46.0%	0.31	9.78	1.07
	3.56	24.54	0.32	0.71	7.87	25.54	39.6%	0.31	8.38	1.07
	3.61	22.42	0.30	0.66	6 70	23.34	36.2%	0.29	6.80	1.02
	3.66	20.34	0.28	0.61	5.63	21.18	32.9%	0.27	5.43	0.96
	3.71	17.92	0.26	0.56	4.67	18.67	29.0%	0.25	4.33	0.93
	3.76	15.59	0.25	0.51	3.83	16.26	25.2%	0.24	3.42	0.89
	3.81	13.94	0.22	0.46	3.10	14.52	22.5%	0.21	2.58	0.83
	3.86	12.28	0.20	0.41	2.44	12.78	19.8%	0.19	1.89	0.77
	3.91	10.63	0.18	0.36	1.87	11.05	17.1%	0.17	1.33	0.71
	3.96	8.97	0.15	0.31	1.38	9.31	14.5%	0.15	0.90	0.65
	4.01	7.58	0.13	0.26	0.97	7.84	12.2%	0.12	0.56	0.58
	4.06	6.32	0.10	0.21	0.62	6.52	10.1%	0.10	0.30	0.49
	4.11	4.60	0.07	0.16	0.35	4.74	7.4%	0.07	0.14	0.41
	4.16	2.99	0.05	0.11	0.16	3.07	4.8%	0.05	0.05	0.32
	4.21	1.54	0.03	0.06	0.04	1.57	2.4%	0.03	0.01	0.22

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	129.00	cfs
CALCULATED FLOW (Qc)=	131.34	cfs
(Qm-Qc)/Qm * 100 =	-1.8	%
MEASURED WATERLINE (WLm)=	2.26	ft
CALCULATED WATERLINE (WLc)=	2.46	ft
(WLm-WLc)/WLm * 100 =	-8.5	%
MAX MEASURED DEPTH (Dm)=	1.80	ft
MAX CALCULATED DEPTH (Dc)=	1.81	ft
(Dm-Dc)/Dm * 100	-0.7	%
MEAN VELOCITY=	2.29	ft/sec
MANNING'S N=	0.045	
SLOPE=	0.005	ft/ft
.4 * Qm =	51.6	cfs
2.5 * Qm=	322.5	cfs

RECOMMENDED INSTREAM FLOW:

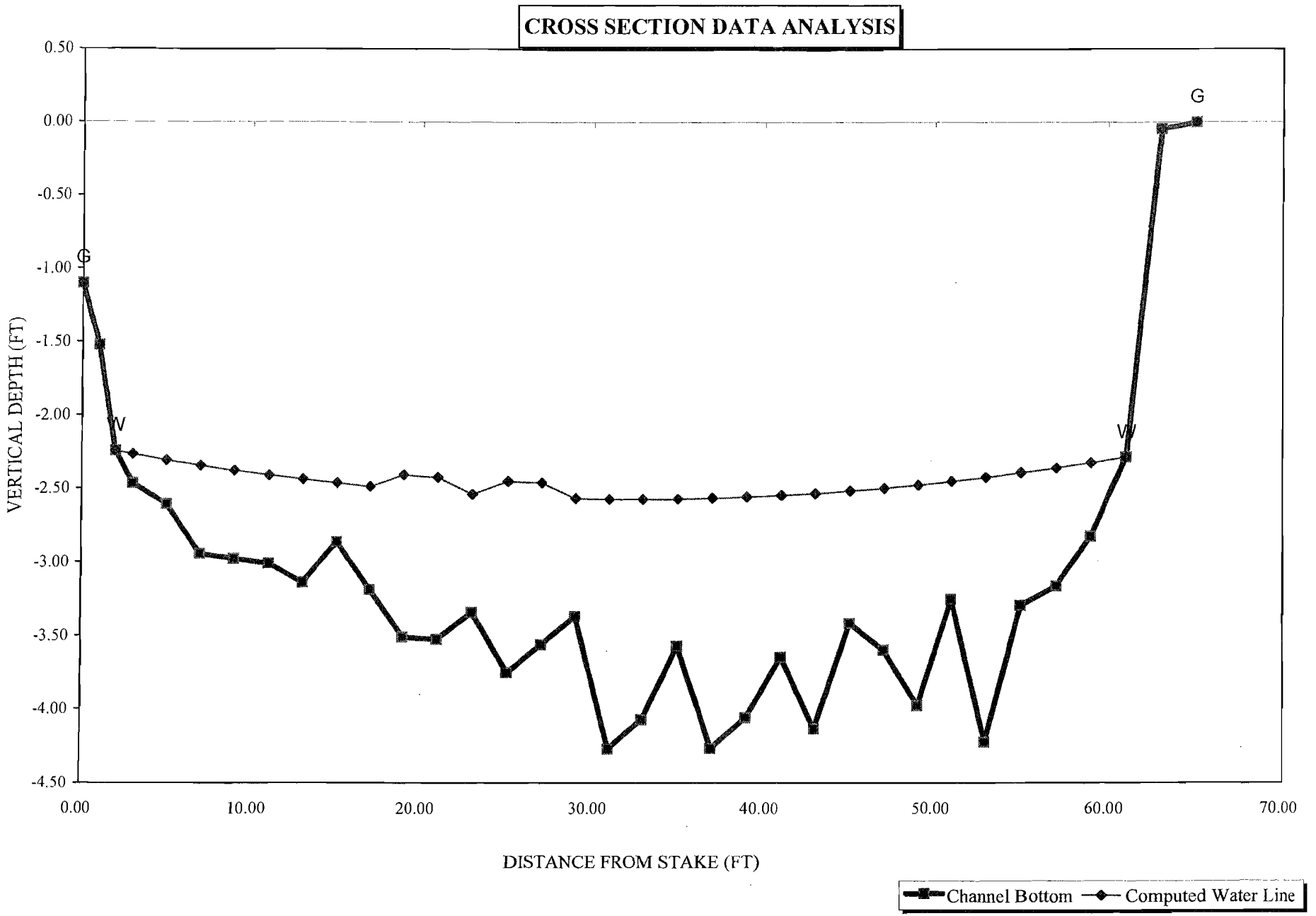
FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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

Roaring Fork #3



Data Input & Proofing

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2
DATE: 4/14/1977
OBSERVERS: Bennett, Siebirg

1/4 SEC: W 1/2
SECTION: 17
TWP: 8 S
RANGE: 86 W
PM: 10:00

COUNTY: Pitkin
WATERSHED: Roaring Fork River
DIVISION:
DOW CODE:
USGS MAP:
USFS MAP:

Sag Tape
TAPE WT: 0.0225 lbs / ft
TENSION: 32 lbs

SLOPE: 0.005 ft / ft

CHECKED BY:.....DATE.....

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

Total Data Points = 35

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
1	G	0.00	1.10			0.00	0.00	0.00
		1.00	1.50			0.00	0.00	0.00
	W	2.00	2.20	0.00	0.00	0.00	0.00	0.00
		3.00	2.40	0.20	0.20	0.30	0.06	2.27
		5.00	2.50	0.30	0.80	0.60	0.48	2.31
		7.00	2.80	0.60	0.70	1.20	0.84	2.34
		9.00	2.80	0.60	0.80	1.20	0.96	2.38
		11.00	2.80	0.60	1.00	1.20	1.20	2.41
		13.00	2.90	0.70	1.30	1.40	1.82	2.44
		15.00	2.60	0.40	1.70	0.80	1.36	2.46
		17.00	2.90	0.70	1.40	1.40	1.96	2.49
		19.00	3.20	1.10	1.10	2.20	2.42	2.41
		21.00	3.20	1.10	2.00	2.20	4.40	2.42
		23.00	3.00	0.80	2.20	1.60	3.52	2.54
		25.00	3.40	1.30	2.20	2.60	5.72	2.45
		27.00	3.20	1.10	3.00	2.20	6.60	2.46
		29.00	3.00	0.80	2.40	1.60	3.84	2.57
		31.00	3.90	1.70	1.50	3.40	5.10	2.57
		33.00	3.70	1.50	2.40	3.00	7.20	2.57
		35.00	3.20	1.00	4.00	2.00	8.00	2.57
		37.00	3.90	1.70	3.00	3.40	10.20	2.56
		39.00	3.70	1.50	3.00	3.00	9.00	2.56
		41.00	3.30	1.10	2.60	2.20	5.72	2.55
		43.00	3.80	1.60	2.80	3.20	8.96	2.53
		45.00	3.10	0.90	3.30	1.80	5.94	2.52
		47.00	3.30	1.10	2.70	2.20	5.94	2.50
		49.00	3.70	1.50	2.60	3.00	7.80	2.48
		51.00	3.00	0.80	2.70	1.60	4.32	2.45
		53.00	4.00	1.80	1.90	3.60	6.84	2.42
		55.00	3.10	0.90	2.40	1.80	4.32	2.39
		57.00	3.00	0.80	2.30	1.60	3.68	2.36
		59.00	2.70	0.50	0.80	1.00	0.80	2.32
	W	61.00	2.20	0.00	0.00	0.00	0.00	0.00
		63.00				0.00	0.00	0.00
1	G	65.00				0.00	0.00	0.00
					Totals	57.30	129.00	

Station: **MAROON CREEK NEAR ASPEN, CO.**
Parameter: STREAM FLOW CFS
Year: 1911-1917
State: CO
County: PITKIN

ID: 09076000
Statistic: Mean
Latitude: 39:09:47
Longitude: 106:52:49
Elevation: 8240.00
Drainage Area: 41.70

Monthly Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
# Days	217	198	217	210	217	150	155	186	150	186	180	186	2252
Avg Day	28.54	24.92	23.23	28.81	98.74	283.6	250.0	136.6	73.73	58.17	40.51	34.18	82.54
Max Day	56.00	38.00	34.00	69.00	312.0	420.0	365.0	288.0	152.0	153.0	83.00	72.00	420.0
Min Day	20.00	18.00	14.00	17.00	27.00	109.0	106.0	47.00	35.00	28.00	18.00	20.00	14.00
# Months	7	7	7	7	7	5	5	6	5	6	6	6	4
SDev Month	5.06	4.50	3.04	3.88	35.28	67.57	73.10	55.37	27.82	33.93	15.67	13.10	21.17
Skew Month	-0.661	-0.053	0.295	0.305	-0.015	-0.647	-0.407	0.224	0.427	1.69	1.58	1.18	-0.998
Min Month	20.00	18.00	18.81	23.43	55.35	182.4	167.5	70.03	41.80	30.68	28.40	20.00	61.52
Max Month	33.81	31.24	28.03	35.33	147.1	363.2	319.2	217.6	112.2	121.9	69.20	57.06	111.7
Exceedences													
1%	44.00	37.02	30.00	69.00	276.6	420.0	365.0	274.2	151.0	145.3	80.60	70.28	366.4
5%	38.00	32.00	29.00	43.00	230.4	385.0	350.3	246.4	144.5	143.0	69.00	61.10	305.0
10%	36.00	31.20	28.00	35.00	195.0	385.0	340.5	225.4	135.0	127.6	69.00	56.00	233.0
20%	32.00	30.00	27.00	30.00	155.2	365.0	318.0	184.0	103.0	69.00	51.00	43.00	136.0
50%	28.00	24.00	23.00	29.00	81.00	295.0	272.0	134.0	64.00	47.00	36.00	30.00	36.00
80%	24.00	20.00	22.00	23.00	42.00	211.0	176.0	81.00	43.00	33.00	29.00	25.00	25.00
90%	20.00	18.00	19.00	22.00	34.70	168.0	153.5	69.60	39.00	31.00	28.00	20.00	22.00
95%	20.00	18.00	18.00	19.00	31.85	125.5	133.8	59.00	37.00	31.00	27.00	20.00	20.00
99%	20.00	18.00	16.00	18.00	28.00	109.0	114.5	47.86	35.00	28.00	23.40	20.00	18.00

Station: **MAROON CREEK ABOVE ASPEN, CO.**
Parameter: STREAM FLOW CFS
Year: 1969-1994
State: CO
County: PITKIN

ID: 09075700
Statistic: Mean
Latitude: 39:07:25
Longitude: 106:54:17
Elevation: 8720.00
Drainage Area: 35.40

Monthly Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
# Days	775	706	775	750	775	750	775	775	780	806	779	775	9221
Avg Day	18.82	17.47	16.23	19.78	73.47	247.8	190.9	85.55	51.13	38.40	28.52	22.32	67.42
Max Day	35.00	31.00	36.00	60.00	409.0	570.0	519.0	240.0	123.0	80.00	52.00	39.00	570.0
Min Day	9.50	10.00	9.00	9.80	13.00	52.00	30.00	25.00	20.00	16.00	14.00	10.00	9.00
# Months	25	25	25	25	25	25	25	25	26	26	26	25	25
SDev Month	4.65	4.63	4.62	7.22	36.95	70.50	87.93	35.98	15.73	11.19	7.13	5.37	19.03
Skew Month	0.539	0.704	1.40	1.63	1.16	0.085	0.328	0.707	0.674	1.05	0.803	0.583	0.703
Min Month	10.37	10.79	10.97	11.60	28.71	91.93	37.32	26.84	22.23	18.00	15.00	12.06	28.98
Max Month	31.26	27.00	28.52	41.43	174.3	371.7	352.5	163.6	89.53	66.97	44.50	36.00	111.6
Exceedences													
1%	33.00	28.00	30.00	53.00	301.8	510.5	462.5	220.3	97.20	73.94	49.00	37.00	424.0
5%	26.00	27.00	26.00	38.00	199.3	450.0	390.5	166.8	84.00	64.00	43.00	34.00	264.0
10%	25.00	25.00	24.50	31.00	158.5	409.0	336.0	141.0	77.00	56.00	40.00	30.00	193.9
20%	23.00	22.00	19.00	24.00	115.0	344.0	268.0	116.0	64.00	47.00	35.00	27.00	92.00
50%	18.00	16.00	15.00	17.00	50.00	222.0	179.5	75.00	47.00	35.00	26.00	22.00	30.00
80%	15.00	13.00	13.00	14.00	26.00	162.0	98.00	52.00	38.00	30.00	23.00	18.00	17.00
90%	13.00	12.00	12.00	13.00	20.00	125.0	78.50	46.00	34.00	28.00	21.00	16.00	14.00
95%	11.00	11.00	11.00	12.00	17.00	95.50	62.75	40.00	31.00	25.30	19.00	13.00	13.00
99%	10.00	10.00	11.00	10.00	14.00	63.50	32.00	25.00	21.00	17.00	14.00	11.00	11.00

Station: **ROARING FORK RIVER NEAR ASPEN, CO.**
Parameter: STREAM FLOW CFS
Year: 1964-2005
State: CO
County: PITKIN

ID: 09073400
Statistic: Mean
Latitude: 39:10:48
Longitude: 106:48:05
Elevation: 8014.01
Drainage Area: 108.00

Monthly Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
# Days	1271	1158	1271	1230	1271	1230	1271	1271	1230	1271	1230	1271	14975
Avg Day	26.42	25.18	27.40	48.80	196.1	404.8	188.8	67.71	50.25	43.10	34.33	29.37	95.29
Max Day	47.00	55.00	70.00	186.0	1370	1790	1900	513.0	159.0	110.0	77.00	55.00	1900
Min Day	14.00	14.00	15.00	17.00	31.00	41.00	29.00	17.00	19.00	20.00	12.00	15.00	12.00
# Months	41	41	41	41	41	41	41	41	41	41	41	41	41
SDev Month	6.06	5.74	6.27	13.87	83.17	232.4	191.7	37.01	16.64	14.37	10.28	7.63	40.60
Skew Month	0.754	0.645	0.603	0.563	2.17	1.02	2.90	1.82	0.765	0.947	0.874	0.821	1.51
Min Month	16.97	15.39	16.61	26.23	97.03	77.83	46.55	25.74	23.80	23.45	20.73	18.65	41.03
Max Month	44.65	41.07	44.29	79.70	554.1	1017	1057	186.5	94.03	79.97	61.57	47.52	228.5
Exceedences													
1%	45.00	43.00	51.00	149.0	889.0	1430	1226	224.0	115.1	91.00	64.40	50.00	882.0
5%	37.00	35.00	41.00	98.00	429.0	1030	642.3	144.4	86.00	76.45	56.00	46.00	373.0
10%	35.00	33.00	37.00	76.00	361.0	842.0	405.9	112.0	76.00	65.00	50.00	41.00	236.0
20%	32.00	30.00	33.00	61.00	280.0	575.0	242.8	87.00	65.00	56.00	43.00	36.00	102.0
50%	25.00	24.00	26.00	43.00	163.0	314.0	108.0	55.00	46.00	40.00	32.00	27.00	40.00
80%	21.00	20.00	21.00	30.00	83.20	195.0	64.00	39.00	33.00	30.00	25.00	23.00	25.00
90%	19.00	19.00	20.00	25.00	60.10	137.0	51.00	32.00	29.00	27.00	23.00	20.00	22.00
95%	18.00	17.00	18.00	22.00	51.55	105.0	42.00	29.00	26.00	24.00	22.00	19.00	20.00
99%	16.00	15.00	16.00	19.00	40.42	52.30	35.00	22.71	21.00	21.00	20.00	17.71	17.00

Station: **ROARING FORK RIVER AT ASPEN, CO.**
Parameter: STREAM FLOW CFS
Year: 1910-1964
State: CO
County: PITKIN

ID: 09073500
Statistic: Mean
Latitude: 39:11:22
Longitude: 106:48:50
Elevation: 7884.58
Drainage Area: 109.00

Monthly Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
# Days	1333	1215	1333	1290	1333	1290	1333	1333	1290	1333	1290	1333	15706
Avg Day	25.59	24.33	25.01	56.14	276.2	566.8	211.3	60.25	40.11	43.29	34.62	29.14	116.1
Max Day	66.00	56.00	72.00	289.0	1360	2230	1720	380.0	208.0	140.0	97.00	83.00	2230
Min Day	12.00	12.00	14.00	15.00	28.00	33.00	9.00	3.20	0.400	0.500	7.40	10.00	0.400
# Months	43	43	43	43	43	43	43	43	43	43	43	43	43
SDev Month	7.45	7.45	8.22	24.69	119.2	318.1	195.8	45.69	26.07	23.03	12.86	9.23	51.87
Skew Month	1.79	1.61	1.46	0.982	1.12	0.748	1.68	1.08	0.676	1.23	0.759	0.685	0.678
Min Month	16.00	15.79	15.13	24.60	120.2	99.53	18.14	12.91	1.86	7.41	14.58	15.42	43.12
Max Month	51.77	50.96	54.00	130.6	612.7	1429	897.5	172.0	107.8	112.5	63.07	51.29	227.7
Exceedences													
1%	54.00	51.85	58.00	247.1	1020	1831	1177	250.1	142.0	139.7	68.00	57.00	1100
5%	41.00	40.00	42.00	155.5	752.1	1425	670.0	168.8	94.50	94.00	60.00	49.00	540.0
10%	34.70	35.00	35.00	98.00	535.0	1120	511.0	126.0	78.00	74.00	55.00	41.00	322.0
20%	30.00	30.00	31.00	74.00	400.0	846.0	336.0	94.00	62.00	57.40	47.00	40.00	125.0
50%	24.00	22.00	22.00	44.00	217.0	447.0	122.0	42.00	36.00	38.00	31.00	27.00	36.00
80%	20.00	18.00	18.00	26.00	112.0	239.0	50.00	19.00	13.00	28.00	24.00	20.00	22.00
90%	18.00	16.50	17.00	22.00	75.00	160.0	32.00	14.00	8.40	21.00	22.00	18.00	18.00
95%	16.00	16.00	16.00	20.00	58.65	112.0	23.00	11.00	5.80	10.65	18.00	17.00	15.00
99%	15.00	14.00	15.00	16.00	43.00	69.80	10.00	7.07	1.30	1.10	13.00	14.00	7.20

BEFORE THE COLORADO WATER CONSERVATION BOARD

STATE OF COLORADO

REBUTTAL STATEMENT OF THE BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION
WATER DIVISION 5: STAPLETON BROTHERS' DITCH

TABLE OF CONTENTS

Pursuant to Rule 6m(5)(e) of the Rules Concerning the Colorado Instream Flow and Natural Lake Level, 2 CCR 408-2 ("ISF Rules"), the Board of County Commissioners of Pitkin County ("Pitkin County") hereby submits its rebuttal statement in support of the proposed acquisition of the Stapleton Brothers' Ditch water right from Pitkin County for instream flow uses.

I. INTRODUCTION.

This Rebuttal Statement responds to the issues raised by the Basalt Water Conservancy District and the Starwood Metropolitan District (collectively, "Districts") and the Willow Creek Ditch and Herrick Ditch Company and Roaring Fork Land and Cattle Company (collectively, "Maroon Creek Parties") regarding the proposed Pitkin County Water Rights Revocable Trust ("Trust Agreement") between Pitkin County and the Colorado Water Conservation Board ("CWCB"). Pursuant to the Trust Agreement, Pitkin County will initially make 4.3 cfs of its interest in the Stapleton Brothers' Ditch water right ("Stapleton Brothers' Ditch") available for the CWCB for use in its instream flow program, after which time Pitkin County would make additional water rights available for CWCB's use.

The Colorado General Assembly has demonstrated its support for preservation and improvement of Colorado's streams through legislation creating and strengthening the instream flow program, most recently through House Bill 08-1280, which facilitates the proposed Trust Agreement. Use of the Stapleton Brothers' Ditch to improve Maroon Creek and the Roaring Fork River by stacking the water right with the existing minimum instream flow rights will assist the CWCB in achieving the goal established by the General Assembly to acquire senior water rights for improvement of the natural environment. Such use will not adversely impact any other water users, as the Water Court will review the proposed use in a change of use case. The proposed use will also further the CWCB and Pitkin County's mutual goals to protect the natural environment and preserve senior water rights from abandonment.

Pitkin County has proposed the Trust Agreement as a means to donate the use of more than two dozen water rights to the CWCB. Application of the ISF Rule 6 factors by which the CWCB evaluates water rights acquisitions supports approval of the Trust Agreement. Use of water rights for instream flow purposes as proposed in the Trust Agreement is consistent with Pitkin County's commitment to protect the Roaring Fork Basin and support State policies to protect water rights such as the Stapleton Brothers' Ditch. Finally, the Trust Agreement itself is an appropriate mechanism for Pitkin County to make water rights available to the CWCB for instream flow use. For these reasons, discussed further below, Pitkin County urges the CWCB to not be distracted by the misleading issues raised by the Districts and Maroon Creek Parties, and to approve the Trust Agreement establishing the long-term relationship between Pitkin County and the CWCB to further their mutual goals in protecting the Roaring Fork Basin.

II. ACQUISITION OF THE STAPLETON BROTHERS' DITCH IS APPROPRIATE UNDER THE RULE 6 FACTORS.

The factors set forth in ISF Rule 6 establish the criteria by which the CWCB is to evaluate the acquisition of water rights such as the Stapleton Brothers' Ditch. The Rule 6 factors at issue are: (1) administrability of the Stapleton Brothers' Ditch when used for instream flow purposes; (2) potential material injury to existing decreed water rights; (3) the extent to which the natural environment will be preserved or improved to a reasonable degree by the Stapleton Brothers' Ditch; (4) the potential for subsequent use of the Stapleton Brothers' Ditch downstream of the instream flow reach; (5) the effect of the proposed use of the Stapleton Brothers' Ditch on relevant interstate compact issues; and (6) the effect of the proposed use of the Stapleton Brothers' Ditch on maximum utilization of the waters of the State of Colorado. Each of these factors is discussed in turn below. Pursuant to C.R.S. § 37-92-102(3), the CWCB need only find that acquisition of the Stapleton Brothers' Ditch is appropriate under these factors to approve the acquisition and the Trust Agreement.

A. The Stapleton Brothers' Ditch will be Administrable when Used for Instream Flow Purposes as Proposed in the Trust Agreement.

The Districts and Maroon Creek Parties have questioned whether the Stapleton Brothers' Ditch can be administered to preserve and improve the natural environment by stacking water rights. Such questions do not suggest that acquisition of the Stapleton Brothers' Ditch is inappropriate; rather, such inquiry suggests that the Districts and Maroon Creek Parties misunderstand the administration of water rights for instream flow purposes. As described below, administrability of the Stapleton Brothers' Ditch for instream flow purposes as proposed requires that: (1) the Stapleton Brothers' Ditch operate independently from the existing minimum instream flow water rights; (2) the legal framework allow stacking; (3) the historical consumptive use amount that may be protected for instream flow use be determined; and (4) a stream gauge be installed in the vicinity of the headgate. Based on these considerations, the Stapleton Brothers' Ditch will be administrable for instream flow purposes.

1. The Stapleton Brothers' Ditch and the existing minimum instream flow rights will be administrable as independent water rights.

When used for instream flow purposes, the Stapleton Brothers' Ditch will be administered in accordance with its historical use, under its original priority, except that the water that had been historically diverted and consumed by the irrigated crops will now be used in the stream and protected from diversion. This will allow the Stapleton Brothers' Ditch to be administered as a separate and independent water right from the existing minimum instream flow rights, as would occur if the Stapleton Brothers' Ditch was being changed to other purposes. The Stapleton Brothers' Ditch may be stacked with the existing minimum instream flow water rights so that when the existing minimum rights are satisfied, the Stapleton Brothers' Ditch will be used to improve the natural environment. The change of the Stapleton Brothers' Ditch will fundamentally operate like any change of water right.

The Districts suggest that the Stapleton Brothers' Ditch and the existing minimum instream flow water rights would not be administered in priority under the current proposal. Prehearing Statement, p. 5. Similarly, the Maroon Creek Parties have suggested that in order for the Stapleton Brothers' Ditch to be stacked with the existing minimum instream flow water right on Maroon Creek, it will be necessary for the Stapleton Brothers' Ditch to call when the water right is satisfied based on flows at the headgate. Prehearing Statement at 2. These arguments misstate the nature of instream flow water rights and the intended use of the Stapleton Brothers' Ditch. The key to the current proposal and to stacking the Stapleton Brothers' Ditch with the existing minimum instream flow water rights is maintenance of the water rights' priorities. When a water right is changed to allow a different type or place of use, that water right continues to be exercised under its original priority. *Colo. Water Conservation Bd. v. City of Central*, 125 P.3d 424, 437 (Colo. 2005). Indeed, the value of a water right is its priority and the right to adapt the water right to a new use. *Id.* at 434-35.

Contrary to the Maroon Creek Parties' arguments, the Stapleton Brothers' Ditch will not issue a call when it is satisfied based on the flows at the headgate on Maroon Creek. The CWCB may use the Stapleton Brothers' Ditch for instream flow purposes by exercising the water right, without issuing a call, as with any water right. The Colorado Supreme Court has described an instream flow water right as "an in-place right to use of water" that is "no different in concept from other appropriative rights." *Id.* at 437. The suggestion that an instream flow water right is somehow exempt from stream administration and could call when a diversion water right could not is simply not supported by the law.

The claim that the Stapleton Brothers' Ditch would call when satisfied at the headgate is contrary to the proposed use of the water right for instream flow purposes. The proposed use would allow the CWCB to protect water in the stream under the Stapleton Brothers' Ditch when it is in priority. *See id.* at 439 ("The primary value of an instream flow right [is] its ability to preserve the stream conditions."). If the existing minimum instream flow water right is not satisfied, the Stapleton Brothers' Ditch will be used for preservation of the natural environment. If the existing minimum instream flow water right is satisfied, the Stapleton Brothers' Ditch will then be used for improvement of the environment. **Appendix I** to this Rebuttal Statement contains three detailed examples of how streamflows on Maroon Creek and the Roaring Fork River would be distributed among various water rights when the Stapleton Brothers' Ditch is stacked. Under no circumstances would the Stapleton Brothers' Ditch call for water when it is fully satisfied at the headgate. However, water that is available for the Stapleton Brothers' Ditch at the headgate would be protected from diversion through the instream flow reaches as allowed by a Water Court decree.

In summary, changing the Stapleton Brothers' Ditch to instream flow uses will operate like any change of water right, preserving the original priority and status of the Stapleton Brothers' Ditch for a use other than what was originally decreed. By exercising the Stapleton Brothers' Ditch independently of the existing minimum instream flow water rights, as allowed,

the CWCB may use the Stapleton Brothers' Ditch to improve the natural environment in amounts above the minimum instream flow.

2. Stacking is permitted under the ISF Rules and C.R.S. § 37-92-102(3); therefore, use of the Stapleton Brothers' Ditch is administrable as proposed.

The CWCB may stack acquired water rights with appropriated minimum instream flow water rights, allowing the Division Engineer to administer the Stapleton Brothers' Ditch for instream flow purposes as proposed. The General Assembly granted the CWCB two classes of instream flow rights: (1) junior water rights that may be appropriated; and (2) senior water rights that may be acquired. C.R.S. § 37-92-102(3). The first class of rights includes water rights appropriated for preservation of the natural environment by maintaining a minimum instream flow. In contrast, the second class of water rights includes those acquired from third parties, which may be used for either preservation or improvement in an amount not limited by the minimum instream flow. Here, the Stapleton Brothers' Ditch falls within the second, less restrictive, class of CWCB instream flow rights. As such, the Stapleton Brothers' Ditch may be used for preservation or improvement of the natural environment to a reasonable degree.

The ISF Rules allowing stacking is consistent with this statutory structure. The CWCB defines stacking as "an instance in which the Board holds more than one water right for the same . . . reach of stream and exercises the rights independently according to their decrees." ISF Rule 4o. Further, the ISF Rules provide that when acquiring a water right, "[t]he Board shall evaluate whether to combine or stack the acquired water right with any other ISF appropriation or acquisition, based upon the extent to which the acquired right will provide flows or lake levels to preserve or improve the natural environment to a reasonable degree." ISF Rule 6c. Thus, stacking allows the CWCB, in its discretion, to maintain the independence of water rights it acquires rather than incorporating the acquired water right into the existing minimum instream flow water right.

Nevertheless, the Districts argue that stacking is an impermissible expansion of the minimum instream flow under the requirements of C.R.S. § 37-92-102(4)(a). Prehearing Statement, p. 5. This argument misconstrues § 37-92-102(4)(a), which applies only to the first class of CWCB instream flow rights. Section 37-92-102(4)(a) states that "any increase to an existing ***minimum*** instream flow or natural lake level ***appropriation*** or decree shall be made as a new appropriation" (emphasis added). Section § 37-92-102(4)(a) mimics the language creating the first class of CWCB instream flow rights in § 37-92-102(3) by using the language "appropriate." In contrast, § 37-92-102(3) creates the second class of rights by reference to "acquire." The appropriation / acquisition distinction is important in determining the scope of § 37-92-102(4)(a). The emphasized language above limits the application of § 37-92-102(4)(a) to only situations where the CWCB seeks an expansion of the minimum instream flow appropriation. Consequently, the acquisition of additional instream flows contemplated here is not restricted by § 37-92-102(4)(a).

The Districts also argue that stacking is inappropriate under the State Engineer's policy regarding seniors first administration of storage rights, as set forth in Written Instruction and Order 2007-02. Prehearing Statement, p. 5. The seniors first policy was designed to apply when a single entity owns water rights of different priorities for the same use and decreed to the same structure to prevent circumvention of administration for the benefit of the junior water right. *See* **Exhibit M**. Here, the Stapleton Brothers' Ditch will be decreed for two distinct uses: preservation and improvement. As the senior water right, the Stapleton Brothers' Ditch will always be exercised before the existing minimum instream flow water right. Thus, when the junior right operates for preservation, the senior right will be used for improvement. Consequently, the seniors first policy does not prevent stacking water rights for two distinct instream flow uses as allowed by statute and the ISF Rules.

3. The historical consumptive use of the Stapleton Brothers' Ditch, as determined in Case No. 99CW306, is not subject to substantial risk of reduction and can be administered for instream flow purposes.

The amount of water from the Stapleton Brothers' Ditch to be made available to the CWCB for instream flow purposes is the historical consumptive use of the water right, which was determined in Case No. 99CW306. Based on that determination, the Stapleton Brothers' Ditch will yield sufficient water for the Division Engineer to administer the water right to preserve and improve the natural environment. Contrary to the position of the Maroon Creek Parties, the determination in Case No. 99CW306 is not subject to a risk of substantial reduction.

Historical usage of a water right, as determined in a prior Water Court decree, is not subject to relitigation in a subsequent Water Court matter under the *res judicata* doctrine. *In re Midway Ranches Property Owners' Assoc.*, 938 P.2d 515, 524 (Colo. 1997). The Colorado Supreme Court has recognized that the application of these principles to historical use determinations is "important to the stability and reliability of Colorado water rights." *Id.* at 525. A party cannot litigate claims that could have been brought in the earlier case when the historical use was actually determined. *Id.* The Water Court may not modify an earlier decree when the historical consumptive use was calculated and relied upon in drafting the decree. *Farmers High Line Canal & Res. Co. v. City of Golden*, 975 P.2d 189, 201 (Colo. 1999). Here, the historical use of the Stapleton Brothers' Ditch during the period of 1904 through 2004 was determined and relied upon in Case No. 99CW306 when Pitkin County changed the water right to allow municipal uses.

The Maroon Creek Parties have suggested that the CWCB will not be able to use the full 119.25 acre-feet per year of historical consumptive use credits attributed to the Stapleton Brothers' Ditch because the historical consumptive use of the water right must be requantified in the Water Court application to change its use to instream flow purposes. Prehearing Statement, p. 2. Additionally, the Maroon Creek Parties suggest that changing the use of the Stapleton Brothers' Ditch will require the CWCB to be responsible for replacing delayed return flows associated with the historical irrigation use of the Stapleton Brothers' Ditch. Prehearing

Statement, p. 2. These suggestions overstate the risk, if any, associated with changing the use of the Stapleton Brothers' Ditch to instream flow purposes.

The Water Court determined the historical conditions of use of the Stapleton Brothers' Ditch in Case No. 99CW306; therefore, the quantification of the historical use through 2004, including the replacement of delayed return flows, is not subject to relitigation in a future change application. The 99CW306 Decree explicitly states that "quantification of the historic [sic] consumptive use of the Stapleton Brothers' Ditch water right in this Decree shall be *res judicata* as to conditions existing prior to the entry of this Decree." **Exhibit C**, p. 6. In subsequent applications, "consideration of the historic [sic] use of the Stapleton Brothers' Ditch water right ***shall include only the time period subsequent to entry of this Decree***." **Exhibit C**, p. 7 (emphasis added). The conditions existing prior to entry of the 99CW306 Decree include the consumptive use of the water right, as well as return flows from application of the water to irrigation use. By determining the historical consumptive use of the water right, the 99CW306 Decree necessarily determined the amount of water that was diverted at the Stapleton Brothers' Ditch headgate, applied to the historically irrigated property, consumed by the irrigated crops and returned to the stream. The fact that the 99CW306 Decree does not contain requirements for replacement of delayed return flows is conclusive that such replacement is not necessary based on the historical use of the water right for irrigation. The Maroon Creek Parties cannot now attempt to relitigate the historical use of the Stapleton Brothers' Ditch when they had ample opportunity to address any potential injury by the change in Case No. 99CW306 and when the Water Court specifically determined the historical use of the water right.

Moreover, any requantification of the historical consumptive use of the Stapleton Brothers' Ditch or determination of delayed return flows must be limited to the time period since 2004. *Midway Ranches*, 938 P.2d at 525; **Exhibit C**, p. 7. The Division Engineer for Water Division No. 5 has represented to Pitkin County that he typically does not require requantification for such a short period of time, presenting a minimal risk to the CWCB. Thus, suggestions by the Maroon Creek Parties that the CWCB will not be able to use the full 119.25 acre-feet are greatly exaggerated.

As a result of the finality of the findings in Case No. 99CW306 under the *res judicata* doctrine, the historical consumptive use of the Stapleton Brothers' Ditch through 2004 cannot be relitigated. Furthermore, based on the Division Engineer's policy regarding requantification, the short period of unquantified use since 2004 does not present a risk of loss to the CWCB.

4. Pitkin County owns the property adjacent to the Stapleton Brothers' Ditch headgate on which a gauge may be installed, allowing for administration of the Stapleton Brothers' Ditch.

Proper administration of the Stapleton Brothers' Ditch for instream flow purposes will require that a stream gauge be installed on Maroon Creek for measurement of the water right's use for such purposes. The Maroon Creek Parties have suggested that use of the

Stapleton Brothers' Ditch for instream flow purposes will not be administrable because the CWCB must acquire the right to use a private party's property in order to install a stream gauge as required by the ISF Rules and the Division Engineer. Prehearing Statement, p. 2. To the contrary, Pitkin County owns the property immediately downstream from the Stapleton Brothers' Ditch headgate, which it understands to be the ideal location for a stream gauge in this situation. A map is submitted with this Rebuttal Statement which delineates the property owned by Pitkin County in the vicinity of the headgate. **Exhibit N**. The map outlines the Highlands Open Space, owned by Pitkin County within its Open Space and Trails Program, which includes land on both sides of Maroon Creek immediately downstream of the headgate. Pitkin County also owns the access road to the property and will grant access to the CWCB and the Division Engineer, meaning that the CWCB will not need to acquire any property interests from third parties in order to allow administration of the Stapleton Brothers' Ditch for instream flow purposes.

For the reasons set forth above, use of the Stapleton Brothers' Ditch for instream flow purposes, including stacking against the existing minimum instream flow rights, will be administrable. As such, consideration of this ISF Rule 6 factor supports approval of the Trust Agreement and acquisition of the Stapleton Brothers' Ditch.

B. Use of the Stapleton Brothers' Ditch for Instream Flow Purposes will not Cause Material Injury to Other Water Rights.

Under ISF Rule 6, the CWCB must evaluate whether the proposed use of the Stapleton Brothers' Ditch will cause material injury to other water rights. Use of the Stapleton Brothers' Ditch for instream flow uses will be limited to the historical use of the water right, which was determined through 2004 in Case No. 99CW306. With such limitations, other water rights will not be injured by the new use. The Districts and Maroon Creek Parties raise a number of claims of potential injury from the proposed use of the Stapleton Brothers' Ditch. The majority of these claims are based on unrealistic assumptions, such as the mistaken idea that the Stapleton Brothers' Ditch has been abandoned.

As discussed in Pitkin County's Prehearing Statement, the Water Court may not approve a change of water right without ensuring that the proposed change does not result in injury to other water rights. C.R.S. § 37-92-305(3). The change of water right must not result in an enlargement of the consumptive use of the water right or reduce the available water supply to other water rights operating in priority. *Farmers Reservoir & Irrigation Co. v. City of Golden*, 44 P.3d 241, 245-46 (Colo. 2002). The Maroon Creek Parties allege that use of the Stapleton Brothers' Ditch for instream flow purposes will expand the water right beyond its historical use. Prehearing Statement at 2. Because use of the Stapleton Brothers' Ditch for instream flow purposes requires that the CWCB obtain a Water Court decree, which must prevent an expansion of use, these allegations should not prevent acquisition of the Stapleton Brothers' Ditch. The concerns of the Maroon Creek Parties and other water users will be addressed as part of the Water Court application to allow the CWCB to use the Stapleton Brothers' Ditch.

The Starwood Metropolitan District ("Starwood") claims that its ownership interest in the Stapleton Brothers' Ditch water right may be injured as a result of the proposed use for instream flow purposes. Prehearing Statement at 3. Starwood's interest in the Stapleton Brothers' Ditch water right was specifically excluded from the Trust Agreement. The 4.3 cfs proposed to be used for instream flow purposes is the diversion rate of the Stapleton Brothers' Ditch after subtracting a *pro rata* rate for the amount sold to Starwood and other parties and the amount retained by Pitkin County.[1] Therefore, Starwood's interest in the Stapleton Brothers' Ditch water right is distinct from the 4.3 cfs available for use by the CWCB and will operate independently.

In addition, the Districts claim that use of the Stapleton Brothers' Ditch for instream flow purposes will result in an increase in the amount of the Roaring Fork River stream flow that cannot be depleted by their exchanges and thereby cause them injury by limiting the times when the Districts' exchanges can operate. Prehearing Statement at 2-3. Similarly, the Districts claim that protection of the Stapleton Brothers' Ditch for instream flow purposes will result in a change in the historical call regime because water rights downstream of the Ditch will have to call more often in order to divert. Prehearing Statement at 4. A fundamental assumption in these arguments is that the water to be protected through this proposal has been available in the stream for use by the Districts and others. Such an assumption ignores the fact that the Stapleton Brothers' Ditch water to be protected was historically used for irrigation, meaning that it was diverted from Maroon Creek and consumed by the irrigated crops and therefore was not in the stream for use by others. *See* **Exhibit C**, p. 3-4. The Districts and other downstream water users have no legal claim to the Stapleton Brothers' Ditch and cannot claim injury based on a new legal use of water that was not historically in the stream. As owner of the Stapleton Brothers' Ditch, Pitkin County is entitled, within the confines of Colorado law, to change the use of the water right, including to instream flow purposes for use by the CWCB. *See Central*, 125 P.3d at 434-35. The Districts' arguments that require Pitkin County to allow others to use its senior Stapleton Brothers' Ditch would result in a windfall to their junior water rights.

In an attempt to support their arguments, the Districts allege that the Stapleton Brothers' Ditch had been "relinquished" to the stream and could not divert at the time that the Districts' exchanges and the CWCB's existing minimum instream flow water rights were appropriated. Prehearing Statement at 3, 6. Simply stated, the Districts are alleging that the Stapleton Brothers' Ditch was abandoned when the Districts' appropriated their exchanges. This argument has no merit. Abandonment is "termination of a water right in whole or in part as a result of the intent of the owner thereof to discontinue permanently the use of all or part of the water available thereunder." C.R.S. § 37-92-103(2). Pitkin County, as owner, may choose to divert all, a portion or none of its decreed water rights without intending to abandon the water rights. *See Aspen Wilderness Workshop, Inc. v. Colorado Water Conservation Bd.*, 901 P.2d

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[1] A total of 220 acre-feet per year of historical consumptive use was decreed for the 8.0 cfs Stapleton Brothers' Ditch in Case No. 99CW306. Pitkin County sold 5.75 acre-feet to Archer and Sandra Bishop, Alston Gardner and Barbara Lee and 65 acre-feet to Starwood. Pitkin County also retained 30 acre-feet. The remaining 119.25 acre-feet per year was included in the Trust Agreement. The flow rate of 4.3 cfs is the portion of 8.0 cfs corresponding to 119.25 acre-feet.

1251, 1259 n.15 (Colo. 1995). At no time has Pitkin County intended to abandon the Stapleton Brothers' Ditch through its decision to not use the full water right. Nor has the Stapleton Brothers' Ditch ever been listed on the State Engineer's abandonment list.

Furthermore, the 99CW306 Decree specifically accounts for the period of reduced use during the development of the Aspen-Pitkin County Airport prior to 2004. **Exhibit C**, p. 3-4. The period of reduced use was factored into the amount of historical consumptive use attributable to the Stapleton Brothers' Ditch. Finally, Starwood's current allegation that the Stapleton Brothers' Ditch was abandoned and available for appropriation by other parties is at odds with its purchase of 65 acre-feet of the Stapleton Brothers' Ditch for $650,000. **Exhibit Q**. Pitkin County does not believe that Starwood would pay such a premium for a water right if it had any question of whether the water right had been abandoned.

Ironically, the Basalt Water Conservancy District ("Basalt District") argued in 2004 that more than enough water flowed in the Roaring Fork River in 2002, a "1 in 100 to 1 in 300 dry year event," to satisfy both the CWCB's existing minimum instream flow and the Basalt District's claimed exchanges in Case Nos. 01CW305, 02CW77 and 02CW78. Districts' Exhibit F-1. The Basalt District's engineer stated that "had the [three studied] ditches been limited to their decreed amounts, the streamflow within the critical reach may have been as high as 63 cfs. ... it appears that there exists an adequate exchange capacity in the Roaring Fork River to support the various District applications." *Id.* at 1-2. Although Pitkin County does not agree with this conclusion, the argument that protection of an additional 0.52 cfs will injure Basalt District's water rights, when its engineer determined that as much as 8 cfs was available in the Roaring Fork River above the minimum instream flow amount, seems contrary to the position the Basalt District has taken to benefit its own Water Court applications.

The conflicting positions taken by the Basalt District highlight what may be its underlying motivation in challenging the Trust Agreement. The Basalt District has two pending applications for exchanges on the Roaring Fork River in Case Nos. 01CW305 and 02CW77, in which the CWCB filed statements of opposition to protect the instream flow reaches from injury. The Basalt District exchanges cannot operate in a manner to deplete the instream flow reaches, including the portion of the Stapleton Brothers' Ditch used for instream flow purposes. If the Stapleton Brothers' Ditch were to be changed for uses downstream of the confluence of the Roaring Fork and Frying Pan Rivers, the exchanges would indirectly benefit from the change, as the Basalt District could divert the Stapleton Brothers' Ditch water so long as an adequate replacement was made upstream of the place of use. In other words, the Basalt District would receive a windfall benefit to its exchange water rights if Pitkin County decided to change the Stapleton Brothers' Ditch to a use other than instream flow purposes. Under the Trust Agreement proposal, however, the Basalt District may not use the Stapleton Brothers' Ditch to benefit its exchanges, just as the Basalt District could not use the Stapleton Brothers' Ditch under the historical operation of the water right.

In discussing possible injury to other water rights, it must be kept in mind that the Water Court has confirmed the historical use of the Stapleton Brothers' Ditch and determined

that it was not historically in the stream for use by others. Therefore, use for instream flow purposes will not change stream conditions vis-à-vis other water users who do not have a legal claim to use water decreed to the Stapleton Brothers' Ditch. As such, review of this ISF Rule 6 factor supports acquisition of the Stapleton Brothers' Ditch.

C. Use of the Stapleton Brothers' Ditch for Instream Flow Purposes Will Preserve and Improve the Natural Environment to a Reasonable Degree.

The third factor under ISF Rule 6 is the extent to which the Stapleton Brothers' Ditch will preserve or improve the natural environment to a reasonable degree. Implicit in the passage of C.R.S. § 37-92-102(3) is the General Assembly's intent that the natural aquatic and riparian environment of Colorado be preserved and improved. The General Assembly adopted changes to the instream flow program to allow the CWCB to acquire water rights for improvement of the natural environment, demonstrating its intent that the CWCB work toward improvement of Colorado's streams as well as preservation.

The Districts and Maroon Creek Parties argue that the CWCB has failed to demonstrate that the instream flow reaches need improvement. Districts' Prehearing Statement, p. 2; Maroon Creek Parties' Prehearing Statement, p. 2. The proper question is not whether these reaches need improvement; rather, it is whether the Stapleton Brothers' Ditch will benefit the natural environment to a reasonable degree. ISF Rule 6; C.R.S. § 37-92-102(3). The General Assembly has not set forth a standard that the CWCB must prove a need to improve the stream when acquiring a water right. Instead, the statute grants the CWCB discretion in determining whether acquisition of a water right is appropriate: "The board also may acquire... water rights... ***in such amount as the board determines is appropriate*** for stream flows... to preserve or improve the natural environment to a reasonable degree." C.R.S. § 37-92-102(3) (emphasis added). The discretion granted to the CWCB does not require a showing of need, but creates guidance for the CWCB in making decisions to acquire water rights for instream flow. The General Assembly also directed the CWCB to adopt criteria for evaluating "the extent to which leased or loaned water will benefit the natural environment to a reasonable degree," which were adopted in ISF Rule 6. *Id.* The proper analysis under C.R.S. § 37-92-102(3) and ISF Rule 6 is not whether the natural environment needs improvement, but rather whether the natural environment will be preserved or improved to a reasonable degree. Consequently, the CWCB need only find that acquisition of the Stapleton Brothers' Ditch will preserve or improve the stream to a reasonable degree.

In addition, the Maroon Creek Parties' allege that the W-2945 instream flow water right on Maroon Creek has always been met during the irrigation season, precluding the use of the Stapleton Brothers' Ditch for instream flow purposes. Prehearing Statement, p. 1. Review of stream flows on Maroon Creek by Pitkin County's water rights expert concludes that the flows at the Stapleton Brothers' Ditch headgate cannot be determined based on the available data. *See* **Exhibit O**, p. 7-8. However, the limited available data indicates that stream flows on Maroon Creek have approached the 14 cfs minimum instream flow level on several days during the irrigation seasons on the record. *Id.* This does not take into account future changes in stream

conditions such as additional diversions by senior water rights and impacts of climate change, which cannot be predicted. For example, under historical stream conditions, full operation of the Herrick Ditch could realistically reduce Maroon Creek flows below the minimum instream flow level. **Exhibit O, p. 7-9**. Hydrologic studies of the Upper Colorado River basin estimate that runoff may decrease 6 to 20 percent by 2050 as a result of climate change. **Exhibit P**, p. 2. Such uncertainties in future stream conditions underscore the importance of protecting the natural environment of Maroon Creek.

Similarly, the Districts claim that the 85CW646 instream flow water right on the Roaring Fork River has always been satisfied and that the proposed use of the Stapleton Brothers' Ditch is unnecessary. Prehearing Statement, p. 1. Pitkin County's water rights expert has concluded that in 2002, the 85CW646 water right likely was not satisfied during the entire irrigation season. **Exhibit O**, p. 2-6. Thus, the Districts' claims regarding Roaring Fork River flows are overstated and not accurate. Pitkin County's expert has also opined that in future dry years, it is likely that flows in the Roaring Fork River will reach or even drop below 2002 levels. *Id.* at 4. As with Maroon Creek, the analysis of the Roaring Fork River does not take into account changes in water rights diversions or climate conditions. It is short-sighted to assume that stream conditions will not change in the future and that an opportunity to protect the natural environment will not continue to be a benefit.

The Districts also allege that the Stapleton Brothers' Ditch will not provide a measurable benefit to Reach 3[2] because the maximum rate of water to be used for instream purposes is 0.52 cfs. Prehearing Statement, p. 2. Although the amount of water to benefit Reach 3 is small compared to the existing minimum instream flow amount, the addition of this water will offer a benefit to the natural environment by providing a more reliable supply of water for the existing minimum instream flow water right or by allowing the use of up to 55.52 cfs to preserve and improve Reach 3. Furthermore, Pitkin County has proposed to make additional water rights available to the CWCB for instream flow uses. Those water rights will also provide a benefit to Reach 3, making the Stapleton Brothers' Ditch only a fraction of the ultimate benefit that will be realized.

It is inconsistent for the Districts to argue on one hand that use of the Stapleton Brothers' Ditch in Reach 3 will provide no measurable benefit to the stream, and then claim that such use will cause injury to the Districts' water rights. If protection of 0.52 cfs warrants challenging the CWCB's acquisition of the Stapleton Brothers' Ditch, then it is reasonable to conclude that the effect on to the stream is measurable. Additionally, Starwood's recent purchase of 65 acre-feet of the Stapleton Brothers' Ditch historical consumptive use credits, which is estimated to yield a maximum of 0.29 cfs in Reach 3, for $650,000 suggests that protection of 0.52 cfs will result in a valuable benefit to the stream; an investment of that magnitude without an impact on the stream would be nonsensical. **Exhibit Q**; **Exhibit R**, Special

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[2] As described in Pitkin County's Prehearing Statement, Reach 3 is that portion of the Roaring Fork River extending from where Stapleton Brothers' Ditch return flows enter the river to its confluence with the Frying Pan River.

Warranty Deed; Districts' Exhibit B-2. The Districts' own actions indicate that 0.52 cfs is a demonstrable amount of water in Reach 3.

Although Pitkin County defers to the biological opinions of the CWCB staff regarding preservation and improvement of the natural environment, Pitkin County believes that the available information supports a determination that the Stapleton Brothers' Ditch will preserve and improve the instream flow reaches. The CWCB should approve the Trust Agreement and acquisition of the Stapleton Brothers' Ditch based on such a determination.

D. The Stapleton Brothers' Ditch will be Consumptively Used Downstream of the Instream Flow Reach.

The CWCB is instructed by ISF Rule 6 to consider whether the Stapleton Brothers' Ditch may be used downstream of the instream flow reach. The Districts argue that no market exists for the Stapleton Brothers' Ditch historical consumptive use credits downstream of Reach 3 because Ruedi Reservoir provides sufficient supply and because the Roaring Fork River between the Frying Pan and Colorado Rivers has not been strictly administered in recent years. Prehearing Statement, p. 4-5. This overlooks the fact that the Stapleton Brothers' Ditch historical consumptive use credits offer a pre-1922 water supply that would not be curtailed by a Colorado River Compact call, which Ruedi Reservoir cannot. *See* Section II.E. below. The Stapleton Brothers' Ditch also offers protection from a Cameo call by virtue of its inclusion in the Green Mountain Reservoir Historic Users Pool. Thus, a market for the Stapleton Brothers' Ditch does exist in that the water supply offers benefits that Ruedi Reservoir cannot. **Exhibit O**, p. 9. Furthermore, it is not realistic to assume that the Roaring Fork River will never be strictly administered simply because it has not been administered in the past. As evidence of the existence of a market for the Stapleton Brothers' Ditch historical consumptive use credits, Pitkin County is currently engaged in negotiations with the Town of Basalt and others for lease of the historical consumptive use credits. **Exhibit S**, Letter from Tom Kinney.

The Stapleton Brothers' Ditch has received protection from a Cameo call through its inclusion in the Green Mountain Reservoir Historic Users Pool ("HUP"). The Maroon Creek Parties suggest that use of the water right for instream flow purposes will eliminate this protection. Prehearing Statement, p. 3. Pitkin County is diligently seeking a lease of the Stapleton Brothers' Ditch historical consumptive use credits to a downstream water user, through negotiations with the Town of Basalt and other downstream municipal entities. Such a lease would be for HUP-preferred uses of irrigation, domestic or municipal uses, or augmentation of such uses and will ensure that use of the Stapleton Brothers' Ditch for instream flow uses will continue to be protected from a Cameo call. Pitkin County is confident that, prior to the filing of the Water Court application to change the use of the Stapleton Brothers' Ditch, a lease of the consumptive use credits will be finalized and HUP protection will no longer be an issue.

The Maroon Creek Parties have requested that the CWCB impose a term and condition requiring a contract with a downstream user prior to approving the Trust Agreement. Prehearing Statement, p. 3. The Trust Agreement contemplates that additional work, such as

execution of a lease, may be necessary between the time that the Trust Agreement is executed and the Water Court application is filed, in that six months is allowed between the two events. **Exhibit T**, Section III.B. Furthermore, Pitkin County requires the flexibility to use the Stapleton Brothers' Ditch for other purposes if the Trust Agreement is not approved by the CWCB, and as owner of the water right, Pitkin County has the right to do so. Requiring Pitkin County to obtain a lease prior to CWCB approval of the Trust Agreement would unfairly restrict Pitkin County's use of the Stapleton Brothers' Ditch. Finally, C.R.S. § 37-92-102(3) provides that any long-term agreement for use of water rights in the CWCB's instream flow program include a provision that either party "***may*** bring about beneficial use of the historical consumptive use of the leased, loaned, or donated water right downstream of the instream flow reach." (emphasis added). A restriction requiring that a lease to a downstream user is finalized prior to the CWCB's approval of the Trust Agreement is unnecessary, burdensome and contrary to the CWCB's statutory directive. The Stapleton Brothers' Ditch historical consumptive use credits will be available for use downstream of the instream flow reach, favoring acquisition of the water right under this ISF Rule 6 factor.

E. Colorado's Status with Respect to Interstate Compacts will be Preserved Through Use of the Stapleton Brothers' Ditch for Instream Flow Purposes.

ISF Rule 6 requires that the CWCB consider the possibility that use of the Stapleton Brothers' Ditch could implicate interstate compact issues. Use of the Stapleton Brothers' Ditch for instream flow purposes will preserve a valuable pre-1922 water right that cannot be curtailed by a Colorado River Compact call. The Districts allege that use of the Stapleton Brothers' Ditch for instream flow purposes will eliminate the water right's protection from curtailment because the Colorado River Compact requires that the water right be applied to beneficial consumptive use. Prehearing Statement, p. 3, 5-6. Article VIII of the Colorado River Compact provides that "present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact." C.R.S. § 37-61-101. The Compact does not require that protected water rights be applied to a ***consumptive*** beneficial use, but only that they be perfected prior to 1922 through application to a beneficial use as determined by the State of Colorado. *See Bd. of County Com'rs v. Crystal Creek Homeowners Ass'n*, 14 P.3d 325, 337 (Colo. 2000). The claim that a change of a pre-1922 water right to allow a non-consumptive beneficial use eliminates its Compact protection has no basis in Colorado or federal law. Consequentially, use of the Stapleton Brothers' Ditch for instream flow purposes will result in no loss of pre-1922 water rights and will preserve Colorado's status with respect to a Colorado River Compact call, which supports approval of the Trust Agreement and acquisition of the Stapleton Brothers Ditch.

F. Use of the Stapleton Brothers' Ditch for Instream Flow Purposes Furthers the Maximum Utilization of the Water of the State of Colorado.

Consistent with the CWCB's statutory mandate, the ISF Rule 6 factors include whether use of the Stapleton Brothers' Ditch for instream flow purposes will further the maximum utilization of the waters of the State. The Maroon Creek Parties have suggested "that

the CWCB is ultimately better off simply retiring the right which will ensure that it is not requantified to a lesser flow rate amount." Prehearing Statement, p. 2. Such a suggestion is contrary to Colorado water law policies and the CWCB's statutory mandate. The Colorado Supreme Court stated in no uncertain terms that "abandonment is not favored under Colorado water law." *In re Midway Ranches*, 938 P.2d at 527. If the Stapleton Brothers' Ditch was "retired" as the Maroon Creek Parties suggest, one less senior water right would have to be satisfied before the Maroon Creek Parties' junior water rights come into priority. Abandonment of the water right would provide no benefit to the CWCB or the natural environment, but would result in the loss of a valuable pre-1922 water right and a windfall to the Maroon Creek Parties.

Use of the Stapleton Brothers' Ditch for instream flow purposes will protect the water right from abandonment and allow the water to be used for consumptive uses downstream of the instream flow reach, while at the same time preserving and improving the natural environment of Maroon Creek and the Roaring Fork River. These uses further the maximum utilization of the waters of the State and protect a valuable water right, supporting approval of the Trust Agreement and acquisition of the Stapleton Brothers' Ditch.

III. PITKIN COUNTY POLICY ENCOURAGES USE OF WATER RIGHTS FOR INSTREAM FLOW PURPOSES.

In recognition of the significant value of its surroundings, Pitkin County has actively sought to protect the natural environment. The Board of County Commissioners adopted a Strategic Plan in July 2008 highlighting the importance of protecting the Roaring Fork watershed. As one of the "near term" actions, the Strategic Plan recognized that "preservation and protection of the quantity and quality of the County's remaining water resources is of paramount importance." **Exhibit U**, p. 6. The Strategic Plan's listed goals for protection of water resources specifically provide that Pitkin County will "utilize County water rights to enhance instream flows." *Id.* at 7.

Within its Open Space and Trails program, Pitkin County has adopted a policy of acquiring land and water rights to be managed and preserved for recreational, wildlife, agricultural, access, and scenic purposes. **Exhibit V**, Pitkin County Open Space and Trails Program: Statement of Policies and Objectives, p. 1. Furthermore, Article 13.5.1(10) of the Pitkin County Charter provides that one of the purposes of the Open Space and Trails Program is to protect native aquatic habitat and recreational opportunities associated with stream and rivers. Pitkin County also recognizes the importance of supporting and preserving agricultural practices, although the policies of the Open Space and Trails Program do not restrict acquisition of property in order to preserve agricultural lands. **Exhibit V**, p. 3.

Many of the water rights that Pitkin County will make available to the CWCB for instream flow purposes were acquired through the Open Space and Trails program. Other water rights, including the Stapleton Brothers' Ditch, were acquired with property that Pitkin County uses or intends to use for public purposes. Furthermore, many of the water rights identified in the Trust Agreement for the CWCB's instream flow program, including the Stapleton Brothers'

Ditch, have already been partially or fully removed from irrigation. Consequentially, use of the water rights for instream flow purposes will not significantly decrease the amount of irrigated land in Pitkin County. Overall, use of water rights for preservation and improvement of the natural environment is consistent with Pitkin County's policy to protect its natural resources.

The Maroon Creek Parties argue that Pitkin County is attempting to circumvent its own public participation requirements through the Trust Agreement. Prehearing Statement, p. 3. This is simply false. In its initial offer letter to the CWCB, Pitkin County stated that the Trust Agreement "is subject to approval by the Board of County Commissioners after a public hearing." **Exhibit W**. Pitkin County has acknowledged from the initial proposal that its approval would require public participation. In anticipation of the November 16 hearing on this matter, Pitkin County has initiated its public approval process. The Trust Agreement is an appropriate mechanism for making the Stapleton Brothers' Ditch available to the CWCB and does not avoid Pitkin County's approval processes.

IV. THE TRUST AGREEMENT IS AN APPROPRIATE MECHANISM FOR MAKING WATER RIGHTS AVAILABLE FOR USE BY THE CWCB.

The Trust Agreement is a permissible mechanism for placing the Stapleton Brothers' Ditch and other Pitkin County water rights into the CWCB instream flow program. The statutory language grants the CWCB the right and discretion to acquire, "by grant, purchase, donation, bequest, devise, lease, exchange, or other contractual agreement." C.R.S. § 37-92-102(3). The trust mechanism was chosen by Pitkin County and the CWCB, after substantial deliberation, as a contractual mechanism which would be within the purview of the statute and consistent with Pitkin County's Home Rule Charter.

A trust agreement is a contractual relationship, and is therefore contemplated by the statutory language permitting acquisition of instream flow rights by contract. C.R.S. § 37-92-102(3). The Colorado Supreme Court has held that a trust is a contract. *See Denver Foundation v. Wells Fargo Bank, N.A.*, 163 P.3d 1116, 1122 (Colo. 2007). Section 37-92-102(3) lists several contractual mechanisms followed by the language "or other contractual agreement." This evinces the General Assembly's intent that the CWCB may acquire senior water rights by a variety of agreements, whether enumerated or not. Furthermore, the inclusion of a lease within the specifically allowed mechanisms demonstrates that the CWCB need not obtain ownership when acquiring a water right. Therefore, even though not listed in the statute, a trust agreement is a mechanism by which the CWCB is able to acquire water rights.

The Trust Agreement is necessary for Pitkin County to realize its objective of utilizing its water rights to enhance instream flows. **Exhibit U**, p. 7. This goal could not be achieved by outright grant of water rights to the CWCB. As discussed in its Prehearing Statement, Pitkin County has restrictions on its ability to divest itself of water rights. Thus, in order to protect stream flows without an outright grant of water rights, the revocable trust mechanism was introduced by Pitkin County to satisfy the concerns of both parties.

Additionally, the Districts have alleged that the transactional costs associated with approval of the Trust Agreement outweigh the benefits that the CWCB will receive. Prehearing Statement, p. 5. In response to concerns raised by the parties and the CWCB staff, the proposed Trust Agreement has been revised to provide that Pitkin County may not withdraw any water rights from the Trust for 10 years after its effective date. **Exhibit T**, Section XIV.B. Furthermore, weighing the benefits and costs of the Trust Agreement should take into consideration that fact that Pitkin County is proposing to make more than two dozen water rights available to the CWCB for instream flow use, as well as additional water rights that Pitkin County may acquire after approval of the Trust Agreement. These water rights will be available to the CWCB with no financial compensation to Pitkin County. In light of the fact that this proposal presents the first dedication of water rights to the CWCB under House Bill 08-1280, the Trust Agreement was designed to allow the CWCB and Pitkin County to first change the use of one water right so that the parties could adequately deal with any unexpected issues before undergoing a change of all of the water rights identified in the Trust Agreement. Evaluating the total proposal, the benefits to the natural environment of the Roaring Fork Basin outweigh the transactional costs of establishing the long-term trust relationship between Pitkin County and the CWCB.

V. CONCLUSION.

For the reasons presented above, Pitkin County supports the CWCB's acquisition of the Stapleton Brothers' Ditch for preservation and improvement of Maroon Creek and the Roaring Fork River. Pitkin County urges the Board to take this opportunity to preserve and improve the natural environment and stream flows in the Roaring Fork Basin.

VI. RESPONSE TO DISTRICTS' PROPOSED STIPULATIONS.

A. Pitkin County agrees that the Stapleton Brothers' Ditch is a Green Mountain Reservoir HUP beneficiary and is a pre-Compact right.

B. Pitkin County agrees that the Basalt District exchanges are junior to the Stapleton Brothers' Ditch.

C. Pitkin County does not agree with the Districts' third through sixth proposed stipulations.

VII. ADDITIONAL PITKIN COUNTY EXHIBITS.

Copies of exhibits identified below are submitted with this Rebuttal Statement as required by the Notice of Party Status, Prehearing Conference and Deadlines for Submission, except as noted. Numbering of the exhibits below follows the exhibits submitted with Pitkin County's Prehearing Statement.

M. Office of the State Engineer, Written Instruction and Order 2007-02, May 31, 2007.

N. Map of Stapleton Brothers' Ditch Headgate.

O. Letter from Jim Pearce, Canyon Water Resources, LLC to Moses, Wittemyer, Harrison and Woodruff, P.C., October 14, 2009, with all attachments.

P. Western Water Assessment, Climate Change in Colorado. *A Synthesis to Support Water Resources Management and Adaptation*, Executive Summary, 2008. The full report can be found at http://cwcb.state.co.us/Home/ClimateChange/ClaimateChangein ColoradoReport/.

Q. Intergovernmental Agreement for the Purchase and Sale of Water Rights, between Pitkin County and Starwood Metropolitan District, June 30, 2008.

R. Special Warranty Deed from Pitkin County to Starwood Metropolitan District, dated December 22, 2008.

S. Letter from Tom Kinney, Hill, Kinney & Wood, LLC, to Patricia M. DeChristopher, Moses, Wittemyer, Harrison and Woodruff, P.C., October 14, 2009.

T. Pitkin County Water Rights Revocable Trust Agreement, October 1, 2009 draft.

U. Pitkin County Strategic Plan, Strategic Statement and Goals, July 1, 2008.

V. Pitkin County Open Space and Trails Program, Statement of Policies and Objectives.

W. Letter from Jack Hatfield, Pitkin County, to CWCB, January 8, 2009.

Respectfully submitted this 15th day of October, 2009.

MOSES, WITTEMYER, HARRISON AND WOODRUFF, P.C.

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CERTIFICATE OF SERVICE

I hereby certify that the foregoing **REBUTTAL STATEMENT OF THE BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY** was served by e-mail this 15th day of October, 2009, on the following:

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Rhonda L. Olson

Tab 2
Appendix 1

APPENDIX I
Allocation of Water in Stacking Scenarios

This Appendix provides examples of how the Stapleton Brothers' Ditch can be administered for the two separate uses of preservation and improvement of the natural environment, as a continuation of the discussion of administration in Section II.A.1. of Pitkin County's rebuttal statement. The diagrams below demonstrate how stream flows will be allocated among various water rights in Reaches 1 and 3 when the Stapleton Brothers' Ditch is stacked against the existing minimum instream flow rights. Reach 2 operates in a similar manners as Reach 3 with different amounts of water. Note that these scenarios do not include all water rights in the streams. This discussion is for demonstration purposes only and is not intended as an actual administration scenario. The figures represent one moment in time when multiple water rights are seeking to claim water in the stream. The blocks within the diagrams represent distribution of water to particular water rights and are shown from senior to junior, moving bottom to top. Blue blocks represent the natural flow that is unclaimed. Green blocks represent water that is in the stream and protected from diversion for instream flow purposes. Orange blocks represent water that has been diverted out of the stream. The numbers at the top of the diagrams are for reference purposes in the explanation below.

Figure 1 below depicts the allocation of water rights in Reach 1 on Maroon Creek when the natural undepleted flow is 40 cfs and the Herrick Ditch, First Enlargement and the Stapleton Brothers' Ditch, Second Enlargement seek to divert water under their respective decreed water rights. The Herrick Ditch, First Enlargement was decreed in Civil Action No. 4613 for 51.56 cfs, with a 1951 appropriation date, making it senior to the W-2945 instream flow water right and junior to the Stapleton Brothers' Ditch. The Stapleton Brothers' Ditch, Second Enlargement was decreed in Case No. W-3843 for 6.01 cfs, with a 1978 appropriation date, and is junior to the other water rights. Figure 1 shows how the natural flow would be allocated to the four water rights, in order of seniority.

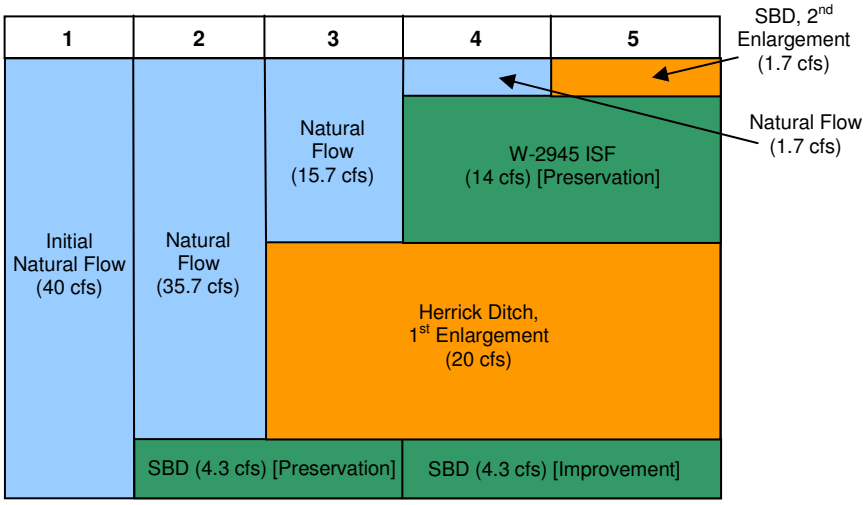

Figure 1 – Maroon Creek (Reach 1)

In Step 1, no water rights claim the natural flow of 40 cfs. In Step 2, the most senior water right, the Stapleton Brothers' Ditch, is used for preservation of the natural environment, leaving 35.7 cfs of natural flow. The Herrick Ditch, First Enlargement can divert up to 35.7 cfs, but in Step 3 is only diverting 20 cfs. This diversion, with the preservation of 4.3 cfs under the Stapleton Brothers' Ditch, leaves 15.7 cfs of natural flow remaining. In Step 4, the W-2945 instream flow right claims its full 14 cfs entitlement for preservation of the natural environment, leaving 1.7 cfs of natural flow. Once a total of 14 cfs can be protected in Maroon Creek, under both the Stapleton Brothers' Ditch and the W-2945 instream flow water right, the Stapleton Brothers' Ditch can be used for improvement of the natural environment. As a result, the Stapleton Brothers' Ditch can be used for improvement in Step 4, allowing a total of 18.3 cfs to be protected in Maroon Creek. In Step 5, the Stapleton Brothers' Ditch, Second Enlargement is limited to diverting the 1.7 cfs remaining after the more senior water rights have been satisfied. The Herrick Ditch, First Enlargement and the Stapleton Brothers' Ditch, Second Enlargement would be limited to these same amounts if the Stapleton Brothers' Ditch was used for its historical irrigation practices and 4.3 cfs was diverted from Maroon Creek at the headgate.

Figure 2 shows the allocation of water in Maroon Creek just below the Stapleton Brothers' Ditch headgate. This example assumes that 14 cfs is in Maroon Creek at the headgate, and the same water rights are claiming water. The Herrick Ditch, First Enlargement and the Stapleton Brothers' Ditch, Second Enlargement are not shown in Figure 2 because the water they claim has been diverted out of Maroon Creek at or upstream of the headgate. In Step 1, 4.3 cfs of the natural flow is allocated to the Stapleton Brothers' Ditch for preservation of the natural environment, leaving 9.7 cfs of natural flow. That 9.7 cfs is allocated to the W-2945 water right for preservation in Step 3, so that all 14 cfs is protected from diversion. The W-2945 water right could then call for the 1.7 cfs diverted by the Stapleton Brothers' Ditch, Second Enlargement, to claim 11.4 cfs for preservation, which is shown in Step 4. With a total of 15.7 cfs protected in Maroon Creek, 1.7 cfs would then be allocated to improvement of the natural environment under the Stapleton Brothers' Ditch.

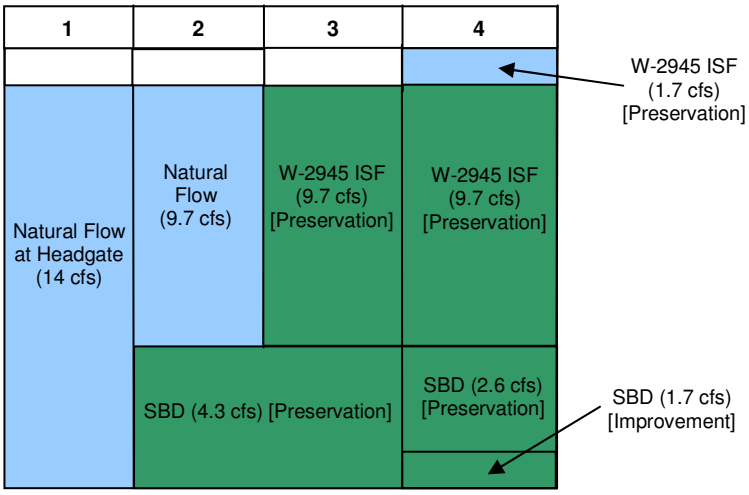

Figure 2 – Maroon Creek (Reach 1)

Figure 3 depicts how Reach 3 of the Roaring Fork River would be administered. Whether the Stapleton Brothers' Ditch is in priority and entitled to protection of the historical consumptive use amount is determined at the Stapleton Brothers' Ditch headgate on Maroon Creek. In this example, the Stapleton Brothers' Ditch is in priority making 0.52 cfs of historical consumptive use credits available in Reach 3; the natural undepleted flow of the Roaring Fork

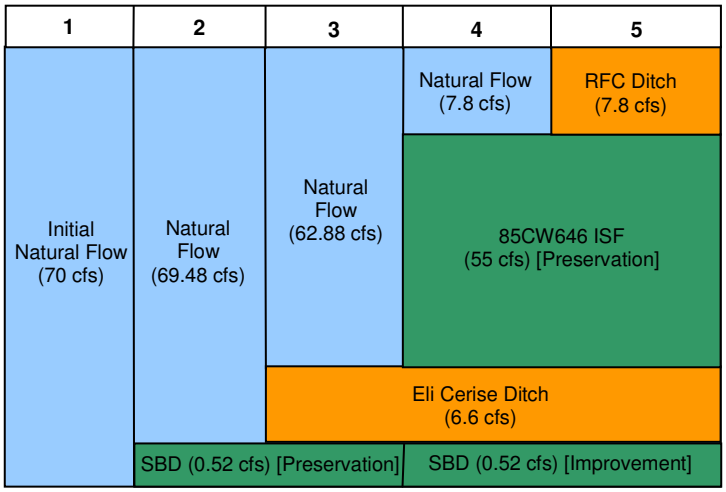

Figure 3 – Roaring Fork River (Reach 3)

River is 70 cfs and the Eli Cerise Ditch, First Enlargement and the RFC Ditch seek to divert water under their respective decreed water rights. The Eli Cerise Ditch, First Enlargement was decreed in Civil Action No. 3082 for 6.6 cfs, with a 1906 appropriation date, making it senior to the 85CW646 instream flow water right and junior to the Stapleton Brothers' Ditch. The RFC Ditch was decreed in Case No. 95CW356 for 10.0 cfs, with a 1995 appropriation date, making it junior to the other water rights.

In Step 1 of Figure 3, the natural flow is 70 cfs. In Step 2, the Stapleton Brothers' Ditch is used for preservation of the natural environment, leaving 69.48 cfs of natural flow that may be used by other water rights. The Eli Cerise Ditch, First Enlargement can divert its full 6.6 cfs in Step 3, resulting in 62.88 cfs of natural flow remaining. In Step 4, the 85CW646 instream flow water right claims its full 55 cfs for preservation of the natural environment. As on Maroon Creek, once the 85CW646 minimum instream flow right is met, the Stapleton Brothers' Ditch can be used for improvement of the natural environment. As a result, in Step 4, a total of 55.52 cfs in the Roaring Fork River is protected from diversion, leaving 7.8 cfs of natural flow. Finally, the RFC Ditch is limited to diversion of the 7.8 cfs remaining natural flow in Step 5. Again, this is the same as if the Stapleton Brothers' Ditch was being used for its historical irrigation practice and 0.52 cfs was consumed by the irrigated crops.

Tab 2
Exhibit M

STATE OF COLORADO

OFFICE OF THE STATE ENGINEER
Division of Water Resources
Department of Natural Resources

1313 Sherman Street, Room 818
Denver, Colorado 80203
Phone (303) 866-3581
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WRITTEN INSTRUCTION AND ORDER 2007-02
Instruction and Order Concerning the Administration of Storage Rights by Seniors First

May 31, 2007

Pursuant to section 37-92-501(1) C.R.S. (2006), the State Engineer hereby issues this Instruction and Order concerning the administration of storage water rights with differing priorities that are decreed to the same structure. When administering such storage rights, the Division Engineers shall administer under a "seniors-first" policy as explained below.

This document shall be published on the Division of Water Resources' website.

1.0 INTRODUCTION

The State Engineer may issue written instructions and orders to the Division Engineers regarding the administration of water rights. The State Engineer may also promulgate rules to establish administration practices, but such rules are not required for administration.

This instruction and order directs the Division Engineers concerning the administration of water rights in a manner that protects the prior appropriation system, and prevents speculation and hoarding.

2.0 PURPOSE

This instruction and order shall direct the Division Engineers in recognizing and administering storage rights.

3.0 AUTHORITY

This instruction and order is issued pursuant to sections 37-92-501, 37-92-103(12), 37-92-301(3), 37-92-502(2)(a), C.R.S. (2006).

This instruction and order ensures that water rights will be administered according to the prior appropriation doctrine and consistent with the priorities as set by decrees.

4.0 PROCEDURES

Under certain circumstances, there are water rights with differing priorities that are decreed to the same reservoir. As a general rule, the Division of Water Resources accounts for reservoir storage as "first in, first out" when the uses for a senior and junior storage right are the same and owned by the same water user. When such rights exist,

EXHIBIT M
Pitkin County

the Division Engineers shall administer these water rights by priority so that the senior water right is stored and used first, unless otherwise decreed, or there is advance notice and the State and Division Engineers' Offices find valid justification for doing otherwise.

If water is stored under the junior right when water is available to a senior right for a reservoir, then a paper fill for that amount will be charged against the senior storage water right to the extent that it remains unsatisfied. Once the senior right is paper filled, the junior continues to store under its own priority and any additional storage may occur only under free river conditions after the junior right is physically or paper filled.

This instruction and order must be implemented in harmony with existing rules and policies. This instruction and order is in effect immediately and shall only be revoked in writing.

Approved by:

Hal D. Simpson, State Engineer

Date: 5/31/07

Tab 2
Exhibit N

Stapleton Brothers Headgate

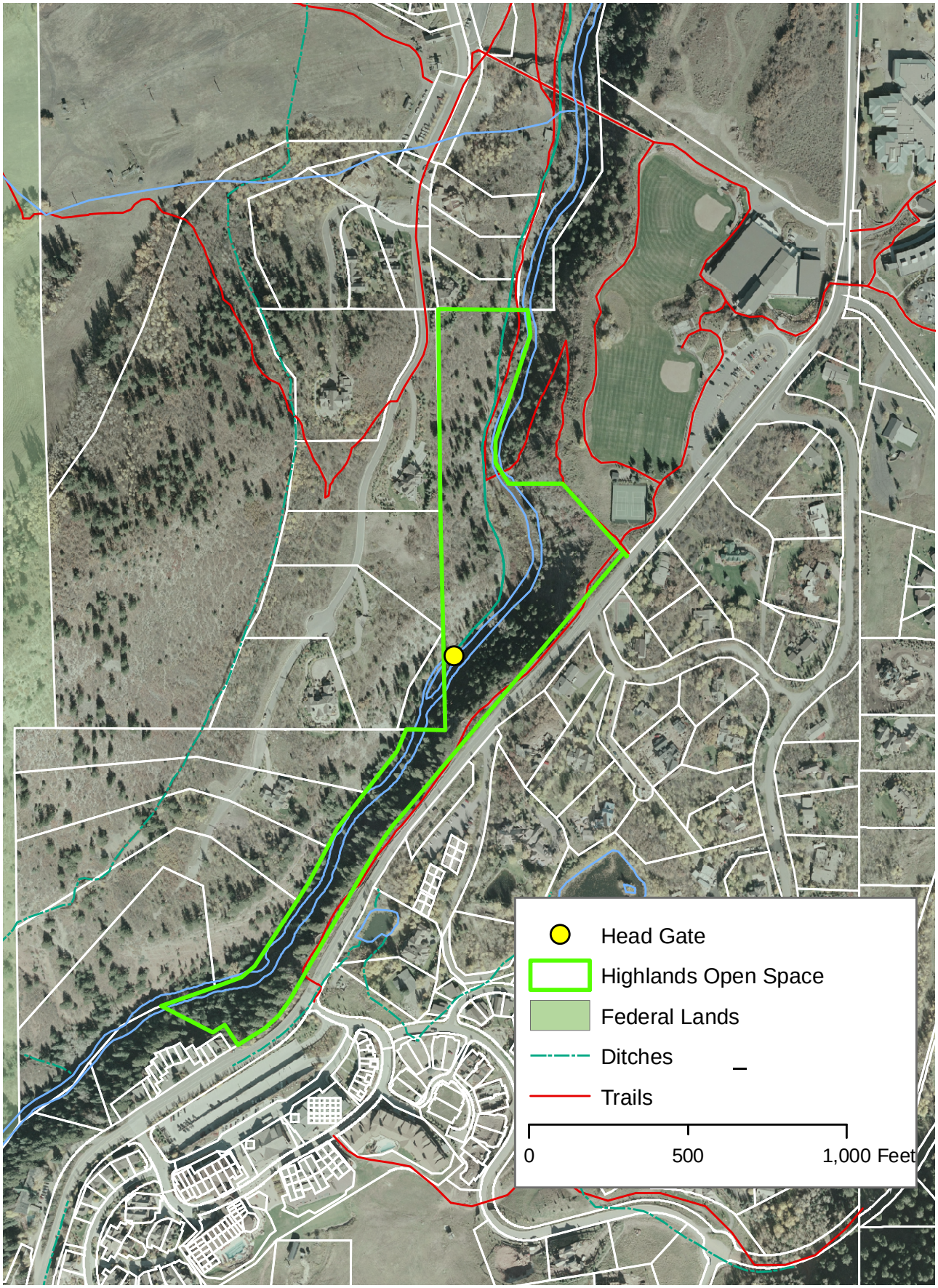


EXHIBIT N
Pitkin County

Tab 2
Exhibit O

EXHIBIT O
Pitkin County

685 Canyon Creek Drive
Glenwood Springs, CO 81601

October 14, 2009

Mr. Tim Beaton
Ms. Patricia DeChristopher
Moses, Wittemyer, Harrison, and Woodruff, P.C.
P.O. Box 1440
Boulder, CO 80306-1440

Dear Tim and Patricia:

This letter transmits Canyon Water Resources, LLC analysis of the Stapleton Brothers Ditch water right for change of use to instream flow purposes. The engineering evaluation addresses factual issues raised by the Basalt Water Conservancy District and the Starwood Metropolitan District, and the Willow Creek Ditch and Herrick Ditch Company and Roaring Fork Land Company in their respective pre-hearing statements. This memorandum provides engineering opinions regarding:

1. Stream flow in the Roaring Fork River from Maroon Creek downstream to the Fryingpan River,

2. Stream flow in Maroon Creek from the confluence of East and West Maroon Creeks downstream to the Roaring Fork River, and

3. The market for leasing the 119.25 acre-feet of Stapleton Brothers Ditch historical consumptive use credit.

The analysis of Roaring Fork River stream flows indicates that in late August and early September 2002, River flows below Home Supply Ditch were likely to be less than the 55 cubic feet per second (cfs) instream water right.

Regarding flows on Maroon Creek, analysis of the stream flow records for the Maroon Creek above Aspen gauge and water rights downstream of the gauge lead to the conclusion that diversions on Maroon Creek could reduce stream flows to less than the 14 cfs instream flow water right. In the future, administration of the right could be triggered by relatively modest changes in water right operations.

I believe the 119.25 acre feet of historical consumptive use credit associated with Stapleton Brothers Ditch is a marketable water supply. The water supply is different from the available reservoir contract supplies because of its "pre-compact" priority and status (for certain uses) as a Green Mountain Reservoir Historical User Pool beneficiary. The historical consumptive use supply is desirable because of its priority, quantity, and location.

The following sections of this letter describe the analyses leading up to my conclusions.

Stream flow in the Roaring Fork River from Maroon Creek downstream to the Fryingpan River

This section analyzes information regarding stream flow on the Roaring Fork River in the instream flow reach from the confluence with Maroon Creek downstream to the Frying Pan River. Within this reach, the location of the potentially lowest seasonal flows is upstream of the confluence with the Frying Pan River and downstream of the large capacity irrigation ditches[1] near Basalt. Below Home Supply Ditch becomes one of the low flow points on the river when the run-off has ended and the ditches are diverting (i.e., August, September and October).

The Basalt Water Conservancy District contends:

> "Under all identified historical flow conditions during the season when the SBD historical consumptive use ("HCU") credits are legally and physically available, and including the drought year 2002, adequate flow was available to satisfy the CWCB's 55 cfs instream flow (ISF) in the reach of the Roaring Fork River above its confluence with the Fryingpan River (the "Upper Reach"). Therefore, under all known historical conditions, the environment to be preserved was satisfied by the existing junior ISF right." [2]

The District's view of flows in 2002 appears to be based on measured flows below the Home Supply Ditch on August 12th (Letter from Resource Engineering Inc. to Dan Merriman, dated September 30th, 2004, Tab F of the prehearing statement). On the 12th, Resource Engineering conducted a "spot" measurement of the River and reported the flow to be 45 cfs. Resource added 18 cfs to the measured flow to account for excess diversions by the Home Supply and Grace-Shehi Ditches and concluded that flow in the "critical" reach may have been as high as 63 cfs.

However, stream gauge data[3] indicate that flows in the Roaring Fork River above the Fryingpan decreased significantly after August 12th. In other words, the Resource analysis is not conclusive that August 12th was the lowest flow day or even the within the lowest 10-days on the Roaring Fork above the Fryingpan in 2002.

Also, downstream of Home Supply Ditch may not be the only location on the Roaring Fork where in low flow years, the stream flows may be less than the instream flow rate of 55 cfs. Depending on water supply operations, other locations downstream of relatively large diversions may become a low flow point on the River,

[1] Grace and Shehi, Home Supply, and Forker Arbaney – Cerise Ditches
[2] Prehearing Statement of the Basalt Water Conservancy District and the Starwood Metropolitan District, paragraph I. A.
[3] Attachment B. ROABMCCO – Roaring Fork River below Maroon Creek, DWR station

Analysis

My analysis indicates that stream flow in the Roaring Fork River below Home Supply Ditch in late August and early September 2002, was likely to be less than the 55 cubic feet per second (cfs) instream flow water right.

There are two DWR stream gauges on the Roaring Fork River in the reach from Maroon Creek to the Frying Pan River:

Table 1: Roaring Fork River Stream Gauges

Location	ID	Drainage Area (sq. mi.)	Period of Record
Roaring Fry River above the Frying Pan (Approx. ½ mile upstream of the Fryingpan River)	ROAFRYCO	515	April - September 2007 and 2008, daily average flow
Roaring Fork River below Maroon Creek (Approx. 2/3 miles downstream of Maroon Creek)	ROABMCCO	290	1989 – 2008, daily average flow

The location of the Roaring Fork above the Fryingpan (ROAFRYCO) stream gauge is approximately ½ mile upstream from the confluence of the Fryingpan River and downstream of the relatively large irrigation ditches near Basalt (Grace-Shehi, Home Supply, and Forker Arbaney – Cerise Ditches). Based on the limited period of record (April – September, in the years 2007 and 2008), flow in the Roaring Fork River at this location has not been appreciably close to in-stream flow water right (55 cfs).

In 2007, the recorded low flow at the ROAFRYCO stream gauge was 153 cfs on September 3rd. In 2008, the recorded low flow was 183 cfs on September 30th (the last day of record[4]). However, September 2007 and 2008 rank[5] in the top 1/3 wettest Septembers. Consequently, these records are not conclusive with respect to dry year flows in the Roaring Fork River at this location within the instream flow reach.

The Roaring Fork below Maroon Creek (ROABMCCO) stream flow records represent the gauged inflow to the instream flow reach. The gauge's location is approximately ½ mile downstream of the confluence of Maroon Creek. Records for the gauge include daily average flow rates for 11/4/1988 to 9/30/08. The lowest recorded irrigation season flows at ROABMCCO are from 2002.

In 2002, the recorded daily average stream flow at ROABMCCO bottomed-out at 62 cfs on September 1st (Table 2). The lowest 10-day average flow in 2002 is calculated to be 65 cfs on September 4th – 7th. On August 12th, 2002, the daily average flow was 94 cfs and the 10-day average flow is calculated to be 104 cfs.

[4] It is likely that stream flows continued to decrease after September 30.
[5] Based on the rank of total volume for the September and the ROABMCCO stream flow records 1989 – 2008.

There is one "spot" measurement of stream flows in the "critical" reach. Resource Engineering[6] measured flows below Home Supply Ditch on August 12th, 2002, and reported a measured flow of 45 cfs. In addition, Resource described the SEO diversion records and comments on August 12th, 2002, that indicate that the Home Supply and Grace and Shehi Ditches were diverting in excess[7] of their adjudicated water rights on that day. Resource accounted for the excess diversions and estimated the flow below the Home Supply Ditch to be 63 cfs. The analysis concluded:

> "…that if the two ditches were properly administered on this date, stream flows within the critical reach would have remained well above the CWCB level."

Home Supply Ditch was apparently diverting 12 cfs in excess of total rights in the structure (71 cfs as opposed to total water rights in the structure of 59 cfs). Resource reported that the Grace Shehi was diverting 6 cfs in excess of total rights in the structure. So, for August 12th, they accounted the flow below Home Supply Ditch as:
45 + 12 + 6 = 63 cfs.

Flows on the Roaring Fork continued to decrease after August 12th. Records for the ROABMCCO station indicate that from August 12th to September 1st stream flows dropped 30 cfs. The upstream gauge indicates that August 12th was not the lowest flow day or even within the low 10 days. Therefore, the Resource evaluation is not conclusive as to low flows below Home Supply Ditch in 2002.

In addition, on September 1st, the Grace Shehi Ditch was diverting at least 6 cfs in excess of the adjudicated water right. However, diversion records for the Home Supply Ditch indicate that it was diverting 10 cfs less than its total adjudicated water rights. Consequently, there could be a net 4 cfs net reduction accounting for "proper administration" of the Grace Shehi Ditch and "full use" of the Home Supply Ditch.

Finally, September 2002 is not the driest September of record in the Roaring Fork River Basin. Table 3 summarizes the ranking of September 2002 flows for three stream gauges over their respective periods of record. The summary indicates that although 2002 was a dry year, we could expect less September monthly flow in about 10% of the years.

Table 3: Ranking of September Flows for Three Roaring Fork River Stream Gauges

Location	ID	Period of Record	September 2002 Rank (Driest first)	Drier Septembers
Roaring Fork near Aspen	09073400	1964 – 2008	4th out of 43, 9th percentile	1977, 1978, 2005
Roaring Below Maroon Creek	ROABMCCO	1989 – 2008	1st out of 20, 5th percentile	None
Roaring Fork at Glenwood Springs	09085000	1906 - 2008	11th out of 100, 11th percentile	1934, 1944, 1948, 1953, 1955, 1956, 1960, 1966, 1977, 1990

[6] Letter from Resource Engineering Inc. to Dan Merriman, dated September 30th, 2004, Tab F of the Basalt Water Conservancy District prehearing statement
[7] Grand Valley Water Users Association administration number 22729.21241 (730 cfs) calling 7/9/02 to 10/4/02

Table 2: Daily Flow Records for the Roaring Fork River below Maroon Creek[8]

Date	ROABMCOO ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN (1988-01-01 to 2008-12-31) (cfs)	10-day Average (cfs)	
8/1/2002	97	109	
8/2/2002	93	107	
8/3/2002	99	105	
8/4/2002	100	104	
8/5/2002	96	102	
8/6/2002	102	100	
8/7/2002	116	100	
8/8/2002	116	102	
8/9/2002	111	103	
8/10/2002	106	104	
8/11/2002	99	104	
8/12/2002	94	104	Date of "spot" measurement below Home Supply Ditch
8/13/2002	91	103	
8/14/2002	85	102	
8/15/2002	81	100	
8/16/2002	77	98	
8/17/2002	76	94	
8/18/2002	75	90	
8/19/2002	76	86	
8/20/2002	83	84	
8/21/2002	90	83	
8/22/2002	92	83	
8/23/2002	84	82	
8/24/2002	74	81	
8/25/2002	71	80	
8/26/2002	67	79	
8/27/2002	67	78	
8/28/2002	67	77	
8/29/2002	68	76	
8/30/2002	67	75	
8/31/2002	64	72	
9/1/2002	62	69	Lowest day
9/2/2002	63	67	
9/3/2002	64	66	
9/4/2002	65	65	Lowest 10-day average
9/5/2002	67	65	
9/6/2002	64	65	
9/7/2002	64	65	
9/8/2002	76	66	
9/9/2002	76	67	
9/10/2002	85	69	
9/11/2002	85	71	
9/12/2002	99	75	
9/13/2002	108	79	

[8] The daily records are provided in Attachment B

Stream flow in Maroon Creek from the confluence of East and West Maroon Creeks downstream to the Roaring Fork River

The CWCB instream flow for Maroon Creek (14 cfs) extends from the confluence of East and West Maroon Creeks to the Roaring Fork River (Exhibit 2, CWCB prehearing statement). There are two historical USGS stream gauges located within the reach.

Table 4: Historical USGS Stream Gauges on Maroon Creek

Location	ID	Drainage Area (sq. mi.)	Period of Record
Maroon Creek near Aspen (old gauge)	09076000	41.7	1911 – 1917
Maroon Creek above Aspen	09075700	35.4	1961 – 1994, daily average flow

The "old" gauge was located just upstream of Willow Creek and recorded flows for several years in the 1910's. That record is not sufficient for this analysis. Instead, this evaluation starts with records from station 09075700. USGS station 09075700 was located in the upper 1 mile of the instream flow reach.

Table 4 summarizes[9] the frequency daily flow for the irrigation season (May 1st - October 31st, 1961 to 1994). Flows less than or equal to 14 cfs were recorded on 10 out of 4630 days over the period of record. The 10 days are all in May of 1978 (the spring following the dry year of record).

Table 5:

Frequency of Daily Flows for Maroon Creek above Aspen, 09075700, Irrigation Season (May 1 - October 31) for the Period of Record, 9/1/1969 - 9/30/1994			
Flow Range (cfs)	Number of Days	Cumulative Number Days	Cumulative Percentage Days
0 - 14	10	10	0.2
14 - 20	105	115	2
20 - 30	334	449	10
30 - 40	675	1124	24
40 - 50	538	1662	36
50 - 60	367	2029	44
60 - 70	303	2332	50
70 - 80	248	2580	56
80 - 90	181	2761	60
90 - 100	140	2901	63
100 - 200	876	3777	82
200 - 300	531	4308	93
300 - 400	209	4517	98
400 - 500	102	4619	100
500 - 800	11	4630	100
2000	0	4630	
more	0		

[9] The daily records are provided in Attachment C.

The gauge record represents the only direct measurement of flow in the Maroon Creek instream flow reach that was presented in the prehearing information. Unlike the situation on the Roaring Fork, no "spot" measurements are available for low flow days in other locations. However, understanding the flow at other locations is important because the "controlling point" for administration of the instream flow water right is probably not located at the gauging station.

The controlling point could potentially be downstream of any one of the relatively large capacity diversion structures on Maroon Creek (Exhibit 2, of the CWCB prehearing statement), such as downstream of the headgate for the Herrick Ditch (total net water rights approximately 65 cfs)[10]. The State database locates Herrick Ditch headgate approximately 1 mile downstream of the gauge station (the first diversion structure downstream of 09075700) and upstream of Willow Creek.

The water budget to estimate flows below the Herrick Ditch headgate is:

Flow downstream of the headgate =
(Flow at gauge 09075700) + (Inflow from un-gauged tributary area) – (Herrick Ditch diversions)

To have 14 cfs in Maroon Creek downstream of the Herrick Ditch headgate while the Ditch is diverting a "full supply" requires that the gauged flow plus inflow from the un-gauged area totals 79 cfs. Table 4 indicates that the stream flows at the gauge were less than 80 cfs 56% of the days during the irrigation season. Depending on operations of the Ditch and the flow contributed from the un-gauged area, it appears that at this particular location Maroon Creek flows less than the instream water right could occur fairly often.

To get more precise, the analysis evaluates the inflow from the un-gauged area, and then "backs-out" the flow required at the stream gauge to supply the ditch diversions and the instream flow. One way to account for a reasonable amount of inflow from the un-gauged tributary area is to assume it has the same run-off per unit area as the gauged area. The un-gauged tributary area is approximately 4 square miles and the USGS lists the area above 09075700 as 35.4 square miles. So, the estimate of un-gauged inflow is:

Inflow from un-gauged tributary area = 4/35.4 x (Flow 09075700)

Accounting for the un-gauged inflow, the water budget is:

Flow downstream of the headgate =
(Flow 09075700) + [(4/35.4) x (Flow 09075700)] – (Herrick Ditch diversions)

[10] Attachment D

Assuming 65 cfs diversions for the Ditch and 14 cfs for the flow downstream of the headgate:

79 cfs = (Flow 09075700) x [1 + (4/35.4)],

Flow 09075700 = 71 cfs

The recorded flow at 09075700 was less than 70 cfs on 50% of the irrigation season days over the period of record. Consequently, I believe that given certain water right operations, the stream flow on Maroon Creek below Herrick Ditch could frequently be reduced to amounts less than the 14 cfs instream flow right.

Market for leasing the Stapleton Brothers Ditch Historical Consumptive Use Credits (HCU)

In my opinion there is a market for leasing the Stapleton Brothers Ditch HCU. The supply is desirable because of its priority, quantity, and location. The water supply is different from the contract supplies out of Ruedi, Wolford or Green Mountain Reservoirs in that the consumptive use was perfected in the early 1900's and represents "pre-Compact" depletions. Generally, water users consider pre-compact supplies more reliable than junior supplies.

The likely "lease" use of the SBD HCU is to augment or supply domestic uses. The potential location of lease uses extends downstream of the headgate to essentially the State line and possibly to "upstream" locations by exchange. The 119.5 acre-feet of HCU is a significant quantity with respect to domestic uses (Tab C, Basalt Water Conservancy District prehearing statement). The lease(s) could be in almost any size and a water district or municipal supplier could conceivably contract the full amount.

Conclusions

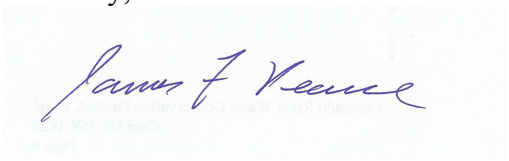
1. The available information indicates that in late August and early September of 2002, stream flow in the Roaring Fork River downstream of the Home Supply Ditch was likely to be less than the instream flow of 55 cfs.

2. At the historical location of the Maroon Creek above Aspen stream gauge, flow records indicate that irrigation season stream flows are rarely less than the instream flow water right of 14 cfs. However, the "controlling point" for administration of the instream flow water right is probably not located at the gauging station. Typically, the lowest stream flows are present downstream of the relatively large diversions.

   A water budget analysis regarding Maroon Creek immediately downstream of the Herrick Ditch (the first significant diversion downstream of the gauge) indicates that given water rights operations, stream flows may often be reduced to rates less than the instream flow amount.

3. The 119.25 acre feet of historical consumptive use credit associated with Stapleton Brothers Ditch is a marketable water supply. The historical consumptive use supply is desirable because of its priority, quantity, and location.

Sincerely,



James F. Pearce. P.E.
Manager, Canyon Water Resources, LLC

Attachments

A – Daily stream flow records for ROAFRYCO, Roaring Fork River above the Fryingpan

B – Daily stream flow records for ROABMCCO, Roaring Fork River below Maroon Creek

C – Daily stream flow records for 09075700, Maroon Creek above Aspen

D – Herrick Ditch Structure Summary

E - Monthly stream flow records for 09073500, Roaring Fork at Aspen

Description: ROARING FORK RIVER AB FRYINGPAN RIVER NR BASALT

Time Series Identifier:	**ROAFRYCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:		**Data Units:**	**CFS**
Latitude, Longitude:	**39.361160, -107.029060**		
UTM X, UTM Y (zone 13 NAD 83):	**325190.0 ,4358820.0**		
Elevation (feet):			

Time Series Creation History:

Available Data: **2007 To 2008**

Selected Time Series From: **2007-1 To 2008-12**

Water Year 2007 (Oct 2006 to Sept 2007)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1							215	643	1000	766	275	165
2							220	775	1050	726	260	161
3							230	779	1310	655	266	153
4							234	809	1270	612	266	156
5							263	675	1420	600	258	156
6							274	599	1640	584	323	190
7							276	528	1220	540	324	208
8							283	463	1030	524	321	193
9							285	460	980	493	275	187
10							288	447	1160	451	236	186
11							267	485	1370	425	222	178
12							254	640	1750	434	205	172
13							252	869	1490	437	204	165
14							235	1020	1450	380	201	156
15							235	1090	1590	361	215	157
16							245	1170	1720	336	246	156
17							272	1160	1810	312	262	276
18							263	1160	1830	323	238	441
19							261	1330	1540	364	222	325
20							269	1460	1470	390	212	280
21							305	1400	1430	417	196	244
22							327	1440	1320	509	181	219
23							312	1120	1210	461	173	217
24							331	927	1220	441	175	375
25							305	782	1120	430	174	326
26							287	718	1000	503	167	271
27							285	735	967	453	159	253
28							320	910	905	510	170	237
29					----		415	1130	845	423	168	230
30					----		553	976	785	345	171	231
31					----		----	905	----	307	160	----
Min	NC	NC	NC	NC	NC	NC	215	447	785	307	159	153
Max	NC	NC	NC	NC	NC	NC	553	1460	1830	766	324	441
Mea	NC	NC	NC	NC	NC	NC	285.37	890.48	1296.73	468.13	223.39	222.13

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER AB FRYINGPAN RIVER NR BASALT

Time Series Identifier:	**ROAFRYCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:		**Data Units:**	**CFS**
Latitude, Longitude:	**39.361160, -107.029060**		
UTM X, UTM Y (zone 13 NAD 83):	**325190.0 ,4358820.0**		
Elevation (feet):			

Time Series Creation History:

Available Data: **2007 To 2008**

Selected Time Series From: **2007-1 To 2008-12**

Water Year 2008 (Oct 2007 to Sept 2008)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1							143	583	2250	2820	670	320
2							150	476	2700	2400	654	324
3							159	414	3030	2090	634	314
4							144	397	3120	2100	617	283
5							151	412	3030	2090	591	284
6							156	526	2620	1960	653	277
7							156	678	2590	2060	693	263
8							147	985	2670	1890	796	241
9							153	832	2150	1720	724	223
10							156	914	2080	1600	718	220
11							140	796	2530	1520	666	217
12							135	820	2090	1400	579	250
13							145	888	1750	1320	528	246
14							174	775	1970	1230	488	232
15							231	736	2350	1150	464	224
16							270	707	3370	1110	480	219
17							229	782	4270	1060	460	210
18							220	1010	4480	1050	425	206
19							263	1330	3570	995	401	200
20							318	1670	2650	956	386	202
21							339	2100	2710	978	373	202
22							347	2320	2800	1090	358	208
23							403	1640	2670	1100	346	194
24							466	1350	2880	1200	341	188
25							439	1250	3030	1010	338	191
26							392	1310	3310	949	338	189
27							367	1370	2870	888	336	191
28							398	1550	2970	997	328	190
29							458	1730	2980	848	320	187
30					----		573	1880	2990	754	315	183
31		----			----		----	1990	----	699	318	----
Min	NC	NC	NC	NC	NC	NC	135	397	1750	699	315	183
Max	NC	NC	NC	NC	NC	NC	573	2320	4480	2820	796	324
Mea	NC	NC	NC	NC	NC	NC	260.73	1103.90	2816	1388.19	494.77	229.27

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER AB FRYINGPAN RIVER NR BASALT

Time Series Identifier:	**ROAFRYCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:		**Data Units:**	**CFS**
Latitude, Longitude:	**39.361160, -107.029060**		
UTM X, UTM Y (zone 13 NAD 83):	**325190.0 ,4358820.0**		
Elevation (feet):			
Time Series Creation History:			
Available Data:	**2007 To 2008**		
Selected Time Series From:	**2007-1 To 2008-12**		

Water Year 2009 (Oct 2008 to Sept 2009)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
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18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31		----										
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			
Time Series Creation History:			
Available Data:	**1988 To 2008**		
Selected Time Series From:	**1988-1 To 2008-12**		

Water Year 1988 (Oct 1987 to Sept 1988)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
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26												
27												
28												
29												
30					----							
31					----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1989 (Oct 1988 to Sept 1989)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1			108	90	88	82	124	237	775	571	310	144
2			108	90	89	84	111	227	790	546	323	141
3			111	92	89	90	115	224	750	534	306	139
4		118	116	94	81	85	107	226	638	531	280	141
5		87	108	96	58	63	108	214	651	520	267	137
6		114	111	98	54	91	115	236	732	505	249	134
7		121	106	88	56	88	130	284	712	473	233	129
8		118	101	76	62	98	153	349	756	449	219	132
9		124	95	82	70	101	159	450	663	427	211	137
10		116	100	90	86	105	148	526	664	417	212	137
11		124	111	94	94	109	147	532	676	404	233	137
12		114	105	74	93	108	140	492	703	443	250	138
13		121	107	66	89	106	137	433	671	415	228	151
14		124	105	70	89	102	145	420	670	399	223	145
15		129	104	78	86	96	161	396	770	367	217	143
16		111	108	76	87	98	186	372	862	342	206	132
17		116	100	80	91	99	202	350	919	325	200	133
18		114	105	80	87	98	222	347	854	309	204	140
19		104	110	82	86	101	244	420	920	301	201	144
20		104	103	80	85	100	263	504	857	291	200	163
21		106	100	80	81	94	322	585	782	280	190	168
22		114	108	80	91	97	352	637	613	270	184	152
23		118	110	82	86	100	366	726	559	296	179	145
24		121	112	82	86	104	384	748	550	424	181	144
25		114	109	80	89	110	382	711	599	373	173	153
26		108	110	74	86	118	374	608	592	376	167	152
27		104	96	80	85	120	348	645	575	329	158	151
28		114	80	82	83	120	301	760	579	346	149	150
29		108	84	80	----	130	272	765	588	389	146	150
30		108	88	82	----	116	257	770	574	366	143	147
31		----	90	84	----	108	----	770	----		146	----
Min	NC	87	80	66	54	63	107	214	550	270	143	129
Max	NC	129	116	98	94	130	384	770	920	571	323	168
Mea	NC	113.85	103.52	82.65	82.39	100.68	215.83	482.71	701.47	400.6	212.52	143.63

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1990 (Oct 1989 to Sept 1990)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	145	137	105	101	89	79	89	142	617	584	205	110
2	140	127	105	106	87	79	91	140	515	564	222	107
3	140	132	110	103	87	80	97	143	528	549	205	104
4	147	137	115	91	87	82	100	140	753	522	191	104
5	146	135	119	92	88	81	99	138	1130	546	174	108
6	142	136	117	91	88	84	99	152	1570	558	165	114
7	139	131	108	92	88	77	98	196	1610	517	159	107
8	139	125	106	94	88	75	104	211	1720	530	151	105
9	139	131	117	96	86	80	114	207	1910	593	153	100
10	143	130	108	97	86	82	101	216	2240	480	150	104
11	138	130	96	97	88	83	105	244	2490	430	150	99
12	142	128	94	96	88	83	107	215	1870	405	153	94
13	142	129	96	96	88	81	106	206	1080	379	170	91
14	143	126	98	97	86	77	103	222	1190	371	168	89
15	146	114	100	93	87	79	117	249	1030	353	174	89
16	165	113	98	87	85	79	127	233	773	332	174	91
17	156	120	98	100	87	77	139	202	777	323	189	118
18	158	115	98	100	89	82	138	222	835	302	192	124
19	154	119	100	99	89	78	145	226	908	296	173	156
20	158	117	102	96	87	83	138	247	815	282	162	142
21	163	118	104	94	83	88	152	270	829	278	159	140
22	159	114	105	94	82	90	164	363	819	261	153	142
23	155	111	107	92	82	94	173	428	814	245	145	140
24	152	114	109	92	77	94	180	548	808	237	137	134
25	147	116	109	90	82	94	178	522	781	270	136	130
26	149	119	110	90	82	96	170	540	754	255	129	124
27	140	113	110	88	82	97	154	522	763	229	126	121
28	144	103	112	88	81	96	148	576	720	218	121	140
29	138	98	103	92	----	93	151	666	667	210	118	156
30	130	100	99	92	----	89	142	546	614	202	118	145
31	131	----	101	95	----	89	----	594	----	202	116	----
Min	130	98	94	87	77	75	89	138	515	202	116	89
Max	165	137	119	106	89	97	180	666	2490	593	222	156
Mea	146.13	121.27	105.13	94.55	85.68	84.55	127.63	307.29	1064.33	371.71	159.29	117.6

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1991 (Oct 1990 to Sept 1991)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	137	164	114	102	90	88	92	123	747	771	292	171
2	159	165	116	102	90	88	106	141	740	755	304	211
3	189	162	110	104	90	86	101	147	669	733	320	182
4	170	157	112	110	92	88	101	145	657	692	360	177
5	172	161	114	110	90	93	114	137	755	654	312	174
6	156	152	114	106	90	87	124	144	911	627	293	162
7	161	148	110	106	90	86	129	156	901	639	290	179
8	196	146	112	106	92	80	132	180	1040	695	268	213
9	177	146	115	106	91	71	113	243	1220	661	252	216
10	180	144	118	106	90	89	115	322	1240	599	245	205
11	194	141	116	106	90	93	111	394	1470	545	241	227
12	177	138	116	107	90	78	105	384	1770	523	254	237
13	175	136	117	104	92	88	97	374	1600	504	276	224
14	172	137	113	103	90	90	101	425	1750	513	255	219
15	175	136	104	100	91	85	102	453	1810	501	244	230
16	174	135	106	102	91	85	108	371	1580	493	252	231
17	179	134	113	102	94	83	120	335	1470	545	231	226
18	170	134	111	100	91	87	129	386	1430	514	208	206
19	200	133	112	98	88	88	124	492	1220	477	211	192
20	196	133	114	92	91	89	125	543	1150	467	220	187
21	180	129	102	94	89	85	132	633	1190	444	206	181
22	176	117	94	96	90	88	126	684	1150	448	192	174
23	189	118	92	96	89	85	136	688	1080	451	182	168
24	183	120	90	100	86	87	135	620	1020	419	174	164
25	180	121	96	98	77	88	145	601	914	410	172	158
26	178	124	100	96	76	88	156	693	818	381	170	156
27	175	125	100	98	74	88	136	769	745	365	179	152
28	176	113	100	98	88	82	133	808	826	346	177	150
29	174	106	104	98	----	86	126	764	881	327	173	152
30	168	110	96	88	----	82	124	803	854	315	162	149
31	168	----	98	90	----	84	----	797	----	305	162	----
Min	137	106	90	88	74	71	92	123	657	305	162	149
Max	200	165	118	110	94	93	156	808	1810	771	360	237
Mea	176	136.17	107.39	100.77	88.64	85.97	119.93	443.71	1120.27	519.97	234.74	189.1

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1992 (Oct 1991 to Sept 1992)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	159	139	119	106	91	85	96	376	516	611	247	231
2	159	140	114	102	91	85	96	387	476	554	241	236
3	156	135	112	100	89	86	98	397	493	503	228	227
4	150	137	118	102	89	92	105	405	535	495	223	217
5	148	139	124	106	86	89	110	416	585	504	243	214
6	153	141	129	106	86	87	113	433	578	512	275	205
7	153	145	125	107	88	85	118	444	575	510	291	204
8	153	137	125	103	89	88	118	492	538	671	290	203
9	152	140	120	101	89	86	129	515	566	605	268	197
10	149	140	120	102	87	82	139	462	591	513	265	182
11	148	141	126	104	85	82	150	401	619	474	301	176
12	147	133	121	104	86	85	149	425	669	477	288	169
13	146	132	116	102	85	85	165	440	763	458	269	166
14	144	133	116	101	88	86	182	483	790	422	259	160
15	145	136	114	99	85	86	181	510	714	395	256	164
16	143	132	116	98	84	86	180	531	639	399	248	167
17	144	130	118	96	86	87	170	554	579	364	255	171
18	147	136	120	98	85	87	189	606	649	344	244	174
19	146	130	123	98	85	84	168	669	736	335	222	174
20	146	126	114	96	86	83	157	767	781	342	215	202
21	144	136	114	96	86	85	153	834	784	339	205	209
22	142	128	116	96	84	90	159	786	773	324	205	205
23	144	118	110	96	85	85	159	732	759	324	222	205
24	144	124	102	96	80	85	147	748	774	351	263	186
25	148	136	104	98	85	82	158	697	803	389	282	189
26	152	132	104	99	82	85	171	728	815	368	303	183
27	147	131	106	96	84	92	191	818	724	325	290	174
28	150	130	106	94	84	100	242	707	669	294	271	174
29	139	129	104	94	83	95	302	622	705	282	250	171
30	143	122	102	94	----	96	355	586	669	276	235	168
31	140	----	104	91	----	95	----	562	----	258	231	----
Min	139	118	102	91	80	82	96	376	476	258	205	160
Max	159	145	129	107	91	100	355	834	815	671	303	236
Mea	147.77	133.6	114.90	99.39	85.97	87.29	161.67	565.58	662.23	419.94	254.35	190.1

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1993 (Oct 1992 to Sept 1993)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	171	155	123	106	99	95	101	201	1420	1660	550	288
2	167	163	125	105	96	93	108	197	1430	1560	529	311
3	159	147	123	105	94	91	104	212	1350	1620	498	287
4	156	144	116	96	86	89	103	248	1080	1380	479	271
5	156	148	117	100	85	91	109	272	1010	1070	492	275
6	159	151	114	105	88	90	105	242	1070	966	469	273
7	162	155	110	105	92	90	101	238	1070	955	443	289
8	159	160	110	107	96	90	101	227	899	1040	470	320
9	171	163	114	104	93	91	103	214	826	1010	480	290
10	165	157	117	99	92	91	114	213	835	1020	451	269
11	165	144	116	104	89	92	111	245	913	1050	467	258
12	162	137	116	99	90	84	115	305	1090	1110	424	258
13	159	142	112	98	88	86	113	407	1400	1100	408	326
14	162	137	110	105	85	90	109	508	1720	1050	397	306
15	165	139	108	102	88	91	110	560	2020	1030	374	288
16	162	137	110	100	91	89	111	647	2010	1000	357	278
17	160	135	108	102	93	87	112	678	2370	959	349	272
18	159	135	110	100	95	94	118	645	1900	899	333	261
19	162	127	107	100	94	91	116	656	1470	839	321	255
20	162	131	102	100	68	89	112	757	1570	807	320	250
21	162	125	105	100	61	93	114	834	1960	770	336	239
22	162	121	105	99	80	91	132	883	1900	745	394	230
23	158	131	105	95	102	94	151	811	2040	690	351	226
24	156	118	105	93	101	98	149	873	1750	674	314	222
25	158	118	110	94	99	105	136	873	1510	618	298	214
26	166	115	105	95	98	114	145	1040	1640	626	334	211
27	165	115	105	95	96	122	171	1100	1700	613	339	209
28	165	115	108	95	94	113	188	1210	1690	589	310	206
29	167	120	112	96	----	109	208	1080	1770	590	296	202
30	164	120	112	96	----	109	217	1120	1910	566	287	198
31	180	----	107	96	----	103	----	1260	----	561	284	----
Min	156	115	102	93	61	84	101	197	826	561	284	198
Max	180	163	125	107	102	122	217	1260	2370	1660	550	326
Mea	162.77	136.83	111.19	99.87	90.46	95.32	126.23	605.03	1510.77	940.87	392.06	259.4

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1994 (Oct 1993 to Sept 1994)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	194	178	148	118	102	98	105	194	1540	529	222	157
2	191	173	141	122	102	98	115	186	1400	500	228	175
3	187	168	137	121	104	100	109	184	1290	479	220	171
4	184	171	146	121	106	102	121	184	1380	450	211	172
5	182	165	139	123	106	103	108	215	1350	432	209	159
6	184	161	136	120	106	103	102	283	1330	402	211	176
7	193	162	134	117	106	100	109	340	1220	377	204	176
8	198	159	136	117	109	99	106	368	1090	357	197	160
9	200	159	135	117	107	94	103	385	992	347	210	146
10	211	161	131	119	109	94	104	367	961	338	209	141
11	211	169	132	118	109	99	99	390	977	323	200	135
12	235	173	134	118	101	98	101	479	949	315	196	134
13	226	165	129	118	101	98	106	517	972	297	214	137
14	216	163	126	118	100	101	117	520	933	286	212	144
15	219	153	132	118	100	103	118	524	883	280	204	158
16	232	150	144	115	102	106	128	553	851	269	191	157
17	226	154	130	115	103	106	151	648	814	265	185	152
18	216	157	129	114	104	104	170	672	812	256	186	151
19	206	149	124	118	100	111	185	655	821	266	204	146
20	206	148	122	117	99	115	208	712	829	272	196	161
21	198	152	124	115	100	100	244	680	813	266	184	243
22	202	161	120	112	99	109	284	694	856	262	183	157
23	198	161	120	113	98	117	303	714	803	267	177	146
24	196	145	118	112	98	109	341	737	748	274	169	145
25	194	134	118	110	100	111	331	780	719	265	164	143
26	195	137	118	111	100	108	271	738	695	245	157	140
27	181	140	120	109	100	96	242	746	667	227	151	136
28	187	145	120	112	98	96	221	853	627	220	154	130
29	185	150	119	110	----	104	214	889	578	215	160	128
30	162	150	118	109	----	95	202	1030	553	215	155	142
31	171	----	118	104	----	100	----	1280	----	210	149	----
Min	162	134	118	104	98	94	99	184	553	210	149	128
Max	235	178	148	123	109	117	341	1280	1540	529	228	243
Mea	199.55	157.1	128.97	115.52	102.46	102.48	170.6	565.06	948.43	313.10	190.71	153.93

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1995 (Oct 1994 to Sept 1995)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	166	143	126	97	101	101	94	148	457	3000	1720	453
2	162	143	122	237	100	99	96	169	552	2960	1490	439
3	152	145	120	215	98	106	99	171	659	2560	1440	435
4	141	139	120	210	96	99	106	159	749	2150	1450	413
5	140	133	123	236	99	96	114	177	847	1730	1470	397
6	150	139	125	144	98	97	118	177	1090	1800	1410	390
7	146	138	120	113	97	83	121	180	1050	2300	1250	402
8	144	141	116	110	97	88	134	185	1000	3160	1190	444
9	141	135	88	108	98	93	145	174	940	3640	975	413
10	144	136	180	106	96	96	124	174	834	4600	894	382
11	146	135	209	108	98	102	114	199	863	5140	911	367
12	144	145	177	105	89	105	118	222	1150	5700	825	353
13	143	141	156	102	99	95	126	202	1650	5200	781	339
14	143	122	134	103	92	92	137	205	2160	4730	746	329
15	155	109	126	102	66	98	129	267	2860	3830	686	318
16	158	129	133	104	109	106	126	326	3060	3440	659	308
17	153	132	128	100	109	111	129	359	3400	3380	634	302
18	152	125	131	97	115	108	124	337	3610	3150	613	310
19	152	128	125	109	108	114	131	333	2410	2880	627	309
20	147	128	134	104	105	101	129	376	2400	3180	617	297
21	150	129	140	111	103	108	121	382	2690	2800	644	292
22	149	126	139	105	104	111	118	453	2800	2310	718	281
23	148	115	126	142	108	106	121	531	2640	2190	751	275
24	147	128	115	177	108	108	118	536	2740	1970	688	269
25	148	127	115	132	107	96	121	543	2890	2140	680	265
26	146	126	110	108	106	104	121	480	3090	2180	619	262
27	143	121	107	104	103	96	126	478	3270	1990	625	257
28	145	130	112	101	103	96	134	422	3600	1890	587	265
29	142	143	108	100	----	91	150	409	3600	1900	543	316
30	150	131	109	95	----	94	153	393	3400	1850	514	312
31	137	----	109	112	----	89	----	404	----	1850	479	----
Min	137	109	88	95	66	83	94	148	457	1730	479	257
Max	166	145	209	237	115	114	153	543	3610	5700	1720	453
Mea	147.87	132.07	128.48	125.71	100.43	99.65	123.23	308.74	2082.03	2954.84	878.58	339.8

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1996 (Oct 1995 to Sept 1996)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	290	231	182	153	137	134	133	214	844	1340	405	225
2	281	216	180	150	132	125	144	220	932	1260	392	217
3	280	193	176	150	132	125	151	246	1140	1170	394	213
4	295	201	178	150	172	121	143	293	1330	1140	405	209
5	289	201	182	151	168	124	140	363	1500	1190	380	206
6	278	209	178	150	141	122	144	431	1580	1110	358	228
7	285	209	176	148	134	119	153	471	1680	1110	346	246
8	278	205	175	158	134	118	166	518	1670	1010	331	223
9	273	205	170	154	134	118	196	587	1700	915	326	218
10	272	210	169	146	133	117	214	615	1640	851	318	212
11	274	198	173	148	130	117	221	642	1660	792	309	209
12	286	205	176	147	130	118	201	749	1850	739	303	217
13	292	204	176	149	133	116	200	856	1990	703	293	242
14	271	202	169	144	130	113	181	940	2250	676	285	242
15	267	205	150	145	130	112	176	993	2580	661	284	255
16	263	201	169	140	129	115	181	1170	2300	677	283	247
17	258	198	158	144	130	117	186	1320	2160	711	276	236
18	254	193	126	139	133	112	188	1240	2210	688	268	234
19	253	192	158	200	130	109	177	1400	2230	660	265	241
20	242	192	157	183	141	113	168	1420	2220	596	263	244
21	239	190	155	161	150	116	168	1230	2360	563	258	235
22	243	190	156	150	145	120	161	1280	2590	536	257	243
23	230	190	158	143	131	121	164	1270	2100	518	262	260
24	225	183	156	161	134	119	184	1100	1850	491	251	254
25	229	186	153	139	126	115	227	1000	1710	474	244	238
26	230	191	156	139	129	112	230	935	1540	458	242	234
27	227	186	156	235	129	114	244	800	1770	446	251	227
28	224	178	153	233	127	118	228	750	1700	435	244	230
29	223	185	150	200	131	120	212	715	1480	493	239	239
30	222	182	150	139	----	123	209	748	1410	453	233	233
31	220	----	153	139	----	126	----	775	----	423	229	----
Min	220	178	126	139	126	109	133	214	844	423	229	206
Max	295	231	182	235	172	134	244	1420	2590	1340	405	260
Mea	257.84	197.7	163.68	157.68	135.69	118.35	183	815.84	1799.2	751.26	296.58	231.9

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1997 (Oct 1996 to Sept 1997)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	225	197	154	135	113	96	143	223	1830	2440	521	324
2	225	190	155	134	114	96	131	209	2040	2070	490	304
3	280	198	144	140	116	96	131	201	1840	1770	474	306
4	281	197	158	135	115	98	138	209	2290	1700	486	320
5	256	193	177	130	113	92	133	256	2340	1590	495	311
6	245	189	159	147	114	97	123	315	2300	1340	564	301
7	233	174	159	135	106	96	120	361	2290	1300	484	333
8	230	170	158	172	107	94	123	387	2420	1220	378	300
9	224	180	160	166	120	92	125	449	1930	1070	339	286
10	221	175	158	145	121	92	121	500	1740	853	440	283
11	218	173	157	134	119	94	118	556	1730	852	479	282
12	215	173	153	133	113	98	112	574	1680	758	472	283
13	211	170	150	131	109	99	114	618	1750	801	434	274
14	209	168	151	133	106	97	115	685	2080	761	413	263
15	213	174	138	127	106	97	122	746	2060	761	384	261
16	224	173	163	118	105	101	130	809	2100	727	363	287
17	212	160	163	150	104	104	154	920	2010	693	345	264
18	212	170	161	191	103	101	181	993	2150	692	329	265
19	227	170	160	178	101	103	192	1020	2440	669	311	273
20	231	171	160	165	102	113	213	1050	2980	656	286	272
21	202	167	159	127	101	127	243	1010	3070	640	275	283
22	199	179	158	122	96	133	228	1110	2820	628	269	321
23	207	181	157	122	106	141	212	962	2940	709	259	313
24	209	172	147	120	104	144	206	944	2530	689	252	322
25	211	165	152	123	100	132	193	915	2370	628	265	323
26	206	160	150	122	101	129	199	843	2200	582	358	283
27	200	161	148	120	99	135	194	731	2390	584	318	293
28	211	148	145	116	96	131	219	680	2570	585	302	276
29	212	161	142	119	----	141	234	730	2430	593	295	265
30	202	160	140	115	----	127	219	965	2470	563	291	262
31	201	----	138	115	----	134	----	1290	----	576	311	----
Min	199	148	138	115	96	92	112	201	1680	563	252	261
Max	281	198	177	191	121	144	243	1290	3070	2440	564	333
Mea	221.03	173.97	154	136.13	107.5	110.65	162.87	685.84	2259.67	951.61	376.84	291.1

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1998 (Oct 1997 to Sept 1998)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	255	205	162	129	110	116	120	217	1330	1160	437	234
2	252	198	159	123	116	121	132	229	1420	1070	419	236
3	280	192	157	123	112	118	127	258	1390	997	384	212
4	264	196	149	121	110	116	125	305	1070	947	371	198
5	248	191	151	118	112	116	126	335	848	911	362	193
6	239	193	155	118	114	116	128	330	705	913	339	189
7	237	193	161	111	113	113	126	309	657	824	318	187
8	256	191	158	109	112	113	125	298	616	771	302	186
9	243	194	153	112	113	113	123	305	627	788	294	184
10	251	187	150	116	110	107	122	341	657	1010	296	180
11	257	191	141	125	105	109	131	401	648	785	296	178
12	259	191	142	121	118	108	144	399	677	700	291	191
13	246	182	142	121	110	109	143	424	812	642	270	200
14	245	180	141	119	116	112	137	475	689	587	259	186
15	247	154	143	128	116	116	131	406	670	552	254	183
16	247	171	142	122	116	118	134	394	638	503	249	184
17	242	172	144	119	113	119	129	446	672	495	247	177
18	240	178	143	116	113	118	131	516	598	476	246	174
19	241	178	142	118	112	113	124	609	631	459	237	170
20	234	184	140	119	109	113	126	711	801	427	229	168
21	229	175	142	119	113	112	127	851	899	420	229	170
22	223	171	138	117	114	118	140	815	1040	439	232	191
23	220	170	135	111	118	125	161	664	1110	416	219	173
24	229	169	154	113	115	134	188	654	1000	523	215	167
25	219	170	150	115	116	148	207	612	941	586	227	162
26	208	171	145	114	110	152	185	784	1080	494	232	160
27	211	178	145	114	116	148	171	872	1130	462	239	158
28	215	167	139	113	113	138	174	1060	1160	488	230	164
29	212	163	141	114	----	131	181	1210	1180	557	213	172
30	212	163	134	114	----	120	198	1270	1200	453	204	160
31	210	----	129	111	----	125	----	1190	----	417	205	----
Min	208	154	129	109	105	107	120	217	598	416	204	158
Max	280	205	162	129	118	152	207	1270	1420	1160	437	236
Mea	237.77	180.6	146.03	117.52	113.04	120.48	143.87	570.65	896.53	653.94	275.65	182.9

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 1999 (Oct 1998 to Sept 1999)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	174	160	132	111	106	100	123	179	849	1740	462	272
2	184	179	130	108	105	101	121	185	932	1690	464	286
3	176	165	128	111	104	99	116	178	911	1530	432	291
4	201	157	128	111	105	100	110	175	938	1250	389	278
5	185	151	124	108	105	101	116	161	1010	1230	425	256
6	174	160	112	108	102	100	110	154	876	1190	488	243
7	180	153	124	107	102	98	115	152	1040	1060	409	233
8	186	154	127	107	102	100	122	166	1570	1070	372	227
9	185	156	129	112	102	95	116	199	1830	1040	353	223
10	190	143	124	108	104	96	112	243	1790	949	371	218
11	188	144	129	106	94	95	106	213	1630	846	402	230
12	184	147	131	106	98	98	113	200	1720	730	367	242
13	183	145	130	105	99	95	121	211	1790	616	327	226
14	183	147	129	106	101	96	125	279	1800	641	306	212
15	182	150	127	110	104	100	117	309	1790	584	342	231
16	176	150	126	108	102	102	109	353	1560	559	321	259
17	174	148	123	108	103	102	114	360	1510	600	322	242
18	167	144	121	105	101	106	115	373	1370	531	301	239
19	170	139	118	109	102	110	123	469	1900	561	299	248
20	170	130	116	111	100	114	137	599	1910	572	303	298
21	163	137	116	109	100	119	156	689	2130	513	295	287
22	165	140	112	106	101	119	155	786	2210	525	310	265
23	164	139	116	107	103	116	147	1020	2160	528	298	251
24	162	139	119	106	100	116	151	1040	2340	508	278	291
25	161	136	115	104	100	122	168	917	2460	532	279	338
26	168	134	113	107	100	135	153	775	2320	582	290	303
27	167	135	113	105	98	138	146	834	2140	494	275	280
28	175	135	109	101	98	123	157	833	1990	463	281	266
29	165	137	109	106	----	118	163	965	1850	440	267	261
30	163	133	109	106	----	121	198	905	1760	440	259	261
31	162	----	109	106	----	121	----	931	----	454	263	----
Min	161	130	109	101	94	95	106	152	849	440	259	212
Max	201	179	132	112	106	138	198	1040	2460	1740	488	338
Mea	175.06	146.23	120.90	107.35	101.46	108.26	131.17	479.13	1669.53	789.29	340.32	258.57

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2000 (Oct 1999 to Sept 2000)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	258	191	142	122	110	104	108	293	1540	384	170	186
2	250	181	143	121	115	107	105	332	1370	378	179	181
3	241	180	139	121	111	105	108	437	1300	356	186	169
4	228	179	134	114	111	104	110	560	1240	340	188	163
5	226	177	132	117	113	108	122	712	1180	313	186	167
6	222	175	144	114	112	104	131	782	1140	300	183	184
7	251	175	142	111	108	110	137	740	1110	290	174	191
8	242	176	135	115	110	105	140	711	1050	295	166	193
9	252	174	128	115	111	105	150	559	1080	314	157	212
10	244	163	140	115	115	105	164	559	1050	313	153	186
11	235	166	133	118	116	100	158	764	930	281	154	167
12	225	165	136	116	112	108	157	691	876	267	166	160
13	223	160	133	114	113	101	171	475	797	259	182	156
14	217	158	127	115	112	102	186	431	678	270	168	153
15	214	160	132	116	113	108	193	418	627	317	168	151
16	212	156	138	118	109	105	177	452	617	485	190	146
17	198	158	132	118	112	102	184	533	539	491	189	144
18	208	160	131	118	110	103	208	431	503	371	190	151
19	206	139	130	119	106	99	197	389	553	313	207	152
20	203	150	128	117	105	105	181	382	598	288	192	147
21	203	149	129	117	111	101	191	409	512	272	190	158
22	200	153	131	118	110	101	205	535	480	257	201	211
23	196	141	133	113	109	102	206	879	457	246	202	193
24	193	131	129	115	108	105	199	1240	421	235	191	183
25	189	168	135	117	106	106	185	1210	412	225	189	175
26	188	155	124	118	108	111	190	982	441	217	198	173
27	187	152	125	117	106	112	225	804	446	212	204	168
28	185	147	124	109	107	119	289	981	421	201	190	166
29	197	145	126	108	107	118	321	1520	390	191	187	175
30	183	144	123	100	----	118	328	1810	399	185	186	178
31	190	----	125	105	----	114	----	1690	----	179	187	----
Min	183	131	123	100	105	99	105	293	390	179	153	144
Max	258	191	144	122	116	119	328	1810	1540	491	207	212
Mea	215.03	160.93	132.35	115.19	110.21	106.35	180.87	732.61	771.9	291.77	183	171.3

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2001 (Oct 2000 to Sept 2001)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	161	139	109	110	95	88	98	296	1130	492	223	201
2	154	140	117	112	95	85	105	356	1220	436	235	189
3	154	139	117	112	93	85	109	311	1200	405	245	183
4	157	140	115	113	92	87	116	264	1050	406	263	174
5	165	150	116	110	92	87	119	259	849	376	244	169
6	160	138	113	106	92	88	116	237	872	356	256	169
7	151	130	115	105	94	88	108	230	1010	353	253	177
8	143	132	113	104	93	89	106	239	1080	349	260	184
9	140	136	114	106	89	89	101	285	1080	351	300	194
10	140	133	114	110	94	89	108	313	1130	383	286	182
11	139	136	115	109	93	89	110	356	1060	346	285	172
12	140	127	117	117	91	88	102	462	956	338	248	171
13	139	124	114	102	91	87	104	593	879	348	229	170
14	139	133	112	102	92	86	102	734	690	328	273	179
15	137	140	114	97	89	86	101	771	614	350	351	173
16	138	129	108	104	89	84	108	913	585	323	284	168
17	141	125	110	104	89	88	117	974	570	282	253	196
18	139	135	113	104	91	86	133	914	616	259	236	221
19	132	129	117	104	90	86	150	868	630	251	224	195
20	132	126	117	104	89	89	162	910	629	246	219	184
21	132	126	119	104	91	96	146	859	613	241	254	175
22	132	126	122	104	89	100	149	698	609	231	242	166
23	134	124	115	104	90	99	135	741	545	224	224	161
24	141	122	120	104	89	99	134	860	551	219	210	156
25	139	121	110	102	90	99	144	901	605	224	199	148
26	138	120	113	95	86	100	160	956	616	236	194	142
27	140	120	113	93	90	101	187	942	653	246	186	139
28	147	119	129	93	87	94	216	1060	564	216	188	135
29	147	118	129	95	----	97	236	1040	553	200	183	134
30	141	117	117	99	----	94	259	964	514	193	190	140
31	144	----	108	93	----	94	----	1060	----	203	202	----
Min	132	117	108	93	86	84	98	230	514	193	183	134
Max	165	150	129	117	95	101	259	1060	1220	492	351	221
Mea	143.10	129.8	115.32	103.90	90.89	90.87	134.7	656.97	789.1	303.58	239.97	171.57

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2002 (Oct 2001 to Sept 2002)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	142	137	112	98	90	85	117	236	700	185	97	62
2	147	133	120	98	90	80	126	222	665	180	93	63
3	148	133	119	101	92	85	130	199	599	172	99	64
4	145	133	116	104	92	87	132	208	486	206	100	65
5	144	132	112	106	92	88	138	236	434	212	96	67
6	144	129	111	103	94	85	142	248	469	196	102	64
7	141	128	115	98	94	80	139	278	485	183	116	64
8	137	141	102	95	94	81	135	288	479	172	116	76
9	150	126	115	97	92	88	138	246	469	164	111	76
10	149	122	120	98	92	91	147	242	452	155	106	85
11	145	124	115	91	90	83	159	245	408	145	99	85
12	151	126	118	97	90	81	150	289	378	138	94	99
13	150	127	113	94	88	84	145	234	380	132	91	108
14	148	128	118	91	88	89	161	248	358	128	85	107
15	152	126	116	95	86	78	180	255	341	126	81	99
16	148	125	114	95	89	78	198	292	312	124	77	93
17	146	125	116	94	84	77	166	291	298	120	76	92
18	141	127	114	97	80	76	162	356	286	117	75	124
19	140	122	112	100	80	77	171	412	274	113	76	118
20	141	112	111	102	81	78	185	451	263	114	83	110
21	141	109	106	105	79	79	162	485	250	115	90	113
22	143	118	103	106	84	83	148	408	240	108	92	111
23	142	124	104	100	80	83	148	369	230	112	84	106
24	137	118	105	99	81	81	162	329	214	114	74	100
25	129	122	106	99	79	80	184	298	208	109	71	95
26	134	118	106	97	72	81	232	299	244	123	67	117
27	134	108	105	95	89	86	250	307	225	119	67	127
28	135	98	104	90	87	90	227	353	182	110	67	124
29	131	110	103	89	----	97	241	410	196	104	68	129
30	131	115	102	89	----	102	235	502	200	100	67	136
31	142	----	101	90	----	108	----	666	----	97	64	----
Min	129	98	101	89	72	76	117	199	182	97	64	62
Max	152	141	120	106	94	108	250	666	700	212	116	136
Mea	142.19	123.2	110.77	97.19	86.75	84.55	167	319.42	357.5	138.48	86.58	95.97

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2003 (Oct 2002 to Sept 2003)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	137	120	97	86	75	71	84	183	2480	519	184	138
2	132	121	93	84	76	69	89	171	2040	523	178	133
3	138	110	90	86	76	71	89	168	1750	501	175	132
4	131	107	88	84	75	72	89	183	1670	480	172	136
5	128	108	90	83	78	74	85	173	1430	456	162	132
6	124	103	85	82	74	73	89	160	1000	435	159	135
7	122	106	88	82	76	72	86	154	905	409	157	180
8	115	108	92	93	76	71	81	152	853	393	162	188
9	118	121	91	92	76	71	86	148	921	372	163	196
10	124	109	99	83	76	72	95	151	994	351	157	233
11	122	106	102	81	76	73	106	143	914	336	153	215
12	120	98	89	80	76	78	113	150	925	320	158	194
13	118	104	90	82	76	78	116	192	975	305	159	201
14	120	107	90	80	76	81	133	215	860	285	156	188
15	121	104	90	78	75	82	144	291	898	273	155	176
16	123	98	88	82	72	81	133	335	897	281	159	171
17	123	103	90	88	74	81	136	468	797	262	168	163
18	122	104	87	87	73	81	138	550	805	255	170	170
19	120	97	82	110	71	79	130	544	795	251	173	177
20	118	100	89	94	70	76	126	544	747	246	149	179
21	116	103	91	92	73	79	129	577	704	237	140	168
22	117	102	87	83	73	75	138	671	706	228	138	167
23	123	102	97	78	71	79	141	829	702	220	140	162
24	117	103	93	76	76	85	130	936	654	210	140	157
25	117	101	93	76	74	82	130	1050	596	203	138	155
26	116	85	93	75	72	80	146	1000	586	197	143	149
27	122	96	93	76	72	83	163	1280	583	230	149	146
28	116	108	93	76	71	77	175	1790	577	209	156	144
29	115	103	93	75	----	74	190	2140	566	215	143	141
30	109	99	93	75	----	77	197	2480	545	199	143	132
31	119	----	93	75	----	80	----	2290	----	185	146	----
Min	109	85	82	75	70	69	81	143	545	185	138	132
Max	138	121	102	110	78	85	197	2480	2480	523	184	233
Mea	121.39	104.53	91.26	83.03	74.25	76.68	122.9	648.97	962.5	309.23	156.29	165.27

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2004 (Oct 2003 to Sept 2004)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	137	118	111	94	82	75	130	156	498	572	188	119
2	152	122	107	96	81	76	136	154	498	485	181	115
3	161	128	102	99	81	76	134	177	588	459	177	116
4	154	120	100	93	81	76	136	237	684	432	194	132
5	151	116	100	78	81	77	149	281	829	423	196	145
6	148	119	104	85	81	73	149	356	1010	421	195	141
7	146	121	105	92	78	76	150	411	1130	412	193	137
8	143	121	110	92	81	78	151	460	1150	393	184	131
9	143	119	99	91	82	81	169	497	1130	380	176	126
10	139	126	97	91	78	83	155	513	1070	363	170	127
11	144	123	105	90	80	82	140	544	852	348	163	129
12	142	116	101	90	80	82	143	492	690	331	156	123
13	142	121	99	90	79	85	136	417	650	324	152	124
14	138	126	105	89	79	84	141	366	755	320	149	120
15	140	119	107	89	78	87	143	335	832	318	143	119
16	141	113	98	89	78	83	148	346	740	336	140	120
17	137	120	98	89	77	84	158	388	662	573	144	120
18	130	113	100	89	78	87	160	396	613	408	151	116
19	128	112	100	88	78	93	153	507	604	371	173	125
20	129	116	100	87	77	101	150	644	632	339	177	184
21	129	116	102	84	76	110	147	659	624	309	164	198
22	128	112	99	82	75	118	141	641	546	276	165	189
23	128	93	94	82	75	123	138	584	492	276	164	160
24	127	128	97	83	75	131	133	560	500	297	151	150
25	124	122	97	83	75	139	134	563	490	263	143	144
26	118	111	97	80	74	138	127	558	494	246	140	139
27	124	105	96	78	76	142	135	574	465	257	138	135
28	124	114	95	78	79	127	154	603	440	232	137	132
29	122	131	94	80	76	116	161	693	469	215	132	131
30	119	114	94	82	----	119	166	573	740	205	128	146
31	117	----	94	82	----	123	----	484	----	195	123	----
Min	117	93	94	78	74	73	127	154	440	195	123	115
Max	161	131	111	99	82	142	169	693	1150	573	196	198
Mea	135.65	117.83	100.23	86.94	78.31	97.58	145.57	457.06	695.9	347.71	160.87	136.43

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2005 (Oct 2004 to Sept 2005)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	142	136	106	95	88	79	78	146	818	907	315	169
2	140	123	106	96	80	78	80	140	884	881	314	162
3	137	126	106	94	87	78	86	137	944	857	323	163
4	136	128	108	96	95	78	92	140	819	774	351	163
5	139	127	108	96	92	78	97	143	696	741	461	161
6	146	126	108	92	93	79	89	152	686	719	338	159
7	154	125	110	96	87	79	98	176	732	709	325	157
8	153	127	110	96	87	79	105	176	722	678	298	160
9	146	135	108	95	80	79	101	166	760	683	293	187
10	144	132	107	100	81	81	100	200	706	648	330	197
11	143	129	105	94	95	80	94	232	631	616	324	178
12	143	126	104	94	85	82	92	198	625	620	330	167
13	151	125	104	93	84	82	99	183	582	638	293	161
14	149	123	103	93	83	79	108	177	560	638	279	159
15	153	119	103	92	83	75	122	198	608	614	260	158
16	153	120	100	92	84	77	129	243	758	567	255	152
17	150	120	99	91	82	80	143	322	888	572	262	148
18	152	120	105	91	82	79	154	317	1020	535	251	145
19	152	117	108	92	84	77	162	400	1210	483	241	141
20	148	114	109	91	82	80	175	524	1250	458	229	140
21	145	120	100	91	81	80	164	682	1230	439	226	140
22	148	115	86	89	80	77	155	829	1270	428	232	182
23	142	112	100	90	79	81	158	947	1290	425	220	167
24	146	113	100	90	77	82	198	1050	1260	515	213	154
25	144	113	100	91	78	80	189	1110	1190	620	209	148
26	143	120	100	91	80	79	166	1130	1140	492	220	142
27	141	112	100	92	79	78	160	1060	1040	416	207	143
28	148	122	100	90	77	82	159	994	973	381	197	235
29	148	112	100	89	----	87	156	910	1000	353	185	231
30	138	88	98	88	----	81	148	950	948	334	179	205
31	138	----	96	90	----	81	----	844	----	322	174	----
Min	136	88	86	88	77	75	78	137	560	322	174	140
Max	154	136	110	100	95	87	198	1130	1290	907	461	235
Mea	145.55	120.83	103.13	92.58	83.75	79.58	128.57	479.87	908	582.68	268.84	165.8

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2006 (Oct 2005 to Sept 2006)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	190	164	133	118	101	100	104	330	872	530	284	176
2	184	168	138	114	101	96	108	349	959	539	264	169
3	173	169	137	117	101	97	108	389	1030	560	249	165
4	179	164	131	112	100	97	118	411	1080	531	248	162
5	194	167	128	109	100	96	127	431	1170	497	253	156
6	187	161	130	120	99	97	130	407	1250	569	280	151
7	183	163	130	115	98	100	122	406	1330	499	251	154
8	178	161	120	112	104	100	123	394	1370	538	242	161
9	202	158	132	111	100	97	135	386	1350	607	231	175
10	206	158	132	106	96	98	150	356	1090	586	228	172
11	192	159	132	120	78	98	161	354	1090	523	239	163
12	186	161	132	115	99	96	161	376	1060	500	226	155
13	183	159	132	106	99	95	190	427	1030	457	233	150
14	186	163	132	110	99	93	220	501	1000	416	218	145
15	193	138	132	110	99	96	255	558	945	386	206	171
16	190	139	132	107	97	91	226	610	828	364	206	187
17	188	146	132	115	97	94	239	663	743	356	199	170
18	183	141	132	111	98	94	251	706	756	341	195	163
19	224	144	132	111	94	95	223	794	756	334	212	158
20	208	138	127	106	95	97	215	844	723	359	202	158
21	205	141	123	110	93	93	227	984	714	427	195	179
22	200	139	123	110	92	95	247	1110	669	345	192	187
23	194	137	122	110	93	95	306	1350	648	324	187	180
24	187	139	119	110	92	95	343	1080	633	308	185	179
25	181	136	118	110	93	98	308	1170	601	302	186	185
26	180	139	117	110	92	101	290	1280	576	298	220	185
27	175	136	119	110	94	96	324	1340	537	307	265	186
28	172	134	116	106	97	99	367	1140	524	280	220	190
29	174	127	117	103	----	103	323	930	530	265	202	197
30	178	136	115	106	----	103	315	831	536	273	189	197
31	170	----	117	102	----	100	----	863	----	275	180	----
Min	170	127	115	102	78	91	104	330	524	265	180	145
Max	224	169	138	120	104	103	367	1350	1370	607	284	197
Mea	187.90	149.5	126.84	110.71	96.46	96.94	213.87	702.26	880	416	222.16	170.87

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2007 (Oct 2006 to Sept 2007)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	203	190	152	110	110	92	130	482	821	566	245	168
2	195	178	143	112	110	95	134	565	858	534	241	156
3	223	186	129	115	110	97	135	552	978	500	261	152
4	229	184	141	118	110	99	137	553	946	480	245	163
5	240	182	146	118	101	99	150	448	1050	473	241	174
6	260	180	154	110	99	99	148	394	1120	451	263	235
7	326	181	136	118	99	95	153	364	869	425	256	219
8	284	177	131	122	98	95	156	341	752	414	265	206
9	260	175	132	125	97	93	153	354	761	379	234	201
10	259	173	130	125	97	95	156	367	892	352	220	195
11	248	158	129	120	98	95	145	420	1010	335	209	184
12	239	176	127	111	99	97	146	539	1210	333	199	176
13	238	155	126	113	97	104	145	663	1030	335	199	169
14	240	165	129	113	98	109	139	760	1050	309	200	167
15	243	153	127	90	96	114	145	804	1130	297	205	168
16	241	157	127	110	97	115	156	865	1180	285	250	173
17	252	162	126	110	95	118	164	863	1230	279	243	307
18	238	158	122	110	96	126	159	884	1160	282	219	295
19	216	155	122	110	97	133	163	996	1020	312	210	239
20	223	155	122	110	98	138	173	1030	999	299	199	216
21	221	154	120	110	96	142	199	993	958	365	187	194
22	212	154	112	110	96	136	196	989	882	387	180	183
23	203	152	122	110	96	134	201	790	827	335	174	205
24	213	150	122	110	96	140	213	691	830	335	178	241
25	213	150	122	110	93	133	200	605	782	321	171	217
26	210	148	125	110	99	132	194	590	719	349	162	204
27	195	142	126	110	97	142	199	631	695	340	162	189
28	203	147	122	110	100	153	232	789	658	365	172	185
29	201	145	119	110	----	142	309	896	614	309	171	185
30	200	123	116	110	----	135	414	764	585	275	170	184
31	196	----	106	110	----	133	----	733	----	257	163	----
Min	195	123	106	90	93	92	130	341	585	257	162	152
Max	326	190	154	125	110	153	414	1030	1230	566	265	307
Mea	229.81	162.17	127.84	112.26	99.11	117.10	178.13	668.23	920.53	363.81	209.48	198.33

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2008 (Oct 2007 to Sept 2008)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	182	162	124	133	128	101	106	314	1670	2110	563	236
2	195	162	112	144	130	105	109	263	1970	1740	542	239
3	187	151	112	150	133	99	112	243	2290	1500	519	231
4	177	149	110	159	127	105	106	238	2020	1460	507	225
5	173	149	111	151	110	99	110	250	1530	1450	495	218
6	170	146	110	118	106	102	111	316	1360	1400	542	215
7	166	146	115	111	104	102	113	368	1400	1410	552	206
8	163	143	111	120	102	98	109	466	1610	1330	615	203
9	167	140	103	107	102	98	109	387	1410	1250	538	201
10	163	142	100	97	99	97	113	395	1460	1210	544	202
11	160	139	102	95	99	97	107	346	1780	1150	510	206
12	161	139	93	96	99	98	106	371	1460	1080	456	236
13	163	133	95	104	102	97	110	414	1270	1040	423	223
14	176	135	114	111	104	102	123	373	1440	988	392	214
15	174	119	99	106	102	98	143	367	1810	950	372	207
16	168	129	108	99	100	98	155	360	2020	929	393	204
17	184	130	115	95	103	99	142	409	2070	899	366	194
18	172	130	115	110	102	98	137	558	2110	888	346	190
19	173	125	105	159	109	98	152	758	2570	852	330	189
20	178	124	95	236	107	101	174	1020	2410	827	312	188
21	177	116	96	133	101	101	182	1310	2420	803	297	193
22	163	99	97	123	101	99	190	1340	2360	821	282	191
23	165	106	102	128	99	96	217	896	2350	848	271	185
24	174	100	98	133	100	100	240	749	2410	882	267	181
25	175	106	97	118	102	103	232	722	2290	774	263	179
26	174	106	89	106	100	105	217	789	2280	745	262	180
27	172	105	84	107	99	109	212	887	2080	739	254	182
28	170	107	84	99	101	107	226	1040	1910	834	243	181
29	169	109	93	91	100	108	250	1200	1950	711	234	177
30	169	111	108	115	----	112	288	1310	2040	635	232	176
31	167	----	120	120	----	121	----	1400	----	590	233	----
Min	160	99	84	91	99	96	106	238	1270	590	232	176
Max	195	162	124	236	133	121	288	1400	2570	2110	615	239
Mea	171.84	128.6	103.77	121.74	105.90	101.71	156.7	640.61	1925	1059.52	392.10	201.73

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN

Time Series Identifier:	**ROABMCCO.DWR.Streamflow.Daily**	**Data Source:**	**DWR**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.199987, -106.817261**		
UTM X, UTM Y (zone 13 NAD 83):	**343078.8 ,4340542.9**		
Elevation (feet):			

Time Series Creation History:

Available Data: **1988 To 2008**

Selected Time Series From: **1988-1 To 2008-12**

Water Year 2009 (Oct 2008 to Sept 2009)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31		----										
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1969 (Oct 1968 to Sept 1969)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												50
2												50
3												52
4												54
5												54
6												52
7												51
8												51
9												51
10												52
11												54
12												52
13												51
14												48
15												48
16												47
17												48
18												48
19												47
20												46
21												46
22												46
23												47
24												46
25												44
26												44
27												43
28												43
29					----							43
30					----							43
31					----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	43
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	54
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	48.37

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1970 (Oct 1969 to Sept 1970)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	43	30	25	19	18	16	14	15	224	285	90	61
2	43	29	25	19	15	16	14	16	212	260	84	63
3	43	29	25	19	16	16	14	16	220	252	84	57
4	44	28	25	19	16	16	17	18	216	234	82	56
5	43	28	25	18	16	16	15	20	200	229	80	56
6	43	28	24	17	16	16	14	23	216	224	80	90
7	40	28	24	18	16	16	14	26	224	234	84	66
8	39	27	22	20	15	16	14	27	234	216	84	57
9	39	28	21	19	16	16	14	30	234	216	78	56
10	39	28	23	19	15	16	14	32	220	212	76	56
11	39	28	22	18	16	16	14	35	208	204	74	56
12	38	29	22	18	16	16	14	39	192	188	74	57
13	38	28	22	18	16	16	14	44	173	173	72	112
14	37	28	22	18	15	16	14	48	173	166	70	100
15	37	28	21	18	16	16	14	51	176	159	70	82
16	37	29	21	19	15	16	14	56	173	156	68	78
17	37	29	21	18	15	16	14	74	184	148	66	78
18	35	28	21	19	15	16	14	95	212	152	65	78
19	35	27	20	18	15	15	14	115	224	148	66	76
20	34	25	20	19	14	14	14	121	242	139	68	74
21	33	27	20	19	16	15	14	136	275	133	72	72
22	33	29	20	19	16	15	14	162	280	130	76	68
23	33	28	20	19	16	14	14	180	285	130	68	61
24	32	27	20	14	16	14	14	200	326	124	65	59
25	32	29	20	16	16	15	14	229	359	115	61	57
26	32	29	17	15	15	14	15	256	364	115	61	54
27	32	29	20	15	15	14	16	265	326	110	59	54
28	32	21	18	17	16	14	15	265	295	102	59	54
29	31	25	16	15	----	14	15	256	326	90	57	51
30	31	25	17	13	----	14	16	252	305	90	59	49
31	30	----	18	15	----	14	----	252	----	92	61	----
Min	30	21	16	13	14	14	14	15	173	90	57	49
Max	44	30	25	20	18	16	17	265	364	285	90	112
Mea	36.58	27.7	21.19	17.65	15.64	15.29	14.37	108.19	243.27	168.58	71.39	66.27

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1971 (Oct 1970 to Sept 1971)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	47	40	28	24	20	16	16	27	68	305	113	61
2	47	39	27	23	20	16	16	27	74	290	108	61
3	47	39	27	22	20	16	16	29	82	252	105	61
4	46	38	27	21	20	15	16	31	86	247	105	61
5	44	38	27	19	20	15	16	33	86	243	100	59
6	44	38	27	19	19	15	17	33	90	234	98	57
7	48	38	27	19	19	15	17	34	100	234	95	57
8	48	38	28	19	19	15	17	35	110	229	90	65
9	47	37	28	19	19	15	17	35	110	220	88	61
10	47	37	28	20	19	15	17	34	113	220	86	57
11	47	36	27	21	19	15	19	32	110	208	84	56
12	46	36	26	22	18	15	20	32	113	208	84	54
13	46	36	25	22	19	15	21	33	118	208	84	52
14	44	35	25	22	19	15	23	35	139	204	82	52
15	44	35	26	22	19	15	23	37	177	200	80	52
16	43	35	26	21	19	15	26	40	216	196	76	51
17	43	34	25	22	18	15	27	47	265	192	74	52
18	43	34	25	22	18	15	28	47	310	180	74	51
19	43	33	25	21	18	15	28	46	430	184	74	49
20	43	32	24	21	18	15	27	46	442	177	78	49
21	43	31	25	20	17	15	27	46	442	166	76	48
22	43	31	25	20	17	14	27	47	412	159	74	47
23	42	30	24	20	17	15	27	51	364	163	72	46
24	43	30	23	20	16	15	27	49	354	152	70	46
25	42	30	22	20	16	15	27	48	376	145	70	44
26	42	30	23	20	16	16	27	51	359	139	68	43
27	40	30	23	20	16	16	27	59	332	133	70	43
28	39	29	24	20	16	16	27	70	310	127	72	42
29	39	29	23	20	----	16	27	76	320	127	70	42
30	39	29	23	20	----	16	26	70	315	118	68	42
31	40	----	25	20	----	16	----	66	----	115	65	----
Min	39	29	22	19	16	14	16	27	68	115	65	42
Max	48	40	28	24	20	16	28	76	442	305	113	65
Mea	43.84	34.23	25.42	20.68	18.25	15.26	22.53	43.42	227.43	192.74	82.35	52.03

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1972 (Oct 1971 to Sept 1972)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	42	29	24	19	16	15	15	21	215	170	58	39
2	42	29	24	20	14	15	15	22	278	150	58	38
3	42	30	24	20	13	15	14	24	296	146	58	38
4	41	30	24	17	15	15	14	25	296	133	58	37
5	39	30	24	19	15	15	15	27	328	133	58	37
6	39	29	24	19	15	15	15	30	386	129	57	38
7	38	29	24	19	15	14	15	31	340	116	57	39
8	38	29	24	19	15	14	15	31	374	108	55	41
9	37	29	24	19	15	14	15	31	340	105	55	39
10	37	29	24	19	15	14	16	31	287	102	54	39
11	36	28	24	20	15	15	17	31	305	97	54	39
12	36	28	24	21	15	15	19	31	305	97	52	38
13	35	28	24	20	15	15	17	31	296	94	52	38
14	34	28	24	19	15	15	16	31	260	88	51	37
15	34	28	23	19	15	15	16	31	224	86	52	37
16	34	28	22	19	14	15	16	34	251	83	51	37
17	36	27	22	19	14	15	16	42	224	78	49	36
18	34	27	22	19	14	15	16	52	233	78	49	36
19	34	26	22	19	14	15	16	61	233	76	46	38
20	33	26	22	19	14	15	16	65	215	74	46	41
21	33	25	22	19	14	15	16	76	215	74	45	42
22	33	25	22	19	14	15	16	78	215	72	45	43
23	32	25	21	19	14	15	17	76	215	67	45	42
24	32	25	21	18	14	15	18	88	196	65	44	42
25	32	25	21	18	14	15	19	102	189	63	43	41
26	31	25	21	18	14	15	20	116	183	63	42	39
27	31	25	21	18	14	15	20	129	176	61	42	38
28	31	25	20	18	15	15	20	133	183	61	41	38
29	31	25	20	18	15	15	20	150	183	58	41	38
30	30	25	19	18	----	15	21	170	183	58	41	37
31	30	----	19	17	----	15	----	196	----	57	39	----
Min	30	25	19	17	13	14	14	21	176	57	39	36
Max	42	30	24	21	16	15	21	196	386	170	58	43
Mea	35.06	27.23	22.45	18.84	14.52	14.87	16.7	64.39	254.13	91.68	49.61	38.73

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1973 (Oct 1972 to Sept 1973)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	36	34	22	18	14	13	13	18	97	296	129	63
2	36	34	22	19	14	13	13	18	91	305	121	61
3	37	34	22	19	14	13	13	18	88	296	121	60
4	37	33	21	19	14	13	13	19	83	269	121	60
5	37	33	21	20	13	14	14	20	76	260	125	58
6	36	32	21	20	13	13	13	21	74	251	129	57
7	37	31	22	20	13	13	14	21	80	251	125	55
8	36	31	23	20	13	13	13	21	100	251	121	54
9	37	31	23	19	13	13	13	22	146	251	116	52
10	36	31	22	19	13	13	13	24	176	251	112	52
11	36	31	22	19	13	13	13	26	196	233	108	52
12	36	31	22	18	13	13	14	30	202	251	105	51
13	36	31	21	18	13	13	14	33	269	233	102	49
14	36	30	21	17	13	13	14	39	305	233	100	48
15	38	30	21	16	13	12	15	43	296	233	94	49
16	37	29	21	16	13	13	14	46	269	215	91	48
17	37	29	21	15	13	13	14	49	224	189	88	48
18	38	28	21	15	13	12	14	32	196	183	88	46
19	38	28	20	14	12	12	14	31	176	202	83	45
20	38	28	20	14	11	12	14	51	150	189	80	45
21	39	27	20	15	12	12	14	105	157	183	78	44
22	39	27	20	14	12	13	14	116	183	170	80	44
23	37	26	20	14	12	13	14	116	215	157	76	43
24	36	26	20	13	12	13	15	125	242	157	76	43
25	36	25	19	14	12	13	15	129	278	150	74	44
26	35	25	19	14	12	12	15	125	351	150	74	44
27	35	25	19	14	13	13	16	108	449	150	72	44
28	35	24	19	14	13	13	16	102	507	142	69	44
29	35	23	18	14	----	13	18	97	522	137	67	43
30	35	23	18	14	----	13	18	91	340	133	65	43
31	35	----	18	14	----	13	----	94	----	133	63	----
Min	35	23	18	13	11	12	13	18	74	133	63	43
Max	39	34	23	20	14	14	18	129	522	305	129	63
Mea	36.52	29	20.61	16.42	12.82	12.84	14.23	57.74	217.93	209.81	95.26	49.63

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1974 (Oct 1973 to Sept 1974)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	43	27	22	19	16	12	13	27	251	251	76	39
2	43	27	22	19	16	13	14	31	242	242	74	38
3	43	27	22	18	15	13	13	33	233	224	74	37
4	42	27	22	19	15	12	13	35	233	208	76	36
5	42	25	22	19	15	12	13	33	224	202	69	37
6	42	25	22	19	15	12	13	37	196	189	65	36
7	40	25	22	19	15	11	13	44	170	182	63	36
8	39	25	22	19	15	12	12	50	156	163	61	36
9	39	25	21	18	15	13	12	58	142	156	63	35
10	38	25	21	18	15	13	13	61	133	150	69	35
11	37	25	21	18	15	13	12	63	146	121	65	34
12	37	25	21	18	15	13	13	65	189	112	60	34
13	35	25	21	18	15	13	12	72	224	108	60	34
14	35	25	21	18	15	13	12	72	251	105	58	34
15	34	25	21	17	14	14	12	72	278	100	56	33
16	34	25	21	18	14	14	12	70	316	97	55	33
17	33	25	21	18	14	14	12	88	316	97	54	33
18	32	24	21	18	14	14	14	91	287	102	52	33
19	32	25	20	18	15	14	14	100	351	112	52	33
20	31	24	20	18	14	14	13	94	340	102	52	33
21	31	24	20	18	14	13	14	91	408	94	50	32
22	32	24	19	17	14	13	14	91	362	112	49	32
23	32	24	19	17	13	13	15	98	351	100	49	31
24	30	24	19	16	13	13	16	105	351	94	48	31
25	30	24	19	17	13	13	19	112	328	94	46	30
26	30	24	19	17	13	13	21	146	316	91	45	30
27	30	24	19	17	13	13	22	189	328	86	45	30
28	30	24	19	16	13	13	22	202	287	83	43	30
29	30	23	19	16	----	13	23	233	278	86	42	30
30	29	23	19	16	----	14	24	242	278	80	40	29
31	28	----	19	16	----	14	----	260	----	78	39	----
Min	28	23	19	16	13	11	12	27	133	78	39	29
Max	43	27	22	19	16	14	24	260	408	251	76	39
Mea	34.94	24.8	20.52	17.71	14.39	13.03	14.83	95.65	265.5	129.71	56.45	33.47

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1975 (Oct 1974 to Sept 1975)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	31	27	23	20	16	14	10	13	54	301	144	62
2	30	27	24	20	15	14	10	13	54	371	134	60
3	30	27	25	20	16	15	10	14	62	389	130	60
4	30	26	25	19	17	15	10	14	86	451	120	58
5	30	26	26	18	17	15	10	14	96	504	116	56
6	30	26	26	18	16	15	10	14	110	483	116	54
7	30	26	25	18	15	15	11	14	130	451	116	54
8	30	26	24	17	16	15	12	14	157	483	116	52
9	30	26	22	17	17	15	11	14	144	483	113	52
10	29	26	21	17	16	15	11	15	144	451	110	52
11	29	26	22	15	15	14	11	16	139	472	106	52
12	30	26	23	14	16	13	11	17	139	451	106	52
13	29	26	23	14	17	13	11	17	134	409	106	52
14	28	26	23	15	18	12	11	18	162	398	106	52
15	28	26	23	15	17	12	11	20	170	430	96	52
16	28	26	23	16	16	12	12	22	187	440	93	50
17	28	26	23	16	16	12	13	24	181	430	91	50
18	29	26	23	17	15	13	12	26	199	380	88	49
19	29	26	22	17	15	14	11	31	175	353	83	47
20	28	25	21	17	14	14	11	36	170	335	83	47
21	29	26	21	17	13	14	11	40	166	301	80	46
22	28	26	20	17	12	14	11	42	166	278	83	45
23	28	26	20	17	11	13	11	42	170	256	80	45
24	27	26	20	17	12	13	11	41	187	234	75	44
25	27	26	17	17	12	12	14	41	199	216	73	42
26	27	26	19	17	12	11	16	41	187	199	70	42
27	27	25	20	16	13	10	15	45	204	187	70	41
28	27	25	20	16	14	10	14	56	228	175	68	41
29	27	24	20	17	----	9	13	62	264	166	66	40
30	27	22	20	16	----	9.8	13	58	286	175	64	38
31	27	----	20	16	----	11	----	56	----	157	62	----
Min	27	22	17	14	11	9	10	13	54	157	62	38
Max	31	27	26	20	18	15	16	62	286	504	144	62
Mea	28.61	25.8	22.06	16.87	14.96	13.03	11.6	28.71	158.33	348.68	95.61	49.57

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1976 (Oct 1975 to Sept 1976)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	38	29	23	18	15	14	14	20	139	204	85	46
2	37	29	22	16	15	14	15	21	157	196	84	44
3	37	28	22	18	15	14	16	22	170	192	81	43
4	37	28	21	18	15	14	18	22	210	191	79	42
5	37	28	20	16	15	14	18	23	241	182	74	42
6	37	28	20	16	15	13	16	25	278	170	70	41
7	37	26	20	16	15	14	16	26	271	160	66	41
8	37	26	20	16	15	14	17	28	317	153	67	41
9	36	26	20	16	15	14	18	28	362	153	72	40
10	35	26	20	16	15	14	19	28	380	150	67	39
11	35	26	19	16	15	14	21	30	362	148	66	38
12	35	26	19	16	15	14	21	32	308	142	64	38
13	35	26	20	16	16	15	19	33	256	143	62	37
14	35	25	19	14	16	14	18	34	228	132	60	37
15	34	25	21	15	16	14	18	37	193	129	58	38
16	34	25	19	16	16	14	18	46	181	130	56	38
17	33	25	18	16	16	14	18	56	171	122	54	39
18	33	25	18	16	16	14	16	73	150	117	55	38
19	33	25	18	16	16	14	16	83	141	127	56	37
20	32	24	19	16	15	13	16	93	163	121	55	38
21	32	24	20	16	15	13	16	99	190	111	55	37
22	31	24	20	16	12	14	17	99	202	108	54	37
23	32	24	19	16	13	14	17	99	196	105	53	36
24	32	23	19	16	14	14	16	99	171	102	52	36
25	30	24	18	16	14	14	16	103	178	99	51	36
26	30	16	18	15	14	14	17	103	192	96	49	38
27	30	17	18	15	14	13	17	106	198	94	49	39
28	30	24	18	15	14	14	18	116	199	87	49	40
29	29	22	18	15	15	14	19	123	197	85	49	39
30	29	19	18	15	----	13	19	127	193	82	48	39
31	29	----	18	15	----	14	----	123	----	84	47	----
Min	29	16	18	14	12	13	14	20	139	82	47	36
Max	38	29	23	18	16	15	21	127	380	204	85	46
Mea	33.58	24.77	19.42	15.90	14.90	13.87	17.33	63.13	219.8	132.74	60.87	39.13

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1977 (Oct 1976 to Sept 1977)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	39	27	20	17	14	11	12	20	86	51	31	25
2	38	26	20	17	14	11	12	21	88	50	30	25
3	39	26	20	17	14	11	12	23	87	48	30	25
4	38	26	20	17	14	11	12	25	94	47	30	24
5	38	25	20	17	13	10	12	26	99	47	29	24
6	37	25	20	17	13	11	12	26	111	47	29	24
7	37	25	20	17	13	11	12	27	119	45	29	23
8	37	25	20	17	13	11	12	33	143	43	29	23
9	36	25	20	17	13	11	13	43	134	42	28	23
10	36	24	19	17	13	11	13	47	127	41	28	22
11	36	24	19	17	13	11	13	46	123	40	27	23
12	35	24	19	17	13	11	13	48	115	38	26	23
13	35	24	19	17	13	11	13	49	115	37	27	22
14	35	23	19	17	12	11	13	54	112	36	27	22
15	35	23	19	17	12	11	13	56	106	35	26	23
16	34	23	19	16	12	11	14	53	100	34	26	23
17	34	22	19	16	12	11	14	51	95	34	25	22
18	34	22	19	16	12	11	14	48	92	33	26	22
19	33	22	18	16	12	11	14	46	88	32	25	22
20	33	22	18	16	12	11	14	44	84	31	26	21
21	33	21	18	16	12	11	14	42	79	30	26	21
22	33	21	18	16	12	11	14	40	74	31	26	21
23	31	21	18	16	11	11	14	37	71	31	25	21
24	31	21	18	16	11	11	14	35	67	32	25	21
25	31	21	18	16	11	11	15	35	65	32	25	21
26	30	21	18	16	11	11	16	34	61	33	25	21
27	30	21	18	16	11	11	17	35	59	32	26	20
28	29	21	18	15	11	11	18	35	57	32	25	20
29	28	21	18	15	----	11	19	36	55	31	25	20
30	28	20	18	14	----	11	19	38	52	31	25	20
31	27	----	18	14	----	11	----	75	----	31	25	----
Min	27	20	18	14	11	10	12	20	52	30	25	20
Max	39	27	20	17	14	11	19	75	143	51	31	25
Mea	33.87	23.07	18.87	16.29	12.39	10.97	13.9	39.61	91.93	37.32	26.84	22.23

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1978 (Oct 1977 to Sept 1978)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	20	16	12	10	10	11	13	16	91	329	128	45
2	20	16	13	9.5	10	12	13	16	108	304	118	44
3	19	16	13	10	10	12	12	17	119	294	113	43
4	19	16	12	11	10	12	12	17	128	261	108	43
5	19	15	12	11	10	12	12	16	125	241	103	42
6	19	16	12	11	10	12	12	16	126	244	98	43
7	20	16	12	11	10	12	12	16	142	243	95	43
8	19	16	12	11	10	12	13	15	163	259	93	42
9	19	17	13	11	10	11	13	15	201	250	89	42
10	19	16	13	11	10	11	13	14	228	245	85	42
11	19	15	13	11	10	11	12	15	271	251	81	42
12	19	15	13	11	11	11	13	15	309	255	77	42
13	18	15	12	11	11	11	13	16	394	252	77	41
14	18	15	12	11	11	11	13	18	387	249	80	40
15	18	15	12	11	12	11	13	20	404	254	76	39
16	18	15	12	10	13	11	13	23	424	255	69	40
17	18	15	12	10	12	12	13	25	367	263	66	40
18	17	15	12	10	11	12	13	27	344	247	66	40
19	17	15	12	10	11	12	13	31	358	240	64	40
20	17	15	11	10	12	12	13	32	381	234	61	39
21	17	14	10	10	11	12	13	37	380	228	59	38
22	17	14	11	10	11	12	13	39	421	213	58	38
23	17	14	12	10	11	12	13	42	374	195	56	37
24	17	14	12	10	11	12	13	48	404	180	54	37
25	17	14	12	10	11	12	14	58	441	167	53	37
26	17	14	12	10	11	12	15	63	427	161	51	37
27	17	14	12	10	11	12	16	72	368	156	50	37
28	17	14	12	10	11	12	15	73	376	153	49	36
29	17	14	12	10	----	12	16	73	379	150	48	36
30	16	14	12	10	----	12	16	76	354	148	47	36
31	17	----	12	10	----	13	----	82	----	139	45	----
Min	16	14	10	9.5	10	11	12	14	91	139	45	36
Max	20	17	13	11	13	13	16	82	441	329	128	45
Mea	18	15	12.06	10.37	10.79	11.74	13.27	33.65	299.8	227.74	74.74	40.03

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1979 (Oct 1978 to Sept 1979)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	35	23	19	14	12	12	10	16	206	370	180	65
2	34	23	19	13	11	12	10	16	193	363	173	63
3	34	23	19	13	11	12	10	16	181	366	162	61
4	33	23	18	13	10	11	10	16	189	326	158	59
5	33	23	18	13	10	11	9.8	17	202	278	152	57
6	33	23	18	13	11	11	10	17	204	264	148	56
7	33	22	17	13	11	11	10	18	207	290	146	55
8	32	22	17	12	11	11	10	18	204	254	143	53
9	32	22	19	12	11	12	10	17	210	253	139	52
10	29	21	18	12	11	12	10	17	209	257	134	51
11	27	22	18	13	12	12	10	16	199	246	130	50
12	26	23	18	13	12	12	10	16	199	257	127	50
13	26	22	17	12	12	12	10	17	211	283	124	49
14	26	22	17	12	12	11	10	17	219	281	126	48
15	26	22	17	12	12	11	10	19	230	282	122	47
16	26	22	18	13	12	11	11	21	281	285	121	46
17	26	22	19	13	12	11	11	24	325	299	118	46
18	25	21	20	13	11	11	12	26	338	291	116	45
19	25	21	17	13	12	11	12	29	296	277	114	45
20	25	20	16	11	12	11	13	37	226	289	109	44
21	26	20	16	10	12	11	14	57	201	277	104	45
22	27	20	16	12	12	11	14	63	221	295	96	44
23	26	20	16	11	11	11	15	78	255	270	92	44
24	26	20	15	11	12	11	15	87	266	261	87	44
25	26	20	15	12	11	11	15	101	293	258	85	43
26	25	20	15	12	12	11	14	129	350	251	81	42
27	25	19	15	11	12	11	15	167	362	236	76	42
28	25	19	15	11	12	11	16	212	366	228	73	41
29	25	20	15	12	----	11	15	211	373	219	71	41
30	25	19	15	11	----	11	16	211	352	206	70	40
31	24	----	15	10	----	10	----	221	----	193	68	----
Min	24	19	15	10	10	10	9.8	16	181	193	68	40
Max	35	23	20	14	12	12	16	221	373	370	180	65
Mea	27.94	21.3	17	12.13	11.5	11.23	11.93	62.16	252.27	274.35	117.58	48.93

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
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Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1980 (Oct 1979 to Sept 1980)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	40	26	20	17	16	17	15	25	130	249	125	65
2	39	26	20	17	16	17	15	26	133	268	121	63
3	39	26	20	17	16	17	16	26	144	279	118	61
4	38	25	20	17	16	16	16	26	165	305	116	59
5	37	25	20	17	16	16	17	28	194	243	111	60
6	37	25	20	17	16	16	16	29	216	186	105	59
7	36	25	19	17	15	16	15	32	227	220	106	57
8	36	25	19	17	15	16	15	32	230	264	104	58
9	36	25	19	17	14	16	16	34	277	252	100	58
10	36	25	18	16	15	16	16	34	295	246	99	62
11	35	25	18	13	16	16	15	34	335	243	96	66
12	35	24	17	16	16	16	16	33	387	240	92	63
13	35	24	16	17	17	16	16	32	437	230	91	59
14	33	24	18	19	18	16	17	33	445	223	92	57
15	33	23	18	19	18	17	17	33	405	214	102	56
16	33	23	18	18	17	16	17	33	388	210	98	55
17	33	22	18	16	17	15	17	34	374	203	91	54
18	33	22	17	16	16	16	17	33	379	198	85	53
19	32	22	17	15	16	16	18	34	416	201	82	51
20	33	22	18	15	16	17	19	36	407	188	82	51
21	31	21	18	15	16	18	20	40	439	174	78	50
22	31	20	18	14	16	17	21	50	482	174	75	49
23	30	20	17	14	16	16	21	88	409	169	73	49
24	30	21	16	16	16	16	20	106	374	161	74	50
25	30	22	18	17	15	16	21	93	396	159	75	49
26	29	22	18	17	16	16	21	88	388	147	78	48
27	29	21	18	17	17	16	22	91	451	144	72	48
28	28	20	17	17	18	16	22	106	429	139	69	48
29	28	17	16	16	18	15	24	123	285	141	67	47
30	27	19	16	16	----	15	25	127	262	136	66	47
31	27	----	17	15	----	15	----	130	----	129	66	----
Min	27	17	16	13	14	15	15	25	130	129	66	47
Max	40	26	20	19	18	18	25	130	482	305	125	66
Mea	33.19	22.9	18.03	16.35	16.21	16.13	18.1	53.84	329.97	204.35	90.61	55.07

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
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Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1981 (Oct 1980 to Sept 1981)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	47	32	24	21	15	13	13	41	111	108	55	40
2	47	32	24	21	15	13	13	48	126	119	54	39
3	46	31	24	21	15	13	13	61	131	100	53	39
4	47	31	24	21	15	13	13	51	146	97	52	39
5	47	31	24	21	15	13	13	48	226	91	51	40
6	46	30	24	20	15	13	13	48	205	88	50	40
7	46	30	24	20	14	13	13	53	215	87	49	39
8	44	30	24	20	14	13	13	58	261	88	49	39
9	43	29	24	20	14	13	13	58	282	86	49	39
10	43	29	24	20	14	13	14	56	348	87	48	39
11	42	29	23	20	14	13	14	56	318	84	46	39
12	42	27	23	19	14	13	14	54	234	83	46	39
13	42	28	23	19	13	13	14	51	209	81	47	41
14	41	28	23	19	13	13	14	49	199	80	46	43
15	40	27	22	18	14	13	15	48	184	80	46	43
16	40	27	22	18	13	13	15	47	156	79	46	43
17	39	27	22	17	13	13	15	46	143	83	45	40
18	38	26	22	17	13	13	16	44	135	80	44	39
19	38	25	22	17	13	13	17	42	129	76	43	39
20	37	25	22	17	13	13	17	42	136	74	42	38
21	36	25	22	17	13	13	17	42	139	73	42	39
22	36	25	22	17	13	13	18	43	140	71	41	40
23	36	25	23	16	13	13	19	41	140	69	41	40
24	35	25	22	15	13	13	19	41	142	65	41	39
25	35	25	22	15	13	13	20	41	143	65	40	39
26	34	25	22	15	13	13	21	41	144	69	40	38
27	35	26	21	15	13	13	24	46	149	71	40	37
28	34	25	21	15	13	13	26	67	144	66	40	36
29	33	25	21	15	----	12	29	75	131	62	40	36
30	32	25	21	15	----	12	34	88	116	59	40	36
31	32	----	21	15	----	13	----	114	----	57	40	----
Min	32	25	21	15	13	12	13	41	111	57	40	36
Max	47	32	24	21	15	13	34	114	348	119	55	43
Mea	39.77	27.5	22.65	17.94	13.68	12.94	16.97	52.90	176.07	79.94	45.35	39.23

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1982 (Oct 1981 to Sept 1982)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	36	29	21	11	18	19	12	25	124	351	206	76
2	36	29	20	11	18	18	12	28	134	260	206	74
3	35	29	20	11	18	17	12	31	148	291	192	73
4	35	28	19	10	18	17	12	34	148	317	178	71
5	35	27	19	10	18	17	12	38	162	304	170	73
6	35	27	19	11	18	15	12	41	162	260	162	71
7	35	27	19	11	18	15	12	42	162	243	154	67
8	35	27	19	11	18	15	12	38	170	232	151	64
9	35	26	19	11	18	17	12	38	174	248	144	64
10	34	26	20	11	18	17	14	41	174	238	140	62
11	34	25	21	11	18	17	14	41	188	226	137	62
12	34	25	22	11	18	16	14	42	201	232	137	67
13	34	24	21	11	18	15	14	42	206	238	130	69
14	34	24	20	12	16	14	14	40	210	238	130	65
15	34	24	19	12	15	14	15	40	216	248	124	62
16	34	24	23	11	16	14	15	40	210	248	121	62
17	34	23	22	12	17	14	15	40	216	254	115	62
18	32	23	22	13	18	13	16	41	238	248	112	64
19	32	23	20	14	20	13	16	41	238	243	112	62
20	32	23	15	14	20	12	16	41	238	238	106	64
21	32	23	14	14	20	12	18	44	272	238	103	65
22	32	22	14	15	20	13	16	46	284	238	100	64
23	31	22	14	16	20	13	16	50	260	238	96	65
24	30	22	14	17	20	14	17	62	291	238	93	65
25	30	22	13	18	20	13	19	64	304	232	93	67
26	30	22	14	17	20	13	20	60	317	226	93	69
27	30	22	13	18	20	13	20	67	330	226	89	73
28	30	21	12	18	20	12	20	78	291	221	87	73
29	30	21	11	18	----	12	22	98	304	221	82	71
30	30	21	11	18	----	12	23	109	324	221	80	71
31	29	----	11	18	----	12	----	112	----	210	78	----
Min	29	21	11	10	15	12	12	25	124	210	78	62
Max	36	29	23	18	20	19	23	112	330	351	206	76
Mea	32.87	24.37	17.45	13.42	18.43	14.45	15.4	50.13	223.2	247.29	126.48	67.23

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1983 (Oct 1982 to Sept 1983)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	73	44	30	19	21	19	19	21	124	372	210	94
2	71	43	29	20	21	19	19	20	138	365	210	89
3	69	41	29	21	22	19	19	20	143	358	207	87
4	69	40	29	23	19	19	19	21	162	337	220	88
5	67	39	28	22	18	18	19	21	166	344	240	83
6	67	39	28	22	20	18	20	21	157	358	230	81
7	67	38	28	22	21	18	20	21	162	365	232	79
8	65	38	28	22	21	18	19	21	178	379	232	77
9	65	38	28	23	20	19	19	22	194	400	216	74
10	64	37	27	22	21	19	19	23	192	432	205	72
11	62	37	27	20	22	19	19	23	195	424	194	70
12	60	35	27	21	21	19	19	22	207	379	191	66
13	62	34	27	22	20	18	19	23	201	344	183	65
14	60	35	26	22	20	19	19	23	206	298	175	64
15	58	34	26	22	20	19	19	23	206	284	166	63
16	57	33	26	22	19	19	19	23	212	291	156	62
17	57	32	26	22	19	19	20	23	226	291	149	61
18	57	31	26	22	19	19	20	23	230	284	147	60
19	56	32	26	22	19	19	20	23	272	284	142	60
20	55	31	25	22	19	19	20	23	291	284	135	59
21	53	31	25	22	19	19	20	23	321	272	130	58
22	51	31	24	22	19	19	20	25	432	272	127	57
23	51	31	25	22	19	19	20	28	480	272	122	57
24	50	30	25	22	19	18	21	30	530	243	118	56
25	49	30	24	22	19	18	21	35	570	243	115	56
26	48	29	25	22	19	18	21	44	540	243	109	55
27	48	29	23	22	19	18	20	62	470	216	107	54
28	47	29	20	22	19	18	20	79	450	205	105	52
29	46	30	18	22	----	18	21	91	448	201	104	52
30	44	29	16	22	----	17	21	106	424	206	99	52
31	44	----	18	21	----	18	----	111	----	201	97	----
Min	44	29	16	19	18	17	19	20	124	201	97	52
Max	73	44	30	23	22	19	21	111	570	432	240	94
Mea	57.81	34.33	25.45	21.74	19.79	18.55	19.7	34.65	284.23	304.74	163.65	66.77

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1984 (Oct 1983 to Sept 1984)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	52	39	31	26	26	23	26	50	419	460	238	123
2	52	39	31	25	26	25	24	52	440	440	221	112
3	52	38	31	26	26	22	24	52	416	420	178	106
4	52	38	31	26	26	23	24	54	379	395	165	101
5	51	38	31	26	26	22	26	58	330	375	162	98
6	51	37	30	25	26	21	29	60	297	365	162	95
7	50	37	30	25	26	22	29	58	259	360	158	97
8	50	38	30	25	26	23	33	56	216	375	154	94
9	48	37	29	25	26	22	38	62	203	400	154	90
10	48	36	30	24	25	22	32	80	192	470	151	90
11	48	36	29	25	25	21	37	96	194	430	144	89
12	48	36	29	25	25	20	31	110	200	385	144	94
13	48	36	29	24	25	20	35	130	218	340	148	89
14	49	36	29	25	26	21	33	150	263	450	140	88
15	48	35	29	25	25	22	37	185	289	420	148	87
16	47	35	28	21	24	22	45	160	304	385	144	87
17	46	34	29	19	26	20	48	140	314	360	137	87
18	46	35	28	17	26	22	52	120	348	340	134	84
19	45	34	28	19	23	21	54	103	358	320	134	81
20	45	34	29	20	23	21	54	117	360	310	130	79
21	44	34	28	21	24	22	52	153	387	300	130	83
22	43	33	28	22	24	23	50	179	435	295	131	85
23	43	33	28	21	23	23	52	222	454	290	128	83
24	43	32	27	22	24	23	56	287	473	324	130	84
25	42	33	27	24	25	25	60	337	520	310	128	82
26	41	32	27	24	22	25	56	365	432	291	126	80
27	41	32	27	24	22	25	54	374	440	278	120	81
28	41	32	27	25	22	24	50	387	450	278	119	80
29	40	32	24	25	23	24	52	399	480	265	114	79
30	40	31	26	23	----	25	50	409	520	248	109	78
31	40	----	27	25	----	25	----	399	----	248	111	----
Min	40	31	24	17	22	20	24	50	192	248	109	78
Max	52	39	31	26	26	25	60	409	520	470	238	123
Mea	46.26	35.07	28.61	23.52	24.69	22.55	41.43	174.32	353	352.48	144.90	89.53

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1985 (Oct 1984 to Sept 1985)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	79	52	37	35	28	25	23	64	210	365	164	72
2	79	52	38	33	26	26	23	76	220	346	163	74
3	79	51	37	33	28	25	22	94	230	349	158	74
4	80	49	36	33	28	24	22	140	227	341	152	74
5	80	49	37	34	28	24	22	140	226	330	150	72
6	77	48	38	34	28	24	22	130	226	316	147	70
7	76	48	39	34	28	24	21	140	225	308	143	69
8	74	47	37	33	28	25	22	150	291	302	140	68
9	73	48	37	32	27	25	22	150	413	303	140	66
10	72	46	36	32	27	24	22	140	461	300	137	65
11	71	45	37	32	27	24	23	140	380	306	135	66
12	71	45	38	32	27	24	24	130	377	292	132	72
13	69	45	38	31	28	25	26	120	391	281	120	66
14	69	45	37	30	28	25	31	110	396	284	115	64
15	69	45	36	30	28	25	37	110	324	297	110	66
16	68	44	36	30	28	25	44	120	412	291	106	67
17	66	44	37	30	27	24	46	120	435	278	101	64
18	64	44	36	30	27	24	48	130	470	266	98	61
19	64	43	36	30	27	24	52	130	473	260	95	63
20	64	43	36	31	27	24	52	120	488	250	92	62
21	63	42	35	31	28	24	50	130	458	240	90	62
22	61	42	34	30	27	24	50	130	467	230	88	63
23	60	41	34	31	26	25	48	140	475	220	86	61
24	60	41	35	31	25	25	46	160	459	210	83	60
25	59	41	35	30	25	24	45	190	439	210	80	60
26	56	40	34	30	25	23	44	220	432	205	79	59
27	56	40	33	30	25	22	46	240	394	196	77	58
28	56	39	34	30	25	22	48	280	369	188	75	64
29	55	39	34	29	----	22	52	290	388	180	75	63
30	54	37	35	29	----	22	56	270	376	176	74	60
31	52	----	34	29	----	23	----	230	----	169	73	----
Min	52	37	33	29	25	22	21	64	210	169	73	58
Max	80	52	39	35	28	26	56	290	488	365	164	74
Mea	66.97	44.5	36	31.26	27	24.06	36.3	152.71	371.07	267.39	112.19	65.5

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1986 (Oct 1985 to Sept 1986)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	59	43	34	27	22	19	23	38	196	351	142	92
2	59	43	34	25	22	19	24	43	197	323	137	89
3	58	42	33	25	22	19	23	49	202	449	135	88
4	56	42	33	25	22	19	23	57	212	455	131	84
5	55	42	33	26	21	18	23	65	237	445	130	81
6	55	42	32	25	21	18	22	67	219	519	132	80
7	60	41	31	25	22	19	23	65	264	459	130	80
8	59	42	31	25	21	20	24	61	293	368	129	82
9	58	42	30	25	21	20	24	59	338	358	126	83
10	56	41	30	25	21	20	24	59	374	304	124	91
11	55	40	29	25	21	20	24	59	346	281	123	84
12	54	40	29	24	21	19	24	61	372	274	121	81
13	54	40	30	24	21	19	25	63	384	273	119	80
14	53	40	31	23	21	19	24	66	372	264	119	79
15	52	39	30	23	20	19	24	67	349	256	116	78
16	51	38	30	23	20	20	25	65	362	264	114	77
17	51	38	31	22	20	21	25	65	362	255	110	76
18	49	38	29	22	20	20	24	64	428	242	108	76
19	49	38	29	22	20	20	24	64	492	232	109	76
20	48	37	29	22	21	20	25	70	502	224	110	76
21	48	37	28	22	19	20	27	83	514	223	109	76
22	47	37	27	23	19	20	29	97	453	217	112	77
23	46	36	27	23	19	20	31	101	435	209	105	79
24	46	36	27	23	20	20	33	113	414	202	109	78
25	45	36	28	22	20	20	35	119	344	196	114	78
26	44	35	28	23	20	20	35	141	366	190	105	76
27	44	35	27	22	19	21	34	148	372	179	101	74
28	44	34	27	23	18	21	33	161	378	167	98	73
29	44	35	27	22	----	21	34	167	344	154	96	73
30	44	34	26	21	----	21	35	158	331	147	95	72
31	44	----	26	22	----	22	----	181	----	148	93	----
Min	44	34	26	21	18	18	22	38	196	147	93	72
Max	60	43	34	27	22	22	35	181	514	519	142	92
Mea	51.19	38.77	29.55	23.52	20.5	19.81	26.77	86.32	348.4	278.32	116.19	79.63

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1987 (Oct 1986 to Sept 1987)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	72	52	38	23	16	18	14	53	93	163	105	63
2	72	51	37	23	17	17	14	54	108	158	111	62
3	72	50	36	23	18	17	14	50	124	152	104	61
4	70	49	36	23	16	17	15	47	135	139	101	60
5	69	48	36	25	16	18	15	52	147	132	99	58
6	68	48	36	25	16	19	15	57	167	132	96	57
7	67	48	36	25	18	21	15	61	176	130	96	57
8	66	47	35	25	17	21	15	71	197	130	97	56
9	65	46	35	25	16	20	15	72	210	128	92	54
10	65	45	27	24	15	18	15	78	199	127	89	53
11	67	45	29	24	16	17	15	82	192	121	86	52
12	65	44	32	24	16	16	15	89	202	120	84	51
13	64	44	30	24	16	16	15	95	204	113	82	50
14	62	44	30	24	16	15	15	101	217	112	80	50
15	62	44	30	24	17	15	15	121	217	107	78	50
16	60	43	31	24	16	15	17	128	194	106	75	49
17	60	42	31	23	16	15	18	139	205	107	73	48
18	59	42	28	23	16	15	19	139	211	104	71	47
19	59	43	27	22	15	15	19	139	207	100	69	46
20	59	42	27	22	17	15	20	137	197	100	67	46
21	59	41	24	21	18	15	20	130	182	100	66	45
22	58	41	24	21	17	15	21	126	166	102	68	45
23	56	41	24	20	17	15	22	126	164	104	69	44
24	56	40	24	20	17	15	24	118	163	102	74	43
25	55	40	25	18	17	14	26	109	159	105	73	43
26	54	39	25	18	14	14	30	105	159	107	69	42
27	53	39	25	17	17	14	33	98	158	110	66	41
28	52	39	24	17	16	14	38	92	156	111	65	41
29	52	38	27	17	----	13	43	88	155	111	65	41
30	51	38	25	20	----	14	48	87	158	106	64	40
31	51	----	26	17	----	14	----	86	----	106	64	----
Min	51	38	24	17	14	13	14	47	93	100	64	40
Max	72	52	38	25	18	21	48	139	217	163	111	63
Mea	61.29	43.77	29.68	21.97	16.39	16.03	20.67	94.52	174.07	117.58	80.58	49.83

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1988 (Oct 1987 to Sept 1988)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	39	32	24	23	22	31	18	19	118	180	67	48
2	39	32	24	19	22	31	19	19	125	166	65	47
3	38	32	23	21	22	30	20	19	153	158	63	47
4	38	32	23	24	19	29	21	20	199	149	62	45
5	38	31	23	24	20	27	22	21	224	147	62	45
6	37	32	23	26	22	28	22	21	241	143	63	44
7	37	31	23	26	23	30	23	22	246	129	63	44
8	36	31	23	26	25	27	24	22	252	122	62	44
9	35	30	23	25	23	29	19	21	256	112	60	43
10	35	29	22	25	25	30	14	21	247	104	59	44
11	35	29	22	25	24	29	15	21	252	101	57	45
12	35	29	22	23	24	26	15	22	236	97	56	49
13	36	29	22	19	24	27	15	24	211	92	54	48
14	36	29	21	23	24	25	16	28	191	88	53	47
15	35	29	19	23	24	29	17	40	189	86	54	47
16	35	28	20	25	26	27	17	57	188	85	54	46
17	35	28	26	24	24	26	18	68	187	83	53	45
18	35	28	26	25	23	25	18	75	186	80	53	44
19	34	27	27	23	26	26	18	71	194	79	51	43
20	34	27	25	17	27	27	18	68	192	76	50	43
21	34	26	22	21	26	28	19	74	200	73	51	42
22	34	26	25	20	28	29	18	80	201	71	51	42
23	33	26	26	21	28	29	18	82	201	71	52	42
24	33	26	25	21	28	30	18	81	210	69	51	43
25	34	25	22	18	27	29	18	91	204	68	50	42
26	33	25	22	21	28	30	17	98	197	67	50	42
27	33	25	24	21	30	32	17	111	191	66	51	41
28	32	25	24	22	31	34	18	111	193	66	50	41
29	32	25	22	22	31	36	17	137	194	70	50	40
30	33	24	24	23	----	26	18	143	192	77	49	40
31	33	----	24	23	----	22	----	117	----	71	49	----
Min	32	24	19	17	19	22	14	19	118	66	49	40
Max	39	32	27	26	31	36	24	143	256	180	67	49
Mea	35.03	28.27	23.26	22.55	25.03	28.52	18.23	58.19	202.33	98.26	55.32	44.1

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1989 (Oct 1988 to Sept 1989)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	40	29	22	23	23	17	16	33	182	218	90	45
2	39	29	22	22	23	16	15	33	190	215	90	45
3	39	29	21	22	23	16	16	33	182	217	90	44
4	39	29	22	22	22	16	13	33	160	215	88	43
5	38	29	21	23	20	15	13	33	172	215	86	43
6	38	29	21	23	20	14	13	34	190	210	83	42
7	38	28	22	21	20	15	14	36	186	198	81	42
8	37	28	20	21	20	15	15	40	205	193	80	41
9	37	28	20	21	23	16	15	46	193	186	79	41
10	36	28	21	23	24	17	15	59	194	184	78	41
11	36	28	21	23	24	19	15	65	197	179	79	40
12	35	28	21	21	23	19	15	64	196	179	78	39
13	35	28	22	19	23	19	16	60	193	169	76	39
14	35	27	22	21	22	18	16	59	179	161	71	38
15	34	27	22	23	22	15	17	61	194	145	68	38
16	34	27	20	22	21	15	18	64	211	132	67	37
17	34	27	19	22	23	16	18	65	203	124	66	37
18	34	27	21	22	23	14	19	66	201	114	64	36
19	33	26	23	22	23	15	20	69	259	108	63	36
20	33	26	23	22	23	15	22	78	264	103	62	36
21	32	26	22	22	22	13	24	90	271	98	61	36
22	31	25	22	22	22	12	27	93	247	94	59	36
23	31	25	23	23	23	13	32	111	231	104	57	35
24	31	25	23	23	25	14	37	120	231	128	55	35
25	30	25	23	23	26	15	39	129	225	108	53	34
26	30	24	22	21	26	17	40	113	221	106	51	34
27	30	24	21	21	24	17	40	130	218	100	50	33
28	30	24	20	23	17	16	38	161	211	93	49	33
29	30	25	21	23	----	18	36	173	215	106	47	33
30	29	25	22	22	----	17	34	199	215	105	46	32
31	29	----	23	23	----	14	----	186	----	92	46	----
Min	29	24	19	19	17	12	13	33	160	92	46	32
Max	40	29	23	23	26	19	40	199	271	218	90	45
Mea	34.10	26.83	21.55	22.06	22.5	15.74	22.27	81.81	207.87	148.35	68.16	38.13

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1990 (Oct 1989 to Sept 1990)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	32	25	16	13	16	17	14	18	96	211	66	38
2	32	25	17	16	15	17	14	18	88	204	65	37
3	32	24	17	16	12	17	14	18	88	196	63	37
4	33	24	17	12	13	17	14	18	129	184	61	36
5	33	24	18	12	15	16	14	18	168	184	60	37
6	32	24	17	13	13	16	14	18	192	181	58	36
7	32	24	16	13	16	15	14	19	221	169	56	35
8	32	24	14	15	15	14	14	20	273	173	54	36
9	32	24	16	15	12	13	14	21	287	182	53	34
10	31	24	16	14	16	13	14	21	344	165	53	34
11	30	23	10	13	15	13	14	22	375	155	52	34
12	30	23	10	13	14	13	14	22	353	147	51	33
13	30	23	16	13	14	13	14	22	326	135	50	33
14	30	23	17	14	14	13	14	22	328	121	49	33
15	30	23	17	13	14	13	15	23	301	111	49	33
16	31	23	15	13	12	13	15	24	273	106	49	33
17	29	23	12	13	14	13	16	23	267	101	49	33
18	29	23	16	11	14	13	16	24	266	99	48	33
19	29	22	16	15	13	13	17	23	267	93	47	33
20	29	22	15	14	16	13	17	23	260	89	46	33
21	29	22	15	12	15	13	17	24	252	87	45	34
22	28	22	16	12	14	13	18	25	246	84	44	33
23	28	22	15	14	14	13	18	28	242	82	43	33
24	28	22	15	15	15	13	18	37	242	80	43	33
25	28	22	13	13	17	13	18	44	239	80	42	32
26	28	22	13	15	17	14	18	50	242	78	42	32
27	28	22	15	13	17	14	18	54	239	74	41	32
28	27	21	15	11	17	14	18	67	232	71	41	31
29	27	17	17	15	----	14	19	80	221	68	40	30
30	27	14	15	15	----	14	18	78	217	66	39	30
31	25	----	13	16	----	14	----	83	----	66	38	----
Min	25	14	10	11	12	13	14	18	88	66	38	30
Max	33	25	18	16	17	17	19	83	375	211	66	38
Mea	29.71	22.53	15.16	13.61	14.61	14	15.73	31.84	242.47	123.94	49.58	33.7

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1991 (Oct 1990 to Sept 1991)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	31	27	20	15	15	15	16	15	179	213	83	46
2	32	27	20	16	14	15	18	16	175	215	82	46
3	32	27	11	16	14	15	16	15	165	212	87	45
4	31	26	15	17	15	15	16	15	142	203	83	45
5	31	26	20	18	14	21	33	15	164	197	79	44
6	31	24	20	17	15	16	35	16	181	194	78	43
7	32	24	17	15	16	13	36	17	180	195	76	44
8	32	23	18	17	17	11	34	18	206	200	73	48
9	31	23	19	15	16	10	29	20	222	197	72	53
10	31	23	20	16	15	12	26	25	237	195	70	52
11	31	23	21	16	14	14	24	30	257	191	69	52
12	31	23	23	15	15	13	19	35	272	188	71	54
13	30	23	23	17	16	14	16	30	274	184	70	55
14	30	23	21	17	16	13	16	35	312	175	69	55
15	30	22	13	16	15	13	16	40	342	163	67	56
16	29	22	18	16	15	12	15	30	327	155	65	56
17	30	22	23	14	17	11	16	25	320	152	64	57
18	29	22	19	13	17	12	20	30	336	145	62	57
19	30	22	18	16	13	13	21	45	294	136	62	56
20	30	22	16	16	16	15	22	55	287	131	60	55
21	29	22	14	13	15	14	23	75	313	123	58	54
22	29	21	13	12	15	13	23	85	324	122	57	52
23	28	21	12	13	16	13	23	90	313	116	55	51
24	28	21	11	13	16	14	19	93	294	114	54	49
25	28	21	13	15	13	15	20	96	267	111	52	48
26	28	21	16	14	14	15	20	108	238	111	51	47
27	27	21	16	16	14	15	16	137	214	107	51	46
28	27	21	16	14	14	14	14	167	220	100	50	45
29	27	16	16	16	----	14	14	160	228	93	48	44
30	27	18	17	13	----	14	14	178	224	89	47	43
31	27	----	15	13	----	14	----	180	----	86	47	----
Min	27	16	11	12	13	10	14	15	142	86	47	43
Max	32	27	23	18	17	21	36	180	342	215	87	57
Mea	29.65	22.57	17.23	15.16	15.07	13.81	21	61.16	250.23	155.26	64.90	49.93

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1992 (Oct 1991 to Sept 1992)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	41	27	22	18	16	16	15	29	125	195	86	62
2	40	28	21	18	16	16	15	33	112	185	83	62
3	40	32	20	20	16	14	15	35	109	168	79	61
4	39	27	22	17	16	14	15	38	114	167	77	58
5	38	27	23	17	18	13	15	41	127	168	74	57
6	38	26	23	17	17	13	14	46	125	169	77	54
7	37	26	22	17	16	13	14	50	123	175	79	51
8	36	26	22	17	16	13	14	53	114	205	79	50
9	35	26	21	17	16	14	15	66	116	195	73	49
10	35	26	21	17	16	13	17	75	126	182	77	48
11	34	26	22	17	16	13	17	75	136	181	95	47
12	34	25	21	17	16	14	18	78	155	182	84	46
13	34	25	22	17	16	14	19	81	174	176	77	45
14	33	25	16	17	16	14	21	87	179	169	73	44
15	33	25	19	17	17	14	21	92	171	161	70	45
16	32	24	20	17	16	14	21	94	170	158	69	46
17	32	24	22	18	17	14	20	101	162	147	69	47
18	31	25	22	17	17	14	23	115	176	134	67	47
19	31	24	21	17	15	14	20	136	191	123	65	47
20	30	24	20	18	16	14	20	173	197	121	63	48
21	30	24	20	16	16	14	20	195	198	113	61	49
22	29	23	20	16	16	14	21	193	201	107	63	48
23	29	24	19	16	17	14	22	197	203	103	68	48
24	30	23	19	16	17	14	21	201	206	106	76	47
25	30	23	19	16	17	14	22	196	212	115	77	47
26	29	23	19	16	17	14	22	197	217	105	77	46
27	28	23	19	16	17	14	22	197	209	96	71	46
28	29	23	19	16	17	14	22	183	197	94	68	45
29	28	23	19	16	17	15	22	167	206	91	65	45
30	28	22	19	16	----	15	25	155	203	90	63	45
31	27	----	19	16	----	15	----	143	----	88	63	----
Min	27	22	16	16	15	13	14	29	109	88	61	44
Max	41	32	23	20	18	16	25	201	217	205	95	62
Mea	32.90	24.97	20.42	16.87	16.41	14.03	18.93	113.61	165.13	144.16	73.16	49.33

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
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Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1993 (Oct 1992 to Sept 1993)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	45	32	25	24	25	26	29	32	269	450	221	90
2	44	32	25	24	26	27	30	30	281	430	219	90
3	43	31	26	23	25	28	29	28	287	410	213	87
4	43	31	26	22	24	27	28	30	272	380	210	84
5	42	30	25	22	24	26	28	32	262	340	212	83
6	42	30	25	23	25	26	28	32	262	300	204	82
7	41	30	24	25	26	25	28	31	257	320	198	83
8	41	29	23	25	26	25	27	30	243	350	201	86
9	40	30	24	25	26	25	27	29	235	380	199	83
10	40	30	25	25	26	24	27	28	224	400	192	80
11	38	29	25	25	26	25	27	27	250	420	186	78
12	38	29	24	25	26	25	28	27	280	440	181	77
13	38	28	23	24	25	25	27	30	320	400	174	84
14	38	28	22	24	24	25	27	36	370	350	169	80
15	37	28	22	26	25	26	26	44	440	320	160	76
16	37	28	22	26	26	26	26	55	480	310	151	75
17	36	27	23	25	26	25	27	70	500	290	142	73
18	36	27	25	26	26	25	27	79	440	270	135	71
19	36	27	24	25	27	25	27	85	390	253	130	71
20	35	27	20	24	28	25	28	96	430	249	125	69
21	35	27	23	24	26	25	28	122	460	262	126	68
22	34	27	24	23	26	25	27	159	490	252	136	67
23	34	27	24	23	27	25	28	169	480	248	122	65
24	34	27	24	22	28	25	29	181	480	244	111	64
25	34	26	24	23	28	26	30	193	450	234	107	64
26	33	25	25	24	27	28	29	227	440	234	119	62
27	33	23	26	24	26	29	29	233	430	235	119	61
28	33	24	25	24	26	29	30	240	470	227	103	59
29	33	25	24	23	----	29	32	241	480	224	97	59
30	32	26	24	23	----	28	33	254	480	223	93	57
31	33	----	25	24	----	28	----	274	----	222	91	----
Min	32	23	20	22	24	24	26	27	224	222	91	57
Max	45	32	26	26	28	29	33	274	500	450	221	90
Mea	37.35	28	24.06	24.03	25.93	26.06	28.2	101.42	371.73	311.84	156.32	74.27

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1994 (Oct 1993 to Sept 1994)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	57	45	36	28	19	19	17	36	157	203	82	44
2	56	44	34	29	20	19	18	37	137	197	83	44
3	56	44	33	28	20	19	17	37	169	186	81	44
4	55	43	32	27	21	18	18	38	195	182	79	45
5	54	43	33	27	21	18	18	40	246	178	77	44
6	53	43	32	26	22	18	18	42	295	175	75	43
7	53	42	32	24	22	17	18	44	292	168	72	43
8	53	42	32	23	21	17	19	46	288	157	69	41
9	53	42	31	25	21	17	19	49	273	151	70	41
10	53	42	30	24	22	16	19	52	297	146	70	39
11	52	43	31	23	22	16	19	52	301	140	67	39
12	53	43	32	22	21	17	19	53	306	134	65	38
13	51	41	31	23	20	17	19	56	279	127	66	39
14	51	40	28	25	19	17	19	58	284	121	65	39
15	50	39	29	26	19	18	20	66	292	116	62	39
16	51	38	29	25	20	17	20	69	286	113	60	39
17	50	38	27	24	21	17	21	81	292	109	56	39
18	49	39	27	24	21	17	22	95	312	106	55	37
19	49	38	28	23	21	17	23	98	311	102	55	37
20	48	36	28	23	21	16	24	117	313	99	54	37
21	47	37	26	23	20	16	26	125	304	97	52	36
22	47	38	26	23	20	16	29	129	310	93	50	36
23	47	39	27	23	19	16	32	136	297	90	49	36
24	46	37	26	23	19	15	34	141	276	89	48	35
25	46	35	26	22	18	15	36	151	265	88	47	35
26	46	33	27	21	18	16	36	165	255	88	46	35
27	46	32	28	21	19	16	36	177	244	87	46	34
28	46	33	29	20	19	17	36	192	231	85	46	34
29	46	35	28	19	----	17	36	178	212	83	46	34
30	45	36	26	18	----	17	36	157	195	83	45	35
31	45	----	27	18	----	17	----	156	----	82	44	----
Min	45	32	26	18	18	15	17	36	137	82	44	34
Max	57	45	36	29	22	19	36	192	313	203	83	45
Mea	50.13	39.33	29.39	23.55	20.21	16.94	24.13	92.68	263.8	125	60.71	38.7

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1995 (Oct 1994 to Sept 1995)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
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20												
21												
22												
23												
24												
25												
26												
27												
28												
29					----							
30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1996 (Oct 1995 to Sept 1996)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
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21												
22												
23												
24												
25												
26												
27												
28												
29												
30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1997 (Oct 1996 to Sept 1997)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
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24												
25												
26												
27												
28												
29					----							
30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
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Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1998 (Oct 1997 to Sept 1998)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
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30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 1999 (Oct 1998 to Sept 1999)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
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30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 2000 (Oct 1999 to Sept 2000)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
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5												
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31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 2001 (Oct 2000 to Sept 2001)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
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30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 2002 (Oct 2001 to Sept 2002)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
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31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 2003 (Oct 2002 to Sept 2003)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
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5												
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30					----							
31		----			----		----		----			----
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Description: MAROON CREEK ABOVE ASPEN, CO.

Time Series Identifier:	**09075700.USGS.Streamflow.Daily**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Daily**
Located in HUC:	**14010004**	**Data Units:**	**CFS**
Latitude, Longitude:	**39.123600, -106.905319**		
UTM X, UTM Y (zone 13 NAD 83):	**335296.2 ,4332221.1**		
Elevation (feet):	**8720**		

Time Series Creation History:

Available Data: **1969 To 2003**

Selected Time Series From: **1969-1 To 2003-12**

Water Year 2004 (Oct 2003 to Sept 2004)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
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30												
31		----										
Min	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Max	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mea	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current calendar year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing

Structure Summary Report

Structure Name: HERRICK DITCH **Water District:** 38 **Structure ID Number:** 749

Source: MAROON CREEK

Location:	Q10	Q40	Q160	Section	Twnshp	Range	PM
		NW	NW	33	10S	85W	S

Distance From Section Lines: From N/S Line: From E/W Line:

UTM Coordinates (NAD 83): Northing (UTM y): 4334331 Easting (UTM x): 336256.8 Spotted from PLSS distances from section lines

Latitude/Longitude (decimal degrees): 39.142777 -106.894722

Water Rights Summary:						
Total Decreed Rate(s) (CFS):	Absolute:	64.8600	Conditional:	0.0000	AP/EX:	0.0000
Total Decreed Volume(s) (AF):	Absolute:	0.0000	Conditional:	0.0000	AP/EX:	0.0000

Water Rights -- Transactions

Case Number	Adjudication Date	Appropriation Date	Administration Number	Order Number	Priority Number	Decreed Amount	Adjudication Type	Uses	Action Comment
02CW0249	1940-02-05	1890-10-01	31648.14884	0	440.5	0.0780 C	S,TF	1	
02CW0249	1940-02-05	1890-10-01	31648.14884	0	440.5	0.0780 C	S,TT	A	BYPASS FOR T LAZY 7 AUG PLAN
CA3330	1940-02-05	1890-10-01	31648.14884	0	440.5	9.3000 C	S	1	
CA4613	1958-06-20	1951-08-01	37552.37102	2	683	51.5600 C	S	1	
89CW0282	1989-12-31	1989-12-22	51125.00000	0		4.0000 C	S,C	13568W	FOR STORAGE IN MAROON CREEK DEVEL RES 1-4
99CW0284	1989-12-31	1989-12-22	51125.00000	0		4.0000 C	S,CA	156W	STORE IN MAROON CR DEVEL RES 1-4, COM & DOM

Water Rights -- Net Amounts

Adjudication Date	Appropriation Date	Administration Number	Order Number	Priority/Case Number	Rate (CFS)			Volume (Acre-Feet)		
					Absolute	Conditional	AP/EX	Absolute	Conditional	AP/EX
1940-02-05	1890-10-01	31648.14884	0	440.5	9.3000	0	0	0	0	0
1958-06-20	1951-08-01	37552.37102	2	683	51.5600	0	0	0	0	0
1989-12-31	1989-12-22	51125.00000	0	89CW0282	4.0000	0	0	0	0	0

Irrigated Acres Summary -- Totals From Various Sources

GIS Total (Acres):	94.971	Reported:	1993
Diversion Comments Total (Acres):	16	Reported:	2007
Structure Total (Acres):		Reported:	

Irrigated Acres From GIS Data

Year	Land Use	Acres Flood	Acres Furrow	Acres Sprinkler	Acres Drip	Acres Groundwater	Acres Total
1993	***Year Total***	94.97	0	0	0	0	94.97
1993	GRASS_PASTURE	94.97	0	0	0	0	94.97

ATTACHMENT D

Diversion Summary in Acre-Feet - Total Water Through Structure

Year	FDU	LDU	DWC	Maxq & Day	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Total
1975	1975-06-20	1975-10-14	117	10 06-20	0	0	0	0	0	0	0	218	615	615	595	278	2321
1976	1976-07-01	1976-10-30	122	9 07-01	0	0	0	0	0	0	0	0	553	553	536	536	2178
1977	1977-05-19	1977-10-31	166	10 05-19	0	0	0	0	0	0	258	595	615	615	595	615	3293
1978	1978-06-20	1978-10-31	134	10 06-20	0	0	0	0	0	0	0	218	615	615	595	615	2658
1979	1979-06-20	1979-10-31	134	10 06-20	0	0	0	0	0	0	0	218	615	615	595	615	2658
1980 *																	1096
1981 *																	1800
1981	1981-07-10	1981-09-29	82	10 07-10	0	0	0	0	0	0	0	0	436	615	575	0	1626
1982	1982-07-01	1982-09-28	90	10 07-01	0	0	0	0	0	0	0	0	615	615	555	0	1785
1983	1983-06-01	1983-10-31	153	10 06-01	0	0	0	0	0	0	0	595	615	615	595	615	3035
1984	1984-05-15	1984-10-31	170	10 05-15	0	0	0	0	0	0	337	595	615	615	595	615	3372
1985	1985-05-15	1985-10-30	169	20 09-26	0	0	0	0	0	0	337	595	615	615	691	704	3556
1986	1986-06-01	1986-10-21	143	12 06-01	0	0	0	0	0	0	0	714	730	721	698	489	3352
1987	1987-06-15	1987-10-30	138	31 10-16	0	0	0	0	0	0	0	317	615	615	584	1187	3319
1988	1988-06-01	1988-10-30	152	30 06-01	0	0	0	0	0	0	0	1785	1831	1845	1785	1785	9031
1989	1989-05-03	1989-10-08	159	33 06-20	0	0	0	0	0	0	173	1002	2029	2029	1821	220	7273
1990	1990-05-10	1990-10-11	148	50 08-09	0	0	0	0	0	0	1884	2797	2890	3022	1919	1041	13553
1991	1991-07-11	1991-10-31	113	23 07-11	0	0	0	0	0	0	0	0	490	369	357	369	1585
1992	1992-06-25	1992-10-04	102	17 07-01	0	0	0	0	0	0	0	120	1012	734	678	90	2635
1993	1993-07-16	1993-10-28	105	10 07-27	0	0	0	0	0	0	0	0	167	411	235	219	1033
1994	1994-06-01	1994-09-21	113	9 06-01	0	0	0	0	0	0	0	536	553	553	321	0	1964
1995	1995-06-17	1995-09-22	98	10 06-20	0	0	0	0	0	0	0	243	584	563	349	0	1740
1996	1996-06-05	1996-10-28	146	9 07-02	0	0	0	0	0	0	0	309	547	458	357	333	2005
1997	1997-06-04	1997-09-17	106	9 08-14	0	0	0	0	0	0	0	375	505	541	242	0	1662
1998	1998-06-04	1998-09-13	102	9 06-20	0	0	0	0	0	0	0	434	553	553	232	0	1773
1999	1999-06-13	1999-09-02	82	9 07-11	0	0	0	0	0	0	0	218	535	538	32	0	1323
2003	2003-05-01	2003-09-30	153	16 05-01	0	0	0	0	0	0	984	952	984	984	952	0	4856
2004	2004-04-01	2004-10-31	214	9 06-04	0	0	0	0	0	163	168	480	507	473	458	473	2721
2005	2005-06-06	2005-09-30	113	21 09-29	0	0	0	0	0	0	0	656	696	699	559	0	2610
2006	2006-05-01	2006-09-30	136	10 05-01	0	0	0	0	0	0	278	595	615	615	595	0	2698
2007	2007-06-03	2007-10-10	119	17 09-04	0	0	0	0	0	0	0	261	231	274	355	90	1212
2008	2008-09-16	2008-09-16	1	8 09-16	0	0	0	0	0	0	0	0	0	0	16	0	16
				Minimum: 8	0	0	0	0	0	0	0	0	0	0	16	0	16
				Maximum: 50	0	0	0	0	0	163	1884	2797	2890	3022	1919	1785	13553
				Average: 15	0	0	0	0	0	5	147	494	733	736	616	363	2992

32.00 years with diversion records

Notes: The average considers all years with diversion records, even if no water is diverted.
The above summary lists total monthly diversions.
* = Infrequent Diversion Record. All other values are derived from daily records.
Average values include infrequent data if infrequent data are the only data for the year.

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comment
1975		20	DITCH USED TO TRANSPORT WATER TO WILLOW CR.
1976		40	
1977		20	
1978		20	
1979		20	
1980	No information available	20	
1981		20	
1982		60	
1983		60	
1984		20	
1985		20	
1986			SUPPLIES WATER TO WILLOW CRK DITCHES
1987		60	ALSO SUPPLIMENTS WILLOW CRK FOR WILLOW DITCHES NO 1,2 & 3
1988		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1989		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1990		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1991		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1992		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1993		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1994		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1995		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1996		60	ALSO USED TO SUPPLEMENT WILLOW CREEK
1997		25	ALSO USED TO SUPPLEMENT WILLOW CREEK
1998		25	ALSO USED TO SUPPLEMENT WILLOW CREEK
1999		25	ALSO USED TO SUPPLEMENT WILLOW CREEK
2000	Water taken but no data available	25	ALSO USED TO SUPPLEMENT WILLOW CREEK
2001	No information available	25	ALSO USED TO SUPPLEMENT WILLOW CREEK
2002	No information available	25	ALSO USED TO SUPPLEMENT WILLOW CREEK
2003		25	ALSO USED TO SUPPLEMENT WILLOW CREEK DITCH
2004		25	USER SUPPLIED DATA & WATER COMM OBSERVATIONS
2006		16	
2007		16	USER SUPPLIED DATA

Note: Diversion comments and reservoir comments may be shown for a structure, if both are available.

Description: ROARING FORK RIVER AT ASPEN, CO.

Time Series Identifier:	**09073500.USGS.Streamflow.Monthly**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Monthly**
Located in HUC:	**14010004**	**Data Units:**	**AF**
Latitude, Longitude:	**39.189430, -106.814484**		
UTM X, UTM Y (zone 13 NAD 83):	**343295.1 ,4339366.3**		
Elevation (feet):	**7884.58**		

Time Series Creation History:

Available Data: **1910 To 2003**

Selected Time Series From: **1910-01-01 To 2003-12-31**

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total
1911	3996.75	3272.77	2459.54	1844.66	1388.45	2023.17	4778.25	21985.11	42371.53	20935.84	6783.57	4046.34	115885.99
1912	6916.46	3623.85	2707.48	1537.21	2070.77	2136.23	2915.75	18553.66	60072.28	37119.22	10578.01	4278.41	152509.33
1913	3709.15	3248.97	2459.54	2152.10	1943.83	2152.10	5295.94	27110.48	37541.70	14721.54	4427.17	6416.62	111179.14
1914	4821.89	3106.16	2459.54	1844.66	1666.14	1844.66	4072.13	36571.77	63813.16	22915.38	8570.70	4764.37	156450.55
1915	5464.54	2979.22	1721.68	1537.21	1332.91	1945.81	3302.53	14707.65	42861.45	22304.46	5200.74	3252.94	106611.14
1916	3330.30	2142.18	2433.75	1963.67	1929.95	2530.95	4869.49	18460.43	54883.45	25886.66	10544.29	5119.41	134094.52
1917	6537.62	3752.78	3064.51	2977.23	2243.34	2322.68	3346.16	10129.73	73976.62	44148.74	8606.41	3776.58	164882.40
1918	3080.38	3060.54	2743.18	2427.80	2187.80	2515.08	3808.32	23587.78	85046.53	22994.71	5240.41	5190.82	161883.35
1919	4324.03	3588.15	2517.06	1904.16	1563.00	1642.34	5174.95	28969.02	24845.32	10532.38	4569.98	2979.22	92609.61
1920	2707.48	2245.32	2152.10	1662.17	1852.59	2072.76	2330.61	22068.42	57164.47	25819.22	8554.84	4185.19	132815.16
1921	3502.86	3248.97	3153.76	3183.52	2830.45	3320.38	3586.17	19101.11	65386.08	22586.12	8003.42	4889.33	142792.17
1933	2685.66	2445.66	2013.25	1844.66	1666.14	1844.66	2677.73	18553.66	52743.25	10276.51	3600.05	2622.19	102973.40
1934	2705.49	1785.15	1229.77	983.82	1166.30	1654.24	6434.47	28625.87	10322.13	2336.56	1390.43	2211.60	60845.84
1935	2203.67	1927.96	1687.96	1553.08	1475.72	1610.60	2469.46	7807.06	39959.59	13061.35	3292.61	3159.72	80208.77
1936	2362.35	1624.49	1299.19	1321.01	1281.34	1277.37	7769.37	37676.58	26741.55	6854.98	4419.24	2530.95	95158.41
1937	2838.39	2064.82	1687.96	1483.66	1162.33	1275.39	2187.80	18468.37	13555.24	4704.86	1229.37	714.06	51372.25
1938	1814.90	1559.03	1303.16	1380.52	1051.26	1166.30	3278.73	14400.21	37791.63	11958.52	2598.39	3026.82	81329.45
1939	2832.44	2336.56	1959.70	1555.06	1317.04	1822.84	4605.69	22564.30	15987.01	3290.63	1116.71	815.22	60203.19
1940	625.20	867.58	948.11	1100.84	908.44	1065.14	2659.87	12384.97	10661.31	1768.49	793.60	1130.99	34914.56
1941	2227.47	1370.60	1200.02	1203.98	979.85	1086.96	1463.82	15386.01	20908.07	4835.77	1122.66	1579.06	53364.28
1942	2683.68	1769.28	1453.91	1277.37	1059.19	1049.27	2679.71	13745.66	54203.11	12686.47	1957.71	1279.36	95844.70
1943	1517.38	1493.58	1785.15	1624.49	1164.31	1293.24	5430.82	14098.72	24176.88	7138.62	4494.61	2521.03	66738.82
1944	2372.27	1963.67	1551.10	1281.34	1156.38	1257.54	1598.70	13384.66	22651.57	7735.65	1418.20	349.29	56720.37
1945	675.38	920.34	1031.42	1164.31	944.15	1049.27	1509.44	11902.98	20656.17	10435.19	4692.96	1765.32	56746.94
1946	1985.48	1963.67	1945.81	1705.81	1386.47	1590.77	4802.05	9943.29	23099.84	5105.53	1731.60	870.16	56130.47
1947	1616.16	1436.05	1261.51	1590.77	1269.44	1275.39	2207.64	19053.50	37619.06	29696.96	4292.29	1983.50	103302.27
1948	2386.15	2251.27	1709.78	1378.53	1319.03	1332.91	2909.79	26309.14	37527.82	6335.30	1468.39	534.75	85462.87
1949	1872.42	1628.45	1773.25	1693.91	1368.61	1660.19	3568.32	10599.82	28046.69	18067.70	2937.56	2429.79	75646.72
1950	2378.22	1755.40	1616.55	1537.21	1281.34	1350.76	3001.04	10042.46	20186.08	4994.45	1003.65	1127.82	50274.98
1951	1769.28	1469.77	1475.72	1255.56	1138.53	1293.24	2173.92	13352.92	22447.27	9578.32	2404.00	789.04	59147.57
1952	1721.68	1537.21	1553.08	1416.22	1271.42	1136.55	3847.99	14556.91	38759.57	9167.74	3703.19	2606.32	81277.88
1953	2090.61	1731.60	1612.59	1477.71	1186.13	1360.68	2100.53	9090.38	28754.80	5706.53	2620.20	1656.22	59387.97
1954	1999.37	1707.79	1469.77	1344.81	1116.71	1209.94	3213.27	10060.31	6105.21	1901.18	1127.22	1285.31	32540.90
1955	2630.12	1551.10	1648.29	1334.90	932.24	1075.06	2953.43	11377.36	13549.29	3453.27	2273.09	689.46	43467.61
1956	679.35	1350.76	1259.52	1126.63	1011.59	1112.74	2459.54	15507.00	15560.56	2622.19	1026.26	110.68	43826.82
1957	455.41	1063.16	1144.48	1120.68	916.38	1005.63	1868.46	7390.52	49696.59	55186.92	8451.69	2677.73	130977.65
1958	2292.93	2066.81	2400.03	1848.62	1360.68	1263.49	2019.20	25293.59	39348.67	4086.01	1408.29	1007.62	84395.94

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing.

Description: ROARING FORK RIVER AT ASPEN, CO.

Time Series Identifier:	**09073500.USGS.Streamflow.Monthly**	**Data Source:**	**USGS**
Located in Water Division, District:	**38, 5**	**Measurement Type:**	**Streamflow**
Located in County, State:	**PITKIN, CO**	**Data Interval:**	**Monthly**
Located in HUC:	**14010004**	**Data Units:**	**AF**
Latitude, Longitude:	**39.189430, -106.814484**		
UTM X, UTM Y (zone 13 NAD 83):	**343295.1 ,4339366.3**		
Elevation (feet):	**7884.58**		

Time Series Creation History:

Available Data: **1910 To 2003**

Selected Time Series From: **1910-01-01 To 2003-12-31**

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total
1959	1775.23	1541.18	1352.75	1277.37	1182.17	1370.60	2386.15	11438.84	28832.16	4272.46	1277.37	1203.79	57910.07
1960	2889.96	2092.59	2074.74	1523.33	1190.10	1378.53	4433.12	11258.35	27753.13	5557.77	1221.64	741.83	62115.09
1961	1765.32	1414.24	1219.85	1067.12	1088.94	1134.56	1566.96	12597.21	18371.18	2677.73	818.39	4333.95	48055.45
1962	4639.41	2770.95	2138.21	1804.98	1342.83	1434.07	6010.00	18652.83	34608.11	15895.77	2739.21	1584.82	93621.20
1963	1941.85	1404.32	1207.95	1106.79	888.61	1247.62	2396.07	9804.44	5922.73	1115.32	2247.31	1931.93	31214.93
1964	1644.32	1457.87	1168.28	1229.77	1035.39	930.26	1477.71	13832.93	15858.08	6267.86	3350.13	2453.59	50706.19
2004	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Min:	455.41	867.58	948.11	983.82	888.61	930.26	1463.82	7390.52	5922.73	1115.32	793.60	110.68	31214.93
Max:	6916.46	3752.78	3153.76	3183.52	2830.45	3320.38	7769.37	37676.58	85046.53	55186.92	10578.01	6416.62	164882.40
Mean:	2662.07	2060.27	1791.98	1573.24	1363.45	1537.72	3340.49	16986.19	33729.46	12993.88	3704.83	2386.58	84130.16

Notes:

Years shown are water years.
A water year spans October of the previous calendar year to September of the current year (all within the indicated water year).
Annual values and statistics are computed only on non-missing data.
NC indicates that a value is not computed because of missing data or the data value itself is missing.

Tab 2
Exhibit P

Climate Change in Colorado

A Synthesis to Support Water Resources Management and Adaptation

A REPORT FOR THE COLORADO WATER CONSERVATION BOARD

Colorado
University of Colorado at Boulder

EXHIBIT P
Pitkin County

Climate Change in Colorado

A Synthesis to Support Water Resources Management and Adaptation

A REPORT BY THE WESTERN WATER ASSESSMENT FOR THE COLORADO WATER CONSERVATION BOARD

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Western Water Assessment

Colorado
University of Colorado at Boulder

Produced in cooperation with CU-Boulder University Communications, Marketing & Creative Services.

Photos

Cover *(left image) and* ***page 40***, images courtesy of Casey A. Cass, CU-Boulder University Communications, Marketing & Creative Services. ***Page 15***, ©2008 Denver Metro Convention & Visitor's Bureau.

Contents

EXECUTIVE SUMMARY

The scientific evidence is clear: the Earth's climate is warming. Multiple independent measurements confirm widespread warming in the western United States; in Colorado, temperatures have increased by approximately 2°F between 1977 and 2006. Increasing temperatures are affecting the state's water resources. (Sections 1, 2, 4, 5, 6)

THIS REPORT is a synthesis of climate change science important for Colorado's water supply. It focuses on observed trends, modeling, and projections of temperature, precipitation, snowmelt, and runoff. Climate projections are reported out to the mid-21st century, because this is a relevant time frame for development of adaptation strategies.

Although many published studies and datasets include information about Colorado, few climate studies focus only on the state. Consequently, many important scientific analyses for Colorado are lacking. This report summarizes Colorado-specific findings from peer-reviewed regional studies, and presents new graphics derived from existing datasets. The state is home to many experts in climate and hydrology, and this report also draws from ongoing work by these scientists.

Observations, Attribution, and Projections

- Changes in Colorado's climate and implications for water resources are occurring in a global context. On a global scale, climate change has been linked to observed and projected changes in the water cycle. By the mid-21st century, average river runoff and water availability are projected to increase at high latitudes and decrease over dry regions at lower midlatitudes such as the western United States. Changes in the quantity and quality of water may occur due to warming even in the absence of precipitation changes. (Section 1)
- The accumulation of greenhouse gases (including carbon dioxide) in the atmosphere is ***very likely*** the cause of most of the increase in global average temperatures (IPCC AR4 WGI 2007). In North America, temperatures have increased by 2°F in the last 30 years, and "human-induced warming has ***likely*** caused much of the average temperature increase over the past fifty years" (CCSP SAP 3.3 2008, p. 3). (Section 5)
- In Colorado, temperatures have increased about 2°F in the past 30 years. All regions examined within the state warmed during the last 30 years, except the far southeast corner, in which there was a slight cooling trend. (Section 2)
- Climate models show a 1°F warming in the West over the last 30 years in response to greenhouse gas emissions from human activities (anthropogenic). However no studies have specifically investigated whether the detected trends in Colorado can be attributed to anthropogenic greenhouse gases. (Sections 2, 4)
- Climate models project Colorado will warm 2.5°F [+1.5 to +3.5°F] by 2025, relative to the 1950–99 baseline, and 4°F [+2.5 to +5.5°F] by 2050. The 2050 projections show summers warming by +5°F [+3 to +7°F], and winters by +3°F [+2 to +5°F]. These projections also suggest that typical summer monthly temperatures will be as warm as or warmer than the hottest 10% of summers that occurred between 1950 and 1999. By way of illustration, mid-21st century summer temperatures on the Eastern Plains of Colorado are projected to shift westward and upslope, bringing into the Front Range temperature regimes that today occur near the Kansas border. (Section 5)
- Winter projections show fewer extreme cold months, more extreme warm months, and more strings of consecutive warm winters. Typical projected winter monthly temperatures, although significantly warmer than current, are between the 10th and 90th percentiles of the historical record. Between today and 2050, typical January temperatures of the Eastern Plains of Colorado are expected to shift northward by ~150 miles. In all seasons, the climate of the mountains is projected to migrate upward in elevation, and the climate of the Desert Southwest to progress up into the valleys of the Western Slope. (Section 5)
- In all parts of Colorado, no consistent long-term trends in annual precipitation have been detected. Variability is high, which makes detection of trends difficult. Climate model projections do not agree whether annual mean precipitation will increase or decrease in Colorado by 2050. The multi-model average projection shows little change in annual mean precipitation, although a seasonal shift in precipitation does emerge. (Sections 2, 5)
- A widespread and large increase in the proportion of precipitation falling as rain rather than snow, and reduction in snow water equivalent (SWE) have been observed elsewhere in the West. In Colorado, however, these changes are smaller and not as significant. Most of the reduction in snowpack in the West has occurred below about 8200 ft.

However, most of Colorado's snowpack is above this elevation, where winter temperatures remain well below freezing. (Section 2)

- Projections show a precipitous decline in lower-elevation (below 8200 ft) snowpack across the West by the mid-21st century. Modest declines are projected (10–20%) for Colorado's high-elevation snowpack (above 8200 ft) within the same timeframe. (Section 5)
- Between 1978 and 2004, the spring pulse (the onset of streamflows from melting snow) in Colorado has shifted earlier by two weeks. Several studies suggest that shifts in timing and intensity of streamflows are related to warming spring temperatures. The timing of runoff is projected to shift earlier in the spring, and late-summer flows may be reduced. These changes are projected to occur regardless of changes in precipitation. (Sections 2, 5)
- Recent hydrology projections suggest declining runoff for most of Colorado's river basins in the 21st century. However, the impact of climate change on runoff in the Rio Grande, Platte, and Arkansas Basins has not been studied as extensively as the Colorado River Basin. (Section 5)
- The lowest five-year period of Colorado River natural flow since records began in the late 1800s occurred in 2000 to 2004 (9.9 million acre feet per year). Recent hydrologic studies of the Upper Colorado River Basin project multi-model average decreases in runoff ranging from 6% to 20% by 2050 compared to the 20th century average, although one statistical streamflow model projects a 45% decline by 2050. The range of individual model projections within a single study can include both increasing and decreasing runoff due to the range of climate model output used to drive the hydrology models. Ongoing studies are attempting to resolve methodological differences in order to reduce the range of uncertainty in runoff projections. (Sections 2, 5)
- Throughout the West, less frequent and less severe drought conditions have occurred during the 20th century than revealed in the paleoclimate records over the last 1000 years. Precipitation variations are the main driver of drought in Colorado and low Lake Powell inflows, including the recent drought of 2000–07, and these variations are consistent with the natural variability observed in long-term and paleoclimate records However, warming temperatures may have increased the severity of droughts and exacerbated drought impacts. (Sections 4, 5)
- Because global climate models do not represent the complexity of Colorado's topography, researchers are using "downscaling" and other techniques to study processes that matter to Colorado water resource managers. Several projects are underway to improve regional understanding: Some use statistical "downscaling" methods, which adjust for the effects of elevation and the mountains on snowfall and temperature; other studies involve compiling, calibrating, and studying historical datasets; others involve enhanced climate modeling efforts to include finer spatial resolution that better represents Colorado's mountainous terrain. (Section 3)

SIDEBAR ES-1. Communicating Uncertainty

Recognizing the difficulty in communicating scientific uncertainty to those outside the community, climate assessments now make statements designed to communicate probability. The so-called likelihood terminology indicates "the assessed likelihood, using expert judgment, of an outcome or a result" (IPCC AR4 WGI 2007, p. 3). The likelihood terminology quoted in this document follows two different but similar conventions, shown below.

It is important to recognize that the likelihood terminology used here is independent of consequence; these are not risk statements and the consequences of potentially cascading effects are not implicit in the likelihood statements.

The authors and editors of this report did not develop likelihood statements independently. Here, all likelihood statements are quoted from three major assessments (IPCC AR4 WGI 2007, IPCC 2008, CCSP SAP 3.3) where long-term processes involving large panels of experts arrived at conclusions based on the best available science.

Statements quoted from IPCC AR4 WGI and the IPCC Technical Paper on Water use this convention:	Statements quoted from CCSP SAP 3.3 use an intentionally less discrete system:
virtually certain (>99%)	
extremely likely (>95%)	
very likely (>90%)	*very likely* (about 75–100%)
likely (>66%)	*likely* (about 60–75%)
*more likely than not** (>50%)	
*about as likely as not** (>33-66%)	
unlikely (<33%)	*unlikely* (about 25–40%)
very unlikely (<10%)	*very unlikely* (about 0–25%)
extremely unlikely (<5%)	
*exceptionally likely** (<1%)	

* these likelihood terms used by IPCC are not quoted in this report

Implication for Water Resource Managers

Climate change will affect Colorado's use and distribution of water. Water managers and planners currently face specific challenges that may be further exacerbated by projected climate changes. The implications of climate change in this report are consistent with the broader conclusions in the CCSP SAP 4.3, the IPCC Technical Paper on Water (2008), and the 2007 National Academy of Science Report "Colorado River Basin Water Management."

This report provides a scientific basis to support further studies of water resources impacts. However, the assessment and quantification of specific climate change impacts on water resources is beyond the scope of this document.

A synthesis of findings in this report suggests a reduction in total water supply by the mid-21st century. When combined with temperature increases and related changes in evaporation and soil moisture, all recent hydrologic projections show a decline in runoff for most of Colorado's river basins by the mid-21st century. (Section 6)

Tab 2
Exhibit Q

EXHIBIT Q
Pitkin County

RECEPTION#: 551002, 07/14/2008 at
11:52:07 AM,
1 OF 6, R $0.00 Doc Code AGREEMENT
Janice K. Vos Caudill, Pitkin County, CO

INTERGOVERNMENTAL AGREEMENT FOR THE PURCHASE AND SALE OF WATER RIGHTS

This Intergovernmental Agreement (hereinafter referred to as "IGA") is entered into between the County Commissioners of Pitkin County, whose address is in care of John Ely, Esq., Pitkin County Attorney's Office; 530 E. Main Street, Aspen, Colorado 81611 ("Seller") and the Board of Directors for the Starwood Metropolitan District, 121 Stewart Drive, Aspen, Colorado 81611 ("Buyer"), effective this 30 day of June, 2008.

RECITALS

WHEREAS, Seller is the owner of the following described water right: 8 cubic feet per second absolute of the Stapleton Brothers' Ditch, decreed on October 16, 1933 in Civil Action No. 3000, Pitkin County District Court, State of Colorado, with an appropriation date of June 30, 1904; and

WHEREAS, Seller obtained a decree dated January 31, 2005 for change of water right, approval of plan for augmentation and appropriative right of exchange regarding this water right from the District Court, Water Division No. 5, Case No. 99CW306; and

WHEREAS, the change of Stapleton Brothers' Ditch water right in Case No. 99CW306 included confirmation of 220 acre-feet per year of consumptive use water credits ("Stapleton Brothers' Ditch Credits"); and

WHEREAS, of the 220 acre-feet per year of Stapleton Brothers' Ditch Credits, an estimated 18 acre-feet per year will be used by the Seller to irrigate landscaped acreage on the Aspen-Pitkin County Airport property; and

WHEREAS, pursuant to the application for change of water right, approval of plan for augmentation and appropriative right of exchange in Case No. 99CW306, the remaining 202 acre-feet per year of Stapleton Brothers' Ditch Credits may be retained by Pitkin County, or sold or leased to other water users; and

WHEREAS, Buyer is a Metropolitan District organized under the laws of the State of Colorado to among other things, provide water service to the Starwood Subdivision;

WHEREAS, Buyer intends to incorporate the Stapleton Brothers' Ditch Credits in a supplemental augmentation plan to be filed with the Division 5 Water Court;

WHEREAS, Seller desires to sell and Buyer desires to purchase Stapleton Brothers' Ditch Credits as follows:

Now, therefore, in consideration of the mutual promises set forth in this IGA, the parties agree as follows:

1. Agreement to Buy and Sell Water Rights. Seller agrees to sell and Buyer agrees to buy 65.00 acre feet of the Stapleton Brothers' Ditch Credits described above, as calculated as an overall percentage of the 220 acre-feet per year of consumptive use credits. These

65 acre-feet of Stapleton Brothers' Ditch Credits shall be delivered pro-rata out of the monthly distribution set forth in the decree in Case No. 99CW306 to the extent physically and legally available, and shall not include any Grizzly Reservoir storage water available to the County.

2. Price and Payment.

a. Purchase Price: Buyer agrees to pay Seller the purchase price of Ten Thousand Dollars ($10,000.00) per acre foot of adjudicated historic consumptive use for a total purchase price of Six Hundred Fifty Thousand Dollars ($650,000), by wire transfer to a bank account designated by Seller.

b. Escrow: Upon full execution of this IGA, Buyer shall deposit Sixty-Five Thousand Dollars ($65,000) into an interest-bearing escrow account for the benefit of Seller. In the event that Buyer terminates this IGA pursuant to Sub-paragraph c., below, Seller will refund the Sixty-Five Thousand Dollars ($65,000) plus any interest accrued, to the Buyer within 10 days of the written notice of termination. In the event Buyer terminates the IGA for any other reason, Buyer's earnest money shall not be refunded to Buyer. If Seller terminates the IGA, Buyer shall receive the interest payment.

c. Review of Information. Buyer, through any employees, agents or other designees of Buyer that it may designate, shall have the right to review and inspect any information relating to the Stapleton Brothers' Ditch Credits or the subject matter of this IGA that Buyer may obtain either before or after the effective date of this IGA. If Buyer determines, in its sole and subjective discretion, that the title to or status of the Seller's interest in and to the Stapleton Brothers' Ditch Credits is not satisfactory to Buyer or that there is insufficient evidence to establish the historic use of the water to Buyer's satisfaction, Buyer shall provide written notice of its determination ("Notice of Unsatisfactory Conditions") to Seller within 90 days of the date of this IGA.

d. Payment of Balance of Purchase Price: At least five (5) days prior to closing Seller shall provide Buyer with the name and address of its bank, the name under which the bank account is held, the bank account number, the wire transfer routing number, and any other information required to complete the wire transfer. Buyer shall arrange for the balance of the purchase price, Five Hundred Eighty Five Thousand Dollars ($585,000), at closing as further described in Paragraph 7, below.

3. Warranties. Seller hereby warrants and represents to Buyer, and such warranties shall be applicable and in full force in effect as of the date of closing of this IGA, that:

a. Seller owns good and marketable title to the Stapleton Brothers' Ditch Credits described in the Recitals above, free and clear of all liens, encumbrances and adverse claims to the use and enjoyment thereof.

b. Seller has taken all actions and received all authorizations necessary to make this IGA a valid obligation binding upon it.

c. The Stapleton Brothers' Ditch Credits have been quantified by the Water Court in the manner required by law, there has been no intent to abandon or other action taken to abandon in whole or in part and the Stapleton Brothers' Ditch Credits are not currently the subject of an abandonment proceeding.

d. Seller makes no warranties or representations about the suitability of the Stapleton Brothers Ditch Credits for Buyer's use or purposes.

4. Transfer of Historic Consumptive Use Credits Associated with the Stapleton Brothers' Ditch Credits. Seller shall transfer the historic consumptive use credits decreed to the Stapleton Brothers' Ditch Credits to Buyer by a special warranty deed insuring that grantor did not convey or adversely affect title during its ownership tenure.

5. Dry-up Covenant. As a result of this sale and the changes contemplated herein, Seller agrees to execute a Dry-up Covenant.

6. Water Court Approval. It will be necessary for Buyer to obtain Water Court approval to utilize the Stapleton Brothers' Ditch Credits as a source of replacement water in the plan for augmentation. Seller agrees to cooperate with Buyer and assist Buyer as needed providing information necessary to quantify historic consumptive use or any other information necessary to obtain a decree in this matter. The parties shall be responsible for their individual costs and attorney fees associated therewith.

7. Closing. The date of closing shall be 180 days following mutual execution of this IGA. At closing, the following actions shall occur:

a. Buyer shall wire to Seller the balance of the purchase price in the amount of Five Hundred Eighty Five Thousand Dollars ($585,000).

b. Seller shall deliver to Buyer a duly executed and acknowledged special warranty deed as described above.

c. Seller shall deliver the Dry-up Covenant described above.

d. The parties shall execute, acknowledge and deliver any and all other documents necessary to carry out the intent and purposes of this IGA and to comply with applicable law.

8. Time of Essence; Remedies. Time is of the essence. If any payment due hereunder is not paid, honored or tendered when due, or if any other obligation hereunder is not performed or waived as herein provided, there shall be the following remedies:

a. If Buyer is in default, Seller may elect to terminate this IGA, or Seller may elect to treat this IGA as being in full force and effect and Seller shall have the right to specific performance or damages, or both.

b. If Seller is in default, Buyer may elect to terminate this IGA, or Buyer may elect to treat this IGA as being in full force and effect and Buyer shall have the right to specific performance or damages, or both.

c. Anything to the contrary herein notwithstanding, in the event of any litigation arising out of this IGA, the court shall award to the prevailing party all reasonable costs and expenses, including attorney fees.

9. Miscellaneous Provisions.

a. All provisions hereof shall apply to and be binding upon the parties hereto, their agents, successors and assigns.

b. All notices or other communications required or permitted under this IGA shall be in writing, and shall be personally delivered or sent by facsimile telecommunication, by overnight air express service or by certified mail, postage prepaid, return receipt requested, addressed to the parties at their respective addresses set forth below, which, for purposes of this IGA, are the law offices of the parties' respective attorneys. Such notice or other communication shall be deemed given (i) upon receipt if personally delivered, (ii) upon sending if delivered by facsimile telecommunication, (iii) one business day after tendering to a reputable overnight air express service, and (iv) three business days after mailing if by certified mail. Notice of change of address shall be given by written notice in the manner detailed above.

To Seller:

Board of County Commissioners of
Pitkin County
Attn: John Ely, Esq.
Pitkin County Attorney
530 E. Main Street, Suite I
Aspen, CO 81611-2939
(970) 920-5190

With copies to:

Timothy Beaton, Esq.
Moses, Wittemyer, Harrison &
Woodruff, P.C.
P.O. Box 1440
Boulder, CO 80301
(303) 443-8782

To Buyer:

Starwood Metropolitan District
Executive Director of the Board of
Directors
121 Stewart Drive
Aspen, Colorado 81611
(970) 925-8939

With copies to:

Paul J. Taddune, Esq.
Law Office of Paul J. Taddune
323 W. Main Street, Ste 301
Aspen, CO 81611
(970) 925-9199

Balcomb & Green, P.C.
PO Drawer 790
Glenwood Springs, CO 81602
(970) 945-6546

c. All promises, warranties, covenants and representations contained in this IGA shall survive the closing.

d. This IGA shall be governed under, and construed pursuant to, the laws of the State of Colorado.

Approved as to form:
PITKIN COUNTY

By: John Ely
Its: Attorney

BALCOMB & GREEN, P.C.

Scott M. Balcomb
Sara M. Dunn

e. This IGA shall be modified by writing only, which writing must be executed by the parties hereto in order to be effective.

f. Neither party has had any contact or dealings regarding the Stapleton Brothers' Ditch Credits, or any communication in connection with the subject matter of this transaction, through any licensed real estate broker, entity, agent, commission salesperson, or other person who will claim a right to compensation or a commission or finder's fee as a procuring cause of the sale contemplated herein. The parties agree that no commissions are due and owing as a result of this transaction.

g. This IGA may be executed in counterparts, all of which taken together shall be considered one instrument.

h. This IGA may be executed by facsimile, any of which, shall be deemed an original signature and bind the executing party.

i. This IGA shall be effective on the last date it is signed by the parties.

j. Confidentiality. Buyer recognizes and agrees that part of the consideration for the purchase by Buyer of the sale water rights is the maintenance of the confidentiality of the terms and purchase price paid by Buyer. Buyer shall not disclose to others any terms or condition of this Agreement except as required in the performance of its fiduciary duties or in the course of litigation or otherwise as required by law, or except as expressly permitted by Seller. Seller shall be permitted to disclose the purchase price and terms and conditions of this Agreement in its discretion for purposes or facilitating other sales of Seller's water right interests.

WHEREFORE, the parties have executed this IGA effective as of the date set forth above.

BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY

By: _____
Its: BCC Chairman

ATTEST:

By: _____
Its: Secretary

STARWOOD METROPOLITAN DISTRICT

By: _____
Its: President

ATTEST:
STARWOOD METROPOLITAN DISTRICT

Meg Haynes
By: Meg Haynes 7/2/08
Executive Director

Tab 2
Exhibit R

EXHIBIT R
Pitkin County

SPECIAL WARRANTY DEED

THIS DEED is made this 22nd day of December, 2008, between the **BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY, COLORADO** whose address is Plaza 1, 1st Floor, Courthouse Plaza Building, 530 East Main Street, Aspen, Colorado 81611 ("Grantor"), and **STARWOOD METROPOLITAN DISTRICT**, a special district organized and existing under the laws of the State of Colorado, whose address is 121 Stewart Drive, Aspen, Colorado 81611 ("Grantee"):

WITNESSETH that the Grantor, for and in consideration of the sum of Ten Dollars and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm, unto the Grantee, its successors and assigns forever, the following water rights, together with improvements, if any, situate, lying and being in the County of Pitkin and State of Colorado, described as follows:

> An undivided 13/44th interest in and to the 8.0 cubic feet per second of the Stapleton Brothers' Ditch adjudicated in Civil Action 3000, Pitkin County District Court, on October 16, 1933, having Priority No. 269, and an appropriation date of June 30, 1904, as changed by the decree in Case No. 99CW306, District Court, Water Division No. 5 on January 31, 2005; together with an equal 65 acre-feet of water per year *pro rata* interest in the fully consumable consumptive use water credits as quantified and decree the decree in Case No. 99CW306.

TOGETHER with any and all hereditaments and appurtenances thereto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all the estate, right, interest, claim and demand whatsoever of the Grantor, either in law or equity, of, in and to the above bargained premises.

TO HAVE AND TO HOLD the said premises above bargained and described with the appurtenances, unto the Grantee, its successors and assigns forever. Grantor, for itself, its successors and assigns, does covenant and agree that it shall and will WARRANT AND FOREVER DEFEND the above-bargained premises in the quiet and peaceable possession of the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor.

IN WITNESS WHEREOF, the Grantor has executed this deed on the date first written above.

BOARD OF COUNTY COMMISSIONERS
PITKIN COUNTY, COLORADO

By Jack Hatfield
Name: Jack Hatfield
Title: Chairman

ATTEST:

By Jeanette Jones
Name: Jeanette Jones
Title: ~~Secretary~~ Deputy County Clerk

RECEPTION#: 555335, 12/30/2008 at 09:16:48 AM,
1 OF 2, R $0.00 DF $0.00 Doc Code SPEC WD
Janice K. Vos Caudill, Pitkin County, CO

Tab 2
Exhibit S

LAW OFFICES
HILL, KINNEY & WOOD, LLC

SPRUCE PROFESSIONAL BUILDING
201 MAIN STREET, SUITE 301
CARBONDALE, COLORADO 81623
tk@hkwlawfirm.com

THOMAS C. HILL
THOMAS E. KINNEY
JOSLYN V. WOOD

TELEPHONE
(970) 963-3900
FACSIMILE
(970) 963-3131

EXHIBIT S
Pitkin County

October 14, 2009

Via electronic mail: pdechristopher@mwhw.com

Patricia DeChrisopher, Esq.
Moses Wittemyer Harrison and Woodruff, P.C.
1002 Walnut St., Suite 300
Boulder, CO 80302

RE: Proposed Pitkin County – Town of Basalt IGA for lease of Stapleton Bros. Ditch water rights

Dear Patricia:

The Town of Basalt is currently reviewing Pitkin County's offer via a draft proposed intergovernmental agreement to the Town for leasing the historical irrigation consumptive use associated with the County's 4.3 cfs Stapleton Brothers' Ditch water right for the Town's use downstream from the intersection of the Roaring Fork River with the boundary between Pitkin County and Eagle County pursuant to HB 08-1280 (CRS § 32-92-102(3)). The proposed IGA-water right lease is contingent upon the Colorado Water Conservation Board acquiring the 4.3 cfs Stapleton Brothers' Ditch water right from Pitkin County and obtaining a decree from the District Court, Water Division No. 5 changing the decreed use of this water right to instream flow use within the reach of Maroon Creek downstream from the Stapleton Brothers' Ditch headgate and also within the reach of the Roaring Fork River from the confluence of Maroon Creek to the boundary between Pitkin and Eagle Counties. As part of the Town's review of the proposed IGA, you and I are discussing several issues, including whether Pitkin County will agree to extend the initial term of the water right lease from 10 years to not less than 25 years so that the historical irrigation consumptive use associated with the County's 4.3 cfs Stapleton Brothers' Ditch water right may be used by the Town as a supplemental augmentation water supply downstream of the proposed Roaring Fork River instream flow reach. The Town considers supplemental augmentation use of the historical irrigation consumptive use associated with the County's 4.3 cfs Stapleton Brothers' Ditch water right to be the highest and best use of this water right.

Very truly yours,

HILL, KINNEY & WOOD, LLC

Tom Kinney

Tom Kinney

ec: Town of Basalt staff

Tab 2
Exhibit T

EXHIBIT T
Pitkin County

Declaration of a Revocable Trust
(The Pitkin County Water Rights Revocable Trust)

RECITALS

WHEREAS, this Declaration of a Revocable Trust ("Trust Agreement") is made and executed this _____ day of _____, 20____, by and between the Board of County Commissioners for the County of Pitkin ("Settlor") and the Colorado Water Conservation Board ("Trustee" or "CWCB") (collectively, the "Parties").

WHEREAS, the Trustee is a Colorado administrative agency that was created by statute in 1937 for the purpose of aiding in the protection and development of the waters of the state. It is responsible for water project planning and finance, stream and lake protection, flood hazard identification and mitigation, weather modification, river restoration, water conservation and drought planning, water information, and water supply protection. Pursuant to Colorado law, it has the exclusive authority to hold instream flows in the state of Colorado.

WHEREAS, the Trustee is authorized by Section 37-92-102(3), C.R.S. (2008), to acquire from any person, including any governmental entity, such water, water rights or interests in water as it determines may be required for instream flows to preserve or improve the natural environment to a reasonable degree and to take whatever action may be needed to ensure such instream flows remain in the river.

WHEREAS, the Trustee holds numerous instream flow water rights in the Roaring Fork and Crystal Rivers, and their tributaries ("Roaring Fork River Basin"). In dry years, these instream flow water rights have been known to suffer shortages to varying degrees, with some shorted in the extreme.

WHEREAS, Settlor owns various water rights in the Roaring Fork River Basin, which it holds to manage for the citizens of Pitkin County. Settlor may also acquire various water rights through lease or other contractual arrangements or acquisitions. Some of Settlor's water rights were acquired through Settlor's Open Space and Trails Department with restricted funds and may not be converted or sold without voter approval. Some of Settlor's water rights were acquired through Settlor's Airport Enterprise Fund pursuant to the Taxpayers' Bill of Rights ("TABOR"), under Article X, Section 20 of the Colorado Constitution, and must be managed in a manner consistent with the nature of such enterprise.

WHEREAS, Settlor desires to create a revocable trust of the water rights described in **Exhibits A-1 and A-2**, attached hereto and incorporated herein by reference (collectively, the "Trust Estate") for the purposes hereinafter set forth. Creation of the revocable trust is intended to assist in providing more water when needed for the Trustee's instream flow reaches in the Roaring Fork River Basin.

WHEREAS, Section 37-92-102(3), C.R.S., allows the Trustee to use water rights acquired through leases, loans and other arrangements for instream flow purposes pursuant to amendments to Sections 37-92-102(3), 37-92-103(2), and 37-92-305(3), C.R.S. House Bill 08-1280, signed by Governor Ritter on April 21, 2008, provides certain protections for water rights provided to the CWCB for use in the Instream Flow Program, pursuant to amendments to Sections 37-92-102(3), 37-92-103(2) and 37-92-305(3), C.R.S. It is specifically contemplated that each of those protections shall apply to the Trust Estate and a description of those protections shall be included in each of the water court decrees obtained pursuant to this Trust Agreement.

WHEREAS, the Settlor agrees to execute such further instruments as shall be necessary to vest the Trustee with full authority to manage the Trust Estate, and the Trustee agrees to hold the Trust Estate for the following uses and purposes set forth herein and subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the promises and mutual covenants herein contained, it is agreed as follows:

REVOCABLE TRUST

I. Purpose of the Trust. The purpose of the Trust is to preserve and improve the natural environment to a reasonable degree by providing water rights to supplement instream flows in the Roaring Fork River Basin. In accordance with the entrustment by Settlor and the provisions of this Trust Agreement, Trustee will hold, manage, and operate the Trust Estate in a manner that maximizes the purpose of the Trust.

II. Beneficiary of the Trust.

The Trust is a self-benefited trust, with the Board of County Commissioners of Pitkin County being the beneficiary of the Trust.

III. Delivery of the Trust Estate.

A. Ownership of the Trust Estate shall not be transferred from the Settlor to the Trustee as a result of the entrustment contemplated by this Trust Agreement.

B. The Settlor and Trustee shall, within six (6) months of the execution of this Trust Agreement, file an application, as co-applicants, with the District Court in and for Water Division 5 (the "Water Court") to change the use of the Stapleton Brothers Ditch water rights identified in **Exhibit A-1** to add instream flows as a beneficial use (the "Stapleton Water Court case"). The Stapleton Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Stapleton Water Court case. The Settlor shall have the right to dismiss the Stapleton Brothers Water Court case if it appears likely to the Settlor that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Settlor or (ii) substantially decrease the value of the

Stapleton Brothers Ditch water rights. The Settlor shall consult with the Trustee prior to taking any action to dismiss the Stapleton Water Court case. The Stapleton Brothers Ditch water rights identified in **Exhibit A-1** shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in the Stapleton Water Court case.

C. The Settlor and Trustee's staff shall, within twelve (12) months after receipt of a final decree in the Stapleton Water Court case begin the process to obtain approval of the CWCB to add the water rights identified in **Exhibit A-2** to the Trust Estate in accordance with the procedures set forth in Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, or any other applicable Rule duly promulgated by the CWCB and in effect at the time of such addition. The Trustee and Settlor shall not be obligated to proceed with such addition if CWCB approval requires terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the water rights. After obtaining such approval, the Settlor and Trustee shall file a Water Court application, as co-applicants, with the Water Court to change the use of the water rights identified in **Exhibit A-2** to add instream flows as a beneficial use (the "Remainder Water Court case"). The Remainder Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Remainder Water Court case. The Trustee or the Settlor shall have the right to dismiss the Remainder Water Court case if it appears likely to the Settlor that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the remaining water rights. The Parties shall consult with each other prior to taking any action to dismiss the Remainder Water Court case. The water rights changed in the Remainder Water Court case shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in the Remainder Water Court case.

D. Each Party shall bear its own costs and expenses in the Water Court cases. The Parties shall each bear one-half of the responsibility for any services of an engineer or other consultant necessary to file and prosecute the Water Court cases.

IV. Settlor's Warranties, Rights, and Obligations.

A. The Settlor warrants that it has the legal status and legal capacity to execute, deliver, and perform all requirements of this Trust Agreement and that it has full power and authority to execute and deliver this Trust Agreement and all other documents to be entered into in relation to this Trust Agreement, and it has full power and authority to operate under the entrustment provided for herein.

B. The Settlor reserves the exclusive right at any time and from time to time by instrument in writing signed by the Settlor and delivered to the Trustee to modify or alter this Trust Agreement, in whole or in part, without the consent of the Trustee provided that the duties, powers, and liabilities of the Trustee under this Trust Agreement shall not be changed without its consent; and the Settlor reserves and shall have the right, by instrument in writing, signed by the Settlor and delivered to the

Trustee, to cancel and annul this Trust Agreement, as provided in Section XIV of this Trust Agreement.

C. After the expiration of the Initial Period defined in Section XIV.B, the Settlor may from time to time withdraw all or part of the water rights in the Trust Estate by delivering an instrument in writing duly signed by the Settlor to the Trustee substantially similar to that attached hereto as **Exhibit B**. Such instrument shall describe the property or portion thereof desired to be withdrawn. Upon receipt of such instrument, the Trustee shall thereupon immediately cease the use of the water rights described therein. At least thirty (30) days prior to any such withdrawal, the Settlor shall consult with the Trustee regarding the circumstances and timing of the intended withdrawal.

D. The Settlor may at any time and from time to time add water rights to the Trust Estate by providing written notice to the Trustee of such intent, describing the property or portion thereof desired to be added to the Trust Estate, in a form substantially similar to that attached hereto as **Exhibit C**. The Settlor may add water rights to which it holds title or in which it has a contractual or other interest. The Settlor and the Trustee's staff must obtain approval of the CWCB to add such water rights to the Trust Estate in accordance with the procedures set forth in Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, or any other applicable Rule duly promulgated by the CWCB and in effect at the time of such addition. Neither the Trustee nor the Settlor shall be obligated to proceed with such addition if CWCB approval requires terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the water rights. After obtaining such approval, the Settlor and Trustee shall file a Water Court application to add instream flow uses as a beneficial use ("Supplemental Water Court case"). Any Supplemental Water Court case shall be prosecuted pursuant to Sections 37-92-102(3) and 37-92-305, C.R.S., as amended by House Bill 08-1280. The protections of House Bill 08-1280 shall be specifically incorporated in any decree obtained in the Supplemental Water Court case. The Trustee or the Settlor shall have the right to dismiss any Supplemental Water Court case if it appears likely that a decree will be entered with terms and conditions that would: (i) establish an unreasonable obligation on the Trustee or the Settlor or (ii) substantially decrease the value of the supplemental water rights. The Parties shall consult with each other prior to taking any action to dismiss any Supplemental Water Court case. The water rights changed in any Supplemental Water Court case shall be deemed delivered to and available for use by the Trustee upon receipt of a final decree in such Supplemental Water Court case.

E. The Settlor shall arbitrate, sue upon, defend against, or otherwise deal with and settle claims in favor of or against the Trust Estate as it deems best and the Settlor's decisions regarding and ultimate resolution of any such claims shall be binding and conclusive.

F. Nothing herein shall limit the Settlor's ability to protect the Trust Estate by filing statements of opposition in water court cases that may potentially injure the

Trust Estate; provided, however, that the Settlor shall consult with the Trustee regarding any such statements of opposition prior to filing.

G. The Settlor may bring about beneficial use of the historical consumptive use of the Trust Estate downstream of the instream flow reach benefited by the Trust Estate as fully consumable reusable water or in any other manner allowed by law.

V. Trustee's Warranties, Rights, and Obligations.

A. The Trustee warrants that it has the legal status and legal capacity to execute, deliver, and perform all requirements of this Trust Agreement and that it has full power and authority to execute and deliver this Trust Agreement and all the other documents to be entered into by it in relation to this Trust Agreement, and it has full power and authority to operate under the entrustment provided for herein.

B. The Trustee shall use the Trust Estate for the purposes of preserving or improving the natural environment to a reasonable degree by protecting streamflows in the state of Colorado under Section 37-92-102(3), C.R.S., as amended by House Bill 08-1280, at all times as allowed by all applicable water court decrees and Colorado law, so long as this Trust Agreement is in effect.

C. The Trustee shall be responsible for all administration, monitoring and measuring required by the Division Engineer to use the Trust Estate for instream flow purposes. To the extent that the Division Engineer requires installation of stream gages or other measuring devices in connection with such use, the Trustee shall be responsible for such installation, subject to the availability of funds for such installation.. The Trustee shall be responsible for maintaining all records required by the Division Engineer for administration of the Trust Estate for instream flow purposes. The Trustee and Settlor shall coordinate on whether the Settlor may provide assistance with the operation and maintenance of any such required stream gages or other measuring devices.

D. On January 15 of each year that the Trust Agreement is in force, the Trustee shall provide an annual update to the Settlor regarding use of the Trust Estate for instream flow purposes, including but not limited to flow data from the preceding year, any enforcement activities from the previous year, and planned operations and other considerations for the forthcoming year.

E. The Trustee agrees to undertake such acts as are reasonably required to carry out the tenor, purpose, and intent of this Trust Agreement. To that end, the Trustee shall place a call to enforce the seniority of the Trust Estate in the event the instream flow water right being benefited by all or a portion of the Trust Estate is injured or is presumed to be injured by other water users. If such activities include filing statements of opposition to water court cases, the Trustee shall identify this Trust Agreement in any such statement of opposition. Nothing herein shall diminish the CWCB's right to exercise its discretion regarding enforcement of instream flow water

rights; however, the CWCB acknowledges that the intended use of the Trust Estate is to preserve or improve the natural environment to a reasonable degree.

F. The Trustee shall not assign, pledge, sell, or transfer in any manner any part of the Trust Estate, nor shall it have the power to encumber any part of the Trust Estate.

G. The Trustee shall not engage in any activity that will harm the Settlor's interest the Trust Estate.

VI. Covenant. This Trust Agreement shall be a covenant which runs with the Trust Estate. This Trust Agreement shall be recorded by the Settlor with the Clerk and Recorder of Pitkin County, Colorado and of Garfield County, Colorado.

VII. Notice. Any notice, request, demand and other correspondence made as required by or in accordance with this Trust Agreement shall be made in writing and delivered to the relevant Party at the contact information set out below. Such notice or other correspondence shall be deemed to have been delivered when it is transmitted if transmitted by facsimile, when it is delivered if delivered in person, and three (3) days after posting the same if posted by mail.

To Settlor:

John M. Ely, Esq.
Pitkin County Attorney
530 East Main Street, Suite 302
Aspen, Colorado 81611-1948
Fax: (970) 920-5198

To Trustee:

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

VIII. Interpretation. This Trust Agreement shall be construed, regulated, and governed by and in accordance with the laws of the State of Colorado and shall be interpreted broadly to effect its purpose.

IX. Integration Clause. This Trust Agreement shall supersede all previous agreements between the Parties, and shall be binding upon the Parties and their respective heirs, executors, administrators, successors, and assigns.

X. Dispute Resolution; Jurisdiction and Venue. Pursuant to Section 37-92-102(3) C.R.S., the terms of this Trust Agreement shall be enforceable by each party as a water matter in the District Court for Water Division 5; provided, however, that before

commencing any action for enforcement of this Agreement, the party alleging a breach shall notify the other party in writing of the alleged breach and the parties shall make a good faith effort to resolve their differences through informal consultation.

XI. **No Waiver**. Any failure or delay by a Party in exercising any of its rights, powers and remedies hereunder or in accordance with laws (the "Party's Rights") shall not lead to a waiver of such rights, and the waiver of any single or partial exercise of the Party's Rights shall not preclude such Party from exercising such rights in any other way and exercising the remaining part of the Party's Rights.

XII. **Severability**. Each provision contained herein shall be severable and independent from each of other provisions, and if at any time any one or more provisions herein are found to be invalid, illegal, or unenforceable, the validity, legality, or enforceability of the remaining provisions herein shall not be affected as a result thereof.

XIII. **Amendments**. Any amendments or supplements to this Trust Agreement shall be made in writing and shall take effect only when properly signed by the Parties to this Agreement.

XIV. **Term and Termination of the Trust**. This Trust Agreement shall become effective upon its execution.

A. The term of this Trust Agreement is perpetual unless terminated as allowed by this Section XIV.

B. This Trust Agreement may not be terminated during the initial ten (10) years after this Trust Agreement is executed ("Initial Period").

B. After the expiration of the Initial Period, this Trust Agreement may be terminated upon at least six (6) months prior notice in writing by either Party to the other Party to terminate the Trust hereunder, after which the Trust hereunder shall terminate at the expiration of such six (6) month period or at a later date specified in the termination notice. At least thirty (30) working days prior to providing such notice, the Party initiating the termination shall consult with the other Party regarding its intent to terminate the Trust Agreement.

D. The Trust Agreement shall also be terminated upon occurrence of any event that leads to such termination in accordance with the laws of the State of Colorado.

E. Upon termination of the Trust Agreement, the Trust Estate shall belong to the Settlor and the Trustee shall act at the instruction of Settlor to take all reasonable actions immediately necessary to return the Trust Estate and management thereof to the Settlor.

XV. Rule Against Perpetuities. If it shall be determined that any provisions of the Trust Agreement violates any rule against perpetuities or remoteness of vesting now or hereafter in effect in a governing jurisdiction, the affected portion of the Trust Estate shall be administered as provided in this Trust Agreement until the termination of the maximum period allowed by law at which time and forthwith such part of the Trust Estate shall be removed from the Trust and returned to the quiet possession of the Settlor.

I certify that I have read the foregoing Trust Agreement and it correctly states the terms and conditions under which the Trust Estate is to be held and managed by the Trustee.

Dated as of the date set forth above.

SETTLOR, BOARD OF COUNTY COMMISSIONERS
OF PITKIN COUNTY:

_____
By: _____
Its: _____

ATTEST:

_____
By: _____
Its: Secretary

_____
[Trustee]

Exhibit A-1
Description of Trust Estate – Stapleton Brothers Ditch Water Rights

Name	Decree	Source	Amount
Stapleton Brothers Ditch	99CW306	Roaring Fork River	4.3 cfs (119.25 AF/yr)

Exhibit A-2
Description of Trust Estate – Remaining Water Rights

Name	Decree	Source	Amount
Cramer Ditch, Original Construction	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, First Enlargement	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, Second Enlargement	C.A. No. 132	Sopris Creek	0.143 cfs
Cramer Ditch, Third Enlargement	C.A. No. 3082	Sopris Creek	0.143 cfs
Cramer Ditch (aka Beard Ditch)	W-867	Sopris Creek	0.143 cfs
Cramer Ditch (aka Beard Ditch) (appropriation date 8/25/1961)	W-867	Sopris Creek	0.143 cfs
Cramer Ditch, Fourth Enlargement	W-3414	Sopris Creek	0.143 cfs
Home Supply Ditch, Original Construction	C.A. No. 132	Roaring Fork River	0.5 cfs
Home Supply Ditch, First Enlargement	C.A. No. 2811	Roaring Fork River	0.5 cfs
Home Supply Ditch, Second Enlargement	C.A. No. 3082	Roaring Fork River	0.5 cfs
Home Supply Ditch (alternate point of diversion)	W-1801	Roaring Fork River	0.5 cfs
U.S. Green Ditch No. 2	C.A. No. 4033	Unnamed tributary of the Roaring Fork River	1.0 cfs[1]
U.S. Green Ditch No. 1	C.A. No. 4033	Wheel Barrow Gulch	1.0 cfs[2]
J.H. Smith, Warren Creek Ditch No. 1	C.A. No. 4033	Warren Creek	1.5 cfs[3]
U.S. Green Ditch No. 1	C.A. No. 4033	Wheel Barrow Gulch	2.0 cfs[4]
Wilke Ditch	C.A. No. 2136	Crystal River	1.2 cfs
Crystal River Hot Spring Cooling Water Diversion and Pipeline	87CW202	Crystal River	0.5 cfs

[1] May require cooperation with Aspen Center for Endowment Studies.
[2] 1.0 acre-foot per year of historic consumptive use leased to James Hunting until 2038.
[3] Owned in joint tenancy with City of Aspen.
[4] Owned in joint tenancy with City of Aspen.

Name	Decree	Source	Amount
Crystal River Hot Spring and Pool (aka Granite Hot Springs Nos. 1-4)	87CW202	Geothermal groundwater and surface water tributary to the Crystal River	0.01 AF
Low Line Ditch, Original Construction	C.A. No. 1007	Crystal River	1.538088 cfs
Mautz Spring and Mautz Ditch Nos. 1 and 2	C.A. No. 4033	Mautz Spring is the source for the Mautz Ditch Nos. 1 and 2, along with snow, rain and waste water that run into said spring and ditches	2.0 cfs
John Stern Ditch No. 1	C.A. No. 5884 W-3103	Waste and seepage water	0.5 cfs
Jote Smith Ditch, Original Construction	C.A. No. 132	Brush Creek	0.72 cfs
Jote Smith Ditch, First Enlargement	C.A. No. 132	Brush Creek	0.25 cfs
Cozy Point Ditch, Original Construction	C.A. No. 132 92CW007	Brush Creek	0.19 cfs
Cozy Point Ditch, First Enlargement	C.A. No. 3723 92CW007	Brush Creek	0.24 cfs
Upper Wiese Ditch	C.A. No. 2689 92CW007	Brush Creek	0.20 cfs
Upper Wiese Ditch (appropriation date 9/1/1936)	C.A. No. 3723 92CW007	Brush Creek	0.62 cfs
Cozy Point Pond	88CW479 93CW003	Brush Creek	2.0 AF
Stapleton Ditch	C.A. No. 132	Owl Creek	2.0 cfs
Stapleton Ditch, First Enlargement	C.A. No. 132	Owl Creek	0.8 cfs
Bivert Ditch	C.A. No. 132	Owl Creek	0.5 cfs
Bivert Ditch, First Enlargement	C.A. No. 132	Owl Creek	1.0 cfs
Walthen Ditch	C.A. No. 132	Woody Creek	3.0 cfs
Walthen Ditch, First Enlargement	C.A. No. 132	Woody Creek	3.2 cfs

Exhibit B
Notice of Withdrawal

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

Re: Pitkin County Revocable Water Rights Trust – Notice of Withdrawal

Dear Linda:

Pursuant to Section IV.C. of the Pitkin County Revocable Water Rights Trust Agreement, Pitkin County is hereby providing notice of its intent to withdrawal water rights from the Trust Estate. The following water rights will be withdrawn from the Trust Estate:

Name	Decree	Source	Amount

As required by Section IV.C. of the Trust Agreement, Pitkin County contacted the CWCB at least 30 days prior to this notice to discuss the withdrawal of the water rights specified above. Upon receipt of this letter, the CWCB shall immediately cease the use of the water rights specified above for instream flow purposes.

Sincerely,

John M. Ely
Pitkin County Attorney

Exhibit C
Notice of Addition

Linda J. Bassi
Chief, Stream and Lake Protection Section
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203
Fax: (303) 866-4474

Re: Pitkin County Revocable Water Rights Trust – Notice of Addition

Dear Linda:

Pursuant to Section IV.D. of the Pitkin County Revocable Water Rights Trust Agreement, Pitkin County is hereby providing notice of its intent to add water rights from the Trust Estate. The County wishes to add the following water rights to the Trust Estate:

Name	Decree	Source	Amount

As required by Section IV.D. of the Trust Agreement, we must obtain CWCB approval to acquire the water rights specified above as required by Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program. Please contact me at your convenience to begin the approval process.

Sincerely,

John M. Ely
Pitkin County Attorney

Tab 2
Exhibit U

EXHIBIT U
Pitkin County

Pitkin County Strategic Plan

STRATEGIC STATEMENT and GOALS
July 1, 2008
INTRODUCTION

Pitkin County has developed a Strategic Plan in order to appropriately allocate resources and act responsibly. The Plan strives to identify what is important in our community, both in terms of problems and opportunities. We believe that this Plan will help our community accommodate divergent interests and values, and foster wise decision-making. The County supports these values by providing services that meet the expectations of our citizens, by preserving and enhancing what we identify as important, and by developing strategies that will promote a balance between economic sustainability and quality of life. Our community survey of our local residents, business owners and visitors identified common values in the areas of environmental quality and recreational opportunities. A search for safer neighborhoods, protected access to public lands, and enviable cultural and recreational assets are some reasons why people live in and visit Pitkin County, and the Roaring Fork Valley.

Without a vision and plan, struggles between local government and its constituents will only intensify. New resources are increasingly scarce, and competing services will continue to vie for every budget dollar. There is the real threat that decisions will be made reactively, in the face of the latest disruptive issue. Protection of an economy could cause us to overlook protection of a community, and our neighbors. Our history for caring about our environment, our youth, our elderly, and our less fortunate, could be at risk. As a result, we could quickly move away from a mentality of stewardship, service and generational values, and instead be placed in the inevitable position of reacting to crisis. This Plan provides our community with a map for the allocation of organizational resources in order to best meet the goals of each strategic issue. As an organization, we are tasked with the implementation of the Plan. In order to best meet this responsibility, our organization is moving toward cultural goals of community and organizational integration and interaction, and promotion of innovative and creative problem-solving with an emphasis on accountability and responsibility for our decisions and actions.

Today, Pitkin County is a wonderful place to live, raise families, and be active. Our lives and community have certainly changed, but in almost everyone's eyes, it is a special place to live and visit. The time to plan responsibly for our future is now. It is our hope that this Plan will help us preserve what is important, and promote what we can to sustain a high quality of life. Our perspective is one of seven generations; sustaining a community that we want to live in and one we will be proud to pass onto our children.

Through extensive analysis we have identified nine specific areas that demand attention from us in order to enhance and protect our future. These strategic issues, not in any particular order, are as follows:

1. Growth
2. Regionalism
3. Regional Transportation
4. Workforce Housing
5. Environmental Protection
6. Safe and Healthy Community
7. Community Involvement
8. Organizational Excellence
9. Fiscal Sustainability

GROWTH

Strategic Statement: Pitkin County will continue to actively plan for and manage growth in our County. Reflecting the community's desired level and composition of growth, Pitkin County will facilitate responsible change which fosters a healthy and economically viable community while maintaining a sustainable balance with our natural resources (air, water, land, wildlife). Goals for achieving a responsible growth strategy overlap with many regional and neighborhood issues addressed elsewhere in this Plan.

Background: The people of Pitkin County, indeed the entire Roaring Fork Valley, are clearly as concerned about growth today as they were 25 years ago. In fact, growth is consistently among the top public concerns in Pitkin County. Preserving the incredible natural environment and community character have been primary goals expressed in public forums, surveys and election results.

Growth as a strategic issue is admittedly complex. Growth includes both positive aspects that contribute value to the community and negative aspects that can decrease the quality of life for residents. Genuine planning and policy development have occurred on many levels including the completion of a comprehensive plan for the entire county through the use of neighborhood master plans. Today, we recognize that articulating certain fundamental policies that apply countywide, and setting clear directions are helpful for caucuses, citizens, and planners. Thus, the BOCC has adopted a county policy plan and has produced The Pitkin County Guide to Rural Living. The higher rate of growth outside of Pitkin County creates land use and social challenges for the entire Roaring Fork Valley therefore it is critical that Pitkin County works together with other jurisdictions and in community partnerships on regional growth issues.

Our primary purpose for addressing growth as a strategic issue is its direct link, by citizens and elected officials, to maintaining a high quality of life. Growth affects our lives in socio and economic ways - environment, people and character. Growth issues are key to how livable our community will be in the future. Growth directly and indirectly affects the overall public health issues in our community. Through this strategic plan, we recognize that community decisions must take into consideration a full range of growth alternatives, based upon accurate information and data. Growth decisions today affect our ability to be fiscally responsible to our citizens; therefore we must understand the relationship of growth, the environment, infrastructure, economic forces and transportation planning.

We also recognize that different growth strategies are necessary for different areas of Pitkin County. Our master plans, along with the master plans of other Roaring Fork Valley jurisdictions identify urban growth areas and rural areas. The strategies that we use to accomplish our growth management goals in each area will vary depending upon each unique community and the how that growth changes the composition of our communities.

Goals:

1. Establish a County Growth Policy.
2. Utilize Neighborhood Master Plans and overall County Land Use Policies to direct Land Use decisions.
3. Work in conjunction with regional planners and elected officials. Promote recognition that land use and growth decisions made in individual jurisdictions will affect the region. Strive

to promote opportunities for regional dialogue around issues of mutual concern and interest. As stated in the Regionalism section, more commonalties than differences exist throughout the valley and region.
4. Create forums for community dialogue and education to occur around the issues of growth, environment, affordable housing, and transit oriented development and community health.
5. Create region wide policy plans around community issues. Look for ways to meld housing, growth and transportation planning into a comprehensive strategy that emphasizes the need for growth to be sustainable.
6. Ensure that public safety operations keep up with the pace of growth in order to maintain a safe and responsive community in which to live, work and recreate.

REGIONALISM

Strategic Statement: Pitkin County will work with citizen groups and other jurisdictions in order to identify a shared vision(s) for the region. We recognize and respect that different, yet coordinated, approaches are necessary for various areas of the region. Pitkin County will actively seek opportunities to participate with regional partners in order to address region wide issues such as rivers, landscapes and economies.

Background: With growth of recent years and the expected growth over the next decade, providing mandated and desired services has become increasingly complex. . As a region we must understand the relationship of growth, the environment, infrastructure, economic forces and transportation planning.
Regional relationships have the power to provide guidance and assistance for day-to-day County administrative and operational issues. Regional partnerships can provide a consolidated and powerful voice in state and federal initiatives and when there is a need to respond quickly to federal, state and private grant opportunities.

In recent years there have been a number of regional successes such as coordinated transportation, trails, open space, coordinated technology and software for specific common function, water issues and sharing of information regarding common operations. Continuing to build upon these successes will help us move forward on additional fronts. As a region, we share more similarities than differences. Recognizing what we have in common is a key first step.

Goals: In addition to building relationships, we have identified several key goals for succeeding. They include:

1. Alliance with regional partners: Develop regional relationships and alliances with an emphasis on education and resolution of old biases and attitudes;
2. Develop broad regional policies: Identify stakeholders based upon the specific issue;
3. Regional efficiencies: Promote financial efficiencies in regional work by utilizing existing organizations whenever possible;
4. Shared Vision: Identify common issues and work towards a shared vision and action plan for the region. This may be accomplished issue by issue in order to protect and improve the quality of life for community members.

REGIONAL TRANSPORTATION

Strategic Statement: Pitkin County's role in transportation efforts is to work regionally to solve highway congestion problems and identify and implement viable transportation alternatives that will meet the County's needs and ensure quality of life. Additionally, the County will actively manage the Airport in a manner that encourages commercial service that meets the needs and character of the community.

Background: National transportation studies demonstrate that vehicle miles traveled (VMT) have increased at a rate much greater than population growth. This has been especially true in the Roaring Fork and Colorado River Valleys. In 1993, elected officials of Pitkin County, the City of Aspen, and the Town of Snowmass Village passed a resolution to hold vehicle traffic entering Aspen to 1994 levels (approximately 25,000 vehicles per day). Transportation Demand Management methods, assisted by the economic down turn in 2001, have been successful in helping traffic levels stay below this maximum. Recently, however, this traffic volume standard has been exceeded during peak travel times during the summer months.

The Colorado Department of Transportation (CDOT) also adopted the premise of limiting vehicle traffic into Aspen in the State Highway 82 Basalt to Buttermilk and Entrance to Aspen (validated in 2006) Record of Decision. These Federally approved documents mandate multi-modal improvements to solve congestion problems. High-capacity transit facilities will be critical to providing capacity for the forecasted person-trips in 2015 and beyond.

The Aspen/Pitkin County airport plays a major role in offering access into the Roaring Fork Valley. It is the 4th largest airport in Colorado, as measured by passenger traffic. Approximately forty percent of visitors arrive through the Aspen/Pitkin County Airport with most others arriving by ground transportation. The County is improving the Airport's accessibility to make it more convenient and reliable through major investments in capital improvements. Pitkin County has utilized grants through the Federal Aviation Administration to make over $45 million in safety and efficiency improvements in the past 4 years. Over $80 million in additional improvements will be undertaken by 2011 to make the Aspen/Pitkin County Airport one of the finest facilities in the country.

The Regional Transportation Section of the Strategic Plan addresses transportation planning efforts required in order to provide transportation planning and services in a regional context. State highway improvements, multi-modal transit facility expansion, and capital improvements at the Aspen/Pitkin County Airport will provide services required to support the Roaring Fork Valley.

Goals:

<u>Category: Transportation Mobility</u>

1. Support the Roaring Fork Transportation Authority as the regional entity to create a transit system that offers residents, work force commuters, and visitors responsible and safe transportation alternatives to enhance mobility, quality of life, environmental quality and economic sustainability.
2. Promote the completion of the Entrance to Aspen highway and transit improvements.
3. Provide commuting transportation options for employees.

Category: Transportation Planning

1. Lead Intermountain Transportation Planning Region and continue to secure funding and statewide priority for the five county intermountain region.
2. Provide funding necessary to sustain safe, efficient, and high-quality County Roads.

Category: Transportation and Air travel Interface

1. Regularly update airport master plan to ensure that design and construction of new airport facilities can match community expectations and involve environmental sensitive practices to the extent practical.
2. Pursue opportunities that improve quality and reliability of air service into the airport.

WORK FORCE HOUSING

Strategic Statement: Pitkin County will create and protect affordable housing for its citizens. Pitkin County, in association with the larger valley wide community, is committed to participating in affordable opportunities for all the employees of the Roaring Fork Valley, which contribute to the health of the social and economic fabric of the Roaring Fork Valley.

Background: Everyone has a basic desire to build a life in a community. This might mean having a family, building a home, creating a business or making a contribution to the larger community. The human character of a community is formed by the lives constructed by its members. The more people are able to participate in the life of a community, the more diverse and healthy that community will be. The unique human character if Pitkin County is largely a result of the many people who have built lives here. The Human character of Pitkin County in the future will largely be composed if the lives built by its present and future residents.

Decent affordable housing is necessary to make it possible for people to live in a community over a long enough time to build a life. Without the assurance of a stable place to live, people will not be able to create their own full life in this valley. The cost and affordability of housing in the Roaring Fork Valley makes it difficult for people to begin a life here. As long time members of the community leave, their homes are financially unattainable for the local workforce.

Pitkin County believes it is important to be leaders in the effort to make affordable housing available to the existing and future people who make up this community and who would otherwise not have the opportunity to construct a life here.

Goals:

1. Promote the collaborative involvement of all jurisdictions, the private sector, and special districts throughout the Roaring Fork Valley, towards the creation of affordable housing;
2. Preserve existing affordable housing to the extent possible;
3. Promote the creation of a diversity of housing types in order to ensure affordable housing for a range of individuals and families;
4. Encourage the development of affordable housing in association with sound community planning in Pitkin County and throughout the Roaring Fork Valley;
5. Create quality, energy efficient and sustainable housing design.

ENVIRONMENTAL PROTECTION

Strategic Statement: Pitkin County will preserve and protect the integrity of the Roaring Fork watershed and all of its natural resources. Ecological health will be a priority in our decision making and we will advocate its importance in the decision making of others.

Background: Pitkin County is committed to preserving and protecting the integrity of the Roaring Fork watershed and all of its natural resources. The County's commitment is driven by both the desires of its residents, who ranked the preservation and protection of the environment and open space and trails very high in *The 2004 Pitkin County Community Survey*, and the need to sustain a healthy recreation-based economy.

Since 2004, the County has taken several steps to strengthen its ability to manage growth and minimize environmental impacts. It completed a comprehensive rewrite of the *Land Use Code*, updating and strengthening its environmental standards. It secured voter approval for continued funding and expansion of the Open Space and Trails Program, the first on the Western Slope, which now has the ability to acquire water rights independent of land acquisitions. It created a new Environmental Health & Natural Resources Department, with personnel to focus on pressing water resource issues. The County is moving rapidly to respond to the public's directive.

Near term, the County will focus on the following:

Protection of Water Quantity and Quality

As a headwaters community already subject to trans-mountain diversions, preservation and protection of the quantity and quality of the County's remaining water resources is of paramount importance. Years of drought, coupled with the increased demand for water associated with growth on both the Front Range and in the Colorado River Basin, will make this a significant challenge for all of the Western Slope's headwater communities in the years ahead. In the County itself, changes in the way our population uses its water (*e.g.*, decreasing irrigation and increasing domestic use), increasing levels of non-point source water pollution (*e.g.*, storm water runoff, poorly-maintained onsite wastewater treatment systems) and emerging contaminants (*e.g.*, hormone supplements) must be addressed. Additionally, it is becoming increasingly important that our land use decisions ensure that new development occurs only where and when it is supported by a sustainable water supply.

Protection of Air Quality; Promotion of Energy Efficiencies

The launch of *The Canary Initiative* by the City of Aspen in 2006 elevated public awareness of the air pollution problems in our own community. Vehicular traffic and general and commercial aviation traffic at the Aspen-Pitkin County Airport are among the highest contributors to greenhouse gas emissions in our valley. Pitkin County is committed to working with other members of our mountain community to achieve energy efficiencies and to prevent or reduce air quality impacts associated with new development and increasing levels of air and vehicular traffic in the Roaring Fork Valley.

Open Space and Habitat Preservation and Restoration

Preservation and enhancement of County-wide open space and trails will continue to be a priority. Our successful land acquisition program will remain focused on four basic values: (i) habitat, (ii) recreation, (iii) scenery, and (iv) historic agriculture, while adding a fifth element – protection and preservation of stream flows and aquatic habitat. Through our acquisition program, as well as increased attention to stewardship of lands in our inventory, we will continue to look for opportunities to improve access to public lands and to manage adjacent properties in a manner that preserves the integrity of native wildlife habitat, our surrounding wilderness areas, and other public lands. Conservation of the remaining productive agricultural land and its water rights will be of utmost importance. Restoration and perpetuation of our native wildlife and native plant diversity will continue to be stressed in both our land use decisions and acquisitions.

Regional Activism on Environmental Issues

Pollution and environmental degradation do not respect jurisdictional boundaries. Pitkin County's air quality is affected by energy development occurring elsewhere in the state. Water levels in Ruedi Reservoir and the Fryingpan River fluctuate in response to "calls" to satisfy the requirements of downstream water users on the Colorado River. New trans-mountain diversions are threatened without implementation of water conservation and reuse on the Front Range. Improperly managed growth in neighboring communities degrades wildlife habitat and scenic values, hinders the continuation of agriculture, and destroys regional trail connections. Pitkin County will continue to play an active role in efforts to move industry and other governmental entities toward progressive environmental policies, as well as demanding compliance and enforcement of existing regulations designed to protect environmental quality.

Goals: The County has established the following goals in order to meet its strategic plan for environmental protection.

Category: Protection of Water Quantity and Quality

1. Preserve and protect watershed integrity and water availability and sustainability. Within legal and economic constraints, independently acquire land, conservation easements and water rights. Where prudent, utilize County water rights to enhance instream flows. Support studies designed to quantify the Roaring Fork watershed's environmental and recreational non-consumptive water use needs, as well as the economic value of the non-consumptive use of water to support more informed decision making.
2. Ensure that authorized development does not exceed the carrying capacity of the land. Make ecological health a priority when evaluating the need for further development. Require new and existing development to avoid, or fully mitigate for adverse environmental impacts.

Category: Protection of Air Quality; Promotion of Energy Efficiencies

1. Through our own actions, including procurements, as well as in County policies and regulations, make the control, prevention, and abatement of air pollution a priority.
2. Through our own actions, including procurements, as well as in County policies and regulations, promote the use of renewable and efficient energy, recycling, and solid and hazardous waste reduction, whenever feasible.

Category: Open Space and Habitat Preservation and Restoration

1. Preserve and protect open space and trails and important wildlife habitat. Within legal and economic constraints, independently acquire land, conservation easements and water rights to further this effort.

Category: Regional Activism on Environmental Issues

1. Aggressively participate in local, regional and statewide organizations, as well as statutory, regulatory and contractual initiatives (*e.g.*, intergovernmental agreements) to pursue cooperative solutions to water-related and land management issues, and so as to have the greatest influence on environmental matters of key concern.

SAFE AND HEALTHY COMMUNITY

Strategic Statement: Pitkin County is committed to the mutual pursuit of a peaceful, safe, and healthy environment that promotes meaningful standards of rural mountain resort living for all.

Background:
Pitkin County residents value a strong sense of community and pride themselves on being supportive of each other while respecting individual decisions. Living and/or working in a rural mountain resort community is a choice that requires extra effort and some tradeoffs from everyone. Our community respects and embraces the variety of experiences, expectations and diversity of background we find here. We have repeatedly found that while there are unique differences in life experiences here, we are bound together by common values of scenic/visual quality and recreational activities. It is in working together with people from a variety of different backgrounds that brings us the sense of safety and richness of living that we have created here.

We strive to work with an informed citizenry to be proactive in the identification of individual and community health and safety issues, the development of functional partnerships, the identification of credible funding sources and the establishment of sustainable community solutions. We value a team approach to finding solutions, and work to coordinate local and regional communication and collaboration between the public/private sectors so that community needs are being met in creative ways.

We are guided by constitutional, community and professional standards to respect human dignity and provide the highest level of health and public safety services to people who live, work and play in Pitkin County.

Goals:

1. Pitkin County residents, employees and visitors will live in a safe, secure and healthy environment.
2. People have access to services they value to lead a safe and healthy life.
3. Poverty and other barriers to individual and community life satisfaction will be diminished.
4. People have access to information to lead rich and productive lives.

5. Pitkin County health and safety staff will successfully partner with other public, private and non-profit entities (locally, regionally and nationally) to meet community needs and expectations.
6. Maintain a secure and healthy detention facility with humane treatment in a proactive, direct supervision community jail environment.

COMMUNITY INVOLVEMENT

Strategic Statement: Pitkin County will actively seek Community Involvement by creating and maintaining opportunities to engage, include, and incorporate caucus, neighborhood, municipalities, interest groups and individual participation, interests and feedback. Pitkin County will honor and respect these opportunities while continuing to work to balance and protect community visions and mandates. As a result we will make all County services accountable to our customers and establish a higher value of our services.

Background: According to a study conducted nationwide of citizens, the research indicated citizens:

- Want to be listened to by their elected and appointed officials
- Want to share the responsibility for problem solving
- Want a sense of belonging to a community

Pitkin County intends to change the focus of how citizens are connected with government by creating new roles for citizens, local officials, and administrators. And this change in emphasis from government institution-centered to citizen-centered means:

- Developing successful mechanisms for prompt, accurate and open information sharing
- Supporting more citizen-driven problem solving
- Empowering citizens by identifying commonality of beliefs and interests
- Looking to citizens as leaders sharing the decision-making process
- Encouraging citizens to take the lead in solving community problems
- Inviting citizens to become partners with local governments.

Building a sense of community requires fostering a sense of bonding and connection among citizens (adults and youth) and nurturing a feeling of civic pride. Citizens who feel rooted to their community – often through their neighborhoods, schools, and civic associations – are motivated to become active in public life and to share more readily in the responsibility of caring for the community and resolving the issues or problems that threaten it.

Goals:

1. Pitkin County will have strong relationships with all segments of the community
2. Pitkin County will build awareness of county-wide issues and programs through the web, radio and television broadcasting, and regular productions resulting in informed involvement of citizens.
3. Successful public processes allow individuals, neighborhoods, interest groups and planning areas to participate in problem identification, problems solving and policy development.

4. Healthy relationships with the media result in positive, consistent and proactive coverage of county projects and issues
5. Citizens are repeatedly asked for feedback on customer service and provide positive feedback.

ORGANIZATIONAL EXCELLENCE

Strategic Statement: The community depends on Pitkin County to be responsible stewards of the public trust. Pitkin County will do everything responsibly within our means to utilize public resources efficiently, ethically and intelligently.

Background: In order to implement the tasks and measures called for within the Strategic Plan, Pitkin County must be as integrative, innovative, and productive as possible. The provision of public stewardship and a service ethic are increasingly important. This strategic issue focuses upon those actions, goals and tasks that we must continue to promote in order to serve responsively our community. The specific areas identified as essential components of Organizational Excellence are: Services, Human Resources, Technology, Facilities and Organizational Development.

Services:
Pitkin County provides mandated and essential public services to its citizens in an efficient and ethical manner. We take pride in our service role in the community and our responsibility to protect the public's assets. We strive to perform our duties in a way that creates transparent government administration and establishes public trust in our work. We strive to provide all services and information in a fair and equitable way that gives our citizens equal access. We work to improve our administrative processes so that mandated and essential functions can be provided effectively and are valued in the community. We strive to always perform quality work so our citizens take pride in their government and trust services are provided with truth and honesty.

Human Resources:
Pitkin County strives to maintain a high quality workforce. To this end Pitkin County works to promote personal and professional growth, creativity, innovation, integration, honesty, risk-taking, and incentive programs in a culture of public service and stewardship. We must also advocate a positive, responsible image of our public service to the citizens of Pitkin County.

Currently, there is strong cultural momentum towards a more open system of communication with both the ability of individuals to access information as required as well as a more participatory approach of sharing information in decision making. The County must be willing to adapt our management practices and programs in a way that motivates and acknowledges the needs of our workforce; the main challenges being maintaining competitive wages and benefits and creating affordable workforce housing. We must also continue to monitor those needs to track and changes as we move into the future to maintain the commitments of our employees. As vacancies in the organization occur opportunities will surface for restructuring departments to build on the strengths and goals of today's employees. Understanding and acknowledging turnover transience in the workplace can help to position the County into the best possible recruitment and retention position.

Technology:
Pitkin County strives to provide quality service to the public through access to accurate, relevant information in a timely manner. Capabilities have been expanded to allow the public interactivity on demand through increased Internet based systems. In order to advance technology in the County the position of Technology Coordinator was created and tasked with ensuring the cost-effective acquisitions, implementation and use of technology and management of technology projects throughout the County.

Facilities:
Pitkin County has "made do" for the last decade, fitting increasing numbers of staff, programs and services, storage and equipment into the space that was designed to meet requirements long since surpassed. The existing decentralized facilities have created inefficient operations and have hampered the ability to provide good customer service. These facilities have suppressed interpersonal creativity in problem solving and reduced the ability for multi-department innovation. Because the County has been resourceful, tolerant of less than ideal working conditions, and able to maintain basic services to the public, there has been little publicity given to the space shortages. However, the conditions have become so critical that the County completed a study that looked at ways to alleviate the immediate, significant space deficits and developed ideas to meet long-term needs over the next twenty years. Interestingly, when surveyed, the Public indicated that they too feel that virtually all County facilities are short on space.

Organizational Development:
The County promotes a proactive and participatory approach as it works to meet the needs of our community within our economic constraints. We must be an organization that supports seeking efficiencies, enhancing revenues and promoting community involvement. We strive to address change in a strategically effective manner so that Pitkin County is a better place to work, while providing more benefits to our citizens.

Goals: In order to succeed in these efforts, we have set the following goals:

<u>Category: Services</u>

1. Provide mandated and essential services effectively and efficiently.

<u>Category: Human Resources</u>

1. Maintain competitive compensation levels, benefit plans and workforce housing options that are valued by employees in order to continue to recruit and maintain a highly qualified and motivated workforce.
2. Develop a comprehensive affordable workforce housing plan to assist with the recruitment and retention of employees.
3. Provide employees with a supportive work environment that promotes excellence in customer service and stewardship through professional development.

<u>Category: Technology</u>

1. Develop and maintain efficient and effective use of technology to improve work processes and provide excellent customer service.

Category: County Facilities

1. Design and build centralized facilities that will allow the County to provide high-level customer service with operational efficiency, promote innovation and team building across County Departments, provide functional public meeting space, and allow the County to meet the needs of expanding customer service requirements.
2. Ensure facilities are renovated and constructed as environmentally responsible as practical.

Category: Organizational Development

1. Respond to the needs of our community and our organization through an open, integrative, and participatory approach to achieve innovative, creative and effective initiatives.
2. Maintain an effectively and efficiently structured organization to ensure utilizing resources to their fullest.

FISCAL SUSTAINABILITY

Strategic Statement: Pitkin County will develop revenue sources and partner with other entities to (1) ensure that growth and change pay their way, (2) fund achievement of the Strategic Plan's goals, and (3) financially sustain services valued by the community. While maintaining an internal focus on efficiency and productivity, we will increase our external focus on public and partner involvement.

Background: A major financial challenge for the County is that expenditures are forecast to increase more rapidly than revenues resulting in annual budget deficits beginning in 2010. In addition, the County has insufficient resources to meet its goals of improving and centralizing its facilities and providing housing opportunities for 60% of the workforce in Pitkin County.

From 2002 through 2005 the County's General Fund costs increased by 5.8% annually but revenues increased by only 4.4%, resulting in a structural annual deficit of 1.4%. Even if the significant increases from this period in the cost of utilities, asphalt, fuel and health insurance do not continue, wage increases are likely to exceed the rate of revenue increase. The upward pressure on wages is the result of not enough affordable housing in the Roaring Fork Valley and increasing job opportunities closer to more-affordable housing in the western Colorado River Valley. With wages and benefits comprising 60% of the General Fund budget, this forecast alone is sufficient to continue the structural deficit.

The County's residential growth exacerbates the problem because it does not generate enough revenue, given the County's current revenue structure, to cover the cost of the County services required. Although commercial growth more than covers its cost for County services, it does not provide affordable housing for the entire workforce it requires.

Although a focus on efficiency and productivity has reduced the structural deficit to date, it will not eliminate it, so the County now needs to focus more on revenue growth. The current options for increasing revenues are limited to fee increases for some services and voter-approved property or use tax increases. To develop new revenue sources will require enabling state legislation and maybe even changes to the state constitution. Since most of our revenue

opportunities are dependent on legislation and voter approval, it will be critical for us to involve the community in our efforts.

Goals: To accomplish our strategic statement, we will pursue the following goals:

1. Develop revenue and partner with other entities to sustain services.
2. Develop revenue to ensure that growth and change pay their way.
3. Develop revenue and partner with other entities to fund achievement of the Strategic Plan's goals.
4. Involve the community and partners in valuing our services and developing revenues.
5. Maintain an internal focus on efficiency and productivity.
6. Promote a stable and sustainable local economy.

July,2008

Tab 2
Exhibit V

EXHIBIT V
Pitkin County

PITKIN COUNTY OPEN SPACE AND TRAILS PROGRAM
STATEMENT OF POLICIES AND OBJECTIVES

INTRODUCTION

On November 4, 1990, Pitkin County voters approved a citizen initiative establishing the Pitkin County Open Space and Trails Board of Trustees and authorizing the program to raise funds through a property tax and bonds through November 4, 2000. Pitkin County Resolution #90-93 enabled the Open Space and Trails Board to "establish acquisition priorities and recommend management guidelines and other relevant policies and procedures to guide the expenditure of open space and trails funds".

This statement of the Open Space and Trails Board's General Objectives and Policies provides that guidance. The Board presents this document to its constituents, the residents of Pitkin County, hoping both to inform and involve those who will benefit most from the Open Space and Trails program's accomplishments.

ACQUISITION OBJECTIVE

For the benefit of Pitkin County residents and visitors, and with the recommendation of the Open Space and Trails Board, the Pitkin County Commissioners will acquire appropriate property rights to the maximum feasible amount of new open space and trails throughout Pitkin County.

ACQUISITION POLICIES

Acquisition Policy #1 - Mission

The mission of the Pitkin County Open Space and Trails program is to acquire, preserve, maintain and manage open space for multiple purposes including, but not limited to, recreational, wildlife, agricultural, access, and scenic purposes and to acquire, preserve, develop, manage and maintain trails for similar purposes.

Acquisition Policy #2 - Geographic Balance

The Open Space and Trails Board attempts, through its purchase recommendations to the Pitkin County Commissioners, to allocate the taxpayer's funds for new open space and trails in balanced proportions throughout the County. Emphasis is placed on serving the needs of the County's residents recognizing that, in so doing, the tourism sector will also benefit. The Open Space and Trails Board recommends acquiring property outside the County only when such an acquisition clearly compliments and improves the County's open space or trails system.

Acquisition Policy #3 - Planning

Stewardship practices seek to preserve and enhance the ecological, scenic, recreational and cultural values of the open space and trails acquired by the Open Space and Trails program.

STEWARDSHIP POLICIES

Stewardship Policy #1 - Management Plans

The Open Space and Trails Board encourages the participation of the seller, nearby property owners, local jurisdictions, and the general public, in the preparation of long-range management plans. Each plan will formulate a site-specific, balanced stewardship approach to the preservation, improvement, and use of 1) ecologically sensitive land and water resources, 2) wildlife resources, 3) visual resources, 4) cultural resources, 5) recreational resources, and 6) agricultural uses. Potential impacts of a plan's implementation on adjoining private property, adjoining public lands, and the affected community will be identified for monitoring. Each management plan will address public safety issues, public education about the property, long-term maintenance budgeting, and management accountability.

Stewardship Policy #2 - Appropriate Improvements

The Open Space and Trails Board has adopted appropriate design guidelines for trails, trailhead facilities, and other physical improvements to its properties. These guidelines balance initial cost and quality with long-term maintenance expenses and strive for compatibility with other improvements already in place. The physical impacts of trail development and use are of utmost concern in the planning and construction of new trails, and in their maintenance and management.

Stewardship Policy #3 - Neighborliness

Being a good steward of the land means being a good neighbor. Every reasonable effort is made to minimize or eliminate the impacts of trespassing, litter, noise, fire hazard, livestock harassment, or other inappropriate behaviors on neighboring land owners.

Stewardship Policy #4 - Retain Agricultural Lands

It is the policy of the Open Space and Trails Board to cooperate with the county's agricultural community in strategies designed to retain and continue production on the large tracts of farm and ranch lands which provide important open space buffers between the communities of the Roaring Fork and Crystal River valleys. As a corollary policy, the Board also supports the responsible use of public lands for agricultural and ranching purposes.

Stewardship Policy #5 - Public Use

Public use of properties purchased by the Open Space and Trails Board will vary according to the terms of the purchase and the management plan. Easements may be acquired on private land which prevent future development and preserve open space but do not allow the public physical access to the land. Other properties may be purchased in order to protect essential wildlife habitat or threatened ecosystems. Trail acquisitions may restrict modes and periods of public use. Public use rules for each property are determined on a case-by-case basis within the context of the management planning process.

ADVOCACY OBJECTIVE

Through joint planning and acquisition efforts, and through the County's land use approval process, the Open Space and Trails Board actively performs its role as the public's advocate for trails, for the preservation of open space, and for access to public lands.

ADVOCACY POLICIES

Advocacy Policy #1 - Joint Projects

The Open Space and Trails Board seeks opportunities to cooperate with other local governments, state and federal agencies, and with not-for-profit organizations in projects which meet the Open Space and Trails Program's acquisition criteria and which maximize the potential to acquire open space and trails. For instance, the Open Space and Trails Program may provide acquisition funds which complement development and management resources provided by another agency. The Open Space and Trails Board is prohibited, by its legislation, from transferring property ownership to another agency or entity without voter approval.

Advocacy Policy #2 - Activism

The Open Space and Trails Board is charged with representing the public's interest in open space and trails within the context of county government. The Board may act as a referral agency which reviews land use proposals under County jurisdiction and recommends appropriate open space or trail dedication plan elements to the Planning & Zoning Commission and to the County Commissioners. The Open Space and Trails Board lends its support to the efforts of other organizations whose goals and actions are consistent with the goals of the Open Space and Trails program.

Advocacy Policy #3 - Joint Planning

The Open Space and Trails Board seeks opportunities to contribute to the formulation of open space and trails plans being prepared for the Pitkin County area by other local agencies and organizations which could contribute to the achievement of the Open Space and Trails program's goals.

PERFORMANCE AND EFFICIENCY OBJECTIVE

The Open Space and Trails Board strives always to protect and husband public resources, foster public objectives, and elicit public trust and confidence through efficient and effective performance.

PERFORMANCE AND EFFICIENCY POLICIES

Performance Policy #1 - Staffing

The Open Space and Trails program will keep administrative costs low by operating the program with the minimum staff required to efficiently achieve the program's objectives. The program will employ, under Pitkin County's regular personnel policies and procedures, a highly motivated and capable professional staff and provide them with the guidance and resources needed to operate responsibly and effectively. Performance Policy #2 - Contracted Services When necessary and cost-effective, private sector services will be contracted through open bidding in conformance with County procurement rules and procedures.

PUBLIC SUPPORT OBJECTIVE

The Open Space and Trails Board seeks to build public support for acquisition of open space and trails by encouraging the public's involvement in, access to, and clear understanding of the program's purposes, decisions, and operation.

PUBLIC SUPPORT POLICIES

Support Policy #1 - Openness

The Open Space and Trails Board operates publicly and openly. Board meetings are open to the public and press when such visibility does not compromise a seller's request for confidentiality in the negotiating phase of a purchase or when the program's ability to negotiate a fair price on behalf of the taxpayers is not jeopardized. The Board will make public the final terms of all acquisitions. A public record of the Open Space and Trails Board's meetings, budgets, and plans is available for review on request.

Support Policy #2 - Information Distribution

The Open Space and Trails Board strives to keep the public informed of its activities through the media, speakers, public meetings and workshops, and its own map and other publications. The Board also seeks opportunities to explain the program's open space and trails acquisition mandate and methods to property owners and real estate professionals.

Support Policy #3 - Accountability

The Open Space and Trails Board will report regularly to the Pitkin County Commissioners on its activities. The Board will keep the Pitkin County Commissioners well-informed regarding the status and parameters of acquisition negotiations. The Board will also convene special meetings at least once a year at locations throughout the County to discuss the program's activities and seek guidance for the program's progress.

RESOLUTION OF THE
PITKIN COUNTY OPEN SPACE AND TRAILS
BOARD OF TRUSTEES
AMENDING *OPEN SPACE ACQUISITION*
AND MANAGEMENT POLICIES

Resolution Number 96-01

RECITALS

1. The Pitkin County Open Space and Trails Board of Trustees is charged with the responsibility of acquiring open space properties and trails and developing management guidelines and relevant policies and procedures to guide the expenditure of Open Space and Trails funds within Pitkin County, and;

2. The Pitkin County Open Space and Trails Board of Trustees has adopted criteria, policies and use regulations for the purpose of establishing consistent and predictable procedural guidelines. More specifically, the Board adopted *Open Space Acquisition and Management Policies* by passage of Open Space and Trails Resolution 92-01, dated June 18, 1992, and;

3. The Open Space and Trails Board of Trustees wishes to amend the adopted *Open Space Acquisition and Management Policies* to add criteria by which the Open Space and Trails Program can clarify its position regarding conversion of use of open space lands.

THEREFORE, BE IT RESOLVED, that the Open Space and Trails Board of Trustees does hereby amend the adopted *Open Space Acquisition and Management Policies* as follows:

> Acquisition Policy #6 - Conversion
> While acknowledging that the Open Space and Trails Program enabling legislation allows for the conversion of use of Open Space and Trails Program administered properties only upon an affirmative vote of the public approving such conversion and provision of a replacement property of comparable monetary and open space aesthetic value, the Open Space and Trails Board views its role as an advocate for the protection of all open space lands in Pitkin County and therefore has taken the position that it cannot support any conversion of publicly owned or protected open space for other uses, without consultation

with the Pitkin County Board of County Commissioners and unless the following criteria have been addressed to the Open Space and Trails Board's satisfaction:

a) The conversion of use complies with the original conveyance document.

b) Strong public support has been demonstrated for the conversion of use, and the Project requiring the conversion in use is in the broad community interest.

c) Reasonable and suitable alternatives to the conversion of open space property do not exist.

d) The Open Space and Trails Board agrees that a comparable replacement parcel has been found with the same monetary and aesthetic open space values.

e) The original Grantor of the land or easement does not oppose the proposed conversion of use.

f) The overall impacts to open space are as minimal as possible and will result in no net loss of open space quality or quantity resulting from the conversion transaction.

g) If the property proposed for conversion was originally acquired or protected by the Open Space and Trails Program, the Open Space and Trails Board finds that there will be no or minimal erosion of public trust in the Program by supporting a proposed conversion of use.

h) The character of the open space property and the surrounding area has changed to the point where the values for which the property was originally conserved are negligible or non-existent.

Tab 2
Exhibit W

Pitkin County

530 E. Main Street Aspen, Colorado 81611

January 8, 2009

EXHIBIT W
Pitkin County

Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Dear Members of the Board:

The Board of County Commissioners of Pitkin County ("Pitkin County") is pleased to present to the Colorado Water Conservation Board ("CWCB") a proposal for a long-term dedication of water rights to the CWCB under the recently-enacted House Bill 08-1280 through a trust arrangement with Pitkin County. The proposal, which is subject to approval by the Board of County Commissioners after a public hearing, includes the dedication of several water rights for instream flow purposes and would allow water rights acquired by Pitkin County in the future to also be dedicated to the trust.

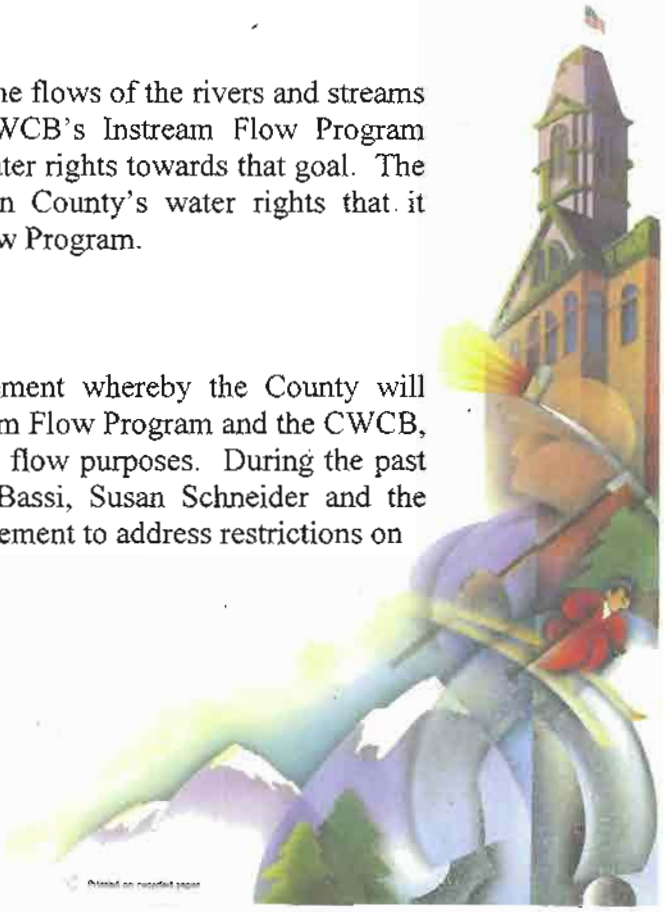
Background

Over the course of several years, Pitkin County has acquired water rights in the Roaring Fork River Basin. Some of these water rights were acquired through the County's Open Space and Trails Department with restricted funds and cannot be sold or otherwise converted without voter approval and replacement of the water rights. Other water rights were acquired through the County's Airport Enterprise Fund, which is governed by the Taxpayers' Bill of Rights ("TABOR"), and cannot be sold or leased absent compliance with TABOR restrictions.

Pitkin County is dedicated to protecting the flows of the rivers and streams in Pitkin County. The County believes that the CWCB's Instream Flow Program presents a valuable opportunity to use the designated water rights towards that goal. The proposed trust agreement will include a list of Pitkin County's water rights that it proposes to dedicate to use in the CWCB's Instream Flow Program.

Trust Agreement Proposal

Pitkin County proposes a trust arrangement whereby the County will designate water rights to be used in the CWCB's Instream Flow Program and the CWCB, as Trustee, will manage those water rights for instream flow purposes. During the past year, Pitkin County has worked closely with Linda Bassi, Susan Schneider and the Colorado Water Trust to develop the proposed trust agreement to address restrictions on



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Suite 201
(970) 920-5220
fax 920-5230

the County's water rights and to benefit stream flows in Pitkin County through the CWCB's Instream Flow Program.

A trust arrangement is proposed as Pitkin County faces numerous restrictions on its ability to transfer water rights, as described above. Through the trust arrangement, Pitkin County will retain ownership and control of the water rights, as required by such restrictions, yet the CWCB may use the water rights for instream flow purposes. Pitkin County also requires the ability to withdraw water rights from the trust, with adequate notice to the CWCB, for future needs that cannot be foreseen at this time. Furthermore, the trust arrangement will allow the County to add water rights to the trust as the County's portfolio expands. In sum, the trust arrangement provides the flexibility necessary to address the restrictions the County faces and to allow the CWCB to use those water rights in the Instream Flow Program.

The proposed trust agreement will designate Pitkin County as the only beneficiary of the trust, even though the water rights may be used to benefit the CWCB's Instream Flow Program. This has been done in order to properly establish a trust under Colorado law. A trust is valid only if it has an ascertainable class of beneficiaries; in other words, the beneficiaries cannot be an indefinite group of individuals. *Clayton v. Hallett*, 70 P. 429, 434 (Colo. 1902); *Frazier v. Frazier*, 263 P. 413, 415 (Colo. 1928). Designation of the Instream Flow Program or the people of Colorado as a beneficiary raises a question as to whether the specific individuals with interests in the trust could be identified, which is a practical as well as a legal problem. For example, the trustee is required to keep all beneficiaries of the trust reasonably informed of the trust and its administration. C.R.S. § 15-16-303(1). With a large and indefinite class of beneficiaries, such as the people of Colorado, the notice requirement would be excessively burdensome for the trustee. In light of these considerations, Pitkin County was selected as the only trust beneficiary in order to ensure that the beneficiary is sufficiently definite and the trust is valid.

Pitkin County asks that the CWCB consider this proposal at its January 27, 2009 meeting. Representatives of the County plan to attend the January 27 meeting to answer questions that the Board may have. Pitkin County looks forward to working with the CWCB on this proposal.

PITKIN COUNTY BOARD OF COUNTY COMMISSIONERS

Sincerely,

Jack Hatfield
Chairman

Enclosures
cc: Timothy J. Beaton, Esq.
Amy Beatie, Esq.

Tab 3

BEFORE THE COLORADO WATER CONSERVATION BOARD

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION
DIVISION 5: STAPLETON BROTHERS DITCH

COLORADO WATER TRUST REBUTTAL STATEMENT

The Colorado Water Trust ("CWT") hereby submits its Rebuttal Statement in support of the Colorado Water Conservation Board ("CWCB") staff's recommendation for an instream flow acquisition on Maroon Creek in the above-captioned matter.

DISPUTED FACTUAL ISSUES AND CWT'S POSITION

CWT believes that the acquisition is reasonable and appropriate under the factors and considerations set forth in ISF Rules 6(e) and 6(f) and under all applicable laws, including House Bill 08-1280. CWT makes no further rebuttal statement.

REBUTTAL EXHIBITS

CWT may present and request to introduce into the record the following documents:

(1) Rebuttal documents identified by any party to the hearing.

(2) All other documents previously identified by any party to the hearing.

Please note that the exhibits identified above are already in the administrative record and have been introduced by other parties to the hearing. To the extent these exhibits will be relied upon by CWT, CWT will refer to the exhibits already provided to the hearing officer. Thus, CWT will not be providing separate copies.

REBUTTAL WITNESSES AND SUMMARY OF TESTIMONY

The following witness may give rebuttal testimony, and may be available at the hearing to answer questions from the Board:

(1) **David Robbins, Esq., Vice President, Colorado Water Trust Board of Directors.** Mr. Robbins may testify on the role of CWT in the proposed transaction and details pertaining to the transaction. He may also address legal issues raised by parties to the proceeding.

Respectfully submitted this 15th day of October, 2009.

Amy W. Beatie, Executive Director
Erica O. Payne, Conservation Fellow
Colorado Water Trust
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Denver, Colorado 80202
Phone: (720) 570-2897
Fax: (303) 996-2017
abeatie@coloradowatertrust.org
epayne@coloradowatertrust.org

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Colorado Water Trust Rebuttal Statement** was served on this 15th day of October, 2009, upon the following via electronic mail:

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Linda Bassi
Colorado Water Conservation Board
Department of Natural Resources
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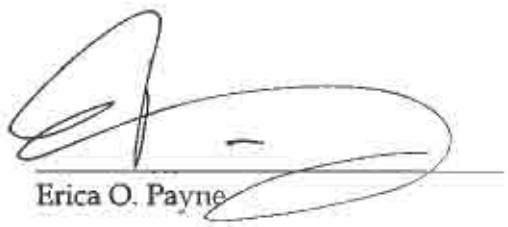
chrisg@balcombgreen.com



Erica O. Payne

Tab 4

BEFORE THE COLORADO WATER CONSERVATION BOARD

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION DIVISION 5: STAPLETON BROTHERS DITCH

Prehearing Statement of Basalt Water Conservancy District and Starwood Metropolitan District

Basalt Water Conservancy District ("BWCD") and Starwood Metropolitan District ("SMD") (collectively the "Districts"), through counsel, present their rebuttal statement. The Districts are limiting their rebuttal statement to Reach 3: the point where the historical return flows entered the Roaring Fork River down to the confluence with the Fryingpan River.

I. Disputed Factual Issues and Districts' Positions:

A. **The Environment to be Preserved. Districts' Position**: The CWCB has not demonstrated a need for additional water to preserve the natural environment in Reach 3 and has not disputed that under all identified historical flow conditions during the season when the Stapleton Brothers Ditch ("SBD") historical consumptive use ("HCU") credits are legally and physically available, including the drought water year 2002, adequate flow was available to satisfy the CWCB's 55 c.f.s. instream flow ("1985 ISF") in the reach.

B. **The Environment to be Improved. Districts' Positions**: Use of the HCU in Reach 3 will provide no measurable benefit to the fish habitat nor any perceived benefit by the fish assemblages of the Roaring Fork River.

1) Based on the maximum monthly pro-rata historical consumptive use flow (0.52 cfs in July) available for ISF use, and the available R2CROSS data[1] for the riffle transect identified as ½ m above Basalt (between 2 irrigation ditches) the increase in the ISF value from 55 cfs to 55.52 cfs is only empirically quantifiable (i.e., you can mathematically derive the potential increased flow but cannot reasonably measure it).

2) From the R2CROSS output, two of the three hydraulic criteria (average water depth and average stream velocity), which are important to support the passage of fish across this riffle, show no change in the values when stream flow

[1] R2CROSS data is original data used to quantify the ISF decreed in 85CW646 and was obtained from Colorado Division of Wildlife's Mark Uppendall.

increases from 55 cfs to 55.52 cfs. Only the percent wetted perimeter criteria shows a change - but only an increase of 0.3 percent, which equates to a widening of the wetted channel width from 52.05 ft to 52.24 ft; or an increase of about 2 inches in a channel that is over 50 feet wide.

3) The potential addition of the maximum consumptive use flow rate of 0.52 c.f.s. in July, and lower flows in other months, represents much less than one percent of the minimum daily flows observed within this reach from 1989 to 2008.

4) These changes are well within the measurement error rates of these parameters when using the R2CROSS methodology. As such, it is not possible to quantify a beneficial change to the fish habitat in the field based on the addition of the HCU using appropriate field protocols.

5) An additional 12 to 15 c.f.s. flow increase at the R2CROSS transect would be required to improve fish habitat by changing the hydraulic conditions in the Roaring Fork River near Basalt.

C. **Potential Material Injury to Existing Decreed Water Rights. Districts' Positions**: The CWCB acknowledges that Pitkin County can sell, convey or otherwise change the HCU subject to further Water Court approvals. The CWCB notes that Pitkin County can do this without injury to other water rights "because Objectors have never had the right to claim Pitkin County's changed water right or rely on that changed right as water subject to their appropriation." *See* CWCB Prehearing Statement, ¶. II.4., p. 5. In other words, CWCB concedes that the removal of the HCU flows from the 1985 ISF right, and the resulting reduction in exchange potential for other water rights junior to the SBD, does not constitute legal injury.

If Pitkin County were to convey the HCU to another upstream appropriator, the HCU flows would no longer be available to support the 1985 ISF. Those HCU flows would instead be consumed elsewhere, rather than supporting the 1985 ISF as they have historically before it was first appropriated. If other appropriators are not entitled to maintenance of the HCU flows, reason and law dictate that the CWCB is not either. In other words, the CWCB concedes it is not entitled to continued benefit of the HCU to support its 1985 ISF right.

Similarly, when the CWCB seeks to change the HCU to improve the natural environment above 55 c.f.s., that water necessarily becomes unavailable to support the existing 1985 ISF. The CWCB is not entitled, by its own admission, to rely on continued benefit of the HCU to its 1985 ISF

when that same water is changed by decree for a different use. However, CWCB and Pitkin County propose, instead, to double count the HCU. First, CWCB would remove the HCU flows from the 1985 ISF that was appropriated subject to that HCU, thereby increasing that call upon other existing water rights by 0.52 c.f.s. in July. Then, CWCB would use those changed HCU flows to support a new "stacked" ISF with a claimed appropriation date of 1909, creating a new .52 c.f.s. call in July on water rights in Reach 3 junior to 1909. This results in an increased call of 1.04 c.f.s. in July, and a concomitant reduction in exchange potential in Reach 3. No other party, private or state, would be allowed to change a water right in a manner that allows its simultaneous use for two competing purposes.

D. **Effect on Maximum Utilization. Districts' Position:** The CWCB's Prehearing Statement admits that change of the SBD to instream flow use will result in loss of HUP beneficiary status unless this water right is also "put to a beneficial use downstream of the ISF reaches that will qualify as a preferred use and maintain the Stapleton Ditch Right's status as an HUP-protected water right." *See* CWCB Prehearing Statement, ¶. III.1.b., p. 9. Nevertheless, the CWCB maintains that elimination of HUP beneficiary status will not result in injury to other water rights because the new instream flow use is non-consumptive, such that no net reduction in water will result to the system. This position is based on a fundamental misunderstanding of operation of the HUP and its effect on the system.

The historical operation of Green Mountain Reservoir HUP for the benefit of the SBD water right resulted in release of water from Green Mountain Reservoir to the Blue River. This water was then likely available within the Colorado River above a number of senior calling rights, including the Shoshone Power Plant in Glenwood Canyon. That water likely contributed, as well, to the satisfaction of those senior water rights that comprise the Cameo Call.

The CWCB's analysis of this issue, however, overlooks the Blue River and Colorado River above its confluence with the Roaring Fork, and considers only the reach of the Colorado below its confluence with the Roaring Fork River. Changing the SBD to instream flow and eliminating its HUP beneficiary status and the attendant releases from Green Mountain Reservoir eliminates the benefit of those releases to appropriators within the Blue River, including the CWCB's instream flow rights on the Blue River. It likewise eliminates the benefit of those releases to appropriators on the Colorado River above its confluence with the Roaring Fork River. This change in conditions will reduce the amount of water available for the Shoshone Power Plant and other senior appropriators, thereby increasing the likelihood of a call by Shoshone against upstream junior water rights in the Colorado River system. This results both in injury to

the water rights that previously benefitted from the HUP condition on the stream, and in reduced utilization of waters of the State of Colorado.

If the CWCB accepts the proposed donation and relinquishes the HUP beneficiary status for the SBD, it will effectively remove flows from the Blue River where the instream flow decreed in Case No. 87CW299 has significant periods where it is not satisfied and move that water to the Roaring Fork River where the 1985 ISF is always satisfied. Attached is a series of tables prepared by Resource Engineering dated October 13, 2009 entitled "Blue River Gage below Green Mountain and below Spruce Creek" which illustrate the deficit in the instream flow on the Blue River over the period of 1987 through 2008.

Furthermore, the CWCB and Pitkin County overlook a third significant impact of changing the SBD rights to a use that is not HUP protected. The amount of SBD HCU, as quantified, is a direct factor of that water right's status as an HUP beneficiary. Had the SBD not been protected by HUP releases, its season of use and historical consumption would have been reduced from those determined in case 99CW306 to satisfy calls by the Cameo rights. These calls against the SBD were prevented by operation of the HUP. When an HUP beneficiary right is changed to a non-preferred use, the historical consumptive use that can be changed to that new use must be reduced by the amount of the benefit that was historically provided by operation of the HUP. In other words, the SBD HCU will need to be re-quantified downward to account for loss of HUP benefits before it can be placed to use for a non-HUP beneficiary purpose. *See* Report of the Division Engineer, Summary of Consultation, Case No. 08CW179, June 30, 2009, ¶ 6, attached.

Availability of Acquired Water for Subsequent Downstream Use. Districts' Position: CWCB's ideas for potential downstream use are completely speculative and ignore market conditions, including the availability of stored water by contract in the Roaring Fork below Reach 3 and in the Colorado River below the Roaring Fork confluence.

II. Witnesses

The Districts may call the following witnesses to provide testimony as indicated below:

A. R. Scott Fifer, Resource Engineering, 909 Colorado Avenue, Glenwood Springs, Colorado, 81601, 970-945-9777. Mr. Fifer will provide expert testimony regarding 1) BWCD's Upper Reach service area exchanges and contracts; 2) the potential effects of an increased ISF administered senior to BWCD exchanges on BWCD's ability to operate its exchanges and serve its numerous contractees, including material injury to BWCD and SMD water rights; and 3) the absence of actual protection or preservation of the

natural environment through the acquisition and use of the SBD HCU credits as identified in Issues I. A and B above.

B. Eric Mangeot, Resource Engineering, 909 Colorado Avenue, Glenwood Springs, Colorado, 81601, 970-945-9777. Mr. Mangeot may testify to any or all of the matters for which Mr. Fifer has been identified.

C. Alan Martellaro, Division Engineer, and/or Kyle Whitaker, Assistant Division Engineer for Water District No. 5, P.O. Box 396, Glenwood Springs, Colorado 81602, 970-945-5665. Messrs. Martellaro or Whitaker will provide lay and expert testimony regarding 1) the Division of Water Resource's seniors-first water rights administration as identified in Issue II. A above; and 2) administration of the decreed 55 c.f.s. ISF in the Upper Reach and the SBD right.

D. Don Conklin, Jr., Aquatic Ecologist, GEI Consultants, Inc. Ecological Division, 5575 S. Sycamore Street, Suite 101, Littleton CO 80120, 303-794-5530. Mr. Conklin will testify regarding the results of the R2CROSS analysis and other evidence demonstrating that no measurable benefit to the fish habitat or perceived benefit by the fish assemblages will occur in Reach 3 based on the addition of the SBD HCU.

III. Exhibits

The Districts may present and request to introduce into the record the following enclosed documents:

A. Documents identified by CWCB or any other Party.

B. All documents previously identified by these parties.

C. Report of the Division Engineer, Summary of Consultation, Case No. 08CW179, June 30, 2009.

D. Resume of Qualifications, Don J. Conklin, Jr., Aquatic Ecologist, GEI Consultants.

E. Review of Colorado Department of Wildlife R2 Cross Data, Roaring Fork River above Basalt, Colorado, dated October 13, 2009, Resource Engineering, Inc., 909 Colorado Avenue, Glenwood Springs, CO 81601.

F. Fisheries Evaluation of the Proposed Instream Flow Acquisition Division 5: Stapleton Brothers Ditch dated October 14, 2009, GEI Consultants, Ecological Division, 5575 S. Sycamore Street, Suite 101, Littleton CO 80120.

G. Tables prepared by Resource Engineering dated October 13, 2009 entitled "Blue River Gage below Green Mountain and below Spruce Creek"

Dated this 14th day of October, 2009.

David C. Hallford, Esq.
Sara M. Dunn, Esq.
Chris L. Geiger, Esq.
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Phone: 970-945-6546
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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Prehearing Statement of Basalt Water Conservancy District and Starwood Metropolitan District** was served on this 14th day of October, 2009 upon the following via electronic mail.

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Tab 4
Exhibit A

Tab 4
Exhibit B

Tab 4
Exhibit C

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

REPORT OF THE DIVISION ENGINEER

SUMMARY OF CONSULTATION

CASE NO.: 08CW179
APPLICANT: Roaring Fork Land & Cattle Co.

STRUCTURE	APPL. CLAIM	STRUCTURE	APPL. CLAIM
Maroon Ranch Pond	Augmented Structure	Roaring Fork Aug Plan	Augmentation Plan
Maroon Ranch Spring	Augmented Structure	Roaring Fork Exchange	Exchange Right
Willow Creek Ditch	Augmented Structure		
Herrick Ditch	Augmented Structure		

The application was filed with the court on December 30, 2008.

CONCERNS

I cannot recommend approval of this application until the following concerns are addressed:

1. The augmented structures in item 2 of the application should be described in this application, including the location source and amount of diversion or storage to be augmented. Item 4 top of page 6 of the application references a companion case as 08CW___ as a pending application that will adjudicate these rights. The case number reference should be 08CW181.

2. The claimed evaporation on Maroon Ranch Pond, the claimed consumption for the 5.5 acres of new irrigation, and the claimed historic consumptive use for the dry-up of 0.59acres all appear reasonable, however applicant must submit engineering to support these claims. However regarding the HCU analysis, the diversion records indicate that diversions rarely occur in May among other gaps that should be considered in an analysis. The HCU analysis must be done for each year of the study period such that the monthly diversions, adjusted for losses, are compared to the monthly CIR to determine if sufficient water was available for the crop.

3. The application provides the amount to be changed in the Willow Creek Ditch and the Herrick Ditch by priority in paragraph 4.D.iv.d. However, these numbers do not match my calculations. Applicant should provide the calculations used to prorate the change of water rights.

4. The application claims ownership in the Willow Creek Ditch of 4.73cfs of priorities 174 and 192. The Willow Creek Ditch has priorities 129, 174, and 209. Based on the appropriation dates provided the ownership is in priorities 174 and 192, which are 3 cfs each.

5. The application claims ownership in the Herrick Ditch of 7.315 cfs of priority 683. Priority 683 is decreed for 51.56 cfs and is the second priority in the ditch. The senior right in the ditch is priority 440.5, which is decreed for 9.3cfs. The records of monthly totals submitted for the Herrick Ditch are an average of 7cfs to 13cfs, leaving very little water for priority 683. The engineering submitted should explain how the historic use on the 34 acres is attributed to the Herrick Ditch priority 683.

6. The Herrick Ditch is a Preferred Beneficiary of Green Mountain Reservoir's Historic Users Pool (HUP). As such, the new augmented use to replace losses on Maroon Ranch Pond is not a Preferred Beneficiary, and therefore the historic use of the Herrick Ditch must be reduced by the amount of benefit from the HUP.

7. The proposed change in use on page 8 paragraph 4.c. is not clear. Storage is not a beneficial use of water, while the intent for the non-irrigation uses may occur after the water is stored. The language could read a change from irrigation to irrigation and subsequent to storage in a pond for the uses recreation, aesthetic, piscatorial, wildlife propagation, fire protection, and augmentation.

8. The plan contemplates use of Maroon Ranch Pond releases whenever a local call occurs and dry-up credits do not augment or fully augment depletions. The months at issue are in the shoulders of the growing season, when there are no historic or insufficient historic credits. It is entirely unclear how releases would reach the stream without excessive losses. The plan should consider cutting off inflow from all three sources and allow the pond to drop naturally.

9. The plan does not consider losses associated with the diversion, inflow, and outflow channels associated with the pond. Unless the plan considers these losses, which may include piping flow, diversions for the augmented structure will be curtailed, during times of call.

10. The plan contemplates the curtailment of the new junior irrigation rights, whenever a local call is placed. The Maroon Ranch Spring is intercepted by the Willow Ditch. A structure must be installed to bypass this water to a natural channel.

11. The applicant should consider changing the place of use of some of the historically irrigated 34 acres to the new 5.5 acres of landscape and lawn irrigation, using the new junior irrigation rights to irrigate the historic lands that are changed.

12. Prior to entry of any decree for the proposed plan, the applicant must submit proof of a valid contract with the Basalt Water Conservancy District for sufficient water to operate the plan.

RECOMMENDATIONS

Based on the above concerns, the State and Division Engineers ask that the issues discussed in this consultation be addressed prior to granting any water rights or plan for augmentation, and that the following terms and conditions be included in any decree granted:

1. The applicant shall give adequate notice to the Division Engineer prior to operating the exchange.

2. The transit losses associated with replacement releases in this decree are only for the purposes of establishing that the plan can operate and may be sufficient to prevent injury. Actual transit losses will be determined and assessed at the time releases are made and may be modified per CRS 37-80-102(7) & CRS 37-83-104 as determined necessary by the Division Engineer.

3. Adequate accounting language must be included as follows: "Applicant shall install measuring devices, provide accounting, and supply calculations regarding the timing of depletions as required by the Division Engineer for the operation of this plan. The applicant shall also file an annual report with the Division Engineer by November 15th following each preceding irrigation year (November1 through October 31) summarizing diversions and replacements made under this plan."

4. The plan must include 305(8) language as follows: "Pursuant to CRS 37-92-305(8), the state engineer shall curtail all out-of-priority diversions, the depletions from which are not so replaced as to prevent injury to vested water rights."

5. To assure that adequate protection is provided to other vested water rights or other conditional water rights, the court should retain jurisdiction for a period beginning with the date of decree and extending until five years after the Applicant provides written notice to the parties, the Division Engineer, and the Court that the augmentation plan has become operational and 75% of the out-of-priority diversions have been augmented as contemplated by this plan. Such notice must confirm that the decreed augmenting sources are in place, that the terms and conditions necessary to operate the plan as required by the decree have been met, and that the augmented uses and augmentation have been initiated**.** For any reservoirs to be augmented or used for augmentation, the notice shall include an as-built stage capacity table, an estimate of the active capacity of the reservoir, a profile of the reservoir showing the elevation of inlet and outlet structures, and confirmation that an operable and lockable outlet structure has been installed. If dry up of historic irrigation is a component of the plan a map of that dry up will be provided.

Information requested in this consultation should be submitted to the Division 5 Water Court.

DATE: June 30, 2009 SIGNED: 

Alan C Martellaro, P.E., Division Engineer

Staff Assigned: Alan Martellaro

CRS 1973, 37-92-302(4), signed into law May 17, 1988, provides that the applicant or the applicant's attorney shall mail or deliver a copy of this consultation to all parties of record who filed a statement of opposition to this application. The statute also requires that the applicant or his/her attorney shall file a certificate of mailing with the water clerk for Water Division 5, confirming that this consultation (and attachment) is mailed to any and all opposing parties.

CERTIFICATE OF MAILING

I hereby certify that on this 1st day of July, 2009 a true and correct copy of the foregoing Summary of Consultation of the Division Engineer was served to the individuals listed below, either electronically through LexisNexis File and Serve or by first-class U.S. Mail, as indicated:

Dick Wolfe, P.E., State Engineer
Division of Water Resources
1313 Sherman Street Room 818
Denver, CO 80203
Electronically Served

Patrick, Miller and Kropf Pc
Ramsey L Kropf
Paul L Noto
730 E Durant Ave, Suite 200
Aspen, CO 81611
Electronically Served

R. Diane McCluskey

Tab 4
Exhibit D

Don J. Conklin, Jr., Aquatic Ecologist

GEI Consultants

Education

M.S., Water Resources Management, (Specialization in Aquatic Ecology), University of Wisconsin-Madison, 1983

B.S., Biology, Cornell University, 1980

Background

Mr. Conklin is experienced in multiple aspects of aquatic ecology, including project management, design of aquatic sampling programs, supervision of data collection, data analysis, laboratory analysis, and lab report preparation, field sampling of organisms in a variety of aquatic habitats, identification, and enumeration of biological samples, IFIM data collection and analysis, data reduction, statistical analysis and report preparation.

Mr. Conklin's projects have included work in a number of states including Colorado, Georgia, Idaho, Kentucky, Massachusetts, Montana, Nebraska, New Mexico, Nevada, North Carolina, South Dakota, Wisconsin, and Wyoming.

Experience

Arapahoe Basin Ski Area, Colorado. Reviewed snowmaking and minimum flow issues through use of Instream Flow Incremental Methodology and field sampling of fish and invertebrate populations in the North Fork of the Snake River. Included field measurements of habitat at multiple flows using IFIM, modeling of potential changes in available habitat with different flow regimes, and implementation of a long-term monitoring program for benthic invertebrates and fish populations.

Bow Mar Owners, Inc., Colorado. Recreational fishery management. Quantitatively sampled fish from a private lake to assess current status of fishery resources and to monitor the year-to-year changes in the fishery. Also provided management recommendations for the future.

City of Grand Junction, Colorado. Provided expertise to address proposed stream classification changes on tributaries to the Colorado River near Grand Junction. Included review of ammonia toxicity issues, flow modification, habitat quality, and water quality (e.g., selenium toxicity) on fish populations in Persigo Wash. Included field sampling of fish populations and preparation of expert witness testimony for the Colorado Water Quality Control Commission.

Conoco, Inc./City of Aurora/Metro Wastewater Reclamation District/Valero Energy, Colorado. Assessment of resident fisheries and review of selenium toxicity for development of site-specific ambient water quality criteria for Sand Creek, Colorado.

Golden Reward Mining Company, South Dakota. Conducted an analysis of invertebrate and algal samples and prepared an annual technical summary report for a long-term aquatic monitoring program for an existing mine.

Hecla Mining Company, Idaho. Conducted a field sampling of resident fish populations at sites on Jordan Creek and the Yankee Fork in the Salmon River drainage, bracketing an inactive gold mine as part of a long-term annual aquatic monitoring program.

Homestake Mining Company, Colorado. Conducted a seasonal aquatic monitoring program for Indian Creek and Marshall Creek near Salida, Colorado, concentrating on fish and benthic invertebrate populations.

Independence Mining Company, Inc. (AngloGold), Nevada. Provided review of aquatic life criteria issues, with specific reference to selenium, for the threatened species, Lahontan cutthroat trout (Onchorynchus clarki henshawi) in the North Fork Humboldt River, Nevada. Included review of water quality, historic data, and field sampling of fish for analysis of fish tissues and population structure.

Newmont Mining Company/Resurrection Mining, Colorado. Continued seasonal monitoring of benthic invertebrate populations, and annual monitoring of fish populations and fish habitat quality for sites in the upper Arkansas River/California Gulch drainage near Leadville, Colorado.

Snowmass Water & Sanitation District, Colorado. Re-evaluated minimum flow determinations for protection of resident trout populations and development of a long-term monitoring program for trout populations in Snowmass Creek in west central Colorado in relation to water diversions.

Thompson Creek Mining Company, Idaho. Molybdenum mine along two tributaries of the Salmon River in central Idaho. Collect and process biological samples from stations on Thompson and Squaw Creeks, tributaries of the Salmon River, for an annual biological monitoring program. This long-term monitoring program of fish and invertebrate populations was initiated in 1980 and has continued to present.

Tri-State Generation and Transmission Association, Inc., Colorado. A temperature study of the San Miguel River was conducted to determine whether re-segmentation or re-classification of a coldwater segment was warranted, based on the natural temperature regime and the aquatic community. The thermal regime of the river was monitored with temperature loggers, and fish and macroinvertebrate populations were sampled on the longitudinal gradient of the river to determine where the coldwater segment ended and where the transition zone into a warmwater zone began.

Unocal/Molycorp, Inc., New Mexico. Conduct sampling of fish and invertebrate populations in the Red River as part of an annual monitoring plan, as well as sediment toxicity testing. This effort was also being used by the State of New Mexico as part of a TMDL study on the river.

Wharf Resources, South Dakota. Aquatic biological study of Annie Creek and Spearfish Creek, South Dakota, for CERCLA/Superfund Project. Study included sampling and analysis of fish, invertebrate and algae populations, habitat evaluation and acute and chronic toxicity testing.

U. S. Army Corps of Engineers, Colorado. Environmental Impact Statement (EIS) for the Denver Water Moffat Collection System Project. Collected data on fish and invertebrates in the Fraser River Basin. Reviewed and summarized available aquatic biological and hydrological information from the Fraser River, upper Colorado River, Williams Fork River, Blue River, South Boulder Creek, and South Platte River basins. Prepared the Aquatic Biological Resources sections of the DEIS.

U. S. Bureau of Reclamation, Colorado. Environmental Impact Statement (EIS) for the City of Colorado Springs Southern Delivery System (SDS) Project. Collected data on fish, benthic macroinvertebrates, and fish habitat (PHABSIM) in the Arkansas River Basin. Incorporated the available biological information and project hydrology (using IHA) into Existing Environment and Effects Analysis Technical reports. Prepared the Aquatic Biological sections of the DEIS and FEIS.

U. S. Bureau of Reclamation, Colorado. Environmental Assessment (EA) for the City of Aurora Proposed Excess Capacity Contracts Project. Reviewed and summarized the available aquatic biological and hydrological information (using IHA). Prepared the Aquatic Resources sections of the EA.

Aurora Water, Colorado. Prepared the Aquatic Resources Technical Report for the Aurora Prairie Waters Project. Summarized the available data and evaluated the potential effects of the project.

City of Littleton, Colorado. Provided technical assistance in lake management issues for a small urban lake. Conducted review of existing water quality, inflow, and sediment quality data and recommended potential management options to enhance recreational fishing opportunities and to limit algal production.

Evergreen Metropolitan District/Genesee Water & Sanitation District/Town of Morrison, Colorado. Conducted temperature modeling on Bear Creek, Colorado, using USFWS instream temperature model (SSTEMP). Included collection of stream geometry parameters (slope, aspect, shading, etc.), historic flow and temperature data, and new continuous temperature data. Instream temperature changes were modeled under a variety of scenarios of native flow, tributary and effluent inflows to predict potential impacts to resident trout populations.

City of Pueblo, Colorado. Provided a review of fish species composition, including historic and current records, instream habitat conditions, and prepared written testimony for a proposed reclassification of the lower Arkansas River, Colorado. Included expert witness testimony before the Colorado Water Quality Control Commission.

Centennial Water & Sanitation District, Colorado. Provided technical expertise with regard to flow impacts on trout populations in Tarryall Creek as part of an analysis of water sales. Included field sampling of trout and assessment of habitat conditions at multiple sites in the project reach to assess the impacts of increased flows as a result of removal of historic diversions for hay-meadow watering.

Simplot Mining, Idaho. Conducted field sampling of fish and habitat and data analysis as part of an analysis of potential impacts of selenium and elevated TDS in streams near phosphate mines in southeastern Idaho.

DM Farms, North Carolina. Provided expert witness support with regard to potential effects of drainage from a confined-animal-feed-operation (hog farm) on receiving streams. Conducted assessment of existing water quality, habitat, and flow information, as well as field collection of habitat and flow data for use in modeling of dissolved oxygen and bacterial transport downstream of the operation. Included expert witness testimony in front of federal prosecutors.

Arch Minerals, Kentucky. Temperature modeling of streams in southern Kentucky to determine the effects of a proposed coal strip mine on a resident trout population. The mine specifically proposed canopy removal and the construction of sediment settling ponds. Collected site-specific inputs for USGS instream temperature model (SSTEMP), including slope, aspect, vegetative canopy estimates, and established continuous recording temperature monitoring sites. Temperature changes were predicted using the SSTEMP temperature model on an annual basis, seasonal basis, and worst case scenario, and correlated with trout population data and species temperature tolerances to predict impacts.

Avista Corporation, Montana. Collected field data to help determine the population status of the endangered bull trout (Salvelinus confluentus) in the Bull River and its drainage basin in northwestern Montana as part of FERC license conditions for two hydropower dams. This effort involved counting fish through snorkeling and electrofishing, PIT tagging, collecting length/weight data, and genetic tissue sampling. Analysis evaluated current status and recent changes in population levels in the drainage.

Metro Wastewater Reclamation District, Colorado. Conducted a study of pH effects on aquatic life, with specific reference to populations in the South Platte River. Included a detailed literature review, combined with analysis of pH data from the river and effluent compared to resident invertebrate and fisheries data over a 10-year period. Analysis included recommendations for a site-specific adjustment to pH of 6.0 to 9.0.

Three Lakes Water and Sanitation District, Colorado. Impact analysis and long-term monitoring. Conducted aquatic biological sampling of fish and benthic invertebrate populations in several small mountain

streams in Colorado and compiled report on the effects of a nearby water treatment facility on those populations. This sampling was conducted with regard to stream classification issues.

Yellowstone Pipeline Co. Environmental Impact Statement. Baseline aquatic studies for proposed underground pipeline routes. Collection of data on fish, invertebrates, algae, habitat parameters, and spawning redds. Compiled and summarized data for incorporation into an EIS.

Zortman Mining Company, Montana. Conducted biological sampling in support of Use-Attainability Analyses for streams in the vicinity of an inactive gold mine in northeastern Montana. This analysis was in support of proposed NPDES permit limit determinations. Biological sampling included fish population sampling, benthic invertebrate and microinvertebrate population sampling, and detailed habitat measurements and RBP scoring over four seasons.

Aspen Ski Company, Colorado. Minimum flow determinations. Evaluated minimum flow levels for protection of resident trout populations. Reviewed potential habitat enhancement options for Snowmass Creek in west central Colorado in relation to snowmaking diversions. Compiled report on the effects of the proposed minimum stream flows on trout populations.

City of Blackhawk, Colorado. Provided technical support for aquatic biological issues for an Environmental Impact Statement for increasing water sources of a growing mountain community in central Colorado. Incorporated and evaluated biological, chemical and fish habitat data into Baseline Report.

Homestake Mining Company, South Dakota. Conducted an aquatic monitoring program for Whitewood Creek near the confluence with Gold Run Creek for an existing mine. Included sampling of fish and invertebrates.

Homestake Mining Company/Whitewood Development Corporation, South Dakota. Designed and implemented an aquatic baseline monitoring program for a proposed streamside tailings re-mining project along Whitewood Creek and the Belle Fourche River, South Dakota. Included sampling and analysis of fish, fish habitat, fish tissues, invertebrates, and algae.

City of Cheyenne, Wyoming. Review of water quality issues. Reviewed existing aquatic biological data, recreational fishery potential, and collected additional instream habitat information in Crow Creek, southeastern Wyoming, downstream of municipal wastewater reclamation effluent. Included technical review of data collected by state and federal agencies, as well as assessing off-site locations for instream habitat enhancement activities.

Homestake Mining Company, South Dakota. Reviewed historical and current aquatic biological data on Whitewood Creek and the Belle Fourche River, South Dakota, as part of a CERCLA 5-year review. Included comparative analyses of fish, fish habitat, fish tissues, invertebrates, and algae, as well as initiation of a long-term monitoring program for benthic invertebrates and fish population.

Thompson Creek Mining, Idaho. Research investigating the decline of Pacific salmon stocks in the Columbia River System.

Thompson Creek Mining Company, Idaho. Provided aquatic biological expertise in support of development of a supplemental EIS for the mine, specifically with regard to potential effects of predicted water quality on resident fish and salmon in Thompson and Squaw Creeks.

City of Atlanta, Georgia, Bureau of Pollution Control. Aquatic biological assessment of urban streams near Atlanta, Georgia. Conducted field sampling to gather data on the impact of Combined Sewer Overflows on receiving waters, and the application of water quality criteria for metals.

Confidential Client, Massachusetts. Recreational fisheries studies on a stream in Massachusetts, with regard to potential organic chemical contamination. Study included review of available literature, field sampling of fish and invertebrate populations and assessment of recreational fishing potential in support of risk assessment activities.

Noranda Mining, Wisconsin. Environment Impact Statement. Baseline aquatic studies for a proposed mine in northern Wisconsin. Developed sampling program, supervised the collection of aquatic biological data, including fish, invertebrates, algae, aquatic plants and habitat, data analysis and report preparation.

Eastlake Reservoir # 3, Thornton, Colorado. Recreational fishery management. Conducted aquatic biological survey to determine current conditions and potential for future development as a Natural Area. Study included field sampling with various gear types and suggesting options for habitat improvement and enhancing the fishery from a recreational point of view.

City of Arvada, Colorado. Use-attainability analysis of Ralston Creek and selected tributaries, Colorado. Study of fish, invertebrate and algal populations to discern possible non-point source impacts to assist in site-specific stream classification and water quality criteria issues.

The Central Nebraska Public Power and Irrigation District, Nebraska. Impact assessment. Evaluation of the effects of a hydroelectric facility on the biota of Lake Ogallala in western Nebraska for FERC relicensing. Analyzed fish, recreational fishery, invertebrate and water quality data collected during an intensive study of the effects of hydropower operations on aquatic life and a recreational fishery of a receiving lake/stream system. Sampled fish with boat electroshocking units, gill nets, and trap nets, designed and conducted an extensive creel survey. Analyzed biological and chemical data and prepared reports.

Nebraska Public Power District, The Central Nebraska Public Power and Irrigation District, Nebraska. Habitat preference study Platte River, Nebraska. Developed habitat preference criteria for game and forage fish in the Platte River. Assisted with study design, data analysis and report writing as part of FERC relicensing studies.

Denver Water Board, Colorado. Environmental Impact Statement Reports for a large metropolitan water department in Colorado. Incorporated and evaluated biological, chemical and IFIM habitat data into Baseline, Impact, Cumulative Impact and Mitigation Reports. Also, responded to comments to the EIS process from various federal, state, and local agencies.

Denver Water Board, Colorado. Instream trout habitat modeling at over 30 sites throughout the upper South Platte River, Williams Fork River, Fraser River, and Blue River Basins using IFIM methodology. Assisted with study design and implementation, field site selection, data collection, computer analysis and report preparation.

Idarado Mining Company, Colorado. Impact assessment. Evaluation of the effects of historic metal mining and milling activity in the upper San Miguel River, Red Mountain Creek, and Ridgway Reservoir in southwest Colorado. Included sampling fish populations, water quality, phytoplankton, zooplankton, benthic invertebrates, and a creel survey.

Keystone, Breckenridge and Copper Mountain Ski Areas, Colorado. Minimum flow determinations near ski areas in central Colorado. Survey of existing invertebrate communities, fish populations and water chemistry along with review of hydrographs and IFIM output to address minimum flow recommendations below snowmaking diversions.

Denver Water Board, Colorado. Biological survey of over 75 mainstem stations and tributaries on the North Fork South Platte River, South Platte River, Blue River, South Boulder Creek and the Williams Fork

River in central Colorado. Collected field chemical parameters, conducted electrofishing, and collected and processed invertebrate samples and fish population samples and prepared reports to provide baseline information for a Systemwide Environmental Impact Statement.

Grand County Water and Sanitation District, Colorado. Design and implementation of a study to determine the fishery and available instream habitat of a tributary to the Fraser River, Colorado, including surveys of existing fish populations and IFIM trout habitat modeling to provide supporting data for minimum flow issues.

Publications

Bergstedt, L.C., J.W. Chadwick, D.J. Conklin, and S.P. Canton. 2005. **Improvements in brown trout and invertebrate populations in the Arkansas River during reclamation efforts on California Gulch.** Pages 54-73. IN: *Proceedings of a Joint Conference of American Society of Mining and Reclamation.* 22nd Annual National Conference, June 19-23, 2005, Breckenridge, CO.

Canton, S.P., L.C. Bergstedt, J.W. Chadwick, and D.J. Conklin, Jr. 2005. **The importance of identifying natural variation in aquatic communities: the Thompson Creek Molybednum Mine example.** Pages 181-190. IN: *Proceedings of a Joint Conference of American Society of Mining and Reclamation.* 22nd Annual National Conference, June 19-23, 2005, Breckenridge, CO.

Chadwick, J.W., S.P. Canton, D.J. Conklin, and L.C. Bergstedt. 2005. **Determining sources of water quality impacts using biological monitoring: the Molycorp Questa Molybednum Mine example.** Pages 211-223. IN: *Proceedings of a Joint Conference of American Society of Mining and Reclamation.* 22nd Annual National Conference, June 19-23, 2005, Breckenridge, CO.

Chadwick, J.W., L.C. Bergstedt, D.J. Conklin, and S.P. Canton. 2004. **Drought and trout - sometimes less is more.** Pages 1-13. IN: de Carvalho Freitas, C.E., M. Petrere, Jr., A.A.F. Rivas, and D. MacKinlay (eds.). Symposium Proceedings, *Fish Communities and Fisheries*, VI International Congress on the Biology of Fish. Manaus, Brazil, August 1-5, 2004.

Canton, S.P., J.W. Chadwick and D. J. Conklin, Jr. 1997. **Aquatic Biology and Fisheries.** Pages 324-329 in Chapter 7, Environmental Permitting. D.W. Struhsacker (chapter ed.). IN: J.J. Marcus (senior ed.) *Mining Environmental Handbook: Effects of Mining on the Environment and American Environmental Controls on Mining.* Imperial College Press, London.

Chadwick, J.W., D.J. Conklin, Jr., P.L. Winkle, and S.P. Canton. 1997. **Fish species composition in the central Platte River, Nebraska.** *The Southwestern Naturalist* 42(3):280-290.

Conklin, D.J., Jr., S.P. Canton, J.W. Chadwick, and W.J. Miller. 1995. **Habitat suitability curves for selected fish species in the central Platte River, Nebraska.** *Rivers* 5:250-266.

Miller, W.J., J.W. Chadwick, S.P. Canton, D.J. Conklin, Jr., and E.Y. Chrisp. 1991. **The use of IFIM for evaluating effects of a flow alternative on fish habitat in a river system with competing water demands.** IN: *Water Power '91.* ASCE. Denver, CO.

Peckarsky, B.L., P.R. Fraissinet, M.A. Penton, and D.J. Conklin, Jr. 1990. *Freshwater Macroinvertebrates of Northeastern North America.* Cornell University Press. Ithaca, NY.

Chadwick, J.W., S.P. Canton, D.J. Conklin, Jr., and D. Kraus. 1989. Lake Ogallala, Nebraska. *Lake Line* 9:37-40.

Winters, D.S., J.W. Chadwick, D.J. Conklin, and W.J. Miller. 1988. **Winter field methodologies for determination of habitat utilization of brown and rainbow trout in two Colorado mountain rivers.** *Proceedings of the Species Criteria Workshop.* U.S. Fish and Wildlife Service Instream Flow Group.

Peckarsky, B.L., S.I. Dodson, and D.J. Conklin, Jr. 1985. *A Key to the Aquatic Insects of Streams in the Vicinity of the Rocky Mountain Biological Lab, Including Chironomid Larvae from Streams and Ponds.* Colorado Division of Wildlife. Denver, CO.

Water Resources Management Program. 1983. *Fox Lake: A Water Quality and Management Study.* Report No. 121. University of Wisconsin-Madison, Institute for Environmental Studies. Madison, WI.

Professional Certifications

IFIM Training – completed course work given by the U.S. Fish and Wildlife Service:
IFIM 201, Problem solving with IFIM
IFIM 305, Field Techniques for Stream Habitat Analysis
IFIM 310, Using the computer based Physical Habitat Simulation System (PHABSIM)

Professional Memberships

America Fisheries Society
North America Benthological Society
North American Lake Management Society
Colorado Lake and Reservoir Management Society

Tab 4
Exhibit E

RESOURCE
ENGINEERING INC.

David Hallford, Esq.
Balcomb and Green, P.C.
818 Colorado Avenue
Glenwood Springs, CO 81601

October 13, 2009

Via Hand Delivery and Email

RE: Review of Colorado Department of Wildlife R2 Cross Data, Roaring Fork River above Basalt, Colorado

Dear David:

Per your request, Resource Engineering, Inc. (RESOURCE) has examined the Colorado Department of Wildlife's (CDOW) R2 Cross Data used to support the State's recommended Instream Flow (ISF) claim on the Roaring Fork River above Basalt, CO. The R2 Cross Data was provided to RESOURCE by Mark Uppendahl, the Instream Flow Program Coordinator with the CDOW. The data was requested by RESOURCE to assist in the evaluation of the potential improvement to Roaring Fork River streamflow characteristics that might be attributed to a lease agreement of Stapleton Brothers Ditch historical consumptive use credits owned by Pitkin County. A copy of the information received by the CDOW is provided in Attachment 1.

The R2 Cross Data was originally collected by the CDOW in support of the Colorado Water Conservation Board's (CWCB) ISF water right on the Roaring Fork River between its confluence with Maroon Creek near Aspen, CO and its confluence with the Fryingpan River near Basalt, CO (Case No. 85CW646). The cross section data was collected on a representative reach of the Roaring Fork River approximately ½ mile above the Town of Basalt. According to Mark Uppendahl, this data was used by the CDOW to develop its ISF recommendation to the CWCB. The ISF water right was decreed for 55 cubic feet per second (cfs) from April 1st through September 30th and 30 cfs from October 1st through March 31st. The CDOW's R2 Cross Analysis that it used to quantify this ISF right is contained in Table 1, attached. By review of this table, one can ascertain the expected streamflow characteristics of the Roaring Fork River at or near the claimed streamflow amounts. For example, at a streamflow of 56.23 cfs, the CDOW calculated that the river at its study location would have an average velocity of 1.71 feet per second; an average depth is 0.64 feet and a wetted perimeter of 52.5 feet.

One of CWCB's goals in accepting a long term loan of Pitkin County's Stapleton Brothers Ditch water rights is to improve the natural environment of the stream by stacking the historic consumptive use credits associated with the water right on top of its junior ISF water right. CWCB staff believe that; "The additional flows will provide ISF protection for additional fish habitat during the warmer irrigation season (deeper runs and pools), additional protection from harmful water quality parameters (high temperatures and low oxygen levels) and better connectivity for fish passage to different habitats (deeper riffles)." (Prehearing Statement of Staff of Colorado Water Conservation Board, August 27, 2009, p.9).

The R2 Cross data developed by the CDOW provides opportunity to quantify the potential improvement to Roaring Fork River fish habitat expected by staff as a result of acquiring the Stapleton Brothers Ditch water right. Under the proposed acquisition of water rights, the maximum monthly consumptive use available from the Stapleton Brothers Ditch occurs during July at a flow rate of 0.52 cfs. Therefore, upon acquisition of the Stapleton Brothers Ditch water right, the ISF water right within this reach is proposed to be increased from 55.0 cfs to 55.52 cfs in July. Increases during later summer months will be less than 0.52 as historic consumptive use credits typically drop during the later growing season.

The R2 Cross data developed by the CDOW study defined the river's hydraulic characteristic at numerous flow rates including streamflows of 50.58 cfs and 56.23 cfs (see Table 1). To assess the improvement to the stream that might result from acquisition of the Stapleton Brothers Ditch, RESOURCE prorated the data to determine the wetted perimeter, average velocity and average depth data at the CDOW's study site for 55.0 and 55.52 cfs. The results, shown in Table 1, indicate that the CWCB's acquisition of this right would produce imperceptible changes to the hydraulic characteristics of the river. For example, stream velocity would increase by 0.005 feet per second, stream depth would increase by 0.001 feet (0.012 inch), and wetted perimeter would increase by 0.19 feet (2.3 inch). These expected changes are illustrated in Figure 1, attached. These are the increases that CWCB staff has opined will provide "additional fish habitat during the warmer irrigation season" and will provide "better connectivity for fish passage to different habitats".

We appreciate the opportunity to work with you on this important project. If you have any questions or need further information, please feel free to contact us.

Sincerely,

RESOURCE ENGINEERING, INC.

Scott Fifer
Senior Hydrologist

Eric Mangeot, P.E.
Water Resources Engineer

EFM/033-5.3.21
K:\Clients\033 BWCD\5.0 Water Rights\5.3 Water Right Opposition\5.3.21 SBD ISF\CDOW R2 Cross Memo- Fifer.doc

TABLE 1
Colorado Division of Wildlife R2 Cross Data - Roaring Fork River

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER; 2

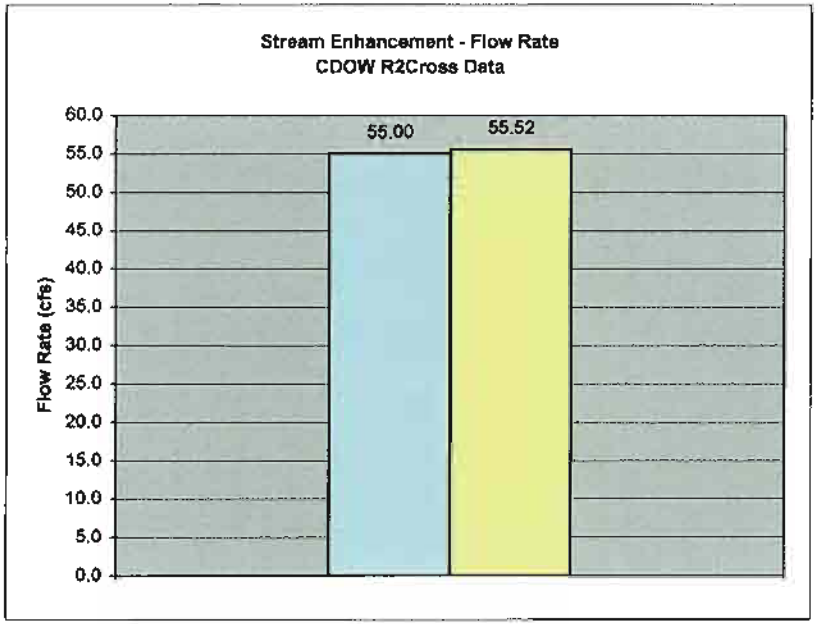
Constant Manning's n

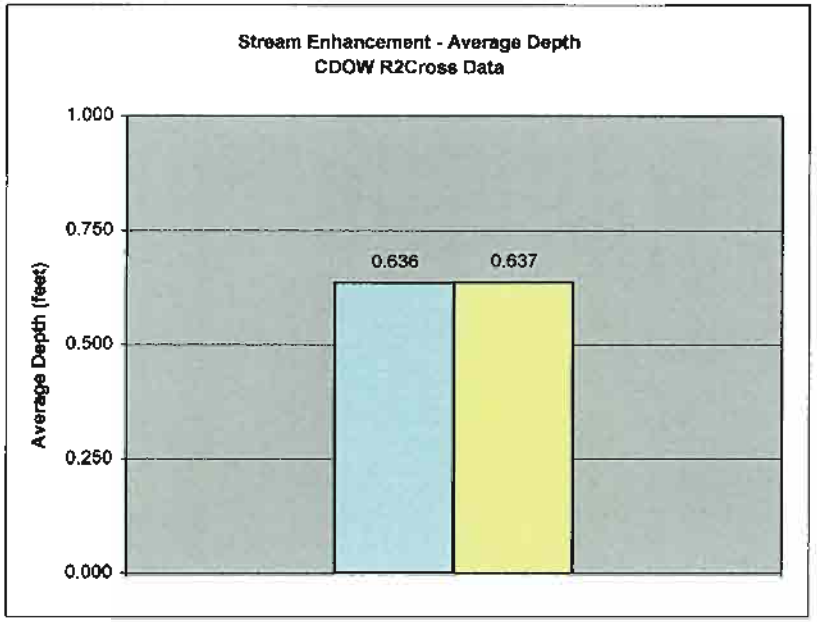
GL = Lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

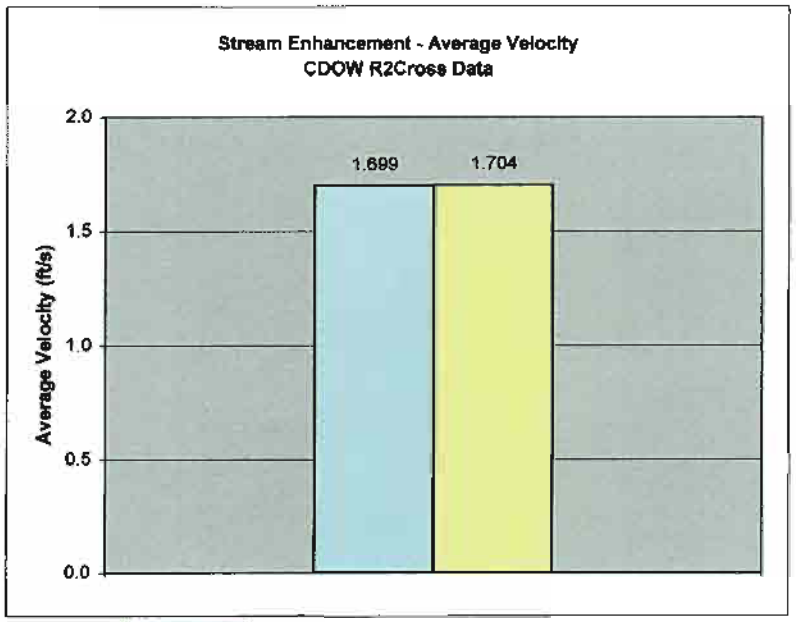
STAGING TABLE

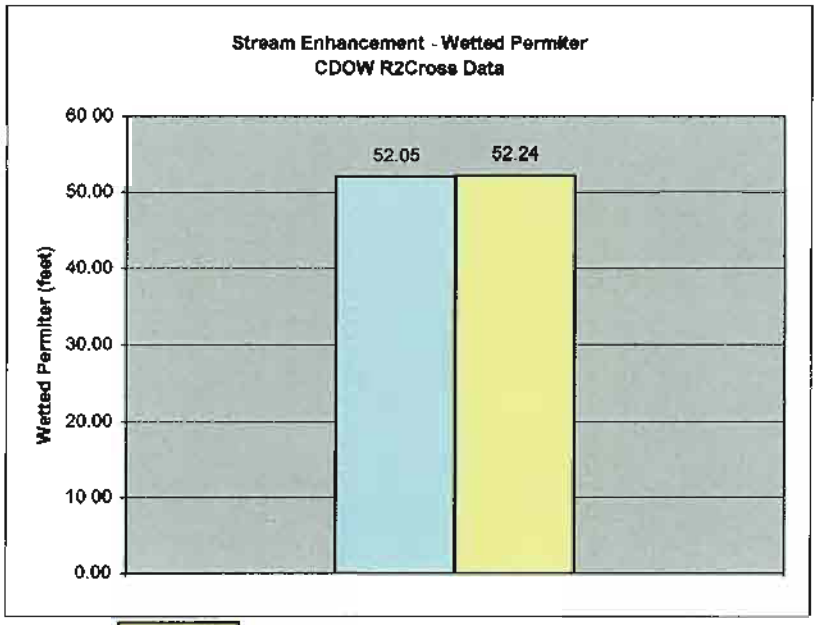
	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ.FT.)	WETTD PERIM (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	1.10	62.06	2.24	3.17	138.88	64.43	100.0	2.16	540.89	3.89
	1.46	60.89	1.92	2.81	116.88	63.03	97.8	1.85	411.72	3.52
	1.51	60.73	1.87	2.76	113.84	62.84	97.5	1.81	394.84	3.47
	1.56	60.60	1.83	2.71	110.80	62.67	97.3	1.77	378.12	3.41
	1.61	60.49	1.78	2.66	107.78	62.52	97.0	1.72	361.65	3.36
	1.66	60.37	1.74	2.61	104.78	62.37	96.8	1.68	345.47	3.30
	1.71	60.26	1.69	2.56	101.74	62.22	96.6	1.64	329.59	3.24
	1.76	60.14	1.64	2.51	98.73	62.06	96.3	1.59	314.01	3.18
	1.81	60.03	1.59	2.48	95.73	61.91	96.1	1.55	298.74	3.12
	1.86	59.92	1.55	2.41	92.73	61.76	95.8	1.50	283.77	3.06
	1.91	59.80	1.50	2.36	89.73	61.61	95.6	1.48	269.11	3.00
	1.96	59.69	1.45	2.31	86.75	61.45	95.4	1.41	254.77	2.94
	2.01	59.58	1.41	2.26	83.78	61.30	95.1	1.37	240.74	2.87
	2.06	59.46	1.36	2.21	80.79	61.15	94.9	1.32	227.03	2.81
	2.11	59.35	1.31	2.16	77.82	61.00	94.7	1.28	213.84	2.75
	2.16	59.23	1.26	2.11	74.85	60.84	94.4	1.23	200.59	2.68
	2.21	59.12	1.22	2.06	71.90	60.69	94.2	1.18	187.86	2.61
	2.26	58.96	1.17	2.01	68.94	60.50	93.9	1.14	175.55	2.55
	2.31	58.83	1.13	1.96	66.00	60.14	93.3	1.10	163.89	2.48
	2.36	58.22	1.08	1.91	63.08	59.72	92.7	1.06	152.70	2.42
	2.41	57.81	1.04	1.86	60.18	59.30	92.0	1.01	141.85	2.36
WL	2.46	57.39	1.00	1.81	57.30	58.87	91.4	0.97	131.34	2.29
	2.51	56.57	0.96	1.76	54.45	58.04	90.1	0.94	121.79	2.24
	2.56	55.67	0.93	1.71	51.64	57.13	88.7	0.90	112.68	2.18
	2.61	54.79	0.89	1.66	48.88	56.24	87.3	0.87	103.90	2.13
	2.66	54.31	0.85	1.61	46.15	55.75	86.5	0.83	94.98	2.06
	2.71	53.82	0.81	1.56	43.45	55.26	85.8	0.79	86.40	1.99
	2.76	53.34	0.76	1.51	40.77	54.76	85.0	0.74	78.17	1.92
	2.81	52.86	0.72	1.46	38.12	54.27	84.2	0.70	70.29	1.84
	2.86	52.30	0.68	1.41	35.49	53.70	83.3	0.66	62.84	1.77
	2.91	51.11	0.64	1.36	32.90	52.50	81.5	0.63	56.23	1.71
	Generated by Resource		**0.637**	**1.364**	**32.583**	**52.239**	**81.098**	**0.626**	**55.520**	**1.704**
	Generated by Resource		**0.636**	**1.349**	**32.351**	**52.047**	**80.803**	**0.623**	**55.000**	**1.699**
	2.96	49.05	0.62	1.31	30.38	50.42	78.3	0.60	50.56	1.66
	3.01	44.98	0.62	1.26	28.03	46.34	71.9	0.60	46.79	1.67
	3.06	43.23	0.60	1.21	25.82	44.57	69.2	0.58	41.89	1.62
	3.11	41.48	0.57	1.16	23.71	42.81	66.4	0.55	37.31	1.57
	3.16	40.19	0.54	1.11	21.67	41.51	64.4	0.52	32.79	1.51
	3.21	39.15	0.50	1.06	19.69	40.47	62.8	0.49	28.42	1.44
	3.26	38.06	0.47	1.01	17.78	39.36	61.1	0.45	24.37	1.37
	3.31	36.94	0.43	0.96	15.88	38.22	59.3	0.42	20.65	1.30
	3.36	35.99	0.39	0.91	14.06	37.23	57.8	0.38	17.14	1.22
	3.41	34.04	0.36	0.86	12.30	35.22	54.7	0.35	14.24	1.16
	3.46	31.39	0.34	0.81	10.67	32.52	50.5	0.33	11.84	1.11
	3.51	28.57	0.32	0.78	9.16	29.62	46.0	0.31	9.78	1.07
	3.56	24.54	0.32	0.71	7.87	25.54	39.6	0.31	8.38	1.07
	3.61	22.42	0.30	0.66	6.70	23.34	36.2	0.29	6.80	1.02
	3.66	20.34	0.28	0.61	5.63	21.18	32.9	0.27	5.43	0.96
	3.71	17.92	0.26	0.56	4.67	18.67	29.0	0.25	4.33	0.93
	3.76	15.59	0.25	0.51	3.83	16.26	25.2	0.24	3.42	0.89
	3.81	13.94	0.22	0.46	3.10	14.52	22.5	0.21	2.58	0.83
	3.86	12.28	0.20	0.41	2.44	12.78	19.8	0.19	1.89	0.77
	3.91	10.63	0.18	0.36	1.87	11.05	17.1	0.17	1.33	0.71
	3.96	8.97	0.15	0.31	1.38	9.31	14.5	0.15	0.90	0.65
	4.01	7.58	0.13	0.26	0.97	7.84	12.2	0.12	0.56	0.58
	4.06	6.32	0.10	0.21	0.62	6.52	10.1	0.10	0.30	0.49
	4.11	4.80	0.07	0.16	0.35	4.74	7.4	0.07	0.14	0.41
	4.16	2.99	0.05	0.11	0.16	3.07	4.8	0.05	0.05	0.32
	4.21	1.54	0.03	0.06	0.04	1.57	2.4	0.03	0.01	0.22

FIGURE 1
Roaring Fork River - 0.5 Miles Above Basalt
Stream Improvement From Stapleton Brothers Ditch Historical Consumptive Use Credit









ATTACHMENT 1

Colorado Division of Wildlife
R2 Cross Data Used to Support Instream Flow
On Roaring Fork River above Basalt, Colorado
Case No. 85CW646

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

LOCATION INFORMATION

STREAM NAME:	Roaring Fork #3
XS LOCATION:	1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER:	2
DATE:	14-Apr-77
OBSERVERS:	Bennett, Siebirg
1/4 SEC:	W 1/2
SECTION:	17
TWP:	8 S
RANGE:	86 W
PM:	0.41666667
COUNTY:	Pitkin
WATERSHED:	Roaring Fork River
DIVISION:	0
DOW CODE:	0
USGS MAP:	0
USFS MAP:	0

SUPPLEMENTAL DATA

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

TAPE WT:	0.0225
TENSION:	32

CHANNEL PROFILE DATA

SLOPE:	0.005

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

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

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

DATA POINTS= 35

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
1 G	0.00	1.10			0.00		0.00	0.00	0.0%
	1.00	1.50			0.00		0.00	0.00	0.0%
W	2.00	2.20	0.00	0.00	0.00		0.00	0.00	0.0%
	3.00	2.40	0.20	0.20	1.02	0.20	0.30	0.06	0.0%
	5.00	2.50	0.30	0.80	2.00	0.30	0.60	0.48	0.4%
	7.00	2.80	0.60	0.70	2.02	0.60	1.20	0.84	0.7%
	9.00	2.60	0.60	0.80	2.00	0.60	1.20	0.96	0.7%
	11.00	2.80	0.60	1.00	2.00	0.60	1.20	1.20	0.9%
	13.00	2.90	0.70	1.30	2.00	0.70	1.40	1.82	1.4%
	15.00	2.60	0.40	1.70	2.02	0.40	0.80	1.36	1.1%
	17.00	2.90	0.70	1.40	2.02	0.70	1.40	1.96	1.5%
	19.00	3.20	1.10	1.10	2.02	1.10	2.20	2.42	1.9%
	21.00	3.20	1.10	2.00	2.00	1.10	2.20	4.40	3.4%
	23.00	3.00	0.80	2.20	2.01	0.80	1.60	3.52	2.7%
	25.00	3.40	1.30	2.20	2.04	1.30	2.60	5.72	4.4%
	27.00	3.20	1.10	3.00	2.01	1.10	2.20	6.60	5.1%
	29.00	3.00	0.80	2.40	2.01	0.80	1.60	3.84	3.0%
	31.00	3.90	1.70	1.50	2.19	1.70	3.40	5.10	4.0%
	33.00	3.70	1.50	2.40	2.01	1.50	3.00	7.20	5.6%
	35.00	3.20	1.00	4.00	2.06	1.00	2.00	8.00	6.2%
	37.00	3.90	1.70	3.00	2.12	1.70	3.40	10.20	7.9%
	39.00	3.70	1.50	3.00	2.01	1.50	3.00	9.00	7.0%
	41.00	3.30	1.10	2.60	2.04	1.10	2.20	5.72	4.4%
	43.00	3.80	1.60	2.80	2.06	1.60	3.20	8.96	6.9%
	45.00	3.10	0.90	3.30	2.12	0.90	1.80	5.94	4.6%
	47.00	3.30	1.10	2.70	2.01	1.10	2.20	5.94	4.6%
	49.00	3.70	1.50	2.60	2.04	1.50	3.00	7.80	6.0%
	51.00	3.00	0.80	2.70	2.12	0.80	1.60	4.32	3.3%
	53.00	4.00	1.80	1.90	2.24	1.80	3.60	6.84	5.3%
	55.00	3.10	0.90	2.40	2.19	0.90	1.80	4.32	3.3%
	57.00	3.00	0.80	2.30	2.00	0.80	1.60	3.68	2.9%
	59.00	2.70	0.50	0.80	2.02	0.50	1.00	0.80	0.6%
W	61.00	2.20	0.00	0.00	2.06		0.00	0.00	0.0%
	63.00				0.00		0.00	0.00	0.0%
1 G	65.00				0.00		0.00	0.00	0.0%
TOTALS					60.48	1.8 (Max.)	57.30	129.00	100.0%

Manning's n = 0.0450
Hydraulic Radius= 0.9473924

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	57.30	68.53	19.6%
2.01	57.30	83.35	45.5%
2.03	57.30	82.15	43.4%
2.05	57.30	80.96	41.3%
2.07	57.30	79.78	39.2%
2.09	57.30	78.59	37.2%
2.11	57.30	77.40	35.1%
2.13	57.30	76.21	33.0%
2.15	57.30	75.03	30.9%
2.17	57.30	73.84	28.9%
2.19	57.30	72.66	26.8%
2.21	57.30	71.48	24.7%
2.22	57.30	70.89	23.7%
2.23	57.30	70.30	22.7%
2.24	57.30	69.71	21.7%
2.25	57.30	69.12	20.6%
2.26	57.30	68.53	19.6%
2.27	57.30	67.94	18.6%
2.28	57.30	67.35	17.5%
2.29	57.30	66.76	16.5%
2.30	57.30	66.18	15.5%
2.31	57.30	65.59	14.5%
2.33	57.30	64.42	12.4%
2.35	57.30	63.25	10.4%
2.37	57.30	62.09	8.4%
2.39	57.30	60.93	6.3%
2.41	57.30	59.77	4.3%
2.43	57.30	58.62	2.3%
2.45	57.30	57.47	0.3%
2.47	57.30	56.32	-1.7%
2.49	57.30	55.18	-3.7%
2.51	57.30	54.05	-5.7%

WATERLINE AT ZERO
AREA ERROR = 2.458

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

Constant Manning's n

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

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
"GL"	1.10	62.06	2.24	3.17	138.88	64.43	100.0%	2.16	540.89	3.89
	1.46	60.89	1.92	2.81	116.88	63.03	97.8%	1.85	411.72	3.52
	1.51	60.73	1.87	2.76	113.84	62.84	97.5%	1.81	394.84	3.47
	1.56	60.60	1.83	2.71	110.80	62.67	97.3%	1.77	378.12	3.41
	1.61	60.49	1.78	2.66	107.78	62.52	97.0%	1.72	361.65	3.36
	1.66	60.37	1.74	2.61	104.76	62.37	96.8%	1.68	345.47	3.30
	1.71	60.26	1.69	2.56	101.74	62.22	96.6%	1.64	329.59	3.24
	1.76	60.14	1.64	2.51	98.73	62.06	96.3%	1.59	314.01	3.18
	1.81	60.03	1.59	2.46	95.73	61.91	96.1%	1.55	298.74	3.12
	1.86	59.92	1.55	2.41	92.73	61.76	95.8%	1.50	283.77	3.06
	1.91	59.80	1.50	2.36	89.73	61.61	95.6%	1.46	269.11	3.00
	1.96	59.69	1.45	2.31	86.75	61.45	95.4%	1.41	254.77	2.94
	2.01	59.58	1.41	2.26	83.76	61.30	95.1%	1.37	240.74	2.87
	2.06	59.46	1.36	2.21	80.79	61.15	94.9%	1.32	227.03	2.81
	2.11	59.35	1.31	2.16	77.82	61.00	94.7%	1.28	213.64	2.75
	2.16	59.23	1.26	2.11	74.85	60.84	94.4%	1.23	200.59	2.68
	2.21	59.12	1.22	2.06	71.90	60.69	94.2%	1.18	187.86	2.61
	2.26	58.98	1.17	2.01	68.94	60.50	93.9%	1.14	175.55	2.55
	2.31	58.83	1.13	1.96	66.00	60.14	93.3%	1.10	163.89	2.48
	2.36	58.22	1.08	1.91	63.08	59.72	92.7%	1.06	152.70	2.42
	2.41	57.81	1.04	1.86	60.18	59.30	92.0%	1.01	141.85	2.36
"WL"	2.46	57.39	1.00	1.81	57.30	58.87	91.4%	0.97	131.34	2.29
	2.51	56.67	0.96	1.76	54.45	58.04	90.1%	0.94	121.79	2.24
	2.56	55.67	0.93	1.71	51.64	57.13	88.7%	0.90	112.68	2.18
	2.61	54.79	0.89	1.66	48.88	56.24	87.3%	0.87	103.90	2.13
	2.66	54.31	0.85	1.61	46.15	55.75	86.5%	0.83	94.98	2.06
	2.71	53.82	0.81	1.56	43.45	55.26	85.8%	0.79	86.40	1.99
	2.76	53.34	0.76	1.51	40.77	54.76	85.0%	0.74	78.17	1.92
	2.81	52.86	0.72	1.46	38.12	54.27	84.2%	0.70	70.28	1.84
	2.86	52.30	0.68	1.41	35.49	53.70	83.3%	0.66	62.84	1.77
	2.91	51.11	0.64	1.36	32.90	52.50	81.5%	0.63	56.23	1.71
	2.96	49.05	0.62	1.31	30.38	50.42	78.3%	0.60	50.58	1.66
	3.01	44.98	0.62	1.26	28.03	46.34	71.9%	0.60	46.79	1.67
	3.06	43.23	0.60	1.21	25.82	44.57	69.2%	0.58	41.89	1.62
	3.11	41.48	0.57	1.16	23.71	42.81	66.4%	0.55	37.31	1.57
	3.16	40.19	0.54	1.11	21.67	41.51	64.4%	0.52	32.79	1.51
	3.21	39.15	0.50	1.06	19.69	40.47	62.8%	0.49	28.42	1.44
	3.26	38.06	0.47	1.01	17.76	39.36	61.1%	0.45	24.37	1.37
	3.31	36.94	0.43	0.96	15.88	38.22	59.3%	0.42	20.65	1.30
	3.36	35.99	0.39	0.91	14.06	37.23	57.8%	0.38	17.14	1.22
	3.41	34.04	0.36	0.86	12.30	35.22	54.7%	0.35	14.24	1.16
	3.46	31.39	0.34	0.81	10.67	32.52	50.5%	0.33	11.84	1.11
	3.51	28.57	0.32	0.76	9.16	29.62	46.0%	0.31	9.78	1.07
	3.56	24.54	0.32	0.71	7.87	25.54	39.6%	0.31	8.38	1.07
	3.61	22.42	0.30	0.66	6.70	23.34	36.2%	0.29	6.80	1.02
	3.66	20.34	0.28	0.61	5.63	21.18	32.9%	0.27	5.43	0.96
	3.71	17.92	0.26	0.56	4.67	18.67	29.0%	0.25	4.33	0.93
	3.76	15.59	0.25	0.51	3.83	16.26	25.2%	0.24	3.42	0.89
	3.81	13.94	0.22	0.46	3.10	14.52	22.6%	0.21	2.58	0.83
	3.86	12.28	0.20	0.41	2.44	12.78	19.8%	0.19	1.89	0.77
	3.91	10.63	0.18	0.36	1.87	11.05	17.1%	0.17	1.33	0.71
	3.96	8.97	0.16	0.31	1.36	9.31	14.5%	0.15	0.90	0.65
	4.01	7.58	0.13	0.26	0.97	7.84	12.2%	0.12	0.56	0.58
	4.06	6.32	0.10	0.21	0.62	6.52	10.1%	0.10	0.30	0.49
	4.11	4.60	0.07	0.16	0.35	4.74	7.4%	0.07	0.14	0.41
	4.16	2.99	0.05	0.11	0.16	3.07	4.8%	0.05	0.05	0.32
	4.21	1.54	0.03	0.06	0.04	1.57	2.4%	0.03	0.01	0.22

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	129.00	cfs
CALCULATED FLOW (Qc)=	131.34	cfs
(Qm-Qc)/Qm * 100 =	-1.8	%
MEASURED WATERLINE (WLm)=	2.26	ft
CALCULATED WATERLINE (WLc)=	2.46	ft
(WLm-WLc)/WLm * 100 =	-8.5	%
MAX MEASURED DEPTH (Dm)=	1.80	ft
MAX CALCULATED DEPTH (Dc)=	1.81	ft
(Dm-Dc)/Dm * 100	-0.7	%
MEAN VELOCITY=	2.29	ft/sec
MANNING'S N=	0.045	
SLOPE=	0.005	ft/ft
.4 * Qm =	51.6	cfs
2.5 * Qm=	322.5	cfs

RECOMMENDED INSTREAM FLOW:

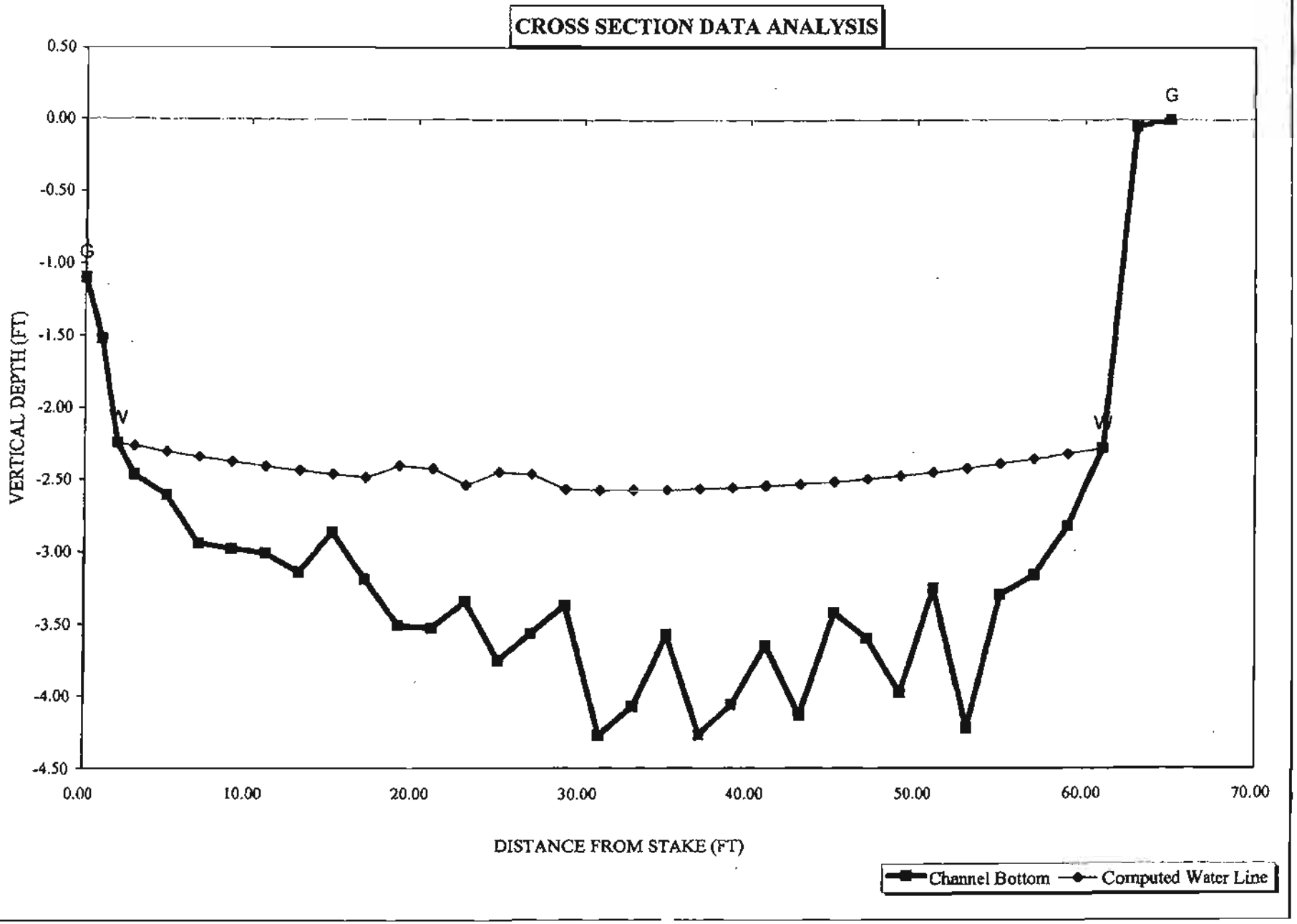
FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

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

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

Roaring Fork #3



Data Input & Proofing

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER: 2
DATE: 4/14/1977
OBSERVERS: Bennett, Siebirg

1/4 SEC: W 1/2
SECTION: 17
TWP: 8 S
RANGE: 88 W
PM: 10:00

COUNTY: Pitkin
WATERSHED: Roaring Fork River
DIVISION:
DOW CODE:
USGS MAP:
USFS MAP:

TAPE WT: Seg Tape 0.0225 lbs / ft
TENSION: 32 lbs

SLOPE: 0.005 ft / ft

CHECKED BY:.....DATE.....

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

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
		Total Data Points = 35						
1	G	0.00	1.10			0.00	0.00	0.00
		1.00	1.50			0.00	0.00	0.00
	W	2.00	2.20	0.00	0.00	0.00	0.00	0.00
		3.00	2.40	0.20	0.20	0.30	0.06	2.27
		5.00	2.50	0.30	0.80	0.60	0.48	2.31
		7.00	2.80	0.60	0.70	1.20	0.84	2.34
		9.00	2.80	0.60	0.80	1.20	0.96	2.38
		11.00	2.80	0.60	1.00	1.20	1.20	2.41
		13.00	2.90	0.70	1.30	1.40	1.82	2.44
		15.00	2.60	0.40	1.70	0.80	1.36	2.46
		17.00	2.90	0.70	1.40	1.40	1.96	2.49
		19.00	3.20	1.10	1.10	2.20	2.42	2.41
		21.00	3.20	1.10	2.00	2.20	4.40	2.42
		23.00	3.00	0.80	2.20	1.60	3.52	2.54
		25.00	3.40	1.30	2.20	2.60	5.72	2.45
		27.00	3.20	1.10	3.00	2.20	6.60	2.46
		29.00	3.00	0.80	2.40	1.60	3.84	2.57
		31.00	3.90	1.70	1.50	3.40	5.10	2.57
		33.00	3.70	1.50	2.40	3.00	7.20	2.57
		35.00	3.20	1.00	4.00	2.00	8.00	2.57
		37.00	3.90	1.70	3.00	3.40	10.20	2.56
		39.00	3.70	1.50	3.00	3.00	9.00	2.56
		41.00	3.30	1.10	2.60	2.20	5.72	2.55
		43.00	3.80	1.60	2.80	3.20	8.96	2.53
		45.00	3.10	0.90	3.30	1.80	5.94	2.52
		47.00	3.30	1.10	2.70	2.20	5.94	2.50
		49.00	3.70	1.50	2.60	3.00	7.80	2.48
		51.00	3.00	0.80	2.70	1.60	4.32	2.45
		53.00	4.00	1.80	1.90	3.60	6.84	2.42
		55.00	3.10	0.90	2.40	1.80	4.32	2.39
		57.00	3.00	0.80	2.30	1.60	3.68	2.36
		59.00	2.70	0.50	0.80	1.00	0.80	2.32
	W	61.00	2.20	0.00	0.00	0.00	0.00	0.00
		63.00				0.00	0.00	0.00
1	G	65.00				0.00	0.00	0.00
					Totals	57.30	129.00	

Tab 4
Exhibit F

14 October 2009

Geotechnical
Water Resources
Environmental and
Ecological Services

Sara Dunn
Balcomb & Green, P.C.
818 Colorado Avenue
P.O. Drawer 790
Glenwood Springs, CO 81602

Re: Fisheries Evaluation of the Proposed Instream Flow Acquisition Division 5: Stapleton Brothers Ditch

Dear Sara:

At your request, GEI Consultants, Inc. (GEI) reviewed the prehearing statements[1] and exhibits regarding the possible donation of a portion of the Stapleton Brothers Ditch Right for Instream Flow (ISF) Rights. We paid special attention to the proposed use of the historical consumptive use quantity below the point of return on the Roaring Fork River to its confluence with the Fryingpan River (sometimes identified as "Reach 3").

Background Information

Pitkin County has offered the use of 119.25 ac-ft of historical consumptive use credits of the total 220 ac-ft Stapleton Brothers Ditch Right to be used for ISF Rights. This quantity of water has only a limited availability of use from May 1st to October 31st of each year in a monthly pro-rata flow rate (Table 1).

Table 1: Monthly pro-rata historical consumptive use flows available for ISF Right.

Month	May	June	July	August	September	October
Flow (cfs)	0.25	0.47	0.52	0.39	0.27	0.05

The monthly historical consumptive use flow is proposed to be delivered into the Roaring Fork at its confluence with Maroon Creek and potentially would be used to enhance the existing Roaring Fork ISF of 55 cfs which extends from the confluence of Maroon Creek to the confluence of the Fryingpan River, approximately 16.1 miles. For example, given the maximum consumptive use flow of 0.52 cfs (Table 1), the ISF Right could potentially increase to 55.52 cfs for the month of July.

1 Prehearing Statement of Basalt Water Conservancy District and Starwood Metropolitan District; In the Matter of Proposed Instream flow Acquisition Division 5: Stapleton Brothers Ditch.
Prehearing Statement of Staff of Colorado Water Conservation Board; In the Matter of Proposed Instream flow Acquisition Division 5: Stapleton Brothers Ditch.

GEI Consultants, Inc./Ecological Division
5575 South Sycamore Street, Suite 101, Littleton CO 80120
303.794.5530 fax: 303.794.5041

However, this is only the maximum potential consumptive use flow – and it occurs in July, typically a higher-flow month in the river. The potential additional flows during other months can be considerably less (Table 1).

A key issue that the Colorado Water Conservation Board (CWCB) needs to adequately address with the proposed changes to the ISF Right is – will the historical consumptive use flow from the Stapleton Brothers Ditch Right provide sufficient improvement, to a reasonable degree[2], to the natural environment (i.e., fisheries habitat) to justify changing it for ISF use in the Roaring Fork from Maroon Creek downstream to the confluence with the Fryingpan River?

We have approached this question following three lines of evidence.

1. First, based on historical hydrological conditions in the Roaring Fork River near the confluence with Maroon Creek,
2. Second, based on the available R2CROSS output data provided by the Colorado Division of Wildlife (CDOW) within the reach from Maroon Creek downstream to the confluence with the Fryingpan River, and
3. Third, based on the seasonal timing of the additional water.

Effect of the Return of Historical Consumptive Use Flow on the Hydrograph

Hydrological conditions in Reach 3 are important to consider in a historical context, because the existing conditions provide a reference by which to measure the potential benefit of adding water during seasonal flow periods (e.g. summer flows noted in the filing – May to October). Daily mean stream flow data were retrieved from the gage at "Roaring Fork River below Maroon Creek near Aspen" (ROABMCCO) for the period from January 1989 to December 2008. This information was used to evaluate the minimum daily flow conditions during the Stapleton Brothers Ditch Right return flow period, May to October of each year, and the typical annual hydrograph. The minimum daily flow observed for each month of the hydrological record provides insight into the quantity of water available in the river at low flows and provides a measure to evaluate ISF needs to maintain fish habitat during low flow conditions. It also provides a "best case" scenario for evaluating the potential beneficial use of adding historical consumptive use flows to this system.

The lowest observed daily flow values mainly occurred during the 2002 extreme drought year when minimum daily flows ranged from 62 cfs in September to 182 cfs in June (Table 2). Through the period of record of 1989 to 2008, flow conditions in May 1991 were also the lowest observed (123 cfs) for that month. In general, low flow conditions during the rising limb of the hydrograph (May) were often in the 150 to 250 cfs range, with conditions during the peak of the hydrograph (June) often between 450

2 CRS § 37-92-103(4) (2000)…For the benefit and enjoyment of present and future generations, "beneficial use" shall also include the appropriation by the state of Colorado in the manner prescribed by law of such minimum flows between specific points or levels for and on natural streams and lakes as are required to preserve the natural environment to a reasonable degree.

to 650 cfs. In the falling portion of the hydrograph later in the summer, low flow conditions were more variable but often in the range of 200 to 450 cfs. During the transition to baseflow conditions from August to October, minimum flows were often in the 100 to 250 cfs range.

Table 2: Minimum daily flow (cfs) observed for relevant months in each year at the Roaring Fork River below Maroon Creek near Aspen gage, 1989 to 2008.

Year	May	June	July	August	September	October
1989	214	550	270	143	129	130
1990	138	515	202	116	89	137
1991	123	657	305	162	149	139
1992	376	476	258	205	160	156
1993	197	826	561	284	198	162
1994	184	553	210	149	128	137
1995	148	457	1,730	479	257	220
1996	214	844	423	229	206	199
1997	201	1,680	563	252	261	208
1998	217	598	416	204	158	161
1999	152	849	440	259	212	183
2000	293	390	179	153	144	132
2001	230	514	193	183	134	129
2002	199	182	97	64	62	109
2003	143	545	185	138	132	117
2004	154	440	195	123	115	136
2005	137	560	322	174	140	170
2006	330	524	265	180	145	195
2007	341	585	257	162	152	160
2008	238	1,270	590	232	176	154
50th Percentile	**200**	**552**	**268**	**177**	**147**	**155**

We also evaluated the mid-point or 50th percentile value of the low-flow data range for each month to summarize the minimum observed flows for each month. The 50th percentile value is typically the lowest observed flow that is expected to occur approximately half of the time. For example, in the month of July, the range of the minimum flows is from 97 cfs to 1,730 cfs, and the 50th percentile value is 268 cfs. In the 20 years of record at this gage, the 50th percentile minimum daily flow for May to October ranged from 147 cfs in September to 552 cfs in June. These values indicate the 50th percentile minimum daily flows are 2 to 10 times greater than the existing ISF Right of 55 cfs for this reach in the May through October period (Table 2).

The minimum daily flows observed in May 1991 and June – October 2002 are the "best case" scenario values by which to measure a beneficial change in flow due to the return of the historical consumptive use flows (i.e. the time when any addition of water would potentially have the most beneficial effect). However, when the minimum observed daily flows for each month are compared with the potential consumptive use flows, it

becomes readily apparent that the additional flows would represent much less than one percent of the flow that occurred in the river during the most extreme low flow conditions during the 20 year period from 1989 to 2008 (Table 3). With much less than 1% change in flow, this donation of the water right would not provide a reasonable benefit to natural environment using a "best case" scenario for beneficial change.

Table 3: Consumptive use return flow (cfs) as a percentage of the minimum daily flow for each month, 1989-2008.

Flow	May	June	July	August	September	October
Minimum Daily Flow	123	182	97	64	62	109
Return Flow	0.25	0.47	0.52	0.39	0.27	0.05
Return Flow as Percentage	0.20%	0.26%	0.54%	0.61%	0.44%	0.05%

When the consumptive use flows are compared to flows of a greater magnitude, such as the minimum daily flow of 1,730 cfs in July 1995, the consumptive use flow of 0.52 cfs becomes even more inconsequential. Based on the historical minimum flow conditions at this gage, there would be no measurable or reasonable benefit in flow by returning the historical consumptive use flows to this reach. Given the size of the river and the observation that minimum flows in this period of the year are often greater than 100 cfs, there are no field methods that can demonstrate that differences in flow of 0.52 cfs (Table 1) will result in any measurable reasonable benefit.

While this evaluation focused on the maximum consumptive use flow which potentially could occur in July, the lower flow periods of September and October are equally important to consider due to the baseflow conditions and the importance of defining the minimum fish habitat. However, the resulting potential consumptive use flows of 0.27 cfs and 0.05 cfs for September and October, respectively, would be equally non-measurable in terms of flow when compared to minimum daily flows observed during the extreme drought year of 2002 for those months (Table 3).

In summary, our evaluation of the effects of this donation based on an analysis of historical minimum flows indicates that the return of historical consumptive use flows to Reach 3 of the Roaring Fork River will not provide a reasonable benefit to the natural environment, nor has the CWCB adequately shown that there will be a reasonable benefit in the Roaring Fork River from the Maroon Creek confluence downstream to the confluence with the Fryingpan River with respect to these flows.

R2CROSS Transect Flows

Seasonal hydrological conditions are also important to consider in this analysis, because there are time periods within the proposed historical consumptive use season (May – October) that are more important for the growth or reproductive success of resident fish populations. Fishery surveys show the Roaring Fork River in the reach of interest supports self-sustaining populations of brown trout, mountain whitefish, mottled

sculpin, and white sucker. The consumptive use season typically represents the growing period for brown trout and mountain whitefish. Spawning for these two species generally occurs later in the fall (October – November).

The CDOW collected R2CROSS data to evaluate the hydraulic conditions necessary to support the passage of fish across typical riffle habitat in the consumptive use reach of the Roaring Fork River. Providing suitable hydraulic habitat to maintain adequate water velocity, water depth and percentage of total wetted perimeter width in riffles are key criteria evaluated by the R2CROSS methodology. Hydraulic output information from this methodology becomes the basis for establishing the ISF to protect the natural environment to a reasonable degree.

Using the maximum monthly pro-rata historical consumptive use flow (0.52 cfs in July) available for ISF use, and the available R2CROSS data provided by CDOW for a riffle transect identified as ½ m above Basalt (site between 2 irrigation ditches), the proposed increase in the ISF Right from 55 cfs to 55.52 cfs in July is "mathematically" quantifiable in the consumptive use return flow reach (Table 4). Based on the R2CROSS output, two of the three hydraulic criteria (average water depth and average stream velocity), which are of key importance to support the passage of fish across this riffle, actually show no change in the values when stream flow increases from 55 cfs to 55.52 cfs. Only the third criterion, the percent wetted perimeter criterion, shows a change with the additional flow (*see* Letter from Scott Fifer and Eric Mangeot to David Hallford, Esq. dated October 13, 2009). However, this change represents an increase of only 0.3 percent, which equates to a widening of the wetted channel width from 52.05 ft to 52.24 ft – which equates to an increase of approximately 2 inches in a channel that is over 50 ft wide. These computed changes are well within the measurement error rates of these parameters when using the R2CROSS methodology and it would not be possible to empirically quantify any beneficial changes to the fish habitat in this reach using appropriate protocols in the field.

Our analysis of the R2CROSS data again indicates that the use of the historical return flow from the Stapleton Brothers Ditch Right at the point of return to the Roaring Fork River downstream to the confluence with the Fryingpan River will not provide a measurable benefit to the fish habitat, nor any perceived benefit by the fish assemblages of the Roaring Fork River.

Table 4: Selected portion of R2CROSS output for a riffle located with the consumptive use reach of the Roaring Fork River. Output file was obtained from CDOW via Resource Engineering Inc. Interpolated flows, in addition to other parameters, are shown for baseflow conditions during the late winter period, and for the proposed consumptive use return flows plus the ISF value (e.g. 55 + 0.05 = 55.05 cfs which corresponds to October return flows).

STREAM NAME: Roaring Fork #3
XS LOCATION: 1/2 m. above Basalt (between 2 irrigation ditches)
XS NUMBER; 2

DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ. FT)	WETTD PERIM (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
2.66	54.31	0.85	1.61	46.15	55.75	86.5	0.83	94.98	2.06
Interpolated	Baseflow	0.82	1.58	44.27	55.41	86.01	0.80	89.00	2.01
2.71	53.82	0.81	1.56	43.45	55.26	85.8	0.79	86.40	1.99
2.76	53.34	0.76	1.51	40.77	54.76	85.0	0.74	78.17	1.92
2.81	52.86	0.72	1.46	38.12	54.27	84.2	0.70	70.29	1.84
2.86	52.30	0.68	1.41	35.49	53.70	83.3	0.66	62.84	1.77
2.91	51.11	0.64	1.36	32.90	52.50	81.5	0.63	56.23	1.71
Interpolated	July	0.64	1.35	32.58	52.24	81.10	0.63	55.52	1.70
Interpolated	June	0.64	1.35	32.56	52.22	81.07	0.63	55.47	1.70
Interpolated	August	0.64	1.35	32.53	52.19	81.02	0.63	55.39	1.70
Interpolated	September	0.64	1.35	32.47	52.15	80.96	0.62	55.27	1.70
Interpolated	May	0.64	1.35	32.46	52.14	80.94	0.62	55.25	1.70
Interpolated	October	0.64	1.35	32.37	52.07	80.83	0.62	55.05	1.70
Interpolated	ISF value	0.64	1.35	32.35	52.05	80.80	0.62	55.00	1.70
2.96	49.05	0.62	1.31	30.38	50.42	78.3	0.60	50.58	1.66
3.01	44.98	0.62	1.26	28.03	46.34	71.9	0.60	46.79	1.67

Seasonal Timing of Adding Flow

From a fisheries standpoint, the winter baseflow season is often more important with respect to flow additions than the seasonally high flow through the summer period. Adding water during the lowest baseflow conditions could potentially have more benefit to fish habitat in winter period. To address the timing aspect of when flow can be more critical to fish habitat, we also evaluated the 50th percentile of the daily flows observed for each day of the year (not just May-Oct), over the 20 year hydrological record at the ROABMCCO gage (Figure 1).

The hydrograph shows that months of February and March represents the time of year when baseflow conditions are the lowest (89 cfs) in the Roaring Fork River. The corresponding ISF for the winter period (October through April) is 30 cfs. Therefore, the 50th percentile daily flows are still much greater than the 30 cfs ISF (Figure 1). The lowest observed daily flow for the period of record is 54 cfs which occurred in February 1989. Nonetheless, based on the previous analysis above, addition of the maximum consumptive return flows of 0.52 cfs would still have no measureable or reasonable benefit, even during winter low baseflow conditions.

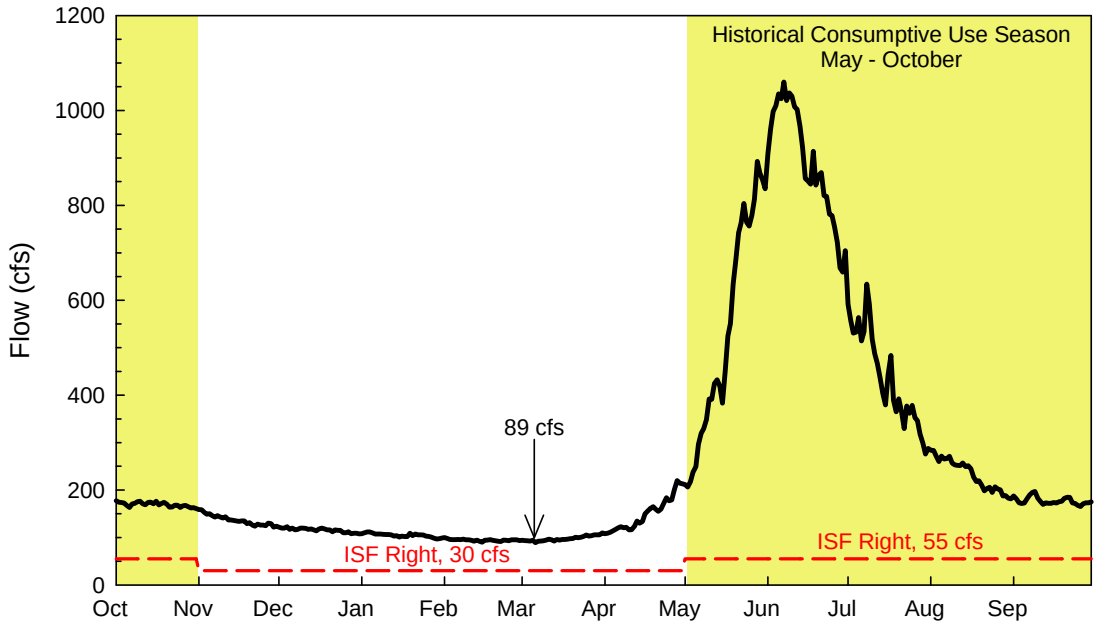


Figure 1: Typical daily flow (50th percentile) for each day of the year at the Roaring Fork River below Maroon Creek near Aspen gage, 1989 to 2008.

How Much Flow is Needed to Show a Change in the Hydraulic Criteria

We considered an additional question during the course of our analysis – how much additional flow would be needed to measurably increase the fish habitat given the existing baseflow conditions or the ISF. This analysis specifically examined the three R2CROSS criteria – average water depth, percent wetted perimeter, and average stream velocity – and determined the flow at which at least a 10 percent change in any one of the criterion

occurred. The 10 percent change is a commonly used threshold when evaluating changes in fisheries habitat, and is appropriate to use with the R2CROSS methodology to evaluate changes in stream habitat or hydraulic characteristics.

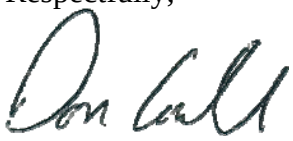
To address the question of how much flow is needed to increase the fish habitat at the R2CROSS transect we examined the output data at the baseflow conditions identified during February and March, as well as at the ISF Right of 55 cfs. Based on the median daily flow hydrograph (Figure 1), the lowest typical baseflow is 89 cfs. Using the R2CROSS output data, we referenced the average water depth, average water velocity, and percent wetted perimeter that corresponded to a flow of 89 cfs then added 10 percent to each value. Using the reference flow of 89 cfs, an additional flow of 15 cfs would be required to achieve a 10 percent change in the average water depth at this riffle. Similarly, using a reference value of 55 cfs, an additional flow of 12 cfs would be required to achieve a 10 percent change in the average water depth at this riffle. To achieve a 10 percent change in average velocity or percent wetted perimeter for either reference flow value, at least a 20 cfs or more flow would be required to increase these criteria. Thus, a 12-15 cfs flow increase at the R2CROSS transect would likely result in a measurable change of the hydraulic conditions in the Roaring Fork River near Basalt. This gives an indication of the magnitude of the changes in flow that may be necessary to benefit fish habitat in this section of the Roaring Fork River.

Our Conclusion

The proposed return of the historical consumptive use flows from May to October of each year from the point of return on the Roaring Fork River downstream to the confluence with the Fryingpan River will not provide a reasonable benefit to the natural environment. The potential addition of the maximum consumptive flow rate of 0.52 cfs in July, and lower flows in other months, represents much less than 1 percent of the minimum daily flows observed within this reach from 1989 to 2008. These small differences in flow are not measureable by R2CROSS methodology, nor would they be perceived by the fish assemblages of the Roaring Fork River.

In addition, it is our opinion that the amount of flow needed to change the hydraulic conditions and increase the fish habitat at the R2CROSS transect upstream of Basalt may require approximately an additional 12 to 15 cfs in winter. This amount of flow would reasonably increase the average water depth by approximately 10 percent above reference flows of 55 cfs and 89 cfs, respectively.

Respectfully,



Don J. Conklin

Craig F. Wolf

Tab 4
Exhibit G

Table 1
Blue River Gage Below Green Mountain
No. of Days Flows Are Less Than CWCB ISF 87CW299

Year	Month					
	May	June	July	August	Sept	October
1987	0	0	0	0	0	0
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	13	12	0	0	0	0
1991	0	0	0	0	0	0
1992	0	1	0	0	0	0
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	1	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	1	12	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	6	0	0	0	0	0
2002	0	0	0	0	27	22
2003	7	3	9	0	0	0
2004	6	30	12	0	0	0
2005	29	16	0	0	0	0
2006	0	0	0	0	0	0
2007	0	0	0	0	0	0
2008	0	0	0	0	0	0

Table 2
Blue River Gage Below Spruce Creek
No. of Days Flows Are Less Than CWCB ISF 87CW299

Year	Month					
	May	June	July	August	Sept	October
1989	0	0	0	0	0	0
1990	15	18	1	0	0	0
1991	0	0	0	0	0	0
1992	13	27	19	0	0	0
1993	0	0	0	0	0	0

Table 3
Blue River Gage Below Green Mountain
Average Flow Below CWCB ISF

Year	Month					
	May	June	July	August	Sept	October
1987	0	0	0	0	0	0
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	4.9	4.3	0	0	0	0
1991	0	0	0	0	0	0
1992	0	2.0	0	0	0	0
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	3.0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	4.0	4.2	0	0	0
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
2001	1.0	0	0	0	0	0
2002	0	0	0	0	19.2	23.6
2003	35.7	50.9	2.8	0	0	0
2004	2.5	3.0	4.1	0	0	0
2005	2.5	4.9	0	0	0	0
2006	0	0	0	0	0	0
2007	0	0	0	0	0	0
2008	0	0	0	0	0	0

Table 4
Blue River Gage Below Spruce Creek
Average Flow Below CWCB ISF

Year	Month					
	May	June	July	August	Sept	October
1989	0	0	0	0	0	0
1990	44.8	24.7	1.00	0	0	0
1991	0	0	0	0	0	0
1992	11.4	26.46	25.6+	0	0	0
1993	0	0	0	0	0	0

Tab 5

BEFORE THE COLORADO WATER CONSERVATION BOARD

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION DIVISION 5: STAPLETON BROTHERS DITCH

Rebuttal Statement of Willow Creek Ditch and Herrick Ditch Company and Roaring Fork Land and Cattle Company

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Willow Creek Ditch and Herrick Ditch Company and Roaring Fork Land and Cattle Company, through their undersigned attorneys, submit this Rebuttal Statement for the November 16, 2009 hearing in this matter.

I. Introduction.

Willow Creek Ditch and Herrick Ditch Company (the "Ditch Company") operates the Willow Creek Ditch and Herrick Ditch structures located on Willow Creek and Maroon Creek, upstream from the Stapleton Brothers Ditch. Roaring Fork Land and Cattle Company ("Roaring Fork") is a shareholder in the Ditch Company, and also owns water rights which are a subject of pending water court cases on Willow Creek and Maroon Creek. The Ditch Company and Roaring Fork outlined their chief concerns in their August 27, 2009 Prehearing Statement. The Ditch Company and Roaring Fork submit this Rebuttal Statement only to clarify and/or rebut certain issues raised by the Colorado Water Conservation Board ("CWCB") and Pitkin County in their Prehearing Statements.

II. Rebuttal/Clarification Issues.

A. Historical Return Flows.

The CWCB argues that "[i]n Case No. 99CW306, the timing of return flows was assumed to be within the same month as diversion and no delayed return flows need to be maintained…. This ISF reach [on the Roaring Fork River between Maroon Creek and the Fryingpan Rivers] does not rely on any maintenance of delayed historical return flows because Case No. 99CW306 decreeing the change of water right quantified the historical consumptive use and did not specify any delayed historical return flows that would need to be maintained." This argument ignores the fact that the timing of return flows was neither addressed nor litigated in Case No. 99CW306, and is thus proper for consideration in the upcoming change case. Williams v. Midway Ranches Prop. Owners Ass'n, 938 P.2d 515, 525 (Colo. 1997). This argument ignores the fact that the existing ISF on the Roaring Fork River was satisfied in part by delayed return flows from irrigation under the Stapleton Brothers Ditch. This is also a precarious argument to raise because it fails to consider the associated political and public perception risks, namely that:

1. By taking this position, in every future change of water right proceeding involving dry-up of a senior irrigation water right that the CWCB opposes, parties

will use this case as precedent against the CWCB that the applicant need not account for delayed irrigation return flows;

2. By arguing that it will not apply its own legal position of requiring consideration of the timing of return flows to itself when it is the change of water right applicant, the CWCB is sending the message that "the rules don't apply to us" and is attempting to shirk this issue through legal technicality; and

3. It is the CWCB's own instream flow water right on the Roaring Fork River from Maroon Creek to the Frying Pan River that will suffer injury if the delayed return flows associated with this change of water right are not accounted for.

Ignoring this last point is especially troublesome because the CWCB has recently adopted a formal policy of not accepting injury to its own water rights except "…when no other reasonable water supply alternatives can be implemented." Statement of Basis and Purpose, available at http://cwcbweblink.state.co.us/ElectronicFile.aspx?docid=128498; *see also* Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, 2 CCR 408-2, Rules 8(e) and 8(i)(3) (decision not to oppose a water court application does not constitute acceptance of injury by the CWCB.) By applying lower standards to itself when it is the change of water right applicant, the CWCB is forsaking its duties as an impartial, non-partisan public agency charged with "…aiding in the protection and development of the waters of the state… for the welfare and benefit of the state and its inhabitants," C.R.S. § 37-60-102 (2009), and faces serious public perception problems. Applicants for changes of water rights in cases in which the CWCB elects to oppose will hereinafter raise the admitted position of the CWCB. The CWCB will then be in the position of either waiving the claim or sacrificing its credibility.

B. "Whether the amount of water available for acquisition is needed to provide flows to meet a decreed ISF amount in below average years."

In describing the available stream gauge records on Maroon Creek, the CWCB argues that "…data from this gage shows that Maroon Creek dropped below 14 cfs in more than half of the years in the period of record. The gage data also shows a lowest flow amount of 9 cfs for the period of record from 1969 to 1994. This gage shows that the flow was less than 14 cfs on 683 days during the period of record. …Consequently, it appears that the acquired water may be needed to meet the decreed Maroon Creek ISF amount in some below average years." This argument contains a glaring omission.

The Stapleton Brothers Ditch is an irrigation water right. As such, it has a season of use limitation implied in its decree. The decree in Case No. 99CW306 assumed an irrigation season of May 1 through October 31. The engineering report prepared by Martin and Wood Water Consultants, Inc. for Case No. 99CW306, p. 3., states that the season of use is in fact May 23 through September 27. The table attached as **Exhibit A** shows the minimum daily mean discharge (cfs) for each day for the Maroon Creek gauge (period of record from October 1, 1968 through September 30, 1994). The lowest daily mean flow for the entire period of record, only considering the Stapleton Brothers Ditch irrigation season of May 1 through October 30 for each

year, is 13 cfs on May 1. If one looks at the irrigation season as identified in the engineering report, the lowest daily mean flow for the entire period of record is 20 cfs on September 27.[1] Accordingly, the data points used by the CWCB in arguing that the additional water is needed (lowest flow amount of 9 cfs and 683 days the gauge reading dropped below 14 cfs) are irrelevant because they occurred outside of the irrigation season. The USGS data shows that the lowest flow during the irrigation season over the entire period of record was in fact 13 cfs, not 9 cfs as the CWCB states. Thus, the acquired water is not in fact needed to preserve or improve the existing Maroon Creek ISF, because the available data shows that the existing ISF is nearly always satisfied.

C. Potential for Injury to Decreed Water Rights.

The CWCB and Pitkin County argue that there is no potential for injury to decreed water rights presented by the proposed loan. This argument ignores the fact that if the change of water right results in an expansion of historic beneficial use of the Stapleton Brothers Ditch, injury will occur automatically. As explained below, if the full 8 cfs is changed to instream use this is an expansion which constitutes injury. While it is true that the 99CW306 decree quantified the historic *consumptive* use associated with the 136 acres dried up under the Stapleton Brothers Ditch, the decree did not address and quantify the associated *flow rate* based on historic use, and therefore this issue is not res judicata.

The Stapleton Brothers Ditch was decreed for 8 cfs to irrigate 400 acres. See decree attached as **Exhibit B**. As such, the decreed "duty of water" is 1 cfs for 50 acres of land. In water court the CWCB and Pitkin County will have to contrive an argument that the full 8 cfs decreed to irrigate 400 acres was needed and beneficially used without waste to irrigate the 136 acres ultimately dried up. By seeking a further change of use to instream flow purposes, the CWCB and Pitkin County risk that the right will be requantified to a lesser flow rate amount, based on the following fundamental change case principles:

1. Water not applied to a beneficial use never ripens into an appropriation which can be changed. Green v. Chaffee Ditch Co., 371 P.2d 775, 782 (1962).

2. The right to change the use of water rights decreed for agricultural irrigation is limited to the "duty of water" (that amount of water necessary to efficiently grow crops at the decreed place of use,) Weibert v. Rothe Bros., Inc., 618 P.2d 1367, 1371 (Colo. 1980). An implied limitation read into every decree is that diversions are limited to an amount sufficient for the purpose for which the appropriation is made, even though that may be less than the decreed rate of diversion. Id. at 1367.

3. An appropriator cannot enlarge the historical use of a water right by changing it and then diverting the full decreed amount under the new use even

[1] Table 2 of the engineering report shows that the irrigation season identified in that report is more accurate, since the diversion records show that during the period of record diversions began as early as May 1 in only 3 of the 24 years studied.

though the historic beneficial use was less than the decreed rate of diversion. Orr v. Arapahoe County Water and Sanitation Dist., 753 P.2d 1217, 1224 (Colo. 1988).

4. Enlargement of a water right over historic beneficial use constitutes injury. See, e.g., Southeastern Colo. Water Conservancy Dist. v. Fort Lyon Canal Co., 720 P.2d 133, 146 (Colo. 1986.

5. Terms and conditions to prevent injury in a proposed change case include "[t]he relinquishment of part of the decree for which the change is sought… if necessary to prevent an enlargement upon the historical use… to the detriment of other appropriators." C.R.S. § 37-92-305(4) (2009).

The CWCB and Pitkin County will not be able to demonstrate to the water court actual beneficial use without waste of the full 8 cfs decreed to the Stapleton Brothers Ditch. The water right was decreed to irrigate 400 acres. However, by the County's own estimation, only 136 acres were historically irrigated. Since changes of water rights are limited by historic beneficial use and the decreed duty of water, ***the maximum amount available for change will in fact be 1.46 cfs*** (4.3 cfs X (136/400)). The Ditch Company and Roaring Fork implore the CWCB to evaluate the risk of requantification before accepting the loan.

D. Downstream Use/Green Mountain Reservoir Protection.

The CWCB and Pitkin County indicate their desire to locate a water user downstream of the confluence of the Frying Pan and Roaring Fork Rivers to reuse the Stapleton Brothers Ditch consumptive use credits for agricultural irrigation. The reason that the CWCB and County are so eager to locate at downstream user is that without one, use of the water right for instream flow purposes does not qualify as preferred beneficiary under the Green Mountain Reservoir Operating Policy and historic users pool. As such, the water right will be entirely unenforceable at the very times when enforcement would be necessary- when stream flows are low and the "Cameo call" from irrigators near Grand Junction is on- because the Stapleton Brothers Ditch itself will be called out.

Use of the Stapleton Brothers Ditch consumptive use credits at a place other than the decreed place of use constitutes a change of water right, for which a water court change decree is necessary. C.R.S. § 37-92-103(5). C.R.S. § 37-92-302(1)(a) (2009). The CWCB and Pitkin County have not even mentioned that a change case will be necessary in order to effectuate use of the credits downstream of the claimed instream flow use. Furthermore, it is at best questionable whether the downstream irrigation use (a preferred beneficiary) would afford the instream use (a non-preferred beneficiary) Historic User Pool protection. The state Division of Water Resources' position in several cases is that any change of a water right entitled to preferred beneficiary status to a use other than irrigation, domestic, or augmentation of such uses causes loss of historic user protection. Thus, the CWCB faces the risk that this water right will be entirely unenforceable when needed after undertaking the lengthy change case or cases.

E. Effect on Interstate Compacts

The CWCB and Pitkin County argue that converting the Stapleton Brothers Ditch water right to instream flow use will preserve a pre-Colorado River Compact water right. This argument conflicts with the plain language of the Compact. The Colorado River Compact allocates water for "beneficial *consumptive* use….". C.R.S. § 37-61-101(III)(a). The Compact also states that, "[t]he states of the Upper Division shall not withhold water… which cannot reasonably be applied to domestic and agricultural uses." C.R.S. § 37-61-101(III)(e). Read together, these provisions show that converting a pre-Compact water right to a non-consumptive instream use results in loss of protection as a "present perfected right."[2]

Pitkin County raises this argument for fear that its consumptive use credits will decay over time due to non-use. The Ditch Company and Roaring Fork note that in less than five (5) years since the decree, Pitkin County has already sold or used for domestic and irrigation purposes 100.75 acre feet of the 220 acre feet of decreed credits. The Ditch Company and Roaring Fork's position is that Pitkin County and Colorado residents are ultimately better off with the credits being put to beneficial consumptive uses in plans for augmentation or otherwise so that Compact protection is maintained.

III. Conclusion.

The Ditch Company and Roaring Fork request that the CWCB take serious consideration of the risks it will incur by putting the Stapleton Brothers Ditch water right before the water court for a further change. CWCB staff and the County are urging the CWCB to proceed indiscriminately with the proposed loan without evaluating these risks. If the CWCB accepts a water right which is potentially reduced or rendered unenforceable as a result of the change case, it must ask itself whether this process is worthwhile, and whether this is an appropriate test case for HB 08-1280.

HB 08-1280 provides the CWCB with authority to determine what terms and conditions it will accept in a contract or agreement for a proposed instream flow acquisition. C.R.S. § 37-92-102(3). The Ditch Company and Roaring Fork request that the CWCB require the following conditions if it decides to accept the acquisition:

1. In the water court change case, the CWCB will account for delayed irrigation return flows and will consider the extent to which the flow rate decreed to the Stapleton Brothers Ditch is diminished based on historic beneficial use.

2. The CWCB will require a contract with a downstream end user prior to accepting the loan, and will have reached an agreement on who will fund and prosecute the required change case.

3. The CWCB will require the proposed Trust Agreement to be revised such that acceptance of the 34 other water rights owned by Pitkin County and proposed to be loaned to the CWCB is not mandatory, and will require evidence that the Board of County Commissioners of Pitkin County

[2] Note that Compact Article III(a) states that the 7,500,000 acre feet of beneficial consumptive use allocated to the Upper Basin "…shall include all water necessary for the supply of any rights which may now exist."

noticed and provided reasonable opportunity for public input on the proposed loan of all of its irrigation water rights to the CWCB.

4. The CWCB will determine if it can acquire the necessary interests in land to construct the stream gauge necessary to administer and enforce the loaned right, and will determine if funding is available for a stream gauge.

Dated October 15, 2009

PATRICK, MILLER & KROPF, P.C.
A Professional Corporation

/s/ Paul L. Noto
By:_____
Paul L. Noto, #34074
730 E. Durant Street, Suite 200
Aspen, CO 81611
(970) 920-1028

ATTORNEYS FOR WILLOW CREEK DITCH AND HERRICK DITCH COMPANY AND ROARING FORK LAND AND CATTLE COMPANY

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was served on this 15th day of October, 2009 upon the following via electronic mail:

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/s/ Leslie A. Regan

Leslie A. Regan

Tab 5
Exhibit A

Exhibit A

National Water Information System: Web Interface

USGS Water Resources

Data Category: Surface Water | Geographic Area: United States | GO

News New Mapper and Experimental Real-Time Web Service - updated August 2009

USGS Surface-Water Daily Statistics for the Nation

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 09075700 MAROON CREEK ABOVE ASPEN, CO.

Available data for this site | Time-series: Daily statistics | GO

Pitkin County, Colorado
Hydrologic Unit Code 14010004
Latitude 39°07'25", Longitude 106°54'17" NAD27
Drainage area 35.4 square miles
Gage datum 8,720.00 feet above sea level NGVD29

Output formats: HTML table of all data | Tab-separated data | Reselect output format

00060, Discharge, cubic feet per second,

Minimum of daily mean values for each day for 25 - 26 years of record in, cfs (Calculation Period 1968-10-01 -> 1994-09-30)

Period-of-record for statistical calculation restricted by user

Day of month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	10	10	11	10	13	54	51	31	25	20	16	12
2	9.5	10	11	10	13	54	50	30	25	20	16	13
3	10	10	11	10	14	62	48	30	25	19	16	11
4	10	10	11	10	14	83	47	30	24	19	16	12
5	10	10	10	9.8	14	76	47	29	24	19	15	12
6	11	10	11	10	14	74	47	29	24	19	16	12
7	11	10	11	10	14	80	45	29	23	20	16	12
8	11	10	11	10	14	100	43	29	23	19	16	12
9	11	10	10	10	14	110	42	28	23	19	17	13
10	11	10	11	10	14	113	41	28	22	19	16	13
11	11	10	11	10	15	110	40	27	23	19	15	10
12	11	11	11	10	15	113	38	26	23	19	15	10
13	11	11	11	10	16	115	37	27	22	18	15	12
14	11	11	11	10	17	112	36	27	22	18	15	12
15	11	12	11	10	19	106	35	26	23	18	15	12
16	10	12	11	11	21	100	34	26	23	18	15	12
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18	10	11	11	12	23	92	33	26	22	17	15	12
19	10	11	11	11	23	88	32	25	22	17	15	12
20	10	11	11	11	23	84	31	26	21	17	15	11
21	10	11	11	11	23	79	30	26	21	17	14	10
22	10	11	11	11	25	74	31	26	21	17	14	11
23	10	11	11	11	28	71	31	25	21	17	14	12
24	10	11	11	11	30	67	32	25	21	17	14	11
25	10	11	11	14	35	65	32	25	21	17	14	12
26	10	11	11	14	34	61	33	25	21	17	14	12
27	10	11	10	15	35	59	32	26	20	17	14	12
28	10	11	10	14	35	57	32	25	20	17	14	12
29	10	15	9.0	13	36	55	31	25	20	17	14	11
30	10		9.8	13	38	52	31	25	20	16	14	11
31	10		10		56		31	25		17		11

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U.S. Department of the Interior | U.S. Geological Survey

Title: Surface Water data for USA: USGS Surface-Water Daily Statistics
URL: http://waterdata.usgs.gov/nwis/dvstat?

Page Contact Information: Colorado NWISWeb Maintainer
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Tab 5
Exhibit B

Exhibit B

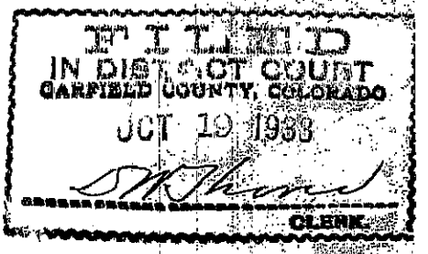
State of Colorado)
) ss.
County of Pitkin)

In the District Court

No. 3000

In the matter of the application of James Stapleton and Timothy Stapleton for an adjudication of their priority of right of the use of water from Maroon Creek for irrigation and other beneficial purposes, through the Stapleton Brothers' Ditch in Water District No. 38.

DECREE



Now on this 16th day of October, A.D. 1933, the same being one of the regular juridicial days of the October term, A.D.1933, of our District Court, the above entitled matter comes on regularly to be heard on the Petition of James Stapleton and Timothy Stapleton and of the objections and protests made and entered herein on the 18th. day of August, A.D. 1933, fixing a time of this hearing and prescribing the notice thereof, to be given to all persons interested adversely therein. The Petitioners appearing by their attorney Wm. R. Shaw, Esq., and no other person or corporation appearing in opposition or otherwise and the time allowed having now expired, thereupon the Petitioners, James Stapleton and Timothy Stapleton, offered evidence in support of their rights and claims made by them herein and the Court having heard and considered the same and being well and fully advised in the premises does now find with reference to the rights and claims of the said James Stapleton and Timothy Stapleton, Petitioners herein,

First: That the Petitioner, James Stapleton and Timothy Stapleton, are the owners of and entitled to the immediate possession of the following described lands situate in Pitkin County, State of Colorado, to-wit: The west half of the northwest quarter, Sec. 9, T. Lo, R. 85, Lots 12, 26, 27, Sec. 27 T. 9 R. 85, East quarter of the southeast quarter Sec. 28, T.9 R. 85, Lot 1, Sec. 33, T. 9 R. 85, lot 17, Sec. 34, T. 9, R. 85, Lot 19, Sec. 27, T. 9 R. 85, Lots 2, 5, 13, 14, Sec. 34, T. 9, R. 85, West half of the southeast quarter, east half of the southwest half, Sec. 34, T. 9. R. 85, West half of the northwest quarter, northwest quarter of the southwest quarter Sec. 34, T.9, R. 85, Lots 7, 10, 15, 16, Sec. 34, T. 9, R. 85.

All of the above described lands being in Township nine south,

Exhibit B

of which 400 acres are under cultivation, all being situate in Water District number 38, Pitkin County, State of Colorado, and are further susceptible of irrigation from the water of the Maroon Creek through the Stapleton Brothers' Ditch.

Second: That the Petitioners are the sole claimants of the said Stapleton Brothers' Ditch; that said ditch takes its supply of water from the Maroon Creek in Water District Number 38; that work of construction was commenced June 1904, and completed to a carrying capacity of 19.15 cubic feet of water per second of time, of which 8 cubic feet of water per second of time has been used by the Petitioners ever since that date upon the lands above described.

Third: That the amount of land lying under the ~~said first~~ enlargement of the said Stapleton Brothers' Ditch, which has been cultivated and irrigated by water from said ditch and the size and carrying capacity thereof is sufficient to entitle the said ditch to an appropriation on the original construction thereof of 8 cubic feet of water per second of time for irrigation purposes for the use and benefit of the Petitioners and their assigns; ~~that the enlargement of the said ditch by reason of its original construction shall be numbered _____ and is entitled to priority number _____ in the decrees of this Court for Water District Number 38, dating from June, 1904.~~

IT IS THEREFORE CONSIDERED, ORDERED, ADJUDGED AND DECREED that the said Stapleton Brothers' Ditch be numbered 189 and is entitled to priority number 269 in the decrees of this Court for Water District Number 38, dating from June, 1904; that said ditch be awarded an appropriation upon the original construction thereof of 8 feet (cubic) of water per second of time dating from June, 1904, and that there be allowed to flow into the said Stapleton Brothers' Ditch from the Maroon Creek for the use and benefit of the Petitioners for irrigation purposes by virtue of said appropriation 8 cubic feet of water per second of time of the waters of the Maroon Creek; and that this Decree shall bind with equal force the heirs and assigns of the

Exhibit B

said James Stapleton and Timothy Stapleton.

IT IS FURTHER ORDERED BY THE COURT that these findings and this decree shall be subject to the same general conditions and provisions as are contained in the general decree of this Court made and entered on the 18th day of ~~August~~ May, A. D. 1889, for Water District Number 38.

IT IS FURTHER ORDERED BY THE COURT that this cause be hereafter omitted from the docket of the court subject to restoration thereon upon the application of the said Petitioners, their heirs and assigns, upon due and proper notice, for the purpose of such further adjudication, if any, he may seek to obtain by reason of the bringing of additional of their said lands under irrigation as aforesaid.

DONE IN OPEN COURT.

John T. Thomas

JUDGE

Tab 6

Colorado Water Conservation Board 1313 Sherman Street, Room 721 Denver, Colorado 80203	
Concerning the Proposed Instream Flow Acquisition of Stapleton Brothers Ditch for Maroon Creek and the Roaring Fork River	
Drew Peternell Trout Unlimited 1320 Pearl Street, Suite 320 Boulder, Colorado 80302 Phone: (303) 440-2937 Email: dpeternell@tu.org	Administrative Proceeding

Trout Unlimited's Rebuttal Statement
Stapleton Brothers Ditch, Water Division No. 5

Pursuant to Rule 6m of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program of the Colorado Water Conservation Board ("CWCB" or "Board"), Trout Unlimited ("TU") hereby submits this Rebuttal Statement.

Introduction

TU is a non-profit fisheries conservation organization. With 150,000 members nationwide and 10,000 members in Colorado, TU's mission is to conserve, protect and restore North America's coldwater fisheries and the watersheds they inhabit. In Colorado, where depleted stream flows and altered flow regimes are amongst the greatest threats to fishery health, TU focuses much of its effort on projects designed to protect or restore flows to rivers and streams in order to sustain trout populations. TU views the CWCB's instream flow program as one of the best tools available in Colorado for achieving its goals, and TU staff and volunteers commit countless hours to working with the CWCB program.

As a non-profit organization, TU has limited finances, staffing and other resources. Nevertheless, TU has elected to participate in these proceedings because of the importance of the CWCB's instream flow acquisition program and because of TU's particular interest in the Roaring Fork River valley and the proposed Stapleton Brother Ditch ("SBD") water right acquisition.

TU supports and concurs with the recommendation of the CWCB staff, as presented in staff's pre-hearing and rebuttal statements. In addition, TU presents the following points:

Disputed Factual or Legal Issues

Natural Environment

CWCB staff proposes to use the full 4.3 cfs diversion amount of the SBD water right to preserve or improve the natural environment of Maroon Creek and the Roaring Fork River from the point of historical diversion on Maroon Creek down to the point of historical return flow on the Roaring Fork. Staff proposes to use the historical consumptive use to preserve or improve the natural environment of the Roaring Fork River from the point of historical return flow down to the confluence with the Fryingpan River. The CWCB would use the SBD acquisition to preserve the natural environment when the existing instream flow rights on Maroon Creek or the Roaring Fork River are not otherwise being met, and the Board would use the SBD water to improve the natural environment when the acquired water would increase flows above the amounts of the existing instream flow rights.

The Basalt Water Conservancy District and the Starwood Metropolitan District (collectively, the "Districts") and the Willow Creek and Herrick Ditch Company and the Roaring Fork Land and Cattle Company (collectively, the "Companies") assert that, historically, flows in Maroon Creek and the Roaring Fork River have been adequate to satisfy the existing instream flow rights and argue that, accordingly, the CWCB's acquisition of the SBD water right is unnecessary. *Districts' Prehearing Statement, p. 1-2; Companies' Prehearing Statement, p. 1-2.* The argument, apparently, is that there is no role for the CWCB's instream flow acquisition program if an appropriated instream flow right in the relevant reach, which by statute would be limited to the amount of water necessary to preserve the environment, is always satisfied. Regardless of whether the instream flow rights on Maroon Creek and the Roaring Fork River have, in fact, always been satisfied historically, the Districts and the Companies ignore the CWCB's authority to acquire water rights to improve the natural environment.

The Colorado General Assembly first authorized the instream flow program in 1973. At that time, the General Assembly granted the CWCB the power only to preserve the environment. S.B. 73-97. In 2001, the General Assembly expanded the instream flow program, conferring on the CWCB the authority to acquire water to preserve or "improve" the natural environment. *S.B. 01-156.* The General Assembly further clarified the CWCB's acquisition authority in 2008, reaffirming the Board's authority to acquire water to improve the environment. *H.B. 08-1280.* It would defy logic, and the General Assembly's intent, to interpret the CWCB's statutory authority to acquire water to **improve** the environment as being limited to circumstances when a water right appropriated to **preserve** the environment is not satisfied, as the Districts and Companies suggest.

As the Colorado Division of Wildlife makes clear in its letter to the CWCB of August 26, 2009, the addition of the SBD water to Maroon Creek and the Roaring Fork River "above the current decreed instream flow values, would improve the natural environment within these reaches by adding depth, velocity and wetted area to these reaches." *Letter From Mark Uppendahl to Linda Bassi, p. 3.* The assertions of the Districts and Companies that there is no

natural environment in need of preservation or improvement are misplaced and should be disregarded.

Maximum Utilization

The Districts raise questions about the impact of the proposed acquisition on maximum utilization of the waters of Colorado. *Districts' Prehearing Statement, p. 3-4.* Maximum utilization is a doctrine of Colorado water law, "intended to make water available for as many decreed uses as there is available supply." *Pagosa Area Water and Sanitation District v. Trout Unlimited*, 170 P.3d 307, 313 (Colo. 2007). According to the Colorado Supreme Court:

> The policy of maximum utilization does not require a single-minded endeavor to squeeze every drop of water from [streams or aquifers]. C.R.S. §37-92-501(2)(e) makes clear that the objective of "maximum use" administration is "optimum use." Optimum use can only be achieved with proper regard for all significant factors, including environmental and economic concerns. *See* C.R.S. §37-92-102(3).

Alamosa La-Jara Water Users Protection Ass'n v. Gould, 674 P.2d 914, 935 (Colo. 1983).

The SBD instream flow acquisition would promote the goal of maximum utilization, as the Supreme Court has articulated the doctrine, for several reasons. First, the instream flow use of the SBD water would be non-consumptive and, as such, the water would be available for successive uses downstream, thereby increasing the number of decreed uses that can be made of the water. Additionally, the instream flow would preserve and improve the natural environment and, in turn, contribute to the tourist-based economy and quality of life in Pitkin County, all relevant factors to the maximum utilization determination under *Alamosa*, 674 P.2d at 935.

The Districts and Companies assert that, as a result of the instream flow acquisition, the SBD water right might lose Green Mountain historic user pool ("HUP") protection, suggesting that this could undermine maximum utilization. *Districts' Prehearing Statement, p. 3-4; Companies' Prehearing Statement, p. 3.* As the CWCB and Pitkin County staff will testify, efforts are underway to lease the consumptive use credit of the SBD water to a downstream consumptive user, and this could shield the SBD water right against loss of HUP protection. Even if this were not the case, the concern that the SBD water right might lose HUP protection and therefore be subject to a call or curtailment from downstream Cameo water rights ignores the fact that the instream flow use would be non-consumptive. As a practical matter, there is no way to call or curtail a non-consumptive water right; the water would be available to a downstream calling right – in this case, the Cameo water rights – without any curtailment. Thus, the potential loss of HUP protection does not impact maximum utilization in any way.

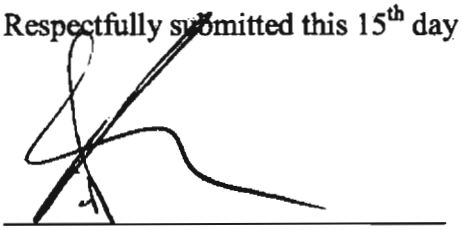
Finally, the Districts and Companies present concerns about the impact of the SBD acquisition on other water rights and the effect this may have on maximum utilization. *Districts' Prehearing Statement, p. 2-4; Companies' Prehearing Statement, p. 2.* In this respect, the Board

should be mindful that the acquisition is specifically designed to have no impact on the amounts of water that historically have been available to other water rights. From the point of historical diversion down to the point of historical return flow, the CWCB would use the amount of historical diversion, an amount of water that would not be available to other users in that reach, regardless of whether the water right is used for its historical irrigation purpose or for the proposed instream flow. Similarly, below the point of historical return flow, the CWCB would use the amount of the historical consumptive use, an amount, again, that would not be available to any other water user, regardless of whether the SBD water right is placed to irrigation or instream flow use.

Rebuttal Witnesses

- Ken Neubecker, president of Colorado Trout Unlimited and resident of the Roaring Fork River valley. Mr. Neubecker will testify regarding the manner in which acquisition of the subject water right for instream flow use will contribute to maximum utilization of the waters of the state.

Respectfully submitted this 15th day of October, 2009.



Drew Peternell
Counsel for Trout Unlimited

Certificate of Service

I hereby certify that a true and correct copy of the foregoing Rebuttal Statement was served on this 15th day of October, 2009 upon the following via electronic mail:

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Tab 7

BEFORE THE COLORADO WATER CONSERVATION BOARD

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION DIVISION 5: STAPLETON BROTHERS DITCH

Motion for Leave to Substitute Testifying Witness

Basalt Water Conservancy District ("BWCD") and Starwood Metropolitan District ("SMD") (collectively the "Districts"), through counsel, hereby request leave to substitute Craig F. Wolf, Aquatic Ecologist, for Don Conklin, Jr. who was identified in the Districts' October 14, 2009 Rebuttal Statement.

Counsel for the Districts were notified October 20th that an unavoidable conflict had arisen for Don Conklin and he would be out of town on November 16th and unable to testify. Craig F. Wolf is also employed by GEI Consultants, Ecological Division, 5575 S. Sycamore Street, Suite 101, Littleton CO 80120 and is the co-author of the Fisheries Evaluation of the Proposed Instream Flow Acquisition Division 5: Stapleton Brothers Ditch dated October 14, 2009 and disclosed in the Districts' Rebuttal Statement.

Craig F. Wolf will testify regarding the results of the R2CROSS analysis and other evidence demonstrating that no measurable benefit to the fish habitat or perceived benefit by the fish assemblages will occur in Reach 3 based on the addition of the SBD HCU. A copy of Craig F. Wolf's Resume of Qualifications is attached hereto.

We have consulted with the other hearing participants regarding our request. The Board of County Commissioners for Pitkin County, Trout Unlimited, the Colorado Water Conservation Board, the Willow Creek and Herrick Ditch Company and the Roaring Fork Land and Cattle Company have no objection to the substitution. We have not received a response to our request from the Colorado Water Trust.

Respectfully submitted this 21st day of October, 2009.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Motion to Substitute Testifying Witness** was served on this 21st day of October, 2009 upon the following via electronic mail.

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Craig F. Wolf, Aquatic Ecologist

GEI Consultants

Education
M.S., Ecology (Environmental Engineering Minor), Texas Tech University, 1997
B.S., Environmental, Population, and Organismic Biology, University of Colorado, 1987

Professional Society Memberships
Colorado Lake and Reservoir Management System (CLRMA)
North American Lake Management Society (NALMS)

Background

Craig Wolf's expertise includes field sampling in a wide variety of aquatic habitats, with emphasis on lakes and reservoirs from Montana to Antarctica. He is experienced in the design of aquatic sampling programs, data analysis, project management and report preparation. He has developed a thorough understanding of statistical and mathematical concepts and incorporated this knowledge into ecological and hydrological models evaluating the effects of flow and nutrient concentrations on aquatic life.

Experience

Colorado River Wild and Scenic Designation. Actively participated in the Stakeholder Group process to provide an Alternative Management Plan to the BLM. Develop proposed flow based resource guides using IFIM to be protective of the fishing outstanding recreational value in the Colorado River from Kremmling downstream to State Bridge.

Southern Delivery System, Environmental Impact Statement. Participated in the IFIM data collection for Fountain Creek, and the development of weighted useable area curves for sand shiner, red shiner and white sucker. Used IFIM and IHA to evaluate how hydrological conditions may affect the fish and benthic invertebrate communities of the Arkansas River, Fountain Creek, Monument Creek, and associated reservoirs.

New Mexico Environmental Department, Draft Hydrology Protocol. Provide a technical review of the hydrological protocol for the determination of ephemeral, intermittent, and perennial waters in the State of New Mexico.

Cherry Creek Basin Water Quality Authority, Colorado. Assist with a long-term monitoring program on nutrient loading and resulting algal biomass for Cherry Creek Reservoir, Colorado. Involved regular monitoring of in-lake nutrients, chlorophyll *a*, algal densities and number of species, zooplankton populations, and derivation of depth profiles for dissolved oxygen and temperature. Also conducted monitoring of influent streams during base flow and during storm events. Compiled data and calculated loads for reservoir modeling, TMDL load allocations, and watershed modeling.

Climax Mining Company, Colorado. Conducted a use-attainability analysis (UAA) for West Fork Clear Creek in support of stream classification issues and development of approved site-specific water quality standards for zinc.

Colorado Department of Public Health and Environment, Colorado. Designed and implemented a study to determine sediment impairment status for western Colorado streams and BLM lands. Included habitat assessment, sampling of benthic invertebrates, and preparation of recommendations regarding impairment status.

Colorado Wastewater Utility Council, Colorado. Provided technical expertise with specific regard to participation in the Nutrient Criteria Workgroup (set up by the Colorado Water Quality Control Division and the Colorado Water Quality Forum). Included technical review of workgroup products, attendance at workgroup meetings, and presentation at symposia concerning aquatic life use classification and water quality criteria issues.

London Mine, Colorado. Provided water quality review and recommendations regarding appropriate site-specific zinc standards for Mosquito Creek and tributaries in the vicinity of an historic mine site. Included review of existing water quality data, TMDL report, and proposed management strategies to protect the aquatic life use.

Newmont Mining Company/Resurrection Mining, Colorado. Continued seasonal monitoring of benthic invertebrate populations, and annual monitoring of fish populations and fish habitat quality for sites in the upper Arkansas River/California Gulch drainage near Leadville, Colorado.

South Platte Coalition for Urban River Evaluation (SP CURE), Colorado. Provided technical support and laboratory toxicity testing with regard to water effects ratio testing for copper at five wastewater treatment discharge points in the South Platte Basin, as well as technical review of use of the biotic ligand model for copper WER development. Also worked with SP CURE members to develop a Pilot Scale "Expected Condition" Study to assess resident and potential aquatic biological communities of an urban, effluent-dominated river.

Unocal/Molycorp, Inc., New Mexico. Conduct sampling of fish and invertebrate populations in the Red River as part of an annual monitoring plan, as well as sediment toxicity testing. This effort was also being used by the State of New Mexico as part of a TMDL study on the river.

U.S. Bureau of Reclamation/City of Colorado Springs, Colorado. Provided aquatic ecological support for an EIS for the proposed Southern Delivery System pipeline and water exchange alternatives. Included review of existing aquatic biological data for the Arkansas River, Fountain Creek, and relevant tributaries, collection of new data, analysis of potential flow impacts to aquatic biota using the Index of Hydrologic Alteration, and analysis of potential changes in water quality on aquatic life.

Research Scientist, Aquatic Ecologist. Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, Montana. Duties included supervision of limnological data collection (chemical, biological and physical parameters), radiochemical production analyses (algal and bacterial), epifluorescence, light, and scanning electron microscopy, analytical geochemistry (carbon, nitrogen, and phosphorus) data analyses, and database management; mentoring graduate and undergraduate students, administration of research activities and budgets, and website development and management.

Publications

Foreman, C.M., C.F. Wolf, and J.C. Priscu. 2004. **Impact of episodic warming events on the geochemical stoichiometry of lakes in the McMurdo Dry Valleys, Antarctica.** *Aquatic Geochmistry* 10: 239-268.

Lee, P.A., J.A. Mikucki, C.M. Foreman, J.C. Priscu, G.R. Ditullio, S.F. Riseman, S.J. deMora, C.F. Wolf, and L. Kester. 2004. **Thermodynamic constraints on microbially mediated process in lakes of the McMurdo Dry Valleys, Antarctica.** *Geomicrobiology Journal* 21:221-237.

Roberts, E.C., J.C. Priscu, C.F. Wolf, W.B. Lyons, and J. Laybourn-Parry. 2004. The distribution of microplankton in the McMurdo Dry Valley Lakes, Antarctica: **Response to ecosystem legacy or present day climatic controls?** *Polar Biology* 27:238-249.

Tab 8

BEFORE THE COLORADO WATER CONSERVATION BOARD

IN THE MATTER OF PROPOSED INSTREAM FLOW ACQUISITION DIVISION 5: STAPLETON BROTHERS DITCH

SECOND PREHEARING ORDER

Hearing Date

The hearing in this matter is scheduled for November 16, 2009, 1:30-5:30 p.m., at 1580 Logan, Suite 610, Denver, Colorado, 80203.

Conduct of Hearing

The Hearing will be governed by the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program, including Rule 6m(5) regarding the conduct of the hearing. At the hearing, the Board will hear from CWCB Staff, the Parties and interested members of the public. The Board will not permit CWCB Staff or Parties to introduce written material at the hearing not previously submitted pursuant to these CWCB Rules without good cause. There will be no cross-examination; only the Board may question witnesses at the hearing.

Allocation of Time

1) CWCB Staff: 58 minutes for presentation; 15 minutes for rebuttal

2) Board of County Commissioners of Pitkin County: 50 minutes for presentation

3) Colorado Water Trust: 7 minutes for presentation

4) Trout Unlimited: 5 minutes for presentation

5) Public Comment: may be limited by CWCB

6) Willow Creek Ditch and Herrick Ditch Co. and Roaring Fork Land and Cattle Co.: 30 minutes for presentation; 20 minutes for closing statement (with Starwood Metropolitan District and Basalt Water Conservancy District)

7) Starwood Metropolitan District and Basalt Water Conservancy District: 40 minutes

Motion

Basalt Water Conservancy District and Starwood Metropolitan District moved for leave to substitute testifying witness on October 21, 2009. There being no objection, the motion for substitution is hereby granted.

Dated this 22nd day of October 2009.

/s/

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Second Prehearing Order was served on this 22st day of October, 2009 upon the following via electronic mail:

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